



Planning To Succeed

Business and Financial Planning
Curriculum for High School Students

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Lesson 1 – Introduction to the Language of Business

Bell Ringer: As quickly as you can write as many expenses that are associated with a beef cattle operation. Consider everything from labor to fuel and don't leave anything out!

A. Section 1 – Est. time: 10-15 minutes

Have each student briefly introduce his/her farming or business background to the rest of the class.

1. Type of farm or business experience
 - a. This farm experience may be from their parent's or grandparents' operation, or a neighbor
2. Have students tell what type of farm experience – what type of operation
 - a. Dairy, Poultry, Beef, Row Crop, Produce etc.
3. If no farm experience, ask them what business experience they have
 - a. Again, can be from a family operation or a neighbor's operation, summer job, etc.
4. Have students tell what their main responsibilities were on this farm or business
5. Look for commonalities among the students' experiences
 - a. each business had to deal with people
 - manager, clients/customers, employees, suppliers, etc.
 - b. each business had assets (buildings, equipment, livestock, land, etc.)
 - c. it took money to run each business
 - d. each business was trying to make profits
 - e. there are laws and regulations that impact each business
 - f. anything else that came up in the discussion

B. Section 2 – Est. time: 45 minutes

Define basic business terms through the use of an example business

1. There is a "unique language" in the business world. You should understand the main business, finance, and accounting terms so that you can talk with lenders, accountants, lawyers, consultants, etc.
2. Let's use a simplified business such as a lawn-mowing business or a roadside stand (or convenience store, or some other business with which the students will be familiar) to illustrate the main business terms.
3. Lawn-mowing business: It is a sole proprietorship owned and operated by Tim. Tim owns 2 riding lawn mowers, 2 string trimmers (Weed-eaters), and 1 blower. He also owns a truck and trailer to haul his equipment. Tim mows lawns within a 20-mile radius of his home. He has 1 hired worker to help him. Most of Tim's customers pay him with a check or cash each time he mows; but, some of his customers ask to be "billed" so that they can pay him at a later date.
 - a. Understanding profits
 - Most businesses operate so that they can make profits. They use these profits to buy new equipment for the business and to pay the owners for their living expenses.
 - "Profits" refer to the money from the sale of products that is "left over" after all expenses are paid.

- i. **Profits** = Revenues – Expenses
- ii. **Revenues** are the money coming in from the sale of products/services over a given period of time (week, month, quarter, year).
 - **Revenues for a product** = Price/unit x Quantity sold
 - For Tim’s business, revenues for mowing lawns are equal to the price that he charges per lawn times the number of lawns that he mows.
 - Tim charges an average price of \$50/lawn. He mows 20 lawns per week. His revenues for the week are \$1,000 (\$50/lawn x 20 lawns)
 - If Tim offered other services besides lawn mowing (fertilizing, weed control, mulching, etc.) he would calculate the revenues from each of these services. He would add the revenues from each service to get the **Total Revenues** for his business.
- iii. **Expenses** are the cost of doing business. There are 2 main types of Expenses:
 - Operating (or Variable) Expenses – aka “Cost of Goods Sold”
 - 1. These expenses are the “day-to-day” expenses of running the business. Many times these expenses are referred to as “out of pocket” expenses. Managers have the most control over operating expenses.
 - 2. For Tim’s business, the main operating expenses are: (have the students name these)
 - Fuel, repairs, and hired labor
 - 3. Total Operating expenses change with the level of business. The more business you do, the higher the operating expenses will be. For example, if Tim does more lawns each week, his total expense for fuel, repairs, and labor will increase. If he does fewer lawns due to bad weather or due to losing customers to other lawn mowing businesses, his total operating expenses will decrease.
 - Overhead (or Fixed) Expenses
 - 1. Fixed expenses, or “overhead” expenses, are expenses that you have just because you are in business. These expenses typically do NOT change with the level of production. For example, Tim’s overhead expenses will not change dramatically if he mows more lawns each week – these expenses will remain fairly constant.
 - 2. Examples of business overhead expenses are:
 - Insurance (auto, building, health, etc.)
 - Rent or lease expenses
 - Advertising
 - Office expenses (utilities, office supplies)
 - Administrative labor (secretary, receptionist, office manager, etc.)
 - Property taxes
 - Interest payments on loans
 - Business licenses
 - Owner’s salary (what the owner pays himself/herself)
 - These expenses remain fairly constant whether Tim does 5 lawns per week or 100 lawns per week. For example, the insurance premiums (the cost of the insurance policy) on the truck will not change if Tim does 5 lawns this week or if he does 100 lawns this week.

3. Depreciation is a fixed (overhead) expense related to buildings and equipment (assets) that are owned by the business. Depreciation is simply the loss of value of an asset (building, lawn mower, truck, etc.) because:
 - It gets older ("Rust out")
 - It wears out from use ("Wear out")
 - Newer equipment is more efficient ("Fade out")
 - Depreciation is an expense to the business. If a business does not generate enough revenues to "cover" the depreciation of its assets, those assets cannot be replaced when they wear out. It is VERY important to include depreciation in your total expenses!
- **Total Expenses** = Operating Expenses + Overhead Expenses
 Over time, a business must be able to generate enough revenues to pay its Total Expenses. That means it is able to pay for its operating inputs and the fixed costs of running the business
- iv. **Gross Margin** = Revenues – Operating Expenses
 Gross Margin is the term businesses use to show the difference between the operating expenses (or Cost of Goods Sold) of a product/service and the selling price of that product/service. You typically want your gross margin on your products and services to be greater than zero.
 - For Tim's business, assume it costs him \$35/lawn in operating expenses (fuel, repairs, hired labor). If he charges \$50/lawn, his gross margin per lawn is \$15/lawn (\$50 - \$35). This margin can be used to pay the overhead expenses of the business, including Tim's salary.
 - If Tim mows 20 lawns per week, his weekly gross margin is \$15/lawn x 20 lawns = \$300/week.
- v. **Profits** = Revenues – Total Expenses
 Or Profits = Revenues – Operating Expenses – Overhead Expenses
 Or Profits = Gross Margin – Overhead Expenses
 - A manager wants the profits for the business to be greater than zero. This means that the business is generating enough revenues to pay for all of the operating expenses and have enough left over to pay for the overhead expenses. By covering the overhead expenses, the business will be paying the owner for his/her efforts and it will be setting aside funds to buy new equipment to replace the older ("depreciated out") equipment.
 -It is important to understand that Revenues are NOT the same thing as Profits. A group of students were selling t-shirts at a college event. I asked them, "how's business today?" They replied by saying, "We've made almost \$200 today." In reality, they had \$200 of revenues that day. Assuming it cost them \$125 in operating expenses to buy those t-shirts, their Gross Margin was only \$75 (\$200 - \$125). If they had \$50 in overhead expenses (for example, they had to pay \$50 to be able to set up a table at that event), then their Profit for the day would be \$25 (\$200 - \$125 - \$50; or \$75 gross margin - \$50 overhead). There is a big difference between thinking you made \$200 of profits and actually making only \$25 of profits!!
 -Revenues = \$200

-Operating Costs (or Cost of Goods Sold) = \$125

-Gross Margin = \$75

-Overhead = \$50

-Profit = \$25

b. The “Capital Structure” of business

i. “Capital” is a term for the resources that a business owns – land, buildings, equipment, and money. If a business makes a “capital purchase”, that means they are buying something to use in the business – buying a new piece of equipment, replacing an older machine with a newer one, expanding the size of the business, etc. A “capital purchase” does not include the purchase of feed, fertilizer, or other things that will be used up in the normal operation of the business.

ii. “Assets” is a similar term to “capital”. An Asset is something of value that the business owns or controls through a long-term contract or lease. Examples of assets in a business include (have the students come up with a list of assets for a business):

- land and buildings (“real property” or “real estate”)

- machinery & equipment – tractors, mowers, wagons, skid loaders

- livestock – cattle, sheep, hogs, poultry

- cash on hand, cash in checking or savings accounts

- accounts receivable – this is money owed to the business for providing a product/service “on credit” – where the customer takes possession of the product today but doesn’t pay until later (typically one month later).

For Tim’s lawn mowing business, the main assets are:

- 2 riding mowers

- 2 string trimmers

- 1 blower

- 1 truck

- 1 trailer

- cash in the business checking account

- accounts receivable owed to Tim from customers who want to be billed and pay at the end of the month

iii. “Liabilities” are debts that the business owes to someone else (its creditors).

- Businesses typically use loans to purchase expensive assets (land, buildings, equipment, etc.). The “lender” or “creditor” gives the owner a set amount of money that is used to make the purchase. The owner agrees to repay that money, plus interest (the cost of borrowing money), over a specified time period. This enables the owner to buy the asset without having to use a large portion of his/her savings or profits.

- There are different types of liabilities:

- Accounts Payable – these are short-term loans that are commonly used to purchase operating inputs (feed, fertilizer, seed, hired labor, etc.). The owner buys these inputs “on account” or “on credit” – that means they take the inputs back to their business, but they don’t actually pay for them until a month or so later.

- Loans – loans are more formal arrangements than Accounts Payable. When an owner wants to borrow money to purchase an asset, he/she will apply for a loan from a lender. If/When the loan application is approved, the lender will provide the owner with a specified amount of money, with the understanding that the money will be used exactly as discussed in the loan application. The owner (borrower) agrees to repay the loan, plus interest, as specified in the loan contract. We'll talk more about loans in the "Balance Sheet" lesson.
- iv. Owners Equity (also called Net Worth)
 - "Equity" is a term that represents how much of an asset is actually paid for by the owner. For example, if Tim pays \$5,000 in cash for a new mower, his "equity" in that mower is \$5,000. However, assume that he buys a \$5,000 mower by paying \$2,000 in cash and borrowing the remaining \$3,000. In this case, Tim's equity in the mower is \$2,000.
 - $\text{Equity} = \text{Net Market Value of the Asset} - \text{The Amount of the Loan that is still owed}$
 - or: $\text{Equity} = \text{Asset Value} - \text{Liability owed on that Asset}$
 - Assume that Tim bought a mower for \$4,000 a few years ago. He paid \$1,000 in cash and borrowed \$3,000 when he bought the mower. Today, that mower is worth \$2,500 if he were to sell it. The mower has lost value over time because it has depreciated - due to use and age. As of today Tim still owes \$800 on the loan. That means Tim's equity in the mower is \$1,700 (\$2,500 value - \$800 loan outstanding).
 - An owner wants to see his/her equity (or net worth) increasing over time. That means that the owner is paying down the loans that were used to build the business, and that the business is earning profits to be able to pay down the loans and reinvest in the business.

Materials: **PowerPoint on "The Language of Business"**
 Note Organizer
 In Class Exercise and Key
 Homework Exercise and Key
 Student Driven Learning Activity



The Language of Business

- There are terms specific to the business world
 - Like learning a new language
- You should understand these terms:
 - To improve your business management
 - To be able to talk with:
 - Lenders
 - Accountants
 - Consultants
 - Lawyers
 - Other business owners/managers

FARM CREDIT
KNOWLEDGE CENTER

Understanding Profits

- Most businesses try to earn profits
 - Profits allow them to:
 - Invest in the company
 - Buy new equipment, expand, replace old equipment
 - Pay the owners
- Profits = the money left after paying all expenses
 - Profits = Revenues - Expenses

FARM CREDIT
KNOWLEDGE CENTER

Profits

- Revenues
 - The money coming in (income) from selling your product or service
 - Revenues = Selling Price/Unit x Units Sold
 - For all products/services sold
 - Revenue refers to the money coming in
 - It does NOT include any expenses

FARM CREDIT
KNOWLEDGE CENTER

Profits

- Expenses = cost of doing business
- 2 Main Types of Expenses:
 - Variable Expenses (Operating Expenses)
 - These are expenses that change directly with the level of production
 - If you increase production, these costs increase
 - If you decrease production, these costs decrease
 - Easy to think of "out of pocket" expenses
 - Also called "Cost of Goods Sold"
 - Examples:
 - Fuel, fertilizer, seed, chemicals, etc.

FARM CREDIT
KNOWLEDGE CENTER

Profits

- Overhead (Fixed) Expenses
 - These are costs that you have just because you are in business
 - Business licenses, property taxes
 - Office rent, insurance premiums
 - Administrative and office expenses, interest on loans
 - Depreciation
 - Owners salary (not always included in overhead)
 - These costs do NOT change significantly if production changes
 - If production increases, office rent does not change

FARM CREDIT
KNOWLEDGE CENTER

Profits

- Total Expenses = Variable Exp. + Overhead
 - Measure of the total cost of doing business
- Gross Margin = Revenues - Variable Expenses
 - You want your gross margin to be greater than \$0
- Gross Margin/Unit = Gross Margin divided by the number of units sold
 - Good number to know
 - It shows which products are earning you the most



Profits

- Total Profit = Revenues - Total Expenses
 - Or: Profit = Gross Margin - Overhead Expenses
 - Also called "net income"
- You want Profit to be greater than \$0
 - The higher the better (usually)!
- When a manager talks about "the bottom line", they are referring to profits



Capital Structure

- Capital = resources that a business owns
 - Land, buildings, equipment, labor, cash
- A "capital purchase" refers to buying something that will be used in the business year after year
 - Tractors, breeding livestock, barns, mowers



Capital Structure

- Asset = something tangible that a business owns or controls
 - Land, buildings, equipment, cash, inventories
 - Breeding livestock, feeder livestock, fencing
 - Accounts receivable
 - This refers to money owed to a producer for items sold "on credit" or "on account"
 - Example: A customer buys \$5,000 of lumber on credit and will be billed at the end of the month.
 - The \$5,000 is called "accounts receivable" for the seller



Capital Structure

- Liabilities = something the business owes to a lender or creditor
 - Accounts Payable = money owed to a supplier for items purchased on credit
 - You will pay the supplier at the end of the month
 - Loans = more formal arrangement than Acct. Payable
 - Loans are used to purchase high-dollar assets
 - Apply to a lender for a loan
 - Lender provides you with funds for your stated purchase
 - You repay the lender over time
 - Terms are specified in the loan contract



Capital Structure

- Owners Equity (or Net Worth)
 - Equity = the difference between market value of an asset and the remaining loan balance
 - Equity = Value of Assets - Remaining Loan
 - You want your equity to be greater than \$0
 - You want your equity to grow over time
 - This means you are:
 - Earning profits
 - Paying down your liabilities
 - The value of your business is growing



The Language of Business– Note Organizer

There are terms specific to the business world

- Like learning a new language

You should understand these terms:

- To improve your business management
- To be able to talk with:
 - _____
 - Accountants
 - _____
 - Lawyers
 - Other business owners/managers

Understanding Profits

Most businesses try to earn profits

- Profits allow them to:
 - _____
 - Buy new equipment, expand, replace old equipment
 - Pay the owners

_____ = the money left after paying all expenses

- $\text{Profits} = \text{Revenues} - \text{Expenses}$

Revenues

- The money coming in (_____) from selling your product or service
- $\text{Revenues} = \text{Selling Price/Unit} \times \text{Units Sold}$
 - For all products/services sold
- Revenue refers to the money coming in
 - It does NOT include any expenses

_____ = cost of doing business

2 Main Types of Expenses:

Variable _____ (Operating Expenses)

- These are expenses that change directly with the level of production
 - If you increase production, these costs increase
 - If you decrease production, these costs decrease
- Easy to think of “out of pocket” expenses
- Also called “_____”
- Examples:
 - Fuel, fertilizer, seed, chemicals, hired labor, repairs

Overhead (_____) Expenses

- These are costs that you have just because you are in business
 - Business licenses, property taxes
 - Office rent, insurance premiums
 - Administrative and office expenses, interest on loans
 - _____
 - Owners salary (not always included in overhead)
- These costs do NOT change significantly if production changes
 - If production increases, office rent doesn't change

Total Expenses = _____ + Overhead

- Measure of the total cost of doing business

_____ = Revenues – Variable Expenses

- You want your gross margin to be greater than \$0

Gross Margin/ _____ = Gross Margin divided by the number of units sold

- Good number to know
- It shows which products are earning you the most

Total Profit = Revenues – _____

- Or: Profit = Gross Margin – Overhead Expenses
- Also called “ _____ ”
- You want Profit to be greater than \$0
 - The higher the better (usually)!
- When a manager talks about “ _____ ”, they are referring to profits

Capital Structure

_____ = resources that a business owns

- Land, buildings, equipment, labor, cash
- A “ _____ ” refers to buying something that will be used in the business year after year
 - Tractors, breeding livestock, barns, mowers

Asset = something tangible that a business owns or controls

- Land, buildings, _____, cash, inventories
- Breeding livestock, feeder livestock, fencing
- Accounts receivable

- This refers to money owed to a producer for items sold “_____” or “_____”
- Example: A customer buys \$5,000 of lumber on credit and will be billed at the end of the month.
 - The \$5,000 is called “accounts receivable” for the seller

_____ = something the business owes to a lender or creditor

- _____ = money owed to a supplier for items purchased on credit
 - You will pay the supplier at the end of the month
- _____ = more formal arrangement than Acct. Payable
 - Loans are used to purchase high-dollar assets
 - Apply to a lender for a loan
 - Lender provides you with funds for your stated purchase
 - You repay the lender over time
 - Terms are specified in the loan contract

Owners Equity (or _____)

- Equity = the difference between market value of an asset and the remaining loan balance
- _____ = Value of Assets – Remaining Loan
- You want your equity to be greater than \$0
- You want your equity to grow over time
 - This means you are:
 - _____
 - Paying down your liabilities
 - The value of your business is growing

The Language of Business– In-Class Exercise

Classify each of the following items associated with Tim’s lawn-mowing business under the appropriate term(s).

- | | |
|---|--------------------------|
| A. Revenue | F. Asset |
| B. Operating Expense (Variable Expense) | G. Account Receivable |
| C. Overhead Expense (Fixed Expense) | H. Account Payable |
| D. Gross Margin | I. Loan |
| E. Profit | J. Equity (or Net Worth) |

- | | |
|-------|---|
| _____ | Tim’s 2 riding mowers, valued at \$4,250 each. |
| _____ | \$2,000 paid to Tim for his mowing services this week. |
| _____ | \$3,000 remaining on the loan used to purchase one of the riding mowers. |
| _____ | \$1,500 that Tim’s customers owe him for mowing their lawns “on account”. They will pay him within the next month or so. |
| _____ | \$500 that Tim owes the supply store for parts to repair his mowers. |
| _____ | \$750 that Tim paid to his hired worker for this week’s wages. |
| _____ | \$2,000 insurance premium payment for auto insurance coverage for the year. |
| _____ | Tim wants to borrow \$2,500 to buy attachments for his mowers. He doesn’t have the cash on hand, so he will try to borrow this money from a lender. |
| _____ | For the month Tim received revenues of \$5,000. He had variable expenses of \$2,800 for fuel, parts, and hired labor. He says, “I made \$2,200 this month.” What is the term for that \$2,200? |
| _____ | Tim’s truck has a market value of \$18,000. He still owes \$4,000 on the loan he used to purchase the truck. What is the term for the \$14,000 difference between the market value of the truck and the remaining loan balance? |
| _____ | Tim bought \$1,400 of fuel and parts for 2 weeks of mowing. |

Use the following information to help Tim understand the financial side of his business:
For the entire year of 2016:

Tim mowed 800 lawns at an average price of \$50/lawn

He paid for the following items:

Fuel - \$6,000

Advertising - \$1,000

Office Rent - \$12,000

Parts & repair costs - \$2,000

Property taxes - \$2,000

Hired Labor for mowing - \$8,000

Interest on mower loans - \$500

Calculate the Total Revenues for Tim's business

Calculate the Total Operating Expenses for the year
(Only include the costs that change as the number of lawns mowed change)

Calculate the Total Overhead Expenses for the year

Calculate the Gross Margin for Tim's business for the year

Calculate the Gross Margin per Lawn for Tim's business.

Calculate the Profit (or Net Income) for Tim's business for the year
Because Tim did not include a salary for himself, the profit for the year is what he can pay himself.

Tim thinks the market value of his business assets is \$30,000. He owes a total of \$12,000 in loans and accounts payable at the moment. Calculate the total equity of Tim's business.

The Language of Business – In-Class Exercise (KEY)

Classify each of the following items associated with Tim's lawn-mowing business under the appropriate term(s).

- | | |
|---|--------------------------|
| A. Revenue | F. Asset |
| B. Operating Expense (Variable Expense) | G. Account Receivable |
| C. Overhead Expense (Fixed Expense) | H. Account Payable |
| D. Gross Margin | I. Liability |
| E. Profit | J. Equity (or Net Worth) |

- F Tim's 2 riding mowers, valued at \$4,250 each.
- A \$2,000 paid to Tim for his mowing services this week.
- I \$3,000 remaining on the loan used to purchase one of the riding mowers.
- G \$1,500 that Tim's customers owe him for mowing their lawns "on account". They will pay him within the next month or so.
- H \$500 that Tim owes the supply store for parts to repair his mowers.
- B \$750 that Tim paid to his hired worker for this week's wages.
- C \$2,000 insurance premium payment for auto insurance coverage for the year.
- I Tim wants to borrow \$2,500 to buy attachments for his mowers. He doesn't have the cash on hand, so he will try to borrow this money from a lender.
- D For the month Tim received revenues of \$5,000. He had variable expenses of \$2,800 for fuel, parts, and hired labor. He says, "I made \$2,200 this month." What is the term for that \$2,200?
- J Tim's truck has a market value of \$18,000. He still owes \$4,000 on the loan he used to purchase the truck. What is the term for the \$14,000 difference between the market value of the truck and the remaining loan balance?
- B Tim bought \$1,400 of fuel and parts for 2 weeks of mowing.

Use the following information to help Tim understand the financial side of his business:

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Parts & repair costs - \$2,000

Property taxes - \$2,000

Hired Labor for mowing - \$8,000

Interest on mower loans - \$500

Calculate the Total Revenues for Tim's business = **800 lawns x \$50/lawn = \$40,000 revenues**

Calculate the Total Operating Expenses for the year = **\$6,000 fuel + \$2,000 parts + \$8,000 labor = \$16,000**

(Only include the costs that change as the number of lawns mowed change)

Calculate the Total Overhead Expenses for the year =

= \$12,000 rent + \$1,000 advertising + \$2,000 taxes + \$500 interest = \$15,500

Calculate the Gross Margin for Tim's business for the year

Gross Margin = Revenues – Variable Expenses = \$40,000 - \$16,000 = \$24,000

Calculate the Gross Margin per Lawn for Tim's business.

= \$24,000 / 800 lawns = \$30/lawn

This indicates that Tim is earning \$30/lawn above his variable costs – this margin can be used to pay for the overhead expenses of the business.

Calculate the Profit (or Net Income) for Tim's business for the year

Because Tim did not include a salary for himself, the profit for the year is what he can pay himself.

Profit = Revenues – Variable Expenses – Overhead = \$40,000 - \$16,000 - \$15,500 = \$8,500

Tim thinks the market value of his business assets is \$30,000. He owes a total of \$12,000 in loans and accounts payable at the moment. Calculate the total equity of Tim's business.

Equity = Market Value of Assets – Liabilities = \$30,000 - \$12,000 = \$18,000 of equity

The Language of Business - Homework

Jan's Bicycle Sales & Repair is a new business in the area. Jan is an avid bike rider – she competes in several road races each year. She also loves to talk to people about the health benefits of riding bicycles. That's one of the main reasons she opened her business. She sells many different types of bicycles, and she repairs all types as well. Let's practice "the language of business" as it relates to Jan's business.

Here is a list of items that are associated with Jan's business:

\$50,000 of bikes in inventory today, ready to sell

\$150,000 building (the store) & land

\$10,000 in the business checking account

\$80,000 loan to purchase the building and land

\$40,000 operating loan to purchase the bikes so she can sell them

\$7,500 depreciation on the building and equipment for the year

\$30,000 of office equipment, displays, cash registers, etc. that she owns

\$8,000 of interest paid this year on the loan to purchase the building

\$2,000 of interest paid this year on the operating loan to purchase the bicycle inventory

\$140,000 of bicycle sales for the year

\$12,000 of property insurance for the year

\$60,000 spent to purchase the bicycles she sold throughout the year

\$5,000 in advertising expenses for the year

\$11,000 that Jan owes to her bicycle parts supplier as of today – to be paid within 1 month

\$20,000 that Al's Bike Tours owes to Jan as of today for bicycles he purchased but hasn't paid for yet

\$25,000 of sales commission (based on the number of bikes sold) that Jan pays to her sales team

Please classify these items into the correct category. Each item belongs in only one category.

Revenues (Item)	(\$)
_____	_____
Operating Expenses (Item)	(\$)
_____	_____
_____	_____
Total Operating Expenses	_____

Overhead Expenses (Item)	(\$)
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
Total Overhead Expenses	_____
Asset (Item)	(\$)
_____	_____
_____	_____
_____	_____
_____	_____
Account Receivable (Item)	(\$)
_____	_____
Account Payable (Item)	(\$)
_____	_____
Operating Loan (Item)	(\$)
_____	_____
Term Loan (Item)	(\$)
_____	_____

Please calculate the Gross Margin for Jan's bike business for the year.

Total Revenues:	\$ _____
- Total Operating Expenses:	\$ _____
= Gross Margin:	\$ _____

Jan sold a total of 800 bicycles last year. Calculate Jan's Gross Margin per bicycle? This represents how much money is left over after paying the operating expenses for each bike sold.

Calculate the Profit (or Net Income) for Jan's business for the year.

Total Revenues:	\$ _____
- Total Operating Expenses:	\$ _____
- Total Overhead Expenses:	\$ _____
= Profit:	\$ _____

How much profit did Jan earn per bicycle that she sold? Briefly explain what this number means to Jan.

Calculate the Total Assets for Jan's business as of today.

Accounts Receivable:	\$ _____
+ Assets:	\$ _____
= Total Assets:	\$ _____

Calculate the Total Liabilities for Jan's business as of today.

Accounts Payable:	\$ _____
+ Operating Loan:	\$ _____
+ Term Loan:	\$ _____
= Total Liabilities:	\$ _____

How much Equity (Net Worth) does Jan have in her business as of today? This is how much Jan has personally invested in her business so far.

Total Assets:	\$ _____
- Total Liabilities:	\$ _____
= Equity (Net Worth):	\$ _____

What does this Equity number mean to Jan?

The Language of Business – Homework (KEY)

Jan's Bicycle Sales & Repair is a new business in the area. Jan is an avid bike rider – she competes in several road races each year. She also loves to talk to people about the health benefits of riding bicycles. That's one of the main reasons she opened her business. She sells many different types of bicycles, and she repairs all types as well. Let's practice "the language of business" as it relates to Jan's business.

Here is a list of items that are associated with Jan's business:

\$50,000 of bikes in inventory today, ready to sell

\$150,000 building (the store) & land

\$10,000 in the business checking account

\$80,000 loan to purchase the building and land

\$40,000 operating loan to purchase the bikes so she can sell them

\$7,500 depreciation on the building and equipment for the year

\$30,000 of office equipment, displays, cash registers, etc. that she owns

\$8,000 of interest paid this year on the loan to purchase the building

\$2,000 of interest paid this year on the operating loan to purchase the bicycle inventory

\$140,000 of bicycle sales for the year

\$12,000 of property insurance for the year

\$60,000 spent to purchase the bicycles she sold throughout the year

\$5,000 in advertising expenses for the year

\$11,000 that Jan owes to her bicycle parts supplier as of today – to be paid within 1 month

\$20,000 that Al's Bike Tours owes to Jan as of today for bicycles he purchased but hasn't paid for yet

\$25,000 of sales commission (based on the number of bikes sold) that Jan pays to her sales team

Please classify these items into the correct category. Each item belongs in only one category.

Revenues (Item)	(\$)
<u>Bicycle Sales</u>	<u>\$140,000</u>
Operating Expenses (Item)	(\$)
<u>Bicycles Purchased (COGS)</u>	<u>\$60,000</u>
<u>Hired Labor</u>	<u>\$25,000</u>
Total Operating Expenses	<u>\$85,000</u>

Overhead Expenses (Item)	(\$)
<u>Depreciation</u>	<u>\$7,500</u>
<u>Interest on Term Loan</u>	<u>\$8,000</u>
<u>Interest on Operating Loan</u>	<u>\$2,000</u>
<u>Property Insurance</u>	<u>\$12,000</u>
<u>Advertising Expense</u>	<u>\$5,000</u>
Total Overhead Expenses	<u>\$34,500</u>

Asset (Item)	(\$)
<u>Bicycle Inventory</u>	<u>\$50,000</u>
<u>Land & Building</u>	<u>\$150,000</u>
<u>Checking Account</u>	<u>\$10,000</u>
<u>Equipment, Displays, etc.</u>	<u>\$30,000</u>

Account Receivable (Item)	(\$)
<u>Al's Bike Tours</u>	<u>\$20,000</u>

Account Payable (Item)	(\$)
<u>Payable to Parts Supplier</u>	<u>\$11,000</u>

Operating Loan (Item)	(\$)
<u>Bicycle Inventory Loan</u>	<u>\$40,000</u>

Term Loan (Item)	(\$)
<u>Land & Building Loan</u>	<u>\$80,000</u>

Please calculate the Gross Margin for Jan's bike business for the year.

Total Revenues:	<u>\$ 140,000</u>
- Total Operating Expenses:	<u>\$ 85,000</u>
= Gross Margin:	<u>\$ 55,000</u>

Jan sold a total of 800 bicycles last year. Calculate Jan's Gross Margin per bicycle? This represents how much money is left over after paying the operating expenses for each bike sold.

\$55,000 / 800 bicycles = \$68.75/bicycle that can be used to pay the overhead expenses

Calculate the Profit (or Net Income) for Jan's business for the year.

Total Revenues:	\$ 140,000
- Total Operating Expenses:	\$ 85,000
- Total Overhead Expenses:	\$ 34,500
= Profit:	\$ 20,500

How much profit did Jan earn per bicycle that she sold? Briefly explain what this number means to Jan.

$$\text{\$20,500} / 800 \text{ bicycles} = \text{\$25.63/bicycle sold}$$

Because Jan has paid all of her operating costs and overhead costs, this \$25.63/bicycle is basically her "salary".

Calculate the Total Assets for Jan's business as of today.

Accounts Receivable:	\$ 20,000
+ Assets:	\$ 240,000
= Total Assets:	\$ 260,000

Calculate the Total Liabilities for Jan's business as of today.

Accounts Payable:	\$ 11,000
+ Operating Loan:	\$ 40,000
+ Term Loan:	\$ 80,000
= Total Liabilities:	\$ 131,000

How much Equity (Net Worth) does Jan have in her business as of today? This is how much Jan has personally invested in her business so far.

Total Assets:	\$ 260,000
- Total Liabilities:	\$ 131,000
= Equity (Net Worth):	\$ 129,000

What does this Equity number mean to Jan?

A couple of ways to describe it:

- it means she has invested a total of \$129,000 of her money into the business over time
- if she were to sell the business and pay off her liabilities, she would have \$129,000 left over (ignoring taxes and sales expenses)

The Language of Business – Student Driven Learning Activity

After completing the homework exercise evaluate the expenses and determine 2-3 ways you may be able to cut expenses without compromising the integrity of the business. You may not remove insurance, etc... Upon determining 2-3 ways prepare justifications for why those costs may be cut and how you will offset for the cut expense. Prepare a sales pitch to your investors to describe how you will cut these costs and how it will or will not affect daily business operations.

Lesson 2 - Introduction to Business Types

Bell Ringer: Name a situation when you would want to be in partnership with someone(s) in a business and name a time when you would not.

A. Section 1 – Review the Language of Business

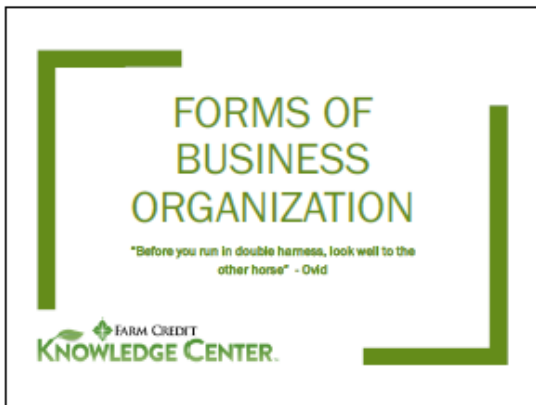
1. Have the students define/apply the main terms.
2. Briefly review the things that businesses have in common (from the students' experiences)
 - need a market (customers)
 - need labor
 - requires money to get started....

B. Section 2 - Discuss types of business legal organization (Est. time 30-40 minutes)

1. Main factors in choosing a form of organization
 - a. Transferability of ownership to others
 - i. 3 main ways
 - a. Sell/buy a share of the business (assets, shares, etc.)
 - Very easy for corporations & LLCs – just sell your shares in the company
 - b. Gift a share of the ownership of assets to others
 - Very easy for corporations & LLCs – just gift your shares to others
 - Harder for sole proprietorships and partnerships
 - Must determine ownership of assets, keep good records
 - Hard to determine the value of these assets
 - c. Inherit a share of the ownership of assets from others
 - b. Taxation
 - i. 2 main types of income tax rates
 - a. Personal income tax rates
 - Usually lower than corporate tax rates
 - Sole proprietors, partnerships, most LLCs and S-corporations are taxed at personal rates
 - b. Corporate income tax rates
 - Mainly for C-corporations
 - ii. Double taxation can be an issue for C-corporations
 - a. Profits of the corporation are taxed at the corporate income tax rate
 - b. Dividends (profits returned to the owners/shareholders) are taxed at the personal income tax rates
 - c. This can be avoided or minimized with the help of an accountant. If you can pay the owners a higher salary instead of giving them a dividend, then you can reduce/eliminate the corporate profits (\$0 corporate income tax). The owners' salaries are taxed at the personal income tax rate

- c. Liability of owners in case of lawsuit or foreclosure/bankruptcy
 - i. This refers to how much of the owners' personal assets are at risk in the case of lawsuits or bankruptcy
 - ii. Unlimited Liability means that the owners are completely responsible for all damages and all debts of the business. The personal assets (house, autos, personal belongings, etc.) may be sold to repay the debts.
 - This is mainly an issue for sole proprietors and general partnerships
 - iii. Limited Liability means that the owner can only lose the amount of money that he/she has invested in the business. For example, if you own 10 shares of John Deere stock worth \$1,000, the maximum amount that you can lose in the case of lawsuit or bankruptcy is \$1,000. The courts and creditors cannot use your personal assets to repay the debts of the corporation.
 - NOTE: If the owners "co-sign" on the loans of the corporation, then their personal assets are now at risk. The owners of the corporation no longer have limited liability
- 2. Main types of organization (2-3 advantages and disadvantages of each type)
 - a. Sole proprietorship
 - b. Partnership (general/limited)
 - c. Corporation (S & C)
 - d. Limited liability corporation (LLC)
- 3. Have students try to give examples of each type

Materials: **PowerPoint presentation – for use as a handout if desired**
 Side-by-side chart for comparison
 In-class Exercise and Key
 Homework Exercise and Key
 A list of examples for each type of organization – developed by teacher
 Forms of Ownership Reading



Main Factors in Choosing a Form of Ownership

- Ease of transferring ownership
 - Sell/buy, gift, inherit
- Tax rates
 - Personal vs Corporate
- Liability exposure (risk)
 - Unlimited liability = your personal assets are at risk
 - Limited liability = you can only lose what you invested

FARM CREDIT
KNOWLEDGE CENTER

Major Forms of Ownership

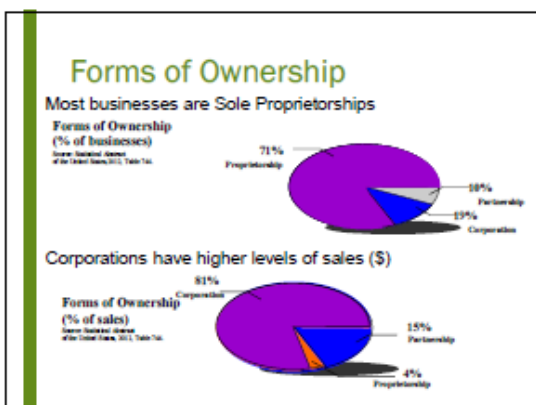
- Sole Proprietorship
- Partnership
- Corporation
- Limited Liability Company

FARM CREDIT
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"Hybrid" Forms of Ownership

- Limited Partnership
- S Corporation
- Cooperative

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Sole Proprietorship

A business owned/managed by one individual

Advantages	Disadvantages
■ Simple to create	■ Unlimited liability
■ Low start-up costs	■ Limited access to assets
■ Taxed at personal rates	■ Hard to transfer ownership to another person

FARM CREDIT
KNOWLEDGE CENTER

Sole Proprietorship

- Good form of organization for:
 - Businesses with very little risk to others
 - Small, part-time, or temporary businesses
 - "Low budget" businesses
- Hard to transfer to another owner
 - Must sell the business to new owner or form a different type of organization (partnership, etc.)



Sole Proprietorship

- Examples:
 - Most farms (85%) are sole proprietorships
 - Many roadside stands/markets
 - Other local businesses?



Partnerships

**2 or more people (or groups)
who co-own a business**

Advantages

- Relatively easy to establish
- Pooling of resources by owners
 - Assets, Capital, etc.
- Taxed at personal rate

Disadvantages

- Unlimited liability
- Harder to transfer to others
- Potential for conflict among owners



Types of Partners

General Partners

- Share in the ownership and management of the business
- Unlimited personal liability
- All partnerships must have at least one general partner

Limited Partners ("silent partners")

- Investors who do NOT participate in the management
- Liability is limited to the amount they have invested
- Any number of limited partners are allowed



Partnerships

- Good form of organization for:
 - Small/Medium-sized businesses
 - Temporary or short-term businesses
 - Businesses that do not face a lot of risk
- Relatively easy to transfer ownership to the other partners
 - Must form a new form of organization if you want to add new partners



Partnerships

- Partnerships can be:
 - **Informal**
 - No written partnership agreement between partners
 - NOT recommended!
 - **Formal**
 - Have a written partnership agreement about:
 - Sharing profits
 - Ownership of the land, buildings, equipment, etc.
 - How to add/remove partners



Partnerships

■ Examples of local partnerships:

- General Partnership?
- Limited Partnership?



Corporations

A separate entity, apart from its owners; may engage in business, make contracts, sue, be sued, and pay taxes

Advantages:

- Limited liability of stockholders*
- Unlimited lifetime
- Very easy to transfer

Disadvantages:

- Taxed at corporate rate
- May face double taxation (profits of firm and profits paid to owners are taxed)
- More legal requirements to establish

* Your personal assets may still be at risk in lawsuits and/or foreclosure.



Types of Corporations

- C Corporations
 - Corporate tax rates (usually higher than personal tax rates)
- S Corporations
 - Closely-held corporation (less than 75 shareholders)
 - Taxed at personal rates
- Cooperatives
 - Owner members; one vote per owner member
 - Profits are returned to owner members



Corporations

■ Good form of organization for:

- Large businesses
- Businesses with several owners
- Businesses that face a lot of risk
- Businesses that want to stay in operation for a long time



Corporations

- Examples of C Corporations
 - Ford, GM, John Deere, Home Depot,
- Examples of S Corporations
 - Many family farm corporations are S corporations
- Examples of Cooperatives
 - Farm Credit of the Virginias, Southern States, Best Western, Minute-Maid, many local utilities are co-ops



Limited Liability Companies (LLC)

Hybrid of a partnership and a corporation

Advantages:

- Limited liability*
- Taxed at personal rates
- No double taxation
 - Taxed at personal rates

Disadvantages:

- "Red-Tape" - can be confusing to create
- Relatively expensive to create

* Your personal assets may still be at risk in lawsuits and/or foreclosure.



Limited Liability Companies (LLCs)

- Good form of organization for:
 - Large businesses
 - Businesses with several owners
 - Businesses that face a lot of risk
 - Businesses that want to stay in operation for a long time
- Not much difference between LLCs, C-corps and S-corps



So which is it gonna be?

- Main determinants:
 - Tax implications
 - Transferability of ownership
- You can make one form look almost identical to any other form
 - Get qualified legal & accounting assistance before choosing a form for your business



Lesson 2- Types of Business Organizations

Notes Organizer

	Advantages	Disadvantages	Who is it good for?	Other
Sole Proprietorship				
Partnership -General Partners -Limited Partners				
Corporations				
C Corporation				

S Corporation	Cooperatives	Limited Liability Company (LLC)

Types of Business Organizations

Worksheet

Directions: Utilize the presentation and notes to fill out the chart. You may also need to do some research of your own.

	Ease/Cost of Start-up	Ease of Transfer	Taxation	Liability
Sole Proprietor				
General Partnership				
Limited Partnership				
C- corporation				
S- corporation				
Cooperative				
Limited Liability Company (LLC)				

Types of Business Organization- Answer Key

	Ease/Cost of Start-Up	Ease of Transfer	Taxation	Liability
Sole Proprietor	Very easy Low cost	Difficult	Personal tax rates	Unlimited Liability
General Partnership	Easy Low cost	Difficult	Personal tax rates	Unlimited Liability
Limited Partnership	Moderate Low cost	Difficult	Personal tax rates	Limited liability for the limited partner. Unlimited liability for the general partners.
C-corporation	Harder Relatively high costs	Very easy	Corporate tax rates May face double taxation	Limited liability for owners
S-corporation	Harder Relatively high costs	Relatively easy	Personal tax rates	Limited liability for owners
Cooperative	Harder Relatively high costs	Moderately difficult	Corporate tax rates may apply	Limited liability for owners
Limited Liability Company (LLC)	Hardest Highest cost	Relatively easy	Personal tax rates (usually)	Limited liability for owners

Forms of Business Organization In-Class Exercise

Choose the most appropriate form of business organization for the following businesses. There may be more than one answer for each! Your choices are:

Sole Proprietorship (SP)

C-Corporation (C)

General Partnership (GP)

S-Corporation (S)

Limited Partnership (LP)

Limited Liability Company (LLC)

_____ Roadside produce market for a family farm operated only in the summer.

_____ Building construction company owned by several people who are not related.

_____ Medical Doctor/Office with 3 doctors

_____ A part-time woodworking business where you sell birdhouses, small furniture, yard ornaments, etc.

_____ A grocery store where 2 people want to own and manage the business, and 1 person wants to just invest \$50,000, but have no management responsibilities.

_____ A student who wants to sell flowers on the sidewalk outside of a local business.

_____ A transportation company that wants to limit ownership of the company to a few family members.

_____ A lawn-mowing business that is only operated for 1 summer.

_____ A landscaping business owned by 3 friends. The company installs very expensive landscapes in a wealthy neighborhood.

_____ A tree removal firm owned by 1 person. He cuts down trees next to houses, buildings, and power lines.

Forms of Business Organization In-Class Exercise (Key)

Choose the most appropriate form of business organization for the following businesses. There may be more than one answer for each! Your choices are:

Sole Proprietorship (SP)

C-Corporation (C)

General Partnership (GP)

S-Corporation (S)

Limited Partnership (LP)

Limited Liability Company (LLC)

- | | |
|----------------------|--|
| <u>SP</u> | Roadside produce market for a family farm operated only in the summer. |
| <u>C, S, LLC</u> | Building construction company owned by several people who are not related. |
| <u>C, LLC</u> | Medical Doctor/Office with 3 doctors |
| <u>SP</u> | A part-time woodworking business where you sell birdhouses, small furniture, yard ornaments, etc. |
| <u>LP</u> | A grocery store where 2 people want to own and manage the business, and 1 person wants to just invest \$50,000, but have no management responsibilities. |
| <u>SP</u> | A student who wants to sell flowers on the sidewalk outside of a local business. |
| <u>S, LLC</u> | A transportation company that wants to limit ownership of the company to a few family members. |
| <u>SP</u> | A lawn-mowing business that is only operated for 1 summer. |
| <u>GP, C, S, LLC</u> | A landscaping business owned by 3 friends. The company installs very expensive landscapes in a wealthy neighborhood. |
| <u>C, LLC, SP</u> | A tree removal firm owned by 1 person. He cuts down trees next to houses, buildings, and power lines. |

NOTE – there is usually not just one correct answer or one best form of organization for a business. C-corps, S-corps, and LLCs are very similar and can be formed so that they are almost identical.

Forms of Business Organization Homework Exercise

Please answer the following questions in a concise, meaningful manner.

1. What are the 3 main factors that you should consider when choosing a form of business organization for your operation?
2. Your entire class wants to start its own small business that does handiwork for low-income families in the community – mowing lawns, shoveling snow, painting fences, etc. The main goal of this business is to gain experience managing a real-world operation while helping improve the community. The work that you will be doing is very low risk – the chances of hurting someone or damaging property are very low. You will charge prices that are just enough to cover your expenses. Finally, you would like this business to continue for several years – long after you have graduated – you will pass the ownership of the business to younger students as you graduate.

What is the best form of business organization for your business? Please give 3 reasons why you selected this particular form of organization.

3. Find at least one example of a local business for each of the main forms of organization.

Type of Organization

Example of a Local Business

Sole Proprietorship:

General Partnership:

Limited Partnership:

C-corporation:

S-corporation:

Limited Liability Company:

4. Choose the owner of a local business – it can be someone from your family who owns a business. Briefly interview them about the form of organization of their business. Ask them questions such as:

What is the form of organization for your business?

What is the main reason you chose this form of organization?

What do you think is the biggest advantage of this form?

What do you think is the biggest disadvantage of this form?

Who did you talk to for advice before you selected this form of business organization?

Write a 1- to 2-page paper that summarizes your interview. Please include a brief description of the business. Also, include your thoughts into your paper: for example, do you agree with the choice of organization? What other type of organization might be appropriate for this business?; What did you learn from this interview....

Forms of Business Organization Homework Exercise (Partial Key)

Please answer the following questions in a concise, meaningful manner.

1. What are the 3 main factors that you should consider when choosing a form of business organization for your operation?

Ease of transfer of ownership to others

Taxation of the business' profits

Liability faced by the owners of the business

2. Your entire class wants to start its own small business that does handiwork for low-income families in the community – mowing lawns, shoveling snow, painting fences, etc. The main goal of this business is to gain experience managing a real-world operation while helping improve the community. The work that you will be doing is very low risk – the chances of hurting someone or damaging property are very low. You will charge prices that are just enough to cover your expenses. Finally, you would like this business to continue for several years – long after you have graduated – you will pass the ownership of the business to younger students as you graduate.

What is the best form of business organization for your business? Please give 3 reasons why you selected this particular form of organization.

Again, there isn't just one correct answer – great opportunity for a little “Debate”.

Main issues:

- not facing much risk
- will not be making a lot of profits (just covering expenses)
- want it to last for several years

To me, the main consideration is wanting it to last for several years – that would lead me to recommend a C-corp or S-corp (possibly an LLC) – this allows the graduating students to

pass their share of ownership to younger students. To me, liability and taxation are not primary factors.

- Find at least one example of a local business for each of the main forms of organization.

Type of Organization

Example of a Local Business

Sole Proprietorship:

General Partnership:

Limited Partnership:

C-corporation:

S-corporation:

Limited Liability Company:

Use your knowledge of local businesses to develop a list of examples for each type of ownership)

- Choose the owner of a local business – it can be someone from your family who owns a business. Briefly interview them about the form of organization of their business. Ask them questions such as:

What is the form of organization for your business?

What is the main reason you chose this form of organization?

What do you think is the biggest advantage of this form?

What do you think is the biggest disadvantage of this form?

Who did you talk to for advice before you selected this form of business organization?

Write a 1- to 2-page paper that summarizes your interview. Please include a brief description of the business. Also, include your thoughts into your paper: for example, do you agree with the choice of organization?; What other type of organization might be appropriate for this business?; What did you learn from this interview....

Forms of Business Organization- Student Driven Learning Activity

Divide into groups and develop an interactive presentation through skit, ppt, charts/diagrams, etc... about one of the types of business organizations. Present this business type to the group without giving away the name or type and see if they can properly identify the business organization.

Forms of Organization- Additional Reading

A house should be built on a strong foundation so that it will last for years to come. If the foundation is weak, the house may fall down. If the foundation is solid, the house will not only last for years, but you can add rooms onto that house over time as your goals change.

The same thing goes for a business – it needs a solid foundation that allows it to survive and possibly grow to meet future needs. That foundation is called the “form of organization” or “form of ownership”. There are 6 primary forms of business organization that allow businesses to survive and grow over time:

- Sole Proprietorship
- General Partnership
- Limited Partnership
- C-corporation
- S-corporation
- Limited Liability Company (LLC)

Now for the big question, “which is the best form of organization for my business?” The answer is, “it depends on three main factors.” Those three factors are:

- Ease of transfer of ownership to others
- Taxation of the business’ profits
- Liability (risk) that the business faces.

Ease of transfer of ownership is important for businesses that want to continue into the future. Many family businesses are passed from one generation to the next. With certain forms of organization this transfer is complicated; with others it is very easy. The three main methods of transferring the ownership of a business from one person to another are:

- Purchasing the business from the current owner
 - You may purchase the entire business or a percentage of the business
- Giving the ownership of the business to others as a gift
- Inheriting the ownership of the business at the death of the current owner.

Each of these methods can be effective, but they will have different tax implications. More importantly, some of these methods of transferring the ownership of a business are much easier than others. We will talk about these differences later. Let’s look at Greta’s Green Grocery for a minute. If she only wants to operate the business for the next 5 years and then close it down, she will not have to be concerned with the ease of transfer – she’ll simply sell the assets. But, what if Greta wants to pass the business to her niece, Emily? Now she must think about which form of organization will allow her to transfer the business to Emily in the easiest, most effective manner.

Most people do not like to pay income taxes, although if you think about it, you only pay income taxes when you make money! So paying income taxes is not a bad thing. But you don't want to have to pay more than you have to. Most forms of business organization are taxed at the owner's personal income tax rate. This is called "pass-through taxation" – the profits literally "pass through" to the owner's personal income tax statement. The other forms of ownership are taxed at the "corporate income tax rate" – in most cases the corporate income tax rates are higher than the personal income tax rate. One major concern that business owners have is something called "double taxation". This is a situation where some of the profits of the corporation are taxed at both the corporate tax rate and the owner's personal tax rate.

The last main factor in choosing a form of organization is liability. Liability is a term that means you are responsible for any of your actions that might harm others. Some forms of organization have "unlimited liability". Unlimited liability means that the business assets AND the personal assets of the owner (houses, cars, etc.) may be sold to pay for any damages caused by the owner's business. In the case of a major lawsuit, the owner may have to sell all of the business assets, and then have to sell some of his/her personal assets to come up with enough cash to pay the damages. Some forms of organization provide "limited liability". This means that only the business assets can be used to pay the damages – but the owner's personal assets do not have to be sold to pay damages. In Greta's case, this would mean that she might have to sell the business assets (freezers, refrigerators, etc.), but not her house and car. But please understand that the forms of organization that offer limited liability do not always protect your personal assets – that's why every business needs liability insurance.

Now, let's describe the main forms of organization.

Sole Proprietorship

A sole proprietorship is owned and managed by one person. There may be several employees, but that one person owns all of the business' assets and makes all of the business decisions. The owner has full control of the business and gets all of the profits of the business. However, the owner also faces all of the risk (liability) associated with the business – he/she has unlimited liability, which means his/her personal assets are at risk because of the business.

This is the easiest form of organization to start. All you have to do is give your business a name, purchase any required business licenses or permits, and open the doors to your business. There is very little cost to start a sole proprietorship. Easy and low start-up costs – these are the two reasons that over 70% of the businesses in the US are sole proprietorships. Another reason is that the earnings of the business are taxed at the owner's personal income tax rate (which is usually lower than the corporate income tax rates).

The main disadvantages of a sole proprietorship are that it has unlimited liability, it is hard to transfer the business to someone else, and it is harder to get access to resources (such as loans). Transferring ownership of a sole proprietorship requires that you dissolve the sole proprietorship

(end its life). If the owner wants to bring in a business partner, he/she has to change from a sole proprietorship to a partnership or a type of corporation – that’s because a sole proprietorship is owned by one person, no more than that. The last disadvantage is that it is harder to get access to resources because there is only one owner. If there were 2 or 3 owners, now you can “pool” their assets together, but you can’t do that with just one person.

Partnerships

Partnerships are very similar to sole proprietorships, except that there is more than one owner. These are very simple to start, they have low start-up costs, they have unlimited liability, and the profits are taxed at the owners’ personal tax rates – just like sole proprietorships. Also, it is relatively difficult to transfer the ownership to people other than the existing owners – if you want to add new partners you may have to dissolve the existing partnership and start over.

The main difference is that there is more than one owner, and that means there can be more than one person making the decisions for the business. This can lead to arguments between the owners.

There are a couple of other things to know about partnerships. First, because there are two or more owners, they can pool their resources rather than relying on just one person’s resources. This makes it easier to have a larger business than with a sole proprietor. The second thing is that each partner is responsible for the other partner’s actions. This means that if your business partner makes a mistake, you are personally responsible for the damages. For example, assume that Greta and Emily form a partnership. One day, Emily doesn’t properly store the produce. That afternoon, some of the customers get sick from eating this produce – they decide to sue the entire business to cover their medical costs. In this case, Greta’s personal assets may have to be sold to pay the damages, even though it was Emily’s mistake!

There are two main types of partnerships – General Partnerships and Limited Partnerships. A General Partnership is what we’ve described already – more than one person, unlimited liability, and so on. In a Limited Partnership, at least one partner is a “limited partner” or a “silent partner”. Silent partners simply contribute resources to the business – such as money, land, equipment – but they have absolutely no voice in the management decisions. So they actually are “silent” when it comes to the management of the business. Silent partners have limited liability – the only thing they can lose in a liability lawsuit or bankruptcy is the value of the resources they contributed to the business. For example, let’s assume that Greta’s uncle, Greg, is a silent partner in the grocery. Greg contributed the land and building to the business. In the event of a lawsuit, the only things that Greg might lose are the land and the building. No one can force Greg to sell his personal assets to cover the damages. But Greta and Emily, who are not silent partners, may lose some of their personal assets. Please note that a silent partner can never make any management decisions for the partnership. If he/she does make some management decisions, he/she is no longer a silent partner and his/her personal assets are now at risk.

Corporations

Corporations are more formal than sole proprietorships and partnerships. You typically need legal help in establishing a corporation – that means you have to hire a lawyer, and that costs money. To establish a corporation you need to have corporate by-laws (rules of operating the business) and articles of incorporation (legal documents describing the business) that are filed with the State Corporation Commission. So forming a corporation is harder and more expensive than forming a sole proprietorship or partnership.

Corporations have an “unlimited lifetime” – that means that they continue to exist even when some of the owners die or leave the business. This is not true for sole proprietorships or partnerships. All you need to do to be an owner of a corporation is own “shares” of the corporation’s “stock”. One stock is equivalent to one share of the ownership of the corporation. If you want to be an owner of John Deere, all you have to do is purchase one of more shares of the John Deere stock - it’s that simple! And once you own stock you can sell it, give it away, or you can leave it to your heirs as an inheritance. This makes it very easy to transfer the ownership of a corporation to other owners. If Greta formed her store as a corporation, she can make Emily a co-owner by giving her some shares or selling her some shares. Greta can even leave the remaining shares of her stock in the business to Emily in her will. One of the main reasons owners choose to form a corporation is that it is very easy to transfer the ownership.

Another reason that owners like to form their business as a corporation is that it provides limited liability to the owners (shareholders). In most cases, a shareholder of a corporation can only lose the value of his/her investment in the stock of the corporation. For example, assume that you own \$1,000 of stock in John Deere. If John Deere were to be sued or go bankrupt, the maximum that you would lose is your \$1,000 of stock – no one can come after your personal assets. However, do NOT rely on this to protect your personal assets – every business owner needs liability insurance to fully protect his/her personal assets.

Corporations also allow owners to gain access to more resources than sole proprietorships and partnerships. If a corporation wants to generate more cash so that they can buy new equipment, they can simply sell more shares of the company. This raises cash that can be used for expanding the business or paying off loans.

Taxation of corporations is different than for sole proprietorships and partnerships. For most corporations, the earnings of the company are taxed at the corporate tax rate, which is usually higher than the personal tax rate. Further, if the corporation decides to pay some of the after-tax profits to its shareholders as a reward for investing in the company, these “dividend” payments are taxed again at the personal tax rate. This is called “double taxation”.

There are two main types of corporations for most business owners: C-corporations and S-corporations. A C-corporation is a business that has no limits on who can be an owner. The profits of a C-corporation are taxed at the corporate tax rate. An S-corporation has limitations on how

many people can be an owner of the business (no more than 75). S-corporations are used by many family-owned businesses so that they can keep the ownership of the company to members of the family. Hence, S-corporations are sometimes called “closely-held corporations” because the ownership is held within the family. The profits of an S-corporation are taxed at the owner’s personal tax rate. Regardless of which type of corporation you choose, you can form a corporation with as little as one owner.

Limited Liability Companies (LLC)

Limited Liability Companies (LLCs) are a combination between corporations and partnerships. As the name states, LLCs offer the owners a form of limited liability (to protect their personal assets). This protection is limited to the value of their ownership in the business. Where owners of a corporation are called shareholders, the owners of an LLC are called “members” – but in reality there is not much difference between shareholders and members.

LLCs are very flexible. Owners can structure an LLC so that it looks and acts like a C-corporation, or like an S-corporation, or like a partnership or sole proprietorship. Most LLCs are set up so the profits are taxed at the owner’s personal tax rate. This allows the owner(s) to avoid double taxation.

To be honest with you, there is not a very big difference between a C-corporation, an S-corporation, and an LLC for most small businesses. They each provide limited liability, have an unlimited lifetime, and can easily be transferred to other owners. The primary difference between these three forms of business is the method in which the profits are taxed.

Please see the following table for a side-by-side comparison of the main forms of business organization.

What about Greta? Which form is best for her green grocery? The answer to that depends on her goals. Here’s a brief look at her decision:

If she only wants to operate the business on her own for a few years and has no interest in transferring the ownership to someone else:

A sole proprietorship might be a good choice. It is easy to set up, it doesn’t cost much money to set-up, and she is in complete control of the business. The main disadvantage is that she will face unlimited liability – that means her personal assets are at risk. But she can reduce that risk by having liability insurance.

She could form a corporation (C or S) or an LLC in this case. This would be more costly, but might provide a little more liability protection. It also makes it easier to transfer ownership if she changes her mind in the future.

If she wants to operate the business with Emily as a co-owner and manager:

Because there is more than one owner, we can rule out a sole proprietorship. If both Greta and Emily are making management decisions they cannot be “silent partners” – so that rules out a

limited partnership. But any of the remaining forms would be appropriate. The general partnership would be the easiest and lowest cost organization to set up; however, it would have unlimited liability and it would be relatively difficult to bring in other partners.

They could form a corporation (C or S) or an LLC in this case as well. This would be more costly, but might provide a little more liability protection. It also makes it easier to bring in new owners in the future. It also makes it much easier for Greta to turn the entire business over to Emily when Greta decides she wants to retire – she can either sell her shares in the business to Emily, or gift them to her.

Lesson 3 - Balance Sheet

Bell Ringer: Thinking back to the last lesson on business types think about 1-2 businesses in your county or town and name their type of Business Organization.

A. Section 1 – Review Key Financial Terms from Lessons 1 and 2 (Est. time 5 minutes)

1. Revenues
2. Operating or Variable Expenses
3. Overhead or Fixed Expenses
4. Gross Margin
5. Profit or Net Income
6. Assets
7. Liabilities
8. Net Worth or Owners Equity
9. Sole Proprietorship
10. General Partnership
11. Limited Partnership
12. C-corporation
13. S-corporation
14. Limited Liability Company
15. Unlimited Liability vs Limited Liability

B. Section 2 - Define A Balance Sheet (Est. time 15-20 minutes)

1. A Balance Sheet is a list of every asset (and the asset values) that the business owns on a given date. It also includes a list of every liability the business owes on that given date. The balance sheet shows how much equity (Owners Equity = Total Assets – Total Liabilities) an owner has in the business. A balance sheet is called a “snapshot” of a business’ financial condition because it just looks at what the business owns and owes on one specific day.
2. Another way to define a balance sheet is that it shows what assets a business has and how the business is paying for those assets. It can pay with its money (Equity or Net Worth) or with someone else’s money (Liabilities).
3. Balance sheets can also be for a person or a household rather than for a business. In this case, it includes all of the items (assets) that a person or household owns on a given day. It also includes a list of all the debts (liabilities) that the person or household owes on that day.
4. Balance Sheets are usually required by lenders as a key part of loan applications. Lenders use balance sheets to analyze the financial condition of a business and to identify some of the strengths and weaknesses of the business.
5. Business owners & managers should also use balance sheets to analyze the financial strengths and weaknesses of the business.
6. Show examples of the personal balance sheet and the business balance sheet
 - a. each shows the assets owned as of that day
 - i. NOT what they will have in the future – what they have today
 - ii. I like to tell students that assets are anything they can physically touch that day
 - cash, car, house, inventories, etc.
 - Note – there are some assets that you can’t actually touch

- Accounts Receivable and Prepaid Expenses (rent, insurance) are examples
- b. each shows liabilities that are owed as of that day
 - i. NOT what they will owe in the future – what they owe today
 - Another way to view this is “if I were to pay off my liabilities today, how much would I have to pay?”
- c. For the Personal Balance Sheet
 - i. Cash on hand = the value of coins & dollars on hand that day
 - ii. Investments = the value of any financial investments he owns on that day
 - iii. Supplies = the value of household supplies (food, office supplies, etc.) that day
 - iv. Auto = the market value of the car on that day (what it could be sold for)
 - v. Household furnishings = furniture, clothes, collections, art, decorations, etc.
 - vi. House = the market value of the house that day
 - Lawn Equipment = market value of lawn mowers, trimmers, edgers, rakes, etc.
 - vii. Tools = the value of all other tools
 - viii. Credit Card Balance = the amount owed on the credit card as of that day
 - ix. Taxes Payable (Property taxes) = the amount on taxes you owe as of that day
 - x. Loan Principal Due This Year = the portion of the loans you are scheduled to pay within the next 12 months
 - xi. Auto Loan = the amount of the auto loan you will still owe after this year’s payments are made
 - xii. Home Mortgage = the amount of the mortgage you will still owe after this year’s payments are made
 - xiii. **Net Worth (Owners’ Equity)** = Total Assets – Total Liabilities
 - This is a measure of your financial value. You want to see this number increasing every year
- d. For the Business Balance Sheet
 - i. Cash on hand = coins and dollars on hand. Also known as “Petty cash”
 - ii. Plants Ready For Sale = the value of all plants that are ready to be sold to customers
 - iii. Growing Plants = the value of all plants that are being grown and are not ready to be sold yet. This is usually just the total of the expenses used to grow the crops to that point in time (seed, fertilizer, water, pots, etc.)
 - iv. Accounts Receivable (from Lesson 2) = the amount of money still owed to the business for products already sold to the customer or for services already provided. This is for any sales that are made “on credit” or “on account”
 - v. Supplies = office supplies, fertilizer, seed, etc.
 - vi. Non-current Assets are valued at their market value (what they could be sold for)
 - vii. Wages Payable = money that is owed to the hired labor for work they have performed. An example would be for a firm that pays its employees on the first of every month. If they have worked for 2 weeks (at the date of the balance sheet) and have not yet been paid, you owe them 2 weeks’ worth of pay.
 - viii. Operating Loan = money borrowed to pay for operating expenses (inventory, supplies, hired labor, etc. – refer to Lesson 2 for examples/definition of operating expenses). An operating loan is usually repaid within 1 year.

- ix. Interest on the Operating Loan (also called “Accrued Interest”) = interest that you owe (but haven’t paid yet) on the operating loan as of that day. It is NOT how much interest you might owe over the remainder of the year – it is just the interest that you owe as of the date on the balance sheet.
- x. Loan Principal Due This Year = the portion of the loan that is scheduled to be repaid within the next 12 months. “Principal” is a term that refers to the money borrowed.

C. Section 3 - Discuss the Sections of a Balance Sheet (Est. time 15-20 minutes)

1. Current assets
 - a. Current assets are assets that will be used up as a part of the production process (supplies, fertilizer, seed) or assets that are meant to be sold within the next year (crops in the bin, feeder livestock, inventory that is ready for sale).
 - b. Examples
 - i. cash, money in checking & savings accounts, prepaid expenses (rent, insurance)
 - ii. fertilizer, seed, chemicals, plants
 - iii. inventories of items you made or purchased and intend to resell
- plants, shoes, food items, etc.
2. Non-current assets (I’d not go into intermediate & long term assets – keep it simple)
 - a. Non-current assets are equipment and facilities that are used to produce your product. These assets usually have a normal life of greater than 1 year. These assets are NOT purchased to be resold, they are purchased to use in the production process. If you sell these assets (without replacing them), you are reducing your ability to produce.
 - b. Examples
 - i. Land, buildings, greenhouses
 - ii. Equipment, tractors, tools
 - iii. breeding livestock (cows/bulls, sows/boars, ewes/rams, etc.)
3. Current liabilities
 - a. Current Liabilities are liabilities that are scheduled to be repaid within the next 12 months
 - b. Examples
 - i. Credit card balances that you have not paid yet
 - ii. Property taxes that have not been paid yet
 - iii. Wages payable, operating loan balance, loan principal due within 12 months
4. Non-current liabilities
 - a. Non-current liabilities are any liabilities that are not scheduled to be repaid within the next 12 months. This is primarily the portion of any loan that is not to be repaid this year.
5. Exercise on classifying assets & liabilities, calculating net worth and working capital

D. Section 4 - The balance sheet is used to calculate (Est. time 5-10 minutes):

- a. Liquidity – the ability of the business to pay its upcoming liabilities (loan payments, property taxes, etc.) without having to sell any of its non-current assets. For example, a dairy farm is considered to be liquid if it has enough cash on hand to pay its bills each month. An illiquid (or non-liquid) farm doesn’t have enough cash to pay its bills on time, so it might resort to selling cows or land to get the cash needed to pay the bills.

- b. Solvency – the ability to repay, or “cover”, all of the liabilities of the household or of the business with the total assets. If your Net Worth (Owners Equity) is negative, you are “insolvent” (this means your liabilities are greater than your assets). You want to see your Net Worth increasing each year.

Materials:

- Example balance sheets**
- PowerPoint Presentation on Balance Sheets**
- Note Organizer**
- In Class Exercise and Key**
- Homework Exercise and Key**
- Take Home Reading**
- Optional Reading for Agricultural Balance Sheets**
 - may help the instructor understand them better

Personal Balance Sheet

Date: August 30, 2023

Assets		Liabilities	
Current Assets		Current Liabilities	
Cash on hand	\$100	Credit Card Balance	\$400
Checking Account	\$2,000	Taxes Payable	\$1,000
Savings Account	\$5,000	Loan Principal Due This Year	\$7,000
Investments (Stocks, bonds)	\$15,000		
Supplies	\$500		
Total Current Assets	\$22,600	Total Current Liabilities	\$8,400
Non-Current Assets		Non-Current Liabilities	
Auto	\$14,000	Auto Loan	\$8,000
Household furnishings	\$25,000	Home Mortgage	\$85,000
House	\$175,000		
Land	\$5,000		
Lawn Equipment	\$3,000		
Tools	\$2,000		
Total Non-Current Assets	\$224,000	Total Non-Current Liabilities	\$93,000
		Total Liabilities	\$101,400
		Net Worth (Owners Equity)	\$145,200
		(Total Assets - Total Liabilities)	
Total Assets	<u>\$246,600</u>	Total Liabilities & Net Worth	<u>\$246,600</u>

Business Balance Sheet for Terry's Landscaping Business

Date: August 30, 2023

Assets		Liabilities	
Current Assets		Current Liabilities	
Cash on hand	\$5,000	Credit Card Balance	\$2,400
Checking Account	\$25,000	Taxes Payable	\$5,000
Savings Account	\$40,000	Wages Payable	\$10,000
Plants Ready for Sale	\$150,000	Operating Loan	\$80,000
Growing Plants	\$45,000	Interest on Operating Loan	\$400
Accounts Receivable	\$35,000	Loan Principal Due This Year	\$53,000
Investments (Stocks, bonds)	\$60,000	Interest on Loan Principal	\$1,400
Supplies	\$500		
Total Current Assets	\$360,500	Total Current Liabilities	\$152,200
Non-Current Assets		Non-Current Liabilities	
Truck	\$25,000	Truck loan	\$9,000
Trailer	\$12,000	Equipment loan	\$18,000
Mowers & equipment	\$32,000	Mortgage (land & buildings)	\$142,000
Skidloader	\$5,000		
Office Equipment	\$3,000		
Tools	\$2,000		
Greenhouse & Office Bldg.	\$115,000		
Land	\$60,000		
Total Non-Current Assets	\$254,000	Total Non-Current Liabilities	\$169,000
		Total Liabilities	\$321,200
		Net Worth (Owners Equity)	\$293,300
		(Total Assets - Total Liabilities)	
Total Assets	<u>\$614,500</u>	Total Liabilities & Net Worth	<u>\$614,500</u>

Business Balance Sheet

Date: August 30, 2023

Assets

Liabilities

Current Assets

Current Liabilities

_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

Total Current Assets \$0

Total Current Liabilities \$0

Non-Current Assets

Non-Current Liabilities

_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

Total Non-Current A \$0

Total Non-Current Liabilities \$0

Total Liabilities \$0

Net Worth (Owners Equity) \$0
(Total Assets - Total Liabilities)

Total Assets \$0

Total Liabilities & Net Worth \$0

INTRODUCTION TO BALANCE SHEETS



Balance Sheet

- List of your assets, liabilities, and net worth at a certain point in time
 - For individuals or households
 - For businesses
- "Snapshot" of your financial position at a certain point in time
 - Shows what you own and what you owe
 - Shows what you own and how you are paying for it



Balance Sheet

- $\text{Assets} = \text{Total Liabilities} + \text{Net Worth}$
 - **Always holds true!!**
 - Assets = the items you have or own
 - These assets are paid for with:
 - Liabilities = "other people's money" (loans or debt)
 - Net Worth = "your money" (down payment)
- Example: Buy a \$150,000 house
 - Make a \$30,000 down payment (Net Worth)
 - Get a \$120,000 mortgage (Liability)



Balance Sheet

- Very important for obtaining credit
 - Lenders may want:
 - Past balance sheets
 - Current balance sheet
 - Projected balance sheets
- Owners & managers use them to identify strengths and weaknesses of the business



Sections of a Balance Sheet

- Current Assets
 - Cash, checking, and savings accounts
 - Assets that will be used up during production
 - Seed, fertilizer, packaging (cartons)
 - Assets that are meant to be sold within the next year
 - Cut flowers, corn, vegetables, finished goods
- They will be sold or used in production within 1 year



Sections of a Balance Sheet

- Non-Current Assets
 - Assets that are used year after year to produce your product or crops
 - Land, buildings, greenhouses, warehouses
 - Equipment, vehicles, tools
 - Breeding livestock (cows/bulls, sows/boars)
 - They usually have a useful life of greater than 1 year
 - They are usually valued at their market value
 - What they could be reasonably sold for



Sections of a Balance Sheet

- Current Liabilities
 - *Liabilities that are scheduled to be repaid within 1 year*
 - *Examples:*
 - Accounts payable – to your suppliers
 - Credit card balances
 - Operating loan principal
 - Portion of loan principal that is due within 1 year
 - Unpaid interest owed as of that day
 - *These are “short-term” debts owed to others as of the day of the balance sheet*



Sections of a Balance Sheet

- Non-Current Liabilities
 - *Liabilities that you will still owe after the next year*
 - *The portion of loans that are scheduled to be paid after this year*
 - Equipment loans
 - Mortgages
 - Personal loans



Net Worth

- Net Worth (Owners Equity)
 - *This represents how much you are “worth” in dollars*
 - *Net Worth = Total Assets – Total Liabilities*
 - *You want to see your Net Worth increasing every year*



Balance Sheet

- Helps evaluate Liquidity and Solvency
 - *Liquidity = ability to meet short-term obligations as they come due, without having to sell productive assets*
 - Involves Current Assets & Current Liabilities
 - *Solvency = ability to meet all obligations as they come due*
 - Involves Total Assets & Total Liabilities



Balance Sheet-Note Organizer

A Balance Sheet lists value of the _____ owned by a business and the value of the _____ that the business owes to its lenders. The _____ of the business shows how much the owners have invested into the business as of that day.

A _____ is something that the business owns and will use up within the next 12 months. Examples include supplies that you have on hand, feed inventories, or accounts receivable.

A _____ is something that the business owns that lasts for more than one year. Examples include machinery and equipment, buildings, and land.

A _____ is something that the business owes to someone and it will be paid within the next 12 months. Examples include accounts payable, loan principal that is to be paid this year, and accrued interest.

A _____ is something that the business owes to someone over the next several years, but it will not be repaid within the next 12 months. Examples include loan principal on a tractor loan that you owe over the next 5 years.

Balance Sheet- Note Organizer (Key)

A Balance Sheet lists value of the Assets owned by a business and the value of the Liabilities that the business owes to its lenders. The Net Worth (or **Owners Equity**) of the business shows how much the owners have invested into the business as of that day.

A Current Asset is something that the business owns and will use up within the next 12 months. Examples include supplies that you have on hand, feed inventories, or accounts receivable.

A Non-Current Asset is something that the business owns that lasts for more than one year. Examples include machinery and equipment, buildings, and land.

A Current Liability is something that the business owes to someone and it will be paid within the next 12 months. Examples include accounts payable, loan principal that is to be paid this year, and accrued interest.

A Non-Current Liability is something that the business owes to someone over the next several years, but it will not be repaid within the next 12 months. Examples include loan principal on a tractor loan that you owe over the next 5 years.

Balance Sheet In-Class Exercise

Determine where the following items would belong on a balance sheet for a greenhouse/floral shop. Use the following classifications:

CA = Current Asset

CL = Current Liability

NA = Not Applicable

NCA = Non-Current Asset

NCL = Non-Current Liability

- _____ \$800 of cut flowers that are ready to be sold
- _____ \$20,000 of operating loan that is still owed to the bank
- _____ \$200,000 of mortgage (loan) that is due after the next year
- _____ \$5,000 of wages that are owed to the workers
- _____ \$3,000 of cash in the cash register
- _____ \$265,000 worth of greenhouse, land, and other buildings
- _____ \$25,000 of seed and fertilizer to be used to grow plants
- _____ \$45,000 of equipment loans that will not be repaid within the next 12 months
- _____ \$75,000 of equipment (fork lift, carts, delivery truck, etc.)
- _____ \$35,000 of money owed to the business from "credit sales"
- _____ \$125,000 of operating expenses paid over the year (utilities, labor, fertilizer, etc.)
- _____ \$4,500 of accrued interest (interest owed but not yet paid)
- _____ \$15,000 in the business checking account
- _____ \$300,000 of revenues from sales throughout the entire year

Use the above assets and liabilities to create a balance sheet for this flower store.

A convenience store has total assets of \$750,000. As of today, the owner still owes \$200,000 of liabilities (loans, accounts payable, etc.) to her lenders. Calculate this owner's Net Worth in her business on this day.

Two years later this convenience store has total assets of \$800,000 and total liabilities of \$100,000. Has the owner's Net Worth increased (improved) or decreased (declined)?

Increased

Decreased

Balance Sheet In-Class Exercise (Key)

Determine where the following items would belong on a balance sheet for a greenhouse/floral shop. Use the following classifications:

CA = Current Asset

CL = Current Liability

NA = Not Applicable

NCA = Non-Current Asset

NCL = Non-Current Liability

<u>CA</u>	\$800 of cut flowers that are ready to be sold
<u>CL</u>	\$20,000 of operating loan that is still owed to the bank
<u>NCL</u>	\$200,000 of mortgage (loan) that is due after the next year
<u>CL</u>	\$5,000 of wages that are owed to the workers
<u>CA</u>	\$3,000 of cash in the cash register
<u>NCA</u>	\$265,000 worth of greenhouse, land, and other buildings
<u>CA</u>	\$25,000 of seed and fertilizer to be used to grow plants
<u>NCL</u>	\$45,000 of equipment loans that will not be repaid within the next 12 months
<u>NCA</u>	\$75,000 of equipment (fork lift, carts, delivery truck, etc.)
<u>CA</u>	\$35,000 of money owed to the business from "credit sales" (Accounts Receivable)
<u>NA</u>	\$125,000 of operating expenses paid over the year (utilities, labor, fertilizer, etc.) - <i>These expenses do NOT all occur on the day of the balance sheet. You would only include the amount of fertilizer, seed, etc. that is on hand that day.</i>
<u>CL</u>	\$4,500 of accrued interest (interest owed but not yet paid) on loans
<u>CA</u>	\$15,000 in the business checking account
<u>NA</u>	\$300,000 of revenues from sales throughout the entire year - <i>These revenues do NOT all occur on the day of the balance sheet. You would only include the amount of cash that is on hand that day.</i>

Use the above assets and liabilities to create a balance sheet for this flower store.
See the Balance Sheet Exercise - Key worksheet in the Lesson 3 Excel file

A convenience store has total assets of \$750,000. As of today, the owner still owes \$200,000 of liabilities (loans, accounts payable, etc.) to her lenders. Calculate this owner's Net Worth in her business on this day.

$$\begin{aligned}\text{Net Worth} &= \text{Total Assets} - \text{Total Liabilities} \\ &= \$750,000 - \$200,000 = \$550,000\end{aligned}$$

Two years later this convenience store has total assets of \$800,000 and total liabilities of \$100,000. Has the owner's Net Worth increased (improved) or decreased (declined) over the past two years?

Increased

Decreased

Net Worth = \$800,000 - \$100,000 = \$700,000. This is larger than the \$550,000 Net Worth from 2 years ago

Balance Sheet Homework Exercise

Use the following information to construct a balance sheet for Joe's Sporting Goods business for January 1, 2017.

First, classify these items in Current Assets, Non-Current Assets, Current Liabilities or Non-Current Liabilities.

CA = Current Asset

CL = Current Liability

NA = Not Applicable

NCA = Non-Current Asset

NCL = Non-Current Liability

- _____ \$40,000 of loan payments due within the next 12 months
- _____ \$350,000 building & land for the store and parking lot
- _____ \$50,000 of operating loan that is still owed to the bank – used to purchase inventory
- _____ \$150,000 of mortgage (loan) on the building that is due after the next year
- _____ \$8,000 of cash in the cash register
- _____ \$85,000 of furniture, office equipment, and display racks
- _____ \$80,000 of shoes, clothing, and sporting gear in inventory, ready to be sold.
- _____ \$45,000 of loans to buy the furniture & display racks that is not due within the next 12 months
- _____ \$25,000 of accounts receivable from sales to a high school baseball team
- _____ \$10,000 owed to an advertising company for a recent radio commercial
- _____ \$7,500 of accrued interest (interest owed but not yet paid)
- _____ \$3,000 of wages that are owed to the workers
- _____ \$35,000 in the business checking account

Use the above assets and liabilities to create a balance sheet for Joe's Sporting Goods store. Use the attached blank balance sheet

Balance Sheet
Joe's Sporting Goods
Date: _____

Assets		Liabilities
Current Assets		Current Liabilities
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
Total Current Assets	_____	Total Current Liabilities
Non-Current Assets		Non-Current Liabilities
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
Total Non-Current Assets	_____	Total Non-Current Liabilities
		Total Liabilities _____
		Net Worth (Owner's Equity) _____
Total Assets	_____	=Total Liabilities & Net Worth _____

From Joe's balance sheet:

Is Joe's business liquid or not liquid? How did you determine this?

Is Joe's business solvent or insolvent? How did you determine this?

Assume Joe sells all of his business assets today and repays all of his liabilities. How much money will he have left over after all the liabilities are repaid? Where can you find this number on his balance sheet?

Balance Sheet Homework Exercise (Key)

Use the following information to construct a balance sheet for Joe's Sporting Goods business for January 1, 2017.

First, classify these items in Current Assets, Non-Current Assets, Current Liabilities or Non-Current Liabilities.

CA = Current Asset

CL = Current Liability

NA = Not Applicable

NCA = Non-Current Asset

NCL = Non-Current Liability

- CL \$40,000 of loan payments due within the next 12 months
- NCA \$350,000 building & land for the store and parking lot
- CL \$50,000 of operating loan that is still owed to the bank – used to purchase inventory
- NCL \$150,000 of mortgage (loan) on the building that is due after the next year
- CA \$8,000 of cash in the cash register
- NCA \$85,000 of furniture, office equipment, and display racks
- CA \$80,000 of shoes, clothing, and sporting gear in inventory, ready to be sold.
- NCL \$45,000 of loans to buy the furniture & display racks that is not due within the next 12 months
- CA \$25,000 of accounts receivable from sales to a high school baseball team
- CL \$10,000 owed to an advertising company for a recent radio commercial
- CL \$7,500 of accrued interest (interest owed but not yet paid)
- CL \$3,000 of wages that are owed to the workers
- CA \$35,000 in the business checking account

Use the above assets and liabilities to create a balance sheet for Joe's Sporting Goods store. Use the attached blank balance sheet

Balance Sheet
Joe's Sporting Goods
Date: January 1, 2023

Assets
Liabilities

Current Assets

Cash in Register	<u>\$8,000</u>
Inventories	<u>\$80,000</u>
Accounts Receivable	<u>\$25,000</u>
Checking Account	<u>\$35,000</u>
Total Current Assets	<u>\$148,000</u>

Current Liabilities

Loan Payments Due	<u>\$40,000</u>
Operating Loan	<u>\$50,000</u>
Accounts Payable	<u>\$10,000</u>
Accrued Interest	<u>\$7,500</u>
Wages Payable	<u>\$3,000</u>
Total Current Liabilities	<u>\$110,500</u>

Non-Current Assets

Building & Land	<u>\$350,000</u>
Furniture, Displays	<u>\$85,000</u>
Total Non-Current Assets	<u>\$435,000</u>

Non-Current Liabilities

Mortgage Remaining	<u>\$150,000</u>
Furniture Loan Rem.	<u>\$45,000</u>
Total Non-Current Liabilities	<u>\$195,000</u>

Total Liabilities **\$305,500**

Net Worth (Owner's Equity) **\$277,500**

Total Assets **\$583,000** **=Total Liabilities & Net Worth** **\$583,000**

From Joe's balance sheet:

Is Joe's business liquid or not liquid? How did you determine this?

Yes, it is liquid. The Current Assets (\$148,000) are greater than the Current Liabilities (\$110,500).

Is Joe's business solvent or insolvent? How did you determine this?

It is solvent. The Total Assets are greater than the Total Liabilities. This means the Net Worth is greater than zero.

Assume Joe sells all of his business assets today and repays all of his liabilities. How much money will he have left over after all the liabilities are repaid? Where can you find this number on his balance sheet?

He will have approximately \$277,500 left over. If he receives \$583,000 from the sale of his assets and he pays all \$305,500 of liabilities – he will have \$277,500.

You can find this number by looking at the Net Worth on the balance sheet.

The Balance Sheet- Student Driven Lesson and Activities

Student Driven Activity: Develop your own scenario to be used with a balance sheet. Be sure to include all portions of the assets and liabilities. Use the example scenario from class to make sure you've included all pieces. The teacher will collect everyone's scenarios and will hand them back out to others in the class to problem solve and create a balance sheet with.

ALTERNATIVE Student Driven LESSON: Have students read the Take Home Reading portion of the lesson. After reading through and using note taking techniques such as highlighting definitions or pertinent information or underlining examples have them divide up into 5 groups. Each group will prepare a short presentation on ONE of the following:

1. Current Assets
2. Non-Current Assets
3. Current Liabilities
4. Non-Current Liabilities
5. Net Worth/Liquidity/Solvency

Be sure to utilize examples of each section so the students will have a place to start when working through the balance sheet worksheets.

The Balance Sheet-Take Home Reading

Have you had to go to the doctor's office recently? Chances are good that the first thing that happened was that your doctor or nurse measured your vital signs as soon as you got there. They measured your pulse rate, your blood pressure, your temperature, and your weight. These are records that show your condition as of today. Then, the doctor probably looked at your historical medical records. These historical records show what has happened to you in the past (diseases, broken bones, etc.), as well as what your vital signs were at those times. Both of these records (your current vital signs and your medical history) give the doctor the information needed to make the best decisions for your health. The same is true for business managers – they need information about the current condition of the business as well as the historical performance of the business to make good decisions.

A good place to get this information is from your business financial records. Financial records help a manager see how the business has performed in the past and the condition of the business today. This helps the manager to determine what the business does well (its strengths) and what it needs to improve (its weaknesses). Once the manager knows these strengths and weaknesses he/she can make decisions to improve the business so that it will be successful over the years.

Let's start analyzing a business in the same manner as a doctor – let's look at the current condition of the business by taking its "vital signs". We do this with a financial statement called the **Balance Sheet**. A balance sheet is a list of all of the assets and liabilities of a business at one point in time – that is, on one specific day. You can make a balance sheet for yourself by getting a piece of paper and making a list of all the things that you own today – clothes, money in your savings account, books, tools, coin collections, iPods, etc. These are your assets. On the other side of the paper list all of the money that you owe to others – money you borrowed from your grandparents, a loan that you have on your cattle or your car, etc. These are your liabilities – what you owe to other people.

After you make this list, go back and put a dollar value on each asset to show what it is worth today. We call this the market value of the asset – what it is worth if you were to sell it in an open market. Also, put a dollar value on your liabilities – how much money do you owe to other people? You have just completed most of your balance sheet – it's that simple!

To finish your balance sheet, add the value of all of your assets. We call this "Total Assets". Then, calculate the total of your liabilities. You guessed it, that is called "Total Liabilities". The final calculation is your Net Worth. Remember that your Net Worth is the dollar value that shows how much you are worth after you pay all of your liabilities. From a business standpoint, Net Worth is the amount that the owner has invested in the business. Here's another way to look at Net Worth – Assume that a business owner wants to get out of business. When he sells his business assets he receives money that is equal to his Total Assets. He then uses that some of that money to pay all of his loans and debts (his Liabilities) that he owes as of that day. The money that he has left over in his hand after paying his liabilities is called his Net Worth – it represents how much he has invested in his business over time.

To calculate Net Worth, simply subtract Total Liabilities from Total Assets:

$$\text{Net Worth} = \text{Total Assets} - \text{Total Liabilities}$$

This equation is always true. We can rearrange this equation to get the following:

$$\text{Total Assets} = \text{Total Liabilities} + \text{Net Worth}$$

Does this equation make sense to you? In a very simple manner, it means that you have two ways of paying for things that you own (your Assets) – you can use your money (your Net Worth) or you can use someone else’s money in the form of a loan (Liabilities). For example, think about buying a car. The purchase price of the car (the asset) is \$20,000. You decide to use your savings to make a down payment of \$5,000 (net worth) and get a loan for the remaining \$15,000 (liability). You see:

$$\text{Total Assets} = \text{Total Liabilities} + \text{Net Worth}$$

$$\text{The Value of the Car} = \text{The Amount of the Loan} + \text{The Amount of Down Payment}$$

$$\$20,000 \text{ car value} = \$15,000 \text{ loan} + \$5,000 \text{ down payment}$$

A Balance Sheet lists the assets of the business and the liabilities of the business on one specific day. You might say that it lists “what the business owns and what the business owes” on a given day. Or, you might say that it shows “what the business owns and how it is paying for those assets – with borrowed money or with the owner’s money.” The reason it is called a Balance Sheet is because the Total Assets are always “balanced” by the Total Liabilities + Net Worth.

A business Balance sheet is relatively easy to construct. We sort the assets into two main categories called Current Assets and Non-Current Assets. Current Assets are assets that will be used up or sold (“converted to cash”) within the next 12 months. Examples include checking accounts, supplies on hand, inventory held for sale, and accounts receivable. Non-Current Assets are assets that are used by the business over several years – these would include land, buildings, machinery, equipment, and breeding livestock. We add Total Current Assets and Total Non-Current Assets to get Total Assets. This is the market value of all of the assets owned by the business on that day.

We do the same thing for the Liabilities. We sort them into liabilities that we will be paying within the next 12 months – we call these Current Liabilities – and into liabilities that we will be repaying after the next 12 months – these are your Non-Current Liabilities. Examples of Current Liabilities include accounts payable, loans that you used to pay for your inventories, and the portion of your long-term loans that are scheduled to be paid within the next 12 months. Non-Current Liabilities include the portion of your equipment, land, or building loans that you will still owe after the next 12 months.

Combine Total Current Liabilities and Total Non-Current Liabilities to get your Total Liabilities. This represents the total amount of money that you owe to others as of that day.

Finally, calculate your Net Worth by using the formula above: $\text{Net Worth} = \text{Total Assets} - \text{Total Liabilities}$. You want to see your Net Worth growing over time – this shows that your business is growing and that you are paying off your debts.

Now, let's put together a balance sheet for Greta's Green Grocery as of July 1, 2023. The first step is to make a list of all of Greta's assets, liabilities, and their values. Here's the information that Greta has provided:

Land	\$100,000
Wages Payable to her workers	\$2,000
Building	\$250,000
Refrigerators & Freezers	\$75,000
Sales Tax Payable to the state	\$1,500
Inventory of Produce that she has for sale	\$5,000
Inventory of Crafts that she has for sale	\$15,000
Accounts Payable	\$25,000 this is what Greta owes to her suppliers for products she has purchased but hasn't paid for as of today
Cash in the cash registers	\$2,000
Cash in her business checking account	\$45,000
Office equipment & furniture	\$5,000
Accounts Receivable	\$10,000 this is from sales to a local restaurant where payment has not been received by Greta as of today
Mortgage to buy the land & building	\$185,000 that is due after the next 12 months
Portion of the Mortgage due this year	\$25,000

Let's use this information to build a Balance Sheet for Greta. The first step is to classify these items as Assets or Liabilities. Remember, Assets are things that the business owns and uses; Liabilities are money that is owed (payable) to someone else.

Greta's Green Grocery Assets on July 1:

Land	\$100,000
Building	\$250,000
Refrigerators & Freezers	\$75,000
Inventory of Produce that she has for sale	\$5,000
Inventory of Crafts that she has for sale	\$15,000
Cash in the cash registers	\$2,000
Cash in her business checking account	\$45,000
Office equipment & furniture	\$5,000
Accounts Receivable	\$10,000

Greta's Green Grocery Liabilities on July 1:

Mortgage to buy the land & building	\$185,000
Portion of the Mortgage due this year	\$25,000
Wages Payable to her workers	\$2,000
Sales Tax Payable to the state	\$1,500
Accounts Payable	\$25,000

Now, let's sort the assets and liabilities into Current and Non-Current categories. Remember, Current refers to things that will be used, converted to cash, or repaid within the next 12 months. Non-Current refers to things with a life of more than 12 months.

Current Assets		Current Liabilities	
Inventory of Produce	\$5,000	Wages Payable	\$2,000
Inventory of Crafts	\$15,000	Sales Tax Payable	\$1,500
Cash in the cash registers	\$2,000	Accounts Payable	\$25,000
Cash in her checking account	\$45,000	Portion of Mortgage	
Accounts Receivable	\$10,000	due this year	\$25,000
Non-Current Assets		Non-Current Liabilities	
Land	\$100,000	Mortgage Remaining	\$185,000
Building	\$250,000		
Refrigerators & Freezers	\$75,000		
Office equipment & furniture	\$5,000		

Now, to complete Greta's Balance Sheet we just need to put a title on it and calculate the totals and the net worth.

**Greta's Green Grocery
Balance Sheet
July 1, 2023**

Assets		Liabilities	
Current Assets		Current Liabilities	
Inventory of Produce	\$5,000	Wages Payable	\$2,000
Inventory of Crafts	\$15,000	Sales Tax Payable	\$1,500
Cash in the cash registers	\$2,000	Accounts Payable	\$25,000
Cash in her checking account	\$45,000	Portion of Mortgage	
Accounts Receivable	<u>\$10,000</u>	due this year	<u>\$25,000</u>
Total Current Assets	\$77,000	Total Current Liabilities	\$53,500
 Non-Current Assets		 Non-Current Liabilities	
Land	\$100,000	Mortgage Remaining	\$185,000
Building	\$250,000		
Refrigerators & Freezers	\$75,000		
Office equipment & furniture	<u>\$5,000</u>		
Total Non-Current Assets	\$430,000	Total Non-Current Liab.	\$185,000
		Total Liabilities	\$238,500
		Net Worth	\$268,500
Total Assets	<u>\$507,000</u>	Total Liab. & Net Worth	<u>\$507,000</u>

And there is Greta's business balance sheet. Notice that the Total Assets (\$507,000) are equal to the Total Liabilities (\$238,500) plus Greta's Net Worth (\$268,500). So her balance sheet actually balances!

Balance Sheets are important financial statements for both managers and lenders. We use this statement to calculate the Liquidity and the Solvency of the business. Liquidity is a term that refers to how easily you can "get your hands on cash" to pay your upcoming liabilities without having to sell your productive assets (your non-current assets). We measure liquidity by comparing your Current Assets to your Current Liabilities. In Greta's business, her Current Assets are \$77,000 are greater than her Current Liabilities are \$53,500. This means that if she had to pay all of her Current Liabilities today, she has enough Current Assets to generate enough the cash needed to pay those liabilities. She can sell her inventories and collect her accounts receivables to generate cash. Combined with her cash in the registers and her checking account, she has more than enough money to pay her \$53,500 of Current Liabilities. We'll talk about other measures of Liquidity later in the semester.

Solvency measures how much of your business you actually own compared to how much money you owe to others. To measure Solvency we look at the Net Worth of the business. If the Net Worth is greater than zero that means your Total Assets are greater than your Total Liabilities – this means that you are “solvent”. If your Net Worth is less than zero (your Total Assets are less than your Total Liabilities) you are “insolvent” – this is a bad situation! Lenders like to see your solvency positive and growing over time. Greta’s Net Worth is a positive \$268,500 which indicates that she is solvent. We’ll show you some other measures of Solvency later, but for now just remember that you are solvent if your Net Worth is greater than zero.

The Agricultural Balance Sheet

THE BASICS

The **balance sheet** is a statement of financial position at a specific point in time. The balance sheet lists everything that is owned and everything that is owed by the business on a given date. This is a method of determining what portion of the business belongs to the owners and what portion belongs to investors or creditors. A balance sheet reflects the result of all past transactions in the business, but not how the current financial position was obtained.

The balance sheet consists of three main parts:

- **Assets:** Assets include anything that is owned or controlled by the business that has monetary value. Assets can be valued at either cost or market value, depending on what is preferred by the person preparing or requesting the balance sheet. Agricultural assets are typically valued at market value. Assets valued on a cost basis are listed at the historical cost (purchase price) minus any accumulated depreciation. Market valued assets are listed at fair market value given the asset’s condition, location, or other relevant attributes. This discussion will use market-valued assets, which is common practice in agricultural finance. Assets should be divided into two categories: current and non-current. It has been convention in agriculture to separate assets into three categories: current, intermediate, and long term. However, the Farm Financial Standards Council recommends a two-category balance sheet that is more consistent with general business. Nevertheless, it is recognized that if a three-category classification gives the reader better insight, it is acceptable as long as the definitions of the classifications are clearly stated. Generally, intermediate assets would have a life between one and ten years, while long-term assets would have a life greater than 10 years. A more detailed discussion of asset classification will follow.
- **Liabilities:** Liabilities include all debts, or claims against the business by creditors, suppliers, or any other person or institution to which a debt is owed. Liabilities are either classified into 2 categories (current, non-current) or 3 categories (current, intermediate, long term). Liabilities include principal outstanding on loans, accrued interest, and accounts payable.
- **Owner Equity:** Owner equity, or net worth, is the difference between total assets and total liabilities. It reflects the owner’s stake in the business and includes investment capital and retained profits. In a corporate business structure, owner equity will include stockholder’s equity, additional paid-in-capital, and retained earnings.

The basis for the balance sheet is the fundamental accounting equation:

$$\text{Assets} = \text{Liabilities} + \text{Owner Equity}$$

This equation shows that the total assets of a business belong partially to creditors (Liabilities) and partially to the owners (Owner Equity). This equation always holds true.

The ownership structure of agricultural businesses is becoming increasingly complex. Combinations of partnerships, corporations, and limited liability companies are quickly emerging with one entity holding operating assets and another controlling the capital assets. For these reasons it is essential to identify for what entity the balance sheet is being prepared. Despite the complexity, there are three common entities for which a balance sheet can be prepared. First, a business balance sheet including only business assets and liabilities can be prepared. Second, a personal balance sheet excluding business assets and liabilities may be desired. Finally, a combined business and personal balance sheet can be prepared. This type of consolidated statement is very popular for sole proprietorships and will be the focus of discussion.

For analysis purposes, the timing of the balance sheet is important. Balance sheets are most useful if they coincide with the timing of the income statement, usually one calendar year. The accrual adjusted income statement, combined with other data, explains the changes in the beginning and end of year balance sheets. However, a balance sheet may be desired at other times, such as a current statement to accompany a credit request.

ASSETS

Current Assets

Current assets are the first classification of assets appearing on the balance sheet. A current asset includes items such as cash or assets that can be turned into cash within a year without disrupting normal business operations. Current assets also include any items that will be consumed within a year. Examples of current assets include:

- **Cash** – Any cash on hand or in checking or savings accounts
- **Marketable Securities** – Stock or other securities that are publicly traded and can be easily turned to cash
- **Accounts Receivable** – Any amounts owed to the business for products or services provided for which payment has not been received

- **Marketable Inventories** – Crops, livestock, or other products held for resale, not breeding livestock, as they are considered non-current assets
- **Cash Invested in Growing Crops** – The dollar amount of inputs invested in growing crops after planting, but before harvest
- **Supplies** – Any items such as fertilizer, chemicals, feed, twine, parts, etc.
- **Prepaid Expenses** – Items that have been paid for but not yet received in full, examples include insurance premiums, rent or lease payments, and certain taxes

Non-Current Assets

The second classification of assets is non-current assets. These assets support production activities and are considered to have a life greater than one year. If using the traditional balance sheet structure, these assets would include the intermediate and long-term categories. In agriculture, common non-current assets include machinery and equipment, breeding livestock, and securities that are not readily marketable. Although breeding livestock could be sold for cash within a year, it is not considered a current asset. Outside of normal replacement patterns, sales of breeding stock to any great degree would disrupt the normal operation of the business, and therefore are considered non-current assets. Non-marketable securities, such as stock in cooperatives or lending institutions such as the Farm Credit System, and business retirement plans are not readily marketable; thus they are classified as non-current assets. If a consolidated business and personal balance sheet is prepared, there may also be some non-current personal assets such as household furnishings and equipment, personal and recreational vehicles, and personal retirement accounts. Another major category of non-current assets is real estate including land, buildings, and improvements. A personal residence may also be included if the balance sheet is prepared for a consolidated entity.

Valuation Issues

A balance sheet is only as valuable as the quality of the information used to prepare it. When valuing assets, a conservative approach is preferred, based upon appraisals and recent sales data in the market. It is important for the person preparing a balance sheet to distinguish between possession and ownership of assets. If a partial interest in property is owned, then only that portion should be reflected on the balance sheet. Ownership issues also arise in the case of life estates and lease agreements. When crop and livestock inventories are included on the balance sheet, they should be accompanied by a schedule detailing the amount and values of each item, indicating how the total value was derived.

It is not uncommon in agriculture for a person to be involved in more than one business venture. It is important to disclose information about assets and liabilities associated with other businesses. One business may show significant equity while another is heavily leveraged. Lenders are likely to request a consolidated balance sheet that reflects all business and personal assets and liabilities.

There are numerous valuation issues that arise when preparing agricultural balance sheets that exceed the scope of our discussion here. However, a controversial valuation issue is that of capital leases. It is becoming increasingly popular for agricultural producers to lease capital items such as tractors, combines, irrigation equipment, and storage structures. In the past, lease obligations were simply included as footnotes to the balance sheet. However, there is a growing opinion that the lease obligations should be placed directly on the balance sheet. To begin our discussion, we must distinguish

between capital leases and operating leases. Operating leases allow the lessee the right to use an asset for a relatively short period of time. Operating leases should simply appear as a note to the balance sheet, similar to the cash rental of farmland. A capital lease is a long-term lease that is actually a tool for financing the acquisition of an asset. In order to be considered a capital lease, the agreement must meet the following ownership tests:

- The lease transfers ownership of property to the lessee at the end of the term.
- The lease contains a bargain purchase option.
- The term of the lease is at least seventy-five percent of the estimated economic life of the property.
- The present value of the minimum lease payment equals or exceeds ninety percent of the fair market value of the leased property.

A capital lease must be reflected on both the asset and liability sides of the balance sheet. We treat the capital lease similar to an equal payment amortized loan. The lease payment is divided into equivalent “principal and interest” portions. The capital lease obligation is separated into current and non-current sections. Although there is no “interest rate” stated in the agreement, an inherent interest rate can be calculated. The leased asset, net of straight-line depreciation, is listed as a non-current asset for each year of the lease term. The “principal and interest” portions due within the year are listed as current liabilities, and the remaining lease obligation is a non-current liability.

LIABILITIES

As with assets, liabilities are classified as either current or non-current, consistent with Farm Financial Standards Council recommendations. The liability section of the balance sheet should include all obligations as of the date of the balance sheet. They are classified based on when repayment is scheduled.

Current Liabilities

Current liabilities include all debts and obligations that are due within the next 12 months. Examples of some common current liabilities are:

- **Accounts Payable** – Money owed to suppliers or other businesses for products or services that your business has received, but not yet made payment
- **Operating Loans** – Any outstanding balances on revolving or non-revolving operating lines of credit (also called Notes Payable)
- **Principal Portion of Term Loans Due Within the Next Year** – The total amount of principal on term loans that is due to be paid within the year
- **Accrued Interest** – The amount of interest that has accrued since the last payment on all loans. This is the total amount of interest that would be due if all loans were paid off as of the day of the balance sheet. It is **not** the total amount of interest due to be paid in the next 12 months.
- **Accrued Income and Property Taxes** – Property taxes are typically paid in a period following when they are incurred and income taxes are paid as frequent as every quarter, so the balance sheet will often reflect some accrued tax liability.
- **Other Accrued Expenses** – Items such as rents and leases that have been utilized, but not yet paid would be accrued expenses

- **Credit Card Debt** – If preparing a consolidated balance sheet, business and personal credit card debt including interest would be included as a current liability.

Non-Current Liabilities

Non-current liabilities capture all obligations that are due and payable beyond one year. The most common non-current liabilities are term loans used to finance machinery, equipment, breeding livestock, or real estate. The portion of the term loan due beyond 12 months is considered a non-current liability. Remember that the principal amount due within 12 months is a current liability.

It is common in agriculture for loans to be financed for one year with the option for renewal at the end of the year given acceptable repayment performance. If the lender is under no obligation to renew the loan at the end of the original agreement, the liability should be classified as current. This treatment may distort financial ratios, but legally the entire obligation is due at the end of one year. Loans from friends and relatives with no specified repayment plan are also considered current liabilities.

Contingent Liabilities

Another category of liabilities not yet discussed appears as a footnote to the balance sheet. Contingent liabilities include such items as guarantees (co-signed notes, etc.), pending lawsuits, and federal and state tax disputes. These items are not liabilities at the present, but the potential for an obligation exists.

OWNER EQUITY

Owner equity is a residual amount after liabilities are subtracted from assets. Owner equity reflects the owner's investment of capital into the business over time, as well as retained earnings. Retained earnings are profits that have been reinvested back into the business rather than withdrawn by the owners (or paid out in dividends in the case of a corporation).

DEFERRED TAXES

As discussed earlier, assets can be valued on the balance sheet, either on a cost or market value basis. A market value balance sheet reflects the impact of deferred tax liabilities. Deferred taxes are the federal and state taxes that would be incurred if the business were liquidated. Deferred taxes on current assets arise because many agricultural producers report income on a cash rather than accrual basis for income tax purposes. Therefore they do not pay taxes on the accumulation of crop and livestock inventories over time. Income taxes would be due if the items were liquidated because inventories are sold and the expenses associated with them have previously been deducted as cash expenses. Deferred taxes may also be present on non-current assets. Some examples of deferred tax situations are:

- Market value of machinery exceeds cost less accumulated depreciation
- Sales price of purchased breeding livestock exceeds the original cost
- Breeding livestock raised on the farm are sold
- Retirement accounts are liquidated early
- Market value of real estate exceeds cost less accumulated depreciation

Deferred taxes are a complicated topic and could have an entire discussion devoted solely to the topic. For simplicity, the case example will be based on the assumption of no deferred taxes.

Case Example:

The following pages contain a case study to illustrate the construction of a combined business and personal balance sheet for a sole-proprietorship operation. Calculations are illustrated where appropriate. Otherwise, the information has been placed in the proper categories on the balance sheet and totaled.

Nick Hokie operates a stocker cattle and beef cow-calf operation in southwestern Virginia. His wife, Polly, is a managing partner for a veterinary clinic in the region with a \$35,000 annual salary. Nick and Polly are both graduates of Virginia Tech and are 35 years old. The Hokies have two sons, a 10-year-old Al and 8-year-old Clark. The Hokies rent the home in which they are currently living.

Nick rents Polly's grandparents' farm, including the machinery. He also owns a 300-acre farm. Nick purchases 400 lb. cattle in the spring each year and then sells them as 700-800 lb. cattle in the fall. He usually has about 120 head. In addition, Nick has about 75 breeding cows and 3 bulls. He raises calves for sale at 500-600 lbs. Nick also sells hay in the winter and occasionally sells high-priced bulls.

One of Nick and Polly's New Year's resolutions was to get a better grasp on their financial situation. They would like to prepare a set of financial statements. The starting point is a current balance sheet. They have provided the following information so that you can prepare a consolidated business and personal balance sheet as of January 1st.

<u>Assets and Liabilities</u>	<u>Market Value on January 1st</u>
Cash	\$8,000
Accounts Receivable (Hay)	\$2,100
Accounts Payable	\$1,000
Credit Card Debt	\$900
Marketable Securities	\$12,000
Supplies	\$1,200
Inventory	\$4,600
1995 Dodge Ram Pickup	\$16,000
1996	\$6,000
Tractor	\$20,000
Breeding Livestock	\$30,000
IRA	\$45,000
Household Goods / Personal Assets	\$12,000
Land and Improvements	\$225,000
Prepaid Insurance	\$1,320 paid each 6/1 & 12/1, covers next 6 months
Accrued Property Taxes	\$1,250 paid each 5/1 & 11/1, covers prior 6 months

Polly co-signed a \$10,000 loan on a car for her youngest sister Holly.

Loan for Farm Purchase

Original Amount:	\$150,000
Balance after last payment:	\$126,637
Lender:	Farm Credit
Interest Rate:	9%
Term:	15 years
Annual Payment:	\$18,609 each December 1st

Cattle Loan

Original Amount:	\$30,000
Balance after last payment:	\$13,735
Lender:	National Bank of Blacksburg
Interest Rate:	10%
Term:	5 years
Annual Payment:	\$7,914 each September 1st

Tractor Loan

Original Amount:	\$24,000
Balance after last payment:	\$18,524
Lender:	Deere Credit
Interest Rate:	8%

Term: 3 years
Quarterly Payment: \$2,269 on 2/1, 5/1, 8/1, 11/1

Prepaid Insurance

The premium is \$1,320 for six months of coverage, or \$220/month (\$1,320 / 6 months). The premium was last paid on 12/1. Therefore, as of 1/1, one month of the premium has been used up, and 5 months, or \$1,100, is prepaid. ($\$220 \times 5 = \$1,100$)

Accrued Property Taxes

Property taxes are paid "after the fact" on assets that you have owned over a period of time. The property tax is \$1,250 paid every six months (or \$208/month). The last payment was made on 11/1. Therefore, as of 1/1, two months of property taxes has accrued, or \$417. ($\$208 \times 2 = \417)

Loan Calculations (see handout on "4-Step Process" for explanation of procedure)

Farm

- | | |
|--------------------------------------|-------------------------|
| 1. $\$126,637 \times .09 = \$11,397$ | interest |
| 2. $\$18,609 - \$11,397 = \$7,212$ | principal within 1 year |
| 3. $\$126,637 - \$7,212 = \$119,425$ | principal beyond 1 year |
| 4. $\$11,397 / 12 \times 1 = \950 | accrued interest |

Cattle

- | | |
|------------------------------------|-------------------------|
| 1. $\$13,735 \times .10 = \$1,374$ | interest |
| 2. $\$7,914 - \$1,374 = \$6,540$ | principal within 1 year |
| 3. $\$13,735 - \$6,540 = \$7,195$ | principal beyond 1 year |
| 4. $\$1,374 / 12 \times 4 = \458 | accrued interest |

Tractor

- | | |
|---|-------------------------|
| 1. $\$18,524 \times .08 = \$1,482$ | approx. interest |
| 2. $4 \times (\$2,269) - \$1,482 = \$7,594$ | principal within 1 year |
| 3. $\$18,524 - \$7,594 = \$10,930$ | principal beyond 1 year |
| 4. $\$1,482 / 12 \times 2 = \247 | accrued interest |

Balance Sheet
Nick and Polly Hokie
January 1, Year X

CURRENT ASSETS

Cash	\$ 8,000
Accounts Receivable	\$ 2,100
Marketable Securities	\$ 12,000
Supplies	\$ 1,200
Inventory	\$ 4,600
Prepaid Insurance	\$ 1,100

Total Current Assets \$ 29,000

NON-CURRENT ASSETS

Intermediate Assets

1995 Dodge Ram Pickup	\$ 16,000
1992 Chevrolet	\$ 6,000
Tractor	\$ 20,000
Breeding Livestock	\$ 30,000
IRA	\$ 45,000
Household / Personal Assets	\$ 12,000

Long-Term Assets

Land and Improvements	<u>\$ 225,000</u>
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Total Non-Current Assets \$ 354,000

TOTAL ASSETS \$ 383,000

CURRENT LIABILITIES

Accounts Payable	\$ 1,000
Credit Card Debt	\$ 900
Principal Due Within 1 Year	
Farm	\$ 7,212
Cattle	\$ 6,540
Tractor	\$ 7,594
Accrued Interest	\$ 1,655
Accrued Property Taxes	<u>\$ 417</u>

Total Current Liabilities \$ 25,318

NON-CURRENT LIABILITIES

Intermediate Liabilities

Remaining Principal - Cattle	\$ 7,195
Remaining Principal - Tractor	\$ 10,930

Long-Term Liabilities

Remaining Principal - Farm	<u>\$ 119,425</u>
----------------------------	-------------------

Total Non-Current Liabilities \$ 137,550

TOTAL LIABILITIES \$ 162,868

OWNER EQUITY \$ 220,132

**TOTAL LIABILITIES AND
OWNER EQUITY** \$ 383,000

Note: co-signed note for \$10,000 as contingent liability

Lesson 4 Income Statement

Bell Ringer: Now that you know what income is, list as many people, businesses and groups that you think would need an income statement and why they would need one.

A. Section 1 – Briefly Review Previous Material (Est. time 5 minutes)

1. Financial Terms & Forms of business
2. Balance Sheet

B. Section 2 – Introduce Income Statement (Schedule F/C, P&L) (Est. time 10-15 minutes)

1. Show an example of an income statement (Nick & Polly Hokie)
2. An Income Statement is a list of all the revenues and expenses for the entire farm/business for a given period (usually 1 year)
3. Shows the profitability of the business (Total Revenues – Total Expenses: from Lesson 2)
4. Discuss how a manager or lender uses an income statement in a loan application
 - a. Income statements tell the loan officer and the manager if the business made profits for the period, and how much profits (loss) it made. The lender wants to see a profitable business – profits allow the business to repay the loan. An unprofitable business will have trouble paying its bills, replacing its assets as they wear out, and repaying its loans.
 - b. Income statements give the manager valuable information that he/she can use to make improvements in the business to increase profits. How can the increase sales revenues or decrease operating expenses? The quickest way to improve the profitability of a business is to reduce its 5 largest expenses (without hurting production or quality).

C. Section 3 – Discuss the Main Sections of An Income Statement (Est. time 30-35 minutes)

1. Revenues
 - a. Revenues are the income from selling its products and services. Ideally, the revenues for each product and service should be listed separately. However, they are commonly “lumped” into 1 category – not recommended!
 - b. The business may have other revenues besides the sale of products and services. They may get revenues from:
 - i. rental of their property or assets
 - ii. custom work for other businesses or subcontracting
 - iii. income from the business’ investments (in stocks, bonds, CDs, etc.)
 - iv. government program payments
 - v. proceeds from an insurance policy
 - c. Principal from loans does NOT get included as a revenue.
2. Expenses
 - a. Ideally, the expenses should be divided into 2 categories: Operating (Variable) and Overhead (Fixed). This gives the manager better information, and enables them to make better decisions. Lenders also like to see the expenses divided this way.
 - b. Operating Expenses are the expenses from producing your products or services. They may also be called “Cost of Goods Sold”. The more you produce, the higher your operating expenses will be. Examples on a farm would be feed, seed, fertilizer, hired labor, and hauling expenses.

- c. Overhead Expenses are the expenses you have just for being in business. These expenses typically do not vary much as you produce more or less – hence, they are often called “fixed expenses”. Examples of Overhead Expenses are:
 - i. Office rent, utilities, administrative costs, property taxes, insurance premiums
 - ii. Depreciation – this represents the loss of value of an asset due to “rust out, wear out, and fade out” (Lesson 2). You do not pay depreciation expenses in cash – they are called “non-cash expenses”. But it is still important to include depreciation expenses on your income statement – they represent a real loss of value (an expense) to the business. If you can’t generate enough revenues to cover your depreciation expenses, you can’t replace your facilities and equipment as they wear out.
 - d. Interest on loans is a business expense. This expense should be included on your income statement.
 - e. Principal payments on loans (the portion of the loan principal that you repaid that period) do NOT go on an income statement. Principal payments are not an expense to the business – they simply represent money that someone lent you and you are repaying. For example, assume you borrow \$100 at 5% interest for 1 year. At the end of the year you will pay the lender \$105 (\$100 of principal + \$100 x 5% interest). Because the lender gave you \$100 and you repaid \$105, the expense of the loan was only \$5 (the interest you paid).
3. Gross Margin
- a. Gross Margin tells a manager how much money is left over from the revenues after the operating (variable) expenses are paid. Another term for gross margin is “short term profits”. You always want your gross margin to be greater than zero. If you cannot find a way to earn a gross margin greater than zero, you should close the business.
4. Net Profit (Net Income, Net Farm Income)
- a. The “bottom line” for a business manager is profits. Other terms for profits are “Net Income” or “Net Farm Income”. Profits are how much of the revenues are left after all expenses (operating and overhead) are paid. You would like to see your profits greater than zero in most cases. If you cannot consistently earn profits greater than zero, you need to make significant changes to the business or close the business.
5. Exercise on filling out a Schedule C, calculating Net Income
- a. Have students identify the top 5 expenses – focus on reducing these without hurting
 - b. revenues or production

Materials: PowerPoint on Income Statements
Note Organizer
In-Class Exercise and Key
Homework Exercise and Key
Student Driven Activity
Reading on Income Statements (optional)

INTRODUCTION TO INCOME STATEMENTS



Income Statement

- List of all Revenues and Expenses incurred over a period of time
 - Revenues = income from sale of products & services
 - Expenses = Operating Expenses & Overhead Expenses
 - Usually for a 1-year period
- Also called Profit & Loss Statement (P&L)
- Shows the profitability of the business
 - The "bottom line" shows your net income or profit for the period



Income Statement

- Can use Schedule F (Farm) or Schedule C (Business) as a format
- Usually part of a loan application
- Managers use it to improve the profitability of the business
- Used to:
 - Measure the profitability of the firm over a specific time period
 - Net Farm Income
 - Weekly, Monthly, Quarterly, Yearly, etc.
 - Measure the ability of the business to repay its loans
 - Repayment ability



Sections of an Income Statement

- Revenues
 - Revenues from sales of products and services
 - List revenues from each product/service separately
 - Other revenues (custom work, gov. payments, etc.)
 - Loan principal is NOT a revenue



Sections of an Income Statement

- Expenses from operations
 - Operating (Variable) expenses
 - Feed, seed, fertilizer, labor
 - aka "Cost of Goods Sold"
 - Overhead (Fixed) expenses
 - Administrative costs, office rent, property taxes
 - Depreciation expense
 - Interest paid that period
- Principal payments are NOT included as expenses



Sections of an Income Statement

- Gross Margin
 - This is not always included on an income statement
 - $Gross\ Margin = Revenues - Total\ Operating\ Expenses$
 - You want to see your gross margin > \$0
- Profits (Net Income, Net Farm Income)
 - The "bottom line"
 - $Profits = Revenues - Total\ Expenses$
 - You want Profits (Net Income) > \$0



Income Statements- Note Organizer

- _____ - income from sale of products and services
- _____ - operating expenses & overhead expenses
- Duration is typically 1 year
- Can be called Profit and Loss Statement
- Shows _____ of the business
 - The _____ shows your net income or profit for the period
- These tax forms can be used as a format
 - _____ - farm
 - _____ - business
- Used to:
 - _____
 - Net farm income
 - Weekly, monthly, quarterly, yearly, etc...
 - _____
 - Repayment ability

SECTIONS OF AN INCOME STATEMENT

	Description	Description (cont.)
REVENUE		
EXPENSES	Operating (variable) expenses-	Overhead (fixed) expenses-

GROSS MARGIN		
PROFITS (Net Income, Net Farm Income)		

Income Statement In-Class Exercise

Use the following information to complete an income statement for Jack's Roadside Market. Not all of the information belongs on an income statement.

Annual Business License	\$100
Hired Labor Wages	\$12,000
Operating Loan Principal Received	\$35,000
Depreciation	\$8,000
Office Expense	\$1,200
Total Sales (Gross Receipts)	\$115,000
Repairs & Maintenance	\$900
Supplies	\$2,000
Interest on Mortgage	\$3,500
Interest on Other Loan	\$700
Legal & Professional Services	\$1,500
Car & Truck Expenses	\$2,500
Advertising	\$800
Utilities	\$4,000
Loan Principal Repaid	\$6,000
Insurance	\$3,000

To calculate the Cost of Goods Sold (Operating Expenses): Use Part III of Schedule C

Beginning Inventory	\$30,000
Hired Labor Wages – Production	\$18,000
Purchase of Inventory	\$25,000
Materials & Supplies	\$3,000
Ending Inventory	\$35,000

Calculate the Gross Margin (Line 7) for Jack's business.

Calculate the Net Income (Line 31) for Jack's business. What can Jack do with these profits?

What can Jack do to try to improve the profitability (net income) of his business?

Income Statement In-Class Exercise (Key)

Use the following information to complete an income statement for Jack's Roadside Market. Not all of the information belongs on an income statement.

Annual Business License	\$100	
Hired Labor Wages	\$12,000	
Operating Loan Principal Received	\$35,000	Does not belong on an income statement
Depreciation	\$8,000	
Office Expense	\$1,200	
Total Sales (Gross Receipts)	\$115,000	
Repairs & Maintenance	\$900	
Supplies	\$2,000	
Interest on Mortgage	\$3,500	
Interest on Other Loan	\$700	
Legal & Professional Services	\$1,500	
Car & Truck Expenses	\$2,500	
Advertising	\$800	
Utilities	\$4,000	
Loan Principal Repaid	\$6,000	Does not belong on an income statement
Insurance	\$3,000	

To calculate the Cost of Goods Sold (Operating Expenses): Use Part III of Schedule C

Beginning Inventory	\$30,000
Hired Labor Wages – Production	\$18,000
Purchase of Inventory	\$25,000
Materials & Supplies	\$3,000
Ending Inventory	\$35,000

Calculate the Gross Margin (Line 7) for Jack's business.

$$\text{Gross Margin} = \$115,000 - \$41,000 = \$74,000$$

Calculate the Net Income (Line 31) for Jack's business. What can Jack do with these profits?

$$\text{Net Income} = \$74,000 - \$40,200 = \$33,800$$

Jack can use this to pay his salary (which is not included on Schedule C), pay income taxes, repay his loans, purchase new equipment, donate some to church/charity, or build his savings (liquidity)

What can Jack do to try to improve the profitability (net income) of his business?

Reduce his top 5 expenses without hurting production. Increase his selling price. Sell new/different products. Stop selling unprofitable products.

Income Statement Homework Exercise

Use the following information to complete an income statement for Ernie's Welding & Machine Shop. Not all of the information belongs on an income statement. Please use the Schedule C tax form to build this income statement.

Total Sales (Gross Receipts)	\$550,000
Wages - Hired Administrative Labor	\$42,000
Car & Truck Expenses	\$5,500
Operating Loan Principal Received	\$125,000
Depreciation	\$15,000
Office Expense	\$2,800
Operating Loan Principal Repaid	\$125,000
Repairs & Maintenance	\$9,000
Other expenses	\$5,000
Rent – machinery	\$20,000
Supplies	\$52,000
Income Taxes	\$28,000
Annual Business License	\$200
Interest on Mortgage	\$12,500
Interest on Other Loan	\$6,000
Legal & Professional Services	\$2,500
Advertising	\$8,000
Utilities	\$34,000
Mortgage Principal Repaid	\$30,000
Insurance	\$23,000

To calculate the Cost of Goods Sold (Operating Expenses): Use Part III of Schedule C

Beginning Inventory	\$50,000
Hired Labor Wages – Production	\$88,000
Purchase of Inventory	\$125,000
Ending Inventory	\$65,000

Calculate the Gross Margin (Line 7) for Ernie's business.

Calculate the Net Income (Line 31) for Ernie's business.

What can Ernie do to try to improve the profitability (net income) of his business?

**SCHEDULE C
(Form 1040)**

Department of the Treasury
Internal Revenue Service (99)

Profit or Loss From Business
(Sole Proprietorship)

► Go to www.irs.gov/ScheduleC for instructions and the latest information.

► Attach to Form 1040, 1040-SR, 1040-NR, or 1041; partnerships must generally file Form 1065.

OMB No. 1545-0074

2021

Attachment
Sequence No. **09**

Name of proprietor

Social security number (SSN)

A Principal business or profession, including product or service (see instructions)

B Enter code from instructions

C Business name. If no separate business name, leave blank.

D Employer ID number (EIN) (see instr.)

E Business address (including suite or room no.) ►

City, town or post office, state, and ZIP code

F Accounting method: (1) ☐ Cash (2) ☐ Accrual (3) ☐ Other (specify) ►

G Did you "materially participate" in the operation of this business during 2021? If "No," see instructions for limit on losses ☐ Yes ☐ No

H If you started or acquired this business during 2021, check here ☐ Yes ☐ No

I Did you make any payments in 2021 that would require you to file Form(s) 1099? See instructions ☐ Yes ☐ No

J If "Yes," did you or will you file required Form(s) 1099? ☐ Yes ☐ No

Part I Income

1	Gross receipts or sales. See instructions for line 1 and check the box if this income was reported to you on Form W-2 and the "Statutory employee" box on that form was checked <input type="checkbox"/>	1
2	Returns and allowances	2
3	Subtract line 2 from line 1	3
4	Cost of goods sold (from line 42)	4
5	Gross profit. Subtract line 4 from line 3	5
6	Other income, including federal and state gasoline or fuel tax credit or refund (see instructions)	6
7	Gross income. Add lines 5 and 6	7

Part II Expenses. Enter expenses for business use of your home **only** on line 30.

8	Advertising	8	18	Office expense (see instructions)	18
9	Car and truck expenses (see instructions)	9	19	Pension and profit-sharing plans	19
10	Commissions and fees	10	20	Rent or lease (see instructions):	
11	Contract labor (see instructions)	11	a	Vehicles, machinery, and equipment	20a
12	Depletion	12	b	Other business property	20b
13	Depreciation and section 179 expense deduction (not included in Part III) (see instructions)	13	21	Repairs and maintenance	21
14	Employee benefit programs (other than on line 19)	14	22	Supplies (not included in Part III)	22
15	Insurance (other than health)	15	23	Taxes and licenses	23
16	Interest (see instructions):		24	Travel and meals:	
a	Mortgage (paid to banks, etc.)	16a	a	Travel	24a
b	Other	16b	b	Deductible meals (see instructions)	24b
17	Legal and professional services	17	25	Utilities	25
28	Total expenses before expenses for business use of home. Add lines 8 through 27a	28	26	Wages (less employment credits)	26
29	Tentative profit or (loss). Subtract line 28 from line 7	29	27a	Other expenses (from line 48)	27a
30	Expenses for business use of your home. Do not report these expenses elsewhere. Attach Form 8829 unless using the simplified method. See instructions. Simplified method filers only: Enter the total square footage of (a) your home: _____ and (b) the part of your home used for business: _____. Use the Simplified Method Worksheet in the instructions to figure the amount to enter on line 30	30	b	Reserved for future use	27b
31	Net profit or (loss). Subtract line 30 from line 29. • If a profit, enter on both Schedule 1 (Form 1040), line 3 , and on Schedule SE, line 2 . (If you checked the box on line 1, see instructions). Estates and trusts, enter on Form 1041, line 3 . • If a loss, you must go to line 32.	31			
32	If you have a loss, check the box that describes your investment in this activity. See instructions. • If you checked 32a, enter the loss on both Schedule 1 (Form 1040), line 3 , and on Schedule SE, line 2 . (If you checked the box on line 1, see the line 31 instructions.) Estates and trusts, enter on Form 1041, line 3 . • If you checked 32b, you must attach Form 6198 . Your loss may be limited.		32a	<input type="checkbox"/> All investment is at risk.	
			32b	<input type="checkbox"/> Some investment is not at risk.	

For Paperwork Reduction Act Notice, see the separate instructions.

Cat. No. 11334P

Schedule C (Form 1040) 2021

Part III	Cost of Goods Sold (see instructions)
-----------------	--

- | | | | | | | | |
|----|---|----|-------------------------------|---|--|---|---|
| 33 | Method(s) used to value closing inventory: | a | <input type="checkbox"/> Cost | b | <input type="checkbox"/> Lower of cost or market | c | <input type="checkbox"/> Other (attach explanation) |
| 34 | Was there any change in determining quantities, costs, or valuations between opening and closing inventory? | | | | | | |
| | If "Yes," attach explanation <input type="checkbox"/> Yes <input type="checkbox"/> No | | | | | | |
| 35 | Inventory at beginning of year. If different from last year's closing inventory, attach explanation | 35 | | | | | |
| 36 | Purchases less cost of items withdrawn for personal use | 36 | | | | | |
| 37 | Cost of labor. Do not include any amounts paid to yourself | 37 | | | | | |
| 38 | Materials and supplies | 38 | | | | | |
| 39 | Other costs | 39 | | | | | |
| 40 | Add lines 35 through 39 | 40 | | | | | |
| 41 | Inventory at end of year | 41 | | | | | |
| 42 | Cost of goods sold. Subtract line 41 from line 40. Enter the result here and on line 4 | 42 | | | | | |

Part IV **Information on Your Vehicle.** Complete this part **only** if you are claiming car or truck expenses on line 9 and are not required to file Form 4562 for this business. See the instructions for line 13 to find out if you must file Form 4562.

- 43** When did you place your vehicle in service for business purposes? (month/day/year) / /

44 Of the total number of miles you drove your vehicle during 2021, enter the number of miles you used your vehicle for:

a Business **b** Commuting (see instructions) **c** Other

45 Was your vehicle available for personal use during off-duty hours? ☐ **Yes** ☐ **No**

46 Do you (or your spouse) have another vehicle available for personal use?. ☐ **Yes** ☐ **No**

47a Do you have evidence to support your deduction? ☐ **Yes** ☐ **No**

b If “Yes,” is the evidence written? ☐ **Yes** ☐ **No**

Part V **Other Expenses.** List below business expenses not included on lines 8–26 or line 30.

[illegible]

Income Statement Homework Exercise (Key)

Use the following information to complete an income statement for Ernie's Welding & Machine Shop. Not all of the information belongs on an income statement. Please use the Schedule C tax form to build this income statement.

Total Sales (Gross Receipts)	\$550,000	
Wages - Hired Administrative Labor	\$42,000	
Car & Truck Expenses	\$5,500	
Operating Loan Principal Received	\$125,000	Not on an income statement
Depreciation	\$15,000	
Office Expense	\$2,800	
Operating Loan Principal Repaid	\$125,000	Not on an income statement
Repairs & Maintenance	\$9,000	
Other expenses	\$5,000	
Rent – machinery	\$20,000	
Supplies	\$52,000	
Income Taxes	\$28,000	Not on an income statement
Annual Business License	\$200	
Interest on Mortgage	\$12,500	
Interest on Other Loan	\$6,000	
Legal & Professional Services	\$2,500	
Advertising	\$8,000	
Utilities	\$34,000	
Mortgage Principal Repaid	\$30,000	Not on an income statement
Insurance	\$23,000	

To calculate the Cost of Goods Sold (Operating Expenses): Use Part III of Schedule C

Beginning Inventory	\$50,000
Hired Labor Wages – Production	\$88,000
Purchase of Inventory	\$125,000
Ending Inventory	\$65,000

Calculate the Gross Income (Line 7) for Ernie's business.

\$352,000 see Schedule C

Calculate the Net Income (Line 31) for Ernie's business.

\$114,500 see Schedule C

What can Ernie do to try to improve the profitability (net income) of his business?

He can try to reduce his 5 largest expenses.

He can charge a higher price for his services, without scaring customers away.

**SCHEDULE C
(Form 1040)**

Department of the Treasury
Internal Revenue Service (IRS)

Profit or Loss From Business
(Sole Proprietorship)

► Go to www.irs.gov/ScheduleC for instructions and the latest information.
► Attach to Form 1040, 1040-SR, 1040-NR, or 1041; partnerships must generally file Form 1065.

OMB No. 1545-0074

2021

Attachment
Sequence No. **09**

Name of proprietor

Ernie McSoldier

Social security number (SSN)

A Principal business or profession, including product or service (see instructions)

Welding & Machinery Repair

B Enter code from instructions

C Business name. If no separate business name, leave blank.

Ernie's Welding & Machinery Shop

D Employer ID number (EIN) (see instr.)

E Business address (including suite or room no.) ►

City, town or post office, state, and ZIP code

F Accounting method: (1) ☐ Cash (2) ☐ Accrual (3) ☐ Other (specify) ►

G Did you "materially participate" in the operation of this business during 2021? If "No," see instructions for limit on losses ☐ Yes ☐ No

H If you started or acquired this business during 2021, check here ☐

I Did you make any payments in 2021 that would require you to file Form(s) 1099? See instructions ☐ Yes ☐ No

J If "Yes," did you or will you file required Form(s) 1099? ☐ Yes ☐ No

Part I Income

1 Gross receipts or sales. See instructions for line 1 and check the box if this income was reported to you on Form W-2 and the "Statutory employee" box on that form was checked <input type="checkbox"/>	1	550,000
2 Returns and allowances	2	
3 Subtract line 2 from line 1	3	550,000
4 Cost of goods sold (from line 42)	4	198,000
5 Gross profit. Subtract line 4 from line 3	5	352,000
6 Other income, including federal and state gasoline or fuel tax credit or refund (see instructions)	6	
7 Gross income. Add lines 5 and 6	7	352,000

Part II Expenses. Enter expenses for business use of your home **only** on line 30.

8 Advertising	8	8,000	18 Office expense (see instructions)	18	2,800
9 Car and truck expenses (see instructions)	9	5,500	19 Pension and profit-sharing plans	19	
10 Commissions and fees	10		20 Rent or lease (see instructions):		
11 Contract labor (see instructions)	11		a Vehicles, machinery, and equipment	20a	20,000
12 Depletion	12		b Other business property	20b	
13 Depreciation and section 179 expense deduction (not included in Part III) (see instructions)	13	15,000	21 Repairs and maintenance	21	9,000
14 Employee benefit programs (other than on line 19)	14		22 Supplies (not included in Part III)	22	52,000
15 Insurance (other than health)	15	23,000	23 Taxes and licenses	23	200
16 Interest (see instructions):			24 Travel and meals:		
a Mortgage (paid to banks, etc.)	16a	12,500	a Travel	24a	
b Other	16b	6,000	b Deductible meals (see instructions)	24b	
17 Legal and professional services	17	2,500	25 Utilities	25	34,000
28 Total expenses before expenses for business use of home. Add lines 8 through 27a	28	237,500	26 Wages (less employment credits)	26	42,000
29 Tentative profit or (loss). Subtract line 28 from line 7	29	114,500	27a Other expenses (from line 48)	27a	5,000
30 Expenses for business use of your home. Do not report these expenses elsewhere. Attach Form 8829 unless using the simplified method. See instructions. Simplified method filers only: Enter the total square footage of (a) your home: _____ and (b) the part of your home used for business: _____. Use the Simplified Method Worksheet in the instructions to figure the amount to enter on line 30	30		27b Reserved for future use	27b	
31 Net profit or (loss). Subtract line 30 from line 29. • If a profit, enter on both Schedule 1 (Form 1040), line 3 , and on Schedule SE, line 2 . (If you checked the box on line 1, see instructions). Estates and trusts, enter on Form 1041, line 3 . • If a loss, you must go to line 32.	31	114,500	32a <input type="checkbox"/> All investment is at risk.		
32 If you have a loss, check the box that describes your investment in this activity. See instructions. • If you checked 32a, enter the loss on both Schedule 1 (Form 1040), line 3 , and on Schedule SE, line 2 . (If you checked the box on line 1, see the line 31 instructions.) Estates and trusts, enter on Form 1041, line 3 . • If you checked 32b, you must attach Form 6198 . Your loss may be limited.			32b <input type="checkbox"/> Some investment is not at risk.		

For Paperwork Reduction Act Notice, see the separate instructions.

Cat. No. 11334P

Schedule C (Form 1040) 2021

Part III Cost of Goods Sold (see instructions)

33	Method(s) used to value closing inventory: a <input checked="" type="checkbox"/> Cost b <input type="checkbox"/> Lower of cost or market c <input type="checkbox"/> Other (attach explanation)			
34	Was there any change in determining quantities, costs, or valuations between opening and closing inventory? If "Yes," attach explanation <input type="checkbox"/> Yes <input type="checkbox"/> No			
35	Inventory at beginning of year. If different from last year's closing inventory, attach explanation <table border="1" style="display: inline-table; vertical-align: bottom;"><tr><td style="width: 50px; text-align: center;">35</td><td style="width: 500px;"></td><td style="width: 100px; text-align: right;">50,000</td></tr></table>	35		50,000
35		50,000		
36	Purchases less cost of items withdrawn for personal use <table border="1" style="display: inline-table; vertical-align: bottom;"><tr><td style="width: 50px; text-align: center;">36</td><td style="width: 500px;"></td><td style="width: 100px; text-align: right;">125,000</td></tr></table>	36		125,000
36		125,000		
37	Cost of labor. Do not include any amounts paid to yourself <table border="1" style="display: inline-table; vertical-align: bottom;"><tr><td style="width: 50px; text-align: center;">37</td><td style="width: 500px;"></td><td style="width: 100px; text-align: right;">88,000</td></tr></table>	37		88,000
37		88,000		
38	Materials and supplies <table border="1" style="display: inline-table; vertical-align: bottom;"><tr><td style="width: 50px; text-align: center;">38</td><td style="width: 500px;"></td><td style="width: 100px;"></td></tr></table>	38		
38				
39	Other costs <table border="1" style="display: inline-table; vertical-align: bottom;"><tr><td style="width: 50px; text-align: center;">39</td><td style="width: 500px;"></td><td style="width: 100px;"></td></tr></table>	39		
39				
40	Add lines 35 through 39 <table border="1" style="display: inline-table; vertical-align: bottom;"><tr><td style="width: 50px; text-align: center;">40</td><td style="width: 500px;"></td><td style="width: 100px; text-align: right;">263,000</td></tr></table>	40		263,000
40		263,000		
41	Inventory at end of year <table border="1" style="display: inline-table; vertical-align: bottom;"><tr><td style="width: 50px; text-align: center;">41</td><td style="width: 500px;"></td><td style="width: 100px; text-align: right;">65,000</td></tr></table>	41		65,000
41		65,000		
42	Cost of goods sold. Subtract line 41 from line 40. Enter the result here and on line 4 <table border="1" style="display: inline-table; vertical-align: bottom;"><tr><td style="width: 50px; text-align: center;">42</td><td style="width: 500px;"></td><td style="width: 100px; text-align: right;">198,000</td></tr></table>	42		198,000
42		198,000		

Part IV Information on Your Vehicle. Complete this part **only** if you are claiming car or truck expenses on line 9 and are not required to file Form 4562 for this business. See the instructions for line 13 to find out if you must file Form 4562.

43	When did you place your vehicle in service for business purposes? (month/day/year) ▶ ____ / ____ / ____
44	Of the total number of miles you drove your vehicle during 2021, enter the number of miles you used your vehicle for:
	a Business _____ b Commuting (see instructions) _____ c Other _____
45	Was your vehicle available for personal use during off-duty hours? <input type="checkbox"/> Yes <input type="checkbox"/> No
46	Do you (or your spouse) have another vehicle available for personal use? <input type="checkbox"/> Yes <input type="checkbox"/> No
47a	Do you have evidence to support your deduction? <input type="checkbox"/> Yes <input type="checkbox"/> No
	b If "Yes," is the evidence written? <input type="checkbox"/> Yes <input type="checkbox"/> No

Part V Other Expenses. List below business expenses not included on lines 8–26 or line 30.

48	Total other expenses. Enter here and on line 27a <table border="1" style="display: inline-table; vertical-align: bottom;"><tr><td style="width: 50px; text-align: center;">48</td><td style="width: 500px;"></td><td style="width: 100px;"></td></tr></table>	48		
48				

Income Statement- Student Driven Activity

Student Driven Activity: Using the same scenario you developed in the Budget lesson add the additional information you need to complete it as an income statement. After adding the additional information the teacher will collect the scenarios and give them to someone different than the previous lesson. The new student will fill out an income statement and Schedule C utilizing the information given. Be sure to create an answer sheet to check your classmate's work!

Income Statement Additional Reading

In the previous lesson we talked about how doctors need to know your current condition and your medical history over time. We discussed how a business' balance sheet shows its current financial condition on that day. Managers and lenders use an Income Statement (also called a Profit & Loss Statement or simply, a P&L) to look at how the business has performed over time - similar to how a doctor looks at your medical history. We refer to this performance as Profitability – did the business make money or lose money last year?

An Income Statement shows all of the Revenues and Expenses of the business over a period of time, usually one year. Revenues are the dollars that come into the business from the sale of goods or services. For Greta, her revenues are the money coming in from the sale of produce and crafts. To calculate Revenues, simply multiply the selling price of the product by the amount that you sell. For example, if Greta sells 100 dozen ears of corn at a price of \$5/dozen, her revenues are \$500 (100 dozen x \$5/dozen). The Income Statement lists all of the revenues that come into the business over that period of time.

Expenses are the costs of doing business. Remember from Lesson 1 – The Language of Business – we classified expenses into Operating (or Variable) Expenses and Overhead (or Fixed) Expenses. Greta's Income Statement will show her operating expenses for the year:

Cost of the Produce she purchased to resell	\$150,000
Cost of the Crafts she purchased to resell	\$80,000

Greta has direct control over her Operating Expenses. She can decide to purchase more produce this year than she did last year, or she can decide to not purchase certain items at all. Remember that Operating Expenses change with the level of sales – the more produce Greta sells, the more she has to purchase; or if she purchases less, she will have less produce to sell, and her sales will decrease. When you purchase items to resell, like Greta's produce and crafts, the purchase price is often called "Cost of Goods Sold".

Greta has less control over her Overhead Expenses than she does for her Operating Expenses. Overhead Expenses are those expenses that she has just because she is in business. Examples of her Overhead Expenses are:

Business License	\$1,000
Utilities (electricity, water, etc.)	\$15,000
Liability Insurance	\$5,000
Supplies	\$10,000
Interest on her loans	\$14,000
Labor	\$70,000
Office Expenses	\$6,000

Property Taxes	\$15,000
Advertising	\$25,000
Legal Fees	\$4,000
Depreciation	\$30,000

Notice that the Overhead Expenses do not necessarily change with the level of sales. Greta will have to pay for her business license, property taxes, and liability insurance regardless of how much produce she sells. Her utility bills and labor expenses may change a little as the level of sales changes, but not very much. Her assets, such as the refrigerators, cash registers and building will lose value (depreciate) whether she has a lot of sales or if she has a bad year. Because these overhead expenses do not change (much) with the level of sales, they are often called “Fixed Expenses”.

The expenses that are listed on an Income Statement are directly related to the business. Greta will not include any of her personal expenses on her Income Statement. There are two other items that are not included on an Income Statement: Principal payments on loans, and income taxes. When you borrow money you typically make regular payments back to the lender to repay the loan. These payments consist of interest (the cost of borrowing money) and principal (money you borrowed from the lender). Let’s look at a very simple example. Assume that you borrow \$100 from a bank. You will pay the bank \$110 at the end of the year. This \$110 includes the \$100 (principal) that you borrowed from the bank and \$10 of interest. The principal is not an expense – you are just repaying money that someone lent to you. In this example, the bank loaned you \$100 of principal. The principal is NOT a revenue for the business, so it doesn’t get listed in the revenue section. When you pay the bank \$110 at the end of the year, you are simply returning the \$100 of principal – this is NOT an expense for the business – plus \$10 of interest, which is an expense. The interest is the cost of getting the loan, so it definitely goes on an Income Statement.

We don’t include income taxes for the business on an Income Statement. That’s because we use an Income Statement to help figure out how much taxes the business will owe on its profits. For this reason, the bottom line of the Income Statement is often called “pre-tax net income” or “earnings before taxes”.

There are several formats for an Income Statement. Two examples are attached to this lesson. Each format has three main sections: Total Revenues, Total Expenses, and Net Income (or Profit). Some formats are much more detailed, some are very basic. Look at the differences in the two example Income Statements. The Schedule F tax form from the Internal Revenue Service (the IRS) is very detailed, listing specific revenues and expenses. The “generic” format simply lists the main categories. But the bottom line on both formats is the same – Net Income. Now, let’s look at the Income Statement for Greta’s business:

**Greta's Green Grocery
Income Statement
For the year 2022**

Revenues:

Produce	\$325,000
Crafts	<u>\$175,000</u>
Total Revenues	\$500,000

Operating Expenses:

Produce	\$150,000
Crafts	<u>\$80,000</u>
Total Operating Expenses	\$230,000

Overhead Expenses:

Business License	\$1,000
Utilities (electricity, water, etc.)	\$15,000
Liability Insurance	\$5,000
Supplies	\$10,000
Interest on her loans	\$14,000
Labor	\$70,000
Office Expenses	\$6,000
Property Taxes	\$15,000
Advertising	\$25,000
Professional Fees (lawyer, accountant)	\$4,000
Depreciation	<u>\$30,000</u>
Total Overhead Expenses	\$195,000

Total Expenses **\$425,000**

Net Income (Profit) **\$75,000**

Greta's Income Statement shows that she earned a profit of \$75,000 for the year. This is before she pays her income taxes. If Greta is operating her business as a sole proprietorship all of these profits are hers – basically, the profits of a sole proprietorship are the owner's "salary" for the year.

Income Statements are an important financial statement for business managers and lenders. This statement shows whether the business has been able to earn profits over time. A business cannot stay open if it doesn't earn profits. Profits, the money that is left after the expenses are paid, allow the

business to grow and expand over time. The profits can be put into a savings account so that the owner is prepared for the bad times when sales are very low. And finally, profits allow the manager to repay the loans that have been taken out by the business.

A more detailed Income Statement lets that manager or lender analyze their business much better. Rather than just showing if the business made profits for the year, a detailed statement can show which products were the most profitable, or which products were actually losing money. A detailed statement helps the manager see what the main expenses are – I like to look at the business' 5 largest expenses to see where the manager can save the most money.

Income Statement

for the period _____

Revenues

_____	_____
_____	_____
_____	_____
_____	_____

Total Revenues

Operating Expenses:

_____	_____
_____	_____
_____	_____

Total Operating Expenses

Overhead Expenses:

_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

Total Overhead Expenses

Total Expenses (Operating + Overhead)

Pre-Tax Net Income (Profit)

Less: Income Taxes

After-Tax Net Income

Lesson 5 Enterprise Budgets

Bell Ringer: Using your best guess describe the differences and similarities between an enterprise and a business.

This lesson is a more difficult lesson with a variety of facets that can be targeted toward a more advanced audience. You will find a pathway for a more advanced audience and then the basic course work here. Use your discretion as to what pathway will serve your class and students better. The advanced portion has additional higher level thinking and problem solving as well as more abstract concepts.

Total Estimated time 50-60 minutes

Objectives:

1. Identify the main inputs necessary to produce a crop or product or service
 - a. Amount Needed
 - b. Cost
2. Practice classifying Operating (Variable) Costs and Overhead (Fixed) Costs
3. Determine the profitability of the enterprise
 - a. Short Run: Return Above Operating Costs
 - b. Long Run: Return Above Total Costs
4. Identify methods of improving the profitability
 - a. Production, finance, marketing, etc.

A. Section 1 - Review Material From Previous Lessons (Est. time 5 mins.)

1. Balance sheet – shows what you own and what you owe on a given day
 - a. Current Assets
 - b. Non-Current Assets
 - c. Current Liabilities
 - d. Non-Current Liabilities
 - e. Net Worth (Owners Equity)
 - f. Liquidity
 - g. Solvency
2. Income statement – shows the profitability of the entire business over a period of time
 - a. Revenues
 - b. Operating (Variable) Expenses
 - c. Overhead (Fixed) Expenses
 - d. Gross Margin
 - e. Profit or Net Income

B. Section 2 - Start a Discussion With Students About Starting a Business

1. Ask the students how they would decide if they should grow tomatoes this year?
 - a. Will it make money this year?
 - b. Is there a good market for the tomatoes this year?
 - c. Is it worth the investment in transplants, plastic, fertilizer, etc.?

2. Ask how they would decide if they should grow tomatoes year after year?
 - a. Will it make money year after year?
 - b. Is the market stable/strong year after year?
3. How do you determine if the tomato enterprise is making money?
 - a. Remind the students about profits (Revenues minus expenses)
4. What can a tomato farmer do to improve the profitability of the enterprise?
 - a. Identify the 5 largest expenses
 - b. Brainstorm methods of reducing these expenses without hurting production or quality

C. Section 3 - What Is An Enterprise:

1. An enterprise is one specific “aspect” of the farm or business. Think about each specific crop or livestock operation on a farm – each is an enterprise. For a grocery store, each “section” of the store is a separate enterprise.
 - a. For example, a dairy farm would typically have the following enterprises:
 - i. the dairy cows, pasture, corn or corn silage, hay
 - b. For a small business, like a grocery store, the enterprises would be something like:
 - i. Vegetables, Fruits, Cereals, Breads
 - ii. Frozen foods, Beverages, Dairy (milk, cheese, eggs, etc.), and so on
 - c. For a landscaping firm, the enterprises might be:
 - i. Residential installation, commercial installation, maintenance, mowing
2. It is important for any business to be able to identify the revenues (sales income) and expenses related to **each enterprise** in the business. This allows the manager to determine where he/she is making profits and where he/she is losing money. Once the manager knows this information, he/she can develop methods of improving the profitability of each enterprise and the business as a whole.
3. Every business **needs** to have a record keeping system that lets the manager sort every revenue and expense by each enterprise in the business or farm.

D. Section 4 - What is an Enterprise Budget? (look at the Lawn Care Business budget)

1. An enterprise budget is an organized list of all of the revenues (sales income) and expenses related to one specific enterprise in the business. It is usually developed on a “per-unit” basis that makes sense for that enterprise. For field crops, they are usually on a per-acre basis. For livestock, they are usually on a per-head basis. For landscaping firms, they are on a square yard (or square foot) basis. For a greenhouse business, they are on a “per-greenhouse” or per square foot basis. For the lawn care business, the budget is set up for an annual basis.
2. An enterprise budget has **3 main sections**, similar to an income statement (remember, an income statement shows profitability for the entire business; an enterprise budget shows profitability for just one specific aspect of the business):
 - a. **Revenues**
 - This shows all of the revenues generated by that enterprise. Revenues are usually calculated by multiplying the quantity sold by the price per unit. For example, for lawn mowing, the only revenue is from the mowing of yards. Total revenues would be the number of lawns mowed times the price per lawn:

$$\text{Total Revenues} = 750 \text{ lawns/year} \times \$100/\text{lawn} = \$75,000/\text{year}$$

- Be sure to include all revenues that are generated by the enterprise. For example, a sheep flock enterprise budget would contain revenues from the sale of:

- lambs
- cull ewes and rams
- wool

b. Operating Costs (Variable Costs or Expenses)

- This section shows all of the “operating inputs” necessary to produce that enterprise. Operating inputs are the inputs that are completely used up each year – fertilizer, lime, seedlings, fuel, repairs, hired labor, etc. Another way to define operating costs is any cost that directly changes as you produce more. For example, the more shoes that a shoe store sells, the higher the cost of the inventory (the cost of goods sold) will be. The more tomatoes you grow, the higher your fertilizer and labor expenses will be. We typically list each input separately, the amount used per unit, the price per unit, and the total amount spent on that input. For example, for tomatoes:

Nitrogen	$80 \text{ lbs/acre} \times \$0.45/\text{lb} = \$36.00/\text{acre}$
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Pest Scouting	$8 \text{ times/acre} \times \$10/\text{time} = \$80.00/\text{acre}$
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- For the mowing enterprise, the operating inputs include fuel, oil, repairs, and hired labor. The more lawns you mow, the higher these expenses will be.

- The quantity used of each input is estimated from the business’ records or from the manager’s experience. Use an estimate of the actual amount you will need to do the job. For hired labor, be sure to include all of the time that the workers are “on the job” – this includes loading the trailer, driving to the site, mowing, meals and breaks, loading the trailer, and returning to the home office. I try to include an additional 25% in the hired labor time estimate – to account for breakdowns, traffic, and other unexpected events. For example, if I think it will take the worker 1 hr to complete a job, I will include 75 minutes instead of 60 minutes.

- The last entry on the variable cost section is “interest on operating expenses”. This is an estimate of the “cost of the money” that is used to produce that enterprise. You will have this cost, called an opportunity cost, whether you use your money to buy the inputs or whether you borrow money to buy the operating inputs. If you use your money, you are losing the interest that you might have earned on your savings account; if you borrow money, this is the actual cost of interest on the loan. We estimate this cost as follows:

$$\text{Interest on Operating Expenses} = \text{Sum of all other Variable Costs} \times \text{Interest Rate} \times \text{portion of the year that money is used}$$

For the mowing operation, Interest on Operating Expenses is calculated like this:

$$\$19,237.50 \times 6\% \times 6 \text{ months} / 12 \text{ months per year} = \$577.13$$

\$19,237.50 is the total of all variable costs from fuel to removal of grass

6% is the annual interest rate

6 months / 12 months = the portion of the year that money is being used

\$577.13 represents the interest you are paying on money used to pay for these variable inputs throughout the year. If you borrowed money, this represents the interest you pay the bank for the loan. If you used money from your checking or savings account, this represents the interest that you will not earn because you used the money.

- Total Operating Cost (TOC) is the total cost of producing your product. Another way to define TOC is that it represents the total “out of pocket” expenses for operating that enterprise. For the mowing enterprise, the manager is spending \$19,814.63 per year to mow 750 total lawns.

c. Fixed Costs (Overhead Costs)

- Fixed costs represent the cost of inputs (assets) that last for more than one year. This would include inputs like tractors, buildings, land, storage bins, mowers, etc. They are called “fixed costs” costs because you have these costs whether you use that asset or whether you leave it sitting unused. For example, you will pay interest on the loan used to buy a tractor whether you use the tractor every day or whether that tractor sits in the barn unused.

- The primary fixed costs for assets are Depreciation, Interest, Property Taxes, and Insurance.

- Depreciation = the loss of value due to age, use, and obsolescence (newer models are more efficient, have better technology, etc.). Your assets will depreciate whether you use them or not. We have to include depreciation as a cost because it represents an economic loss to the business – even though you don’t actually pay it to anyone. If you cannot earn enough to cover your annual depreciation expense, you will not be able to replace your equipment when it wears out, or you will not be able to maintain it in a condition necessary to operate efficiently.

- Interest = the cost of the money that is used to buy the asset. Like interest on operating capital, you will have this cost whether you use your money to buy the asset or whether you borrow money to buy the asset.

- Property Taxes = a fee charged by your town, county, or state. These taxes are usually based on the value of the asset, not by how much you use that asset.

- Insurance = the cost of the insurance to protect you from loss due to damage to the asset. Your insurance costs remain relatively constant regardless of how much you use that asset.
- To estimate the fixed costs of an asset, here are some rough “rules of thumb” (we will go over more precise calculations later in the series):
 - Machinery & equipment – 20-25% of the value of the asset
 - Breeding livestock – 10-15% of the value of the livestock
 - Buildings & facilities – 5-15% of the value of the asset
 - Land – 5-10% of the value of the land
 - Note – we do not calculate depreciation on land
- Many enterprise budgets do not include a salary for the owner. These budgets assume that the owner will use the “Return Above Total Costs” for his/her salary. For the mowing budget, the owner’s labor (salary) is included – this indicates that the owner only wants to operate this enterprise if he/she can pay himself/herself at least \$25,000/year.
- Total Fixed Costs (TFC) are the total overhead costs associated with the assets (equipment, buildings, land, etc.) used in the production of the enterprise – depreciation and interest expenses. It also includes all of the costs that do not change with the level of production – such as insurance premiums and property taxes.

E. Section 5 - What is Return Above Operating Costs (RAOC or RAVC)?

1. Remember, the terms Operating Costs and Variable Costs refer to the same costs.
2. RAOC is how much money you have left after you pay your total operating costs (TOC). In the business world this is referred to as “gross margin”.
3. $RAOC = \text{Total Revenues} - \text{Total Operating Costs}$
For the mowing budget:

$$RAOC = \$75,000 - \$19,814.63 = \$55,185.37/\text{year}$$

- This indicates the mowing enterprise will have over \$55,000 left over after paying for the operating expenses. This \$55,000 can be used to pay the overhead expenses of the business.
4. You always want the RAOC to be greater than zero (\$0). If RAOC is greater than \$0, that means you are earning “short run profits”, or you are “covering your variable costs.” This means that you will have money available to pay at least some of your fixed costs. If your RAOC is less than \$0, that means you are losing money on every unit that you sell – the more units you sell, the more money you will lose. An example would be where your total variable cost per unit for mowing lawns is \$75/lawn, but you are only charging \$50/lawn – you will lose \$25 for every lawn that you mow, and this does not include the fixed costs of your lawn mowing enterprise. If your RAOC is less than \$0, you need to either find ways of improving your profitability (as soon as you can) or you should get out of that enterprise.
 5. The old saying is, “if you can’t cover your variable costs, get out of production.”

F. Section 6 - What is Return Above Total Costs (RATC)?

1. RATC represents the “long run or long term profits” of your enterprise. This number shows how much money is left over after you pay all of the operating costs and overhead costs in your enterprise. This is the number managers are talking about then they talk about “the bottom line”.
2. $\text{RATC} = \text{Total Revenues} - \text{Total Costs}$ or
 $\text{RATC} = \text{Total Revenues} - \text{Total Operating Costs} - \text{Total Overhead Costs}$

For the mowing enterprise:

$$\text{RATC} = \$75,000 - \$19,814.63 - \$41,500 = \$13,685.37/\text{year}$$

- This shows that the mowing business is paying all of its operating expenses and all of its overhead expenses, and still has over \$13,685 left over

Ask the students what the manager could do with this \$13,685

Possibilities:

- Pay the income taxes on the operation
 - Pay themselves a higher salary
 - Repay extra money on their loans
 - Use cash to purchase new equipment
 - Build up their savings account to “improve their liquidity”
 - Refer students to the Balance Sheet lesson
 - Increase the wages for their hired labor, and so on
3. You want your RATC to be greater than \$0 if you want to continue producing that enterprise for several years (the long run). When RATC is greater than \$0, it means that you are generating enough revenues (sales income) to pay all of your variable and fixed costs for the enterprise. That means you are earning enough to maintain and/or replace your equipment over time.
 4. If your RATC is less than \$0, you will need to make changes to your enterprise if you want to continue producing. Otherwise, you should get out of that enterprise if you cannot earn a RATC greater than \$0.

G. Section 7 - What can a manager do to improve the profitability (RAOC and RATC) of an enterprise?

1. The quickest way to improve the profitability of an enterprise is reduce the costs of production – either fixed or variable costs – without hurting the level of production or the quality of the product. I usually recommend that managers use the enterprise budget to identify the 5 largest expenses. Then, try to determine methods of reducing those expenses without hurting production. These methods may be changes in:

- a. production methods (soil testing, inventory reduction, etc.)
 - b. production schedules (changing your planting schedule to better match the weather in your area, etc.)
 - c. changes in business practices (buying in bulk, changing to lower-cost inputs, revising the advertising practices, etc.)
 - d. lowering your fixed costs (getting rid of unused equipment, buying used instead of new equipment, leasing instead of purchasing equipment, etc.)
2. The manager can also look at the pricing strategy of the goods he/she is selling. Is it possible to increase the selling price without “scaring away” too many customers? Can you sell more units by lowering your selling price?

Materials:

- Lawn Care Example**
- PowerPoint on Enterprise Budgets**
- Note Organizer**
- PowerPoint on enterprise Budgets- Advanced**
- Note Organizer- Advanced**
- In-class Exercise and Key**
- In-class Exercise and Key- Advanced**
- Homework Exercise and Key**
- Student Driven Learning Activity**
- Advanced Student Driven Learning Activity**
- Enterprise Budget Take Home Reading**

Lawn Care Business Mowing Enterprise

Revenues	Quantity	Units	Price/Unit	Total
Mowing	750	lawns/year	\$100.00 /lawn	\$75,000.00
Total Revenues				\$75,000.00 /year
Operating (Variable) Costs:				
Fuel	450	gal/year	\$2.75 /gal	\$1,237.50
Oil	400	qts/year	\$3.00 /qt	\$1,200.00
Repairs	750	lawns/year	\$5.00 /lawn	\$3,750.00
Hired Labor	0.8	hours/lawn	\$18.00 /hour	\$10,800.00
Removal of grass - hauling	750	lawns/year	\$3.00 /lawn	\$2,250.00
Interest on Operating Capital 6%	6	months	\$19,237.50 /year	\$577.13
Total Operating Costs				\$19,814.63 /year
Return Above Operating Costs				\$55,185.37 /year
Minimum Yield Necessary to Cover Operating Costs				198.1 lawns/year
Minimum Price Necessary to Cover Operating Costs				\$26.42 /lawn
Overhead Costs				
Depreciation - equipment	1	year	\$1,000 /year	\$1,000.00
Interest on equipment loans	1	year	\$800 /year	\$800.00
Office expenses	1	year	\$5,000 /year	\$5,000.00
Advertising	1	year	\$1,500 /year	\$1,500.00
Insurance premiums	1	year	\$1,200 /year	\$1,200.00
Office rent	1	year	\$7,000 /year	\$7,000.00
Owner Labor	1	owner	\$25,000 /year	\$25,000.00
Total Overhead Costs				\$41,500.00 /year
Total Costs				\$61,314.63 /year
Return Above Total Costs				\$13,685.37 /year
Minimum Yield Necessary to Cover Total Costs				613.1 lawns/year
Minimum Price Necessary to Cover Total Costs				\$81.75 /lawn

Lawn Care Business							
Mowing Enterprise							
Revenues		Quantity	Units	Price/Unit		Total	
	Mowing	750	lawns/year	\$100.00	/lawn	\$75,000.00	
	Other					\$0.00	
	Total Revenues					\$75,000.00	/year
Operating (Variable) Costs:							
	Fuel	450	gal/year	\$2.75	/gal	\$1,237.50	
	Oil	400	qts/year	\$3.00	/qt	\$1,200.00	
	Repairs	750	lawns/year	\$5.00	/lawn	\$3,750.00	
	Hired Labor	0.8	hours/lawn	\$18.00	/hour	\$10,800.00	
	Removal of grass - hauling	750	lawns/year	\$3.00	/lawn	\$2,250.00	
	Interest on Operating Capital	6%	6 months	\$19,237.50	/year	\$577.13	
	Total Operating Costs					\$19,814.63	/year
	Return Above Operating Costs					\$55,185.37	/year
	Minimum Yield Necessary to Cover Operating Costs					198.1	lawns/year
	Minimum Price Necessary to Cover Operating Costs					\$26.42	/lawn
Overhead Costs							
	Depreciation - equipment	1	year	\$1,000	/year	\$1,000.00	
	Interest on equipment loans	1	year	\$800	/year	\$800.00	
	Office expenses	1	year	\$5,000	/year	\$5,000.00	
	Advertising	1	year	\$1,500	/year	\$1,500.00	
	Insurance premiums	1	year	\$1,200	/year	\$1,200.00	
	Office rent	1	year	\$7,000	/year	\$7,000.00	
	Owner Labor	1	owner	\$25,000	/year	\$25,000.00	
	Total Overhead Costs					\$41,500.00	/year
	Total Costs					\$61,314.63	/year
	Return Above Total Costs					\$13,685.37	/year
	Minimum Yield Necessary to Cover Total Costs					613.1	lawns/year
	Minimum Price Necessary to Cover Total Costs					\$81.75	/lawn

ENTERPRISE BUDGETS



What is an Enterprise?

- A specific aspect of a business
- Each crop produced or each product sold
- Example: Grocery store enterprises
 - Vegetables
 - Fruits
 - Dairy, etc.



What is an Enterprise?

- Dairy farm enterprises:
 - Cows
 - Corn silage
 - Alfalfa hay
 - Pasture, etc.
- Lawn care business enterprises:
 - Mowing
 - Installation
 - Maintenance of lawns (spraying, etc.)



Why Do We Care?

- Income statements show the profitability for the entire business
 - But you can't easily see where you are making or losing money from an Income statement
- Enterprise budgets show the profitability of each section of the business
- Enterprise budgets allow breakeven analysis



Enterprise Budgets

- Show the profitability of one specific aspect of the business
- Main sections:
 - Revenues
 - Operating (Variable) Costs
 - Gross Margin (Return Above Operating Costs)
 - Overhead (Fixed) Costs
 - Net Income (Return Above Total Costs)



Enterprise Budgets

- Usually constructed on a per-unit basis
 - Per acre
 - Per head (or per herd)
 - Per greenhouse
 - Per lawn (or per square foot)
- Use the unit that makes it easiest for you



Revenue Section

- Shows all products associated with that enterprise
 - Quantity produced & sold
 - Selling price or value of each product
 - Revenue for each product
 - $\text{Revenue} = \text{Quantity} \times \text{Selling Price}$
- Total Revenue (Gross Revenues)
 - Total value of the enterprise's products



Operating (Variable) Expenses

- Shows all of the operating inputs used in that enterprise
 - Amount of each input used
 - Cost/unit of each input
 - Total cost for each input
- Total Operating Expenses
 - Total of all the operating expenses
 - Referred to as "short run cost of production"



Gross Margin

- aka Return Above Operating Costs
- Gross Margin
 - $\text{Total Revenues} - \text{Total Operating Costs}$
 - Shows how much money is left over after you pay all of your operating expenses
 - Your short term profits
- You want Gross Margin > \$0
 - If it's less than \$0, you are losing money for every unit you produce



Overhead (Fixed) Expenses

- Shows all of the overhead costs for the enterprise
 - Depreciation, rent, property taxes
 - Insurance, interest on term loans
- Total Overhead Expenses
 - Sum of all overhead expenses
- Total Expenses
 - $\text{Total Operating Expenses} + \text{Total Overhead Expenses}$



Net Income

- aka Return Above Total Costs
 - Long term profits
- $\text{Net Income} = \text{Total Revenues} - \text{Total Expenses}$
- Shows how much money is left after you pay all of your expenses for the enterprise



Using an Enterprise Budget

- Improving the profitability of the enterprise
 - Examine your top 5 expenses
 - What can you reduce without hurting production?
 - Can you increase your selling price?
 - Will this "scare off" some clients?
 - Can you increase production?
 - Without increasing costs too much



Enterprise Budgets Note Organizer

What is an Enterprise?

- ▶ A specific aspect of a business
- ▶ Each _____ or _____
- ▶ Example:
 - ▶ Grocery store enterprises
 - _____
 - Fruits
 - Dairy, etc.
 - ▶ Dairy farm enterprises:
 - Cows
 - _____
 - Alfalfa hay
 - Pasture, etc.
 - ▶ Lawn care business enterprises:
 - _____
 - Installation
 - Maintenance of lawns (spraying, etc.)

Why Do We Care?

- ▶ Income statements show the _____ for the ENTIRE business
 - But you can't easily see where you are _____ or _____ money from an income statement

Enterprise Budgets

- ▶ Enterprise budgets show the _____ of each SECTION of the business
- ▶ Enterprise budgets allow _____
- ▶ Show the profitability of one specific aspect of the business
 - ▶ Main sections:
 - _____
 - Operating (_____) Costs
 - Gross Margin (Return Above Operating Costs)
 - Overhead (_____) Costs
 - Net Income (Return Above Total Costs)
- ▶ Usually constructed on a per-unit basis
 - Per _____
 - Per head (or per herd)
 - Per _____

- Per lawn (or per square foot)
- ***Use the unit that makes it easiest for you**

Revenue Section

- ▶ Shows all products associated with that enterprise
 - Quantity produced & sold
 - Selling price or value of each product
 - Revenue for each product
 - _____
- ▶ Total Revenue (_____)
 - Total value of the enterprise's products

Operating (Variable) Expenses

- ▶ Shows all of the operating inputs used in that enterprise
 - _____
 - Cost/unit of each input
 - Total cost for each input
- ▶ Total Operating Expenses
 - _____
 - Referred to as "short run cost of production"

Gross Margin

- ▶ aka _____
- ▶ Gross Margin:
 - Total Revenues – _____
 - Shows how much money is left over after you pay all of your operating expenses
 - _____
- ▶ You want Gross Margin > \$0
 - If it's less than \$0, you are losing money for every unit you produce

Overhead (Fixed) Expenses

- ▶ Shows all of the overhead costs for the enterprise
 - _____
 - Insurance, interest on term loans
- ▶ Total Overhead Expenses
 - _____
- ▶ Total Expenses
 - Total Operating Expenses + Total Overhead Expenses

Net Income

- ▶ aka Return Above Total Costs
 - _____
- ▶ $\text{Net Income} = \text{Total Revenues} - \text{Total Expenses}$
- ▶ Shows how much money is left after you pay all of your expenses for the enterprise

Using an Enterprise Budget

- ▶ Improving the profitability of the enterprise
 - _____
 - What can you reduce without hurting production?
 - Can you increase your selling price?
 - Will this “scare off” some clients?
 - _____?
 - Without increasing costs too much

Advanced Notes

ENTERPRISE BUDGETS



What is an Enterprise?

- A specific aspect of a business
- Each crop produced or each product sold
- Example: Grocery store enterprises
 - Vegetables
 - Fruits
 - Dairy, etc.



What is an Enterprise?

- Dairy farm enterprises:
 - Cows
 - Corn silage
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 - Mowing
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 - Maintenance of lawns (spraying, etc.)



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- Enterprise budgets show the profitability of each section of the business
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Enterprise Budgets

- Show the profitability of one specific aspect of the business
- Main sections:
 - Revenues
 - Operating (Variable) Costs
 - Gross Margin (Return Above Operating Costs)
 - Overhead (Fixed) Costs
 - Net Income (Return Above Total Costs)



Enterprise Budgets

- Usually constructed on a per-unit basis
 - Per acre
 - Per head (or per herd)
 - Per greenhouse
 - Per lawn (or per square foot)
 - Use the unit that makes it easiest for you



Revenue Section

- Shows all products associated with that enterprise
 - Quantity produced & sold
 - Selling price or value of each product
 - Revenue for each product
 - $\text{Revenue} = \text{Quantity} \times \text{Selling Price}$
- Total Revenue (Gross Revenues)
 - Total value of the enterprise's products



Operating (Variable) Expenses

- Shows all of the operating inputs used in that enterprise
 - Amount of each input used
 - Cost/unit of each input
 - Total cost for each input
- Total Operating Expenses
 - Total of all the operating expenses
 - Referred to as "short run cost of production"



Gross Margin

- aka Return Above Operating Costs
- Gross Margin
 - $\text{Total Revenues} - \text{Total Operating Costs}$
 - Shows how much money is left over after you pay all of your operating expenses
 - Your short term profits
- You want Gross Margin > \$0
 - If it's less than \$0, you are losing money for every unit you produce



Overhead (Fixed) Expenses

- Shows all of the overhead costs for the enterprise
 - Depreciation, rent, property taxes
 - Insurance, interest on term loans
- Total Overhead Expenses
 - Sum of all overhead expenses
- Total Expenses
 - $\text{Total Operating Expenses} + \text{Total Overhead Expenses}$



Net Income

- aka Return Above Total Costs
 - Long term profits
- $\text{Net Income} = \text{Total Revenues} - \text{Total Expenses}$
- Shows how much money is left after you pay all of your expenses for the enterprise



Return Above Operating Costs (RAOC)

- How much money is left after your total operating costs
- Also called "Gross Margin"
- $\text{RAOC} = \text{Total Revenues} - \text{Total Operating Costs}$
- Always want RAOC to be greater than 0
 - Means that you have money available above your variable costs



Return above Total Costs (RATC)

- Represents the "long run or long term profits" of your enterprise
- Shows how much money is left over after you pay all of the operating and overhead costs
- Also called "bottom line"
- $RATC = \text{Total Revenues} - \text{Total Costs}$ OR
 $RATC = \text{Total Revenues} - \text{Total Operating Costs} - \text{Total Overhead Costs}$



RATC, cont.

- RATC should be greater than 0
 - Generating enough revenue to pay ALL costs
 - Earning enough to replace equipment over time
- RATC is less than 0
 - Make changes to your enterprise
 - If not- GET OUT



How to increase RAOC and RATC

- Reduce costs of production without hurting the level of production or quality of product
 - Either fixed or variable costs
- Identify 5 largest expenses and determine how one of them can be reduced through:
 - Production methods
 - Production schedules
 - Changes in business practices
 - Lowering your fixed costs
- Examine pricing strategy
 - Can you increase the price without "scaring away" the customer?



Enterprise Budgets- Note Organizer Advanced

What is an Enterprise?

- ▶ A specific aspect of a business
- ▶ Each _____ or _____
- ▶ Example:
 - ▶ Grocery store enterprises
 - _____
 - Fruits
 - Dairy, etc.
 - ▶ Dairy farm enterprises:
 - Cows
 - _____
 - Alfalfa hay
 - Pasture, etc.
 - ▶ Lawn care business enterprises:
 - _____
 - Installation
 - Maintenance of lawns (spraying, etc.)

Why Do We Care?

- ▶ Income statements show the _____ for the ENTIRE business
 - But you can't easily see where you are _____ or _____ money from an income statement

Enterprise Budgets

- ▶ Enterprise budgets show the _____ of each SECTION of the business
- ▶ Enterprise budgets allow _____
- ▶ Show the profitability of one specific aspect of the business
 - ▶ Main sections:
 - _____
 - Operating (_____) Costs
 - Gross Margin (Return Above Operating Costs)
 - Overhead (_____) Costs
 - Net Income (Return Above Total Costs)
- ▶ Usually constructed on a per-unit basis
 - Per _____
 - Per head (or per herd)
 - Per _____

- Per lawn (or per square foot)
- ***Use the unit that makes it easiest for you**

Revenue Section

- ▶ Shows all products associated with that enterprise
 - Quantity produced & sold
 - Selling price or value of each product
 - Revenue for each product
 - _____
- ▶ Total Revenue (_____)
 - Total value of the enterprise's products

Operating (Variable) Expenses

- ▶ Shows all of the operating inputs used in that enterprise
 - _____
 - Cost/unit of each input
 - Total cost for each input
- ▶ Total Operating Expenses
 - _____
 - Referred to as "short run cost of production"

Gross Margin

- ▶ aka _____
- ▶ Gross Margin:
 - Total Revenues – _____
 - Shows how much money is left over after you pay all of your operating expenses
 - _____
- ▶ You want Gross Margin > \$0
 - If it's less than \$0, you are losing money for every unit you produce

Overhead (Fixed) Expenses

- ▶ Shows all of the overhead costs for the enterprise
 - _____
 - Insurance, interest on term loans
- ▶ Total Overhead Expenses
 - _____
- ▶ Total Expenses
 - Total Operating Expenses + Total Overhead Expenses

Net Income

- ▶ aka Return Above Total Costs
 - _____
- ▶ $\text{Net Income} = \text{Total Revenues} - \text{Total Expenses}$
- ▶ Shows how much money is left after you pay all of your expenses for the enterprise

Return above Operating Costs (RAOC)

- ▶ How much money is left after your total operating costs
- ▶ Also called "_____"
- ▶ $\text{RAOC} = \text{_____} - \text{Total Operating Costs}$
- ▶ Always want RAOC to be greater than 0
 - Means that you have money available above your variable costs

Return above Total Costs (RATC)

- ▶ Represents the "_____ " of your enterprise
- ▶ Shows how much money is left over after you pay all of the operating and overhead costs
- ▶ Also called "_____"
- ▶ $\text{RATC} = \text{Total Revenues} - \text{Total Costs}$ OR $\text{RATC} = \text{Total Revenues} - \text{Total Operating Costs} - \text{Total Overhead Costs}$
- ▶ RATC should be greater than 0
 - Generating enough revenue to pay _____
 - Earning enough to replace equipment over time
- ▶ RATC is less than 0
 - Make changes to your enterprise
 - _____

How to increase RAOC and RATC

- ▶ Reduce costs of production without hurting the level of production or quality of product
 - _____
- ▶ Identify 5 largest expenses and determine how one of them can be reduced through,
 - Production methods
 - _____
 - Changes in business practices
 - Lowering your fixed costs
- ▶ Examine pricing strategy
 - Can you increase the price without "_____ " the customer?

Enterprise Budget In-Class Exercise

Andy has been working for his neighbor, growing tomatoes, for the past 3 years. Now, Andy is thinking that he would like to start producing and selling fresh-market tomatoes at the local market. But he isn't quite sure whether he can make money at this or not. So, he has come to you for help.

You told Andy to make a list of all the inputs (fertilizer, transplants, mulch, etc.) that he would be using to produce tomatoes and what they will cost. He came up with this production information as shown on the attached enterprise budget. Please help him complete the budget and help him make the decision whether he should start growing tomatoes or not.

1. Calculate the **Revenue** (sales income) that Andy can earn by selling 500 cartons of tomatoes at \$10/carton. Enter your answer in the Total column of the budget.

2. There are no other sources of revenue for the tomato enterprise. Calculate the **Total Revenues** that Andy can earn from growing and selling 1 acre of tomatoes. Enter your answer in the Total Column.

3. Andy thinks he will need 80 lbs. of nitrogen for his acre of tomatoes. Nitrogen costs \$0.45/lb. How much will Andy need to spend on **nitrogen** for his one acre of tomatoes? Enter your answer in the Total Column of the Nitrogen row of the budget.

4. Andy will have to borrow the money to buy the inputs necessary to grow one acre of tomatoes. He thinks it will cost him \$4,239 to grow one acre of tomatoes (by adding up the variable costs in the total column). He can borrow the money at a 6% annual interest rate from his lender. He will only need to money for 3 months, after which he will repay all of the money, plus interest, to the lender. Calculate the amount of interest Andy will owe for borrowing the money for 3 months at 6% interest. Enter your answer in the Total Column on the **Interest on Operating Capital** row of the budget.

Interest on Operating Capital	=	Amount borrowed	x	Interest rate	x	Portion of the Year the money is borrowed
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6. What are 3-4 actions that Andy can take to improve the profitability of the tomato enterprise?

Enterprise Budget In-Class Exercise Advanced

Andy has been working for his neighbor, growing tomatoes, for the past 3 years. Now, Andy is thinking that he would like to start producing and selling fresh-market tomatoes at the local market. But he isn't quite sure whether he can make money at this or not. So, he has come to you for help.

You told Andy to make a list of all the inputs (fertilizer, transplants, mulch, etc.) that he would be using to produce tomatoes and what they will cost. He came up with this production information as shown on the attached enterprise budget. Please help him complete the budget and help him make the decision whether he should start growing tomatoes or not.

1. Calculate the **Revenue** (sales income) that Andy can earn by selling 500 cartons of tomatoes at \$10/carton. Enter your answer in the Total column of the budget.

2. There are no other sources of revenue for the tomato enterprise. Calculate the **Total Revenues** that Andy can earn from growing and selling 1 acre of tomatoes. Enter your answer in the Total Column.

3. Andy thinks he will need 80 lbs. of nitrogen for his acre of tomatoes. Nitrogen costs \$0.45/lb. How much will Andy need to spend on **nitrogen** for his one acre of tomatoes? Enter your answer in the Total Column of the Nitrogen row of the budget.

4. Andy will have to borrow the money to buy the inputs necessary to grow one acre of tomatoes. He thinks it will cost him \$4,239 to grow one acre of tomatoes (by adding up the variable costs in the total column). He can borrow the money at a 6% annual interest rate from his lender. He will only need to money for 3 months, after which he will repay all of the money, plus interest, to the lender. Calculate the amount of interest Andy will owe for borrowing the money for 3 months at 6% interest. Enter your answer in the Total Column on the **Interest on Operating Capital** row of the budget.

Interest on	=	Amount	x	Interest	x	Portion of the Year the
Operating Capital		borrowed		rate		money is borrowed

5. Calculate the Total Operating Costs for this tomato enterprise by adding all of the operating costs on the budget.
6. Calculate the Return Above Operating Costs. This will tell you if Andy is making profits in “the short run”. We always want this to be a positive number if possible!
7. Using the results of your calculations, do you think Andy should try to grow tomatoes this year or not (for the “short run”)? You can assume that he can borrow the equipment from his uncle for the upcoming year and that his uncle will let him use 1 acre of land for no charge. Explain your decision.
8. Andy needs your help determining whether he should get into this tomato enterprise for the long run (the next 5 years or so). He will have to purchase the necessary equipment and pay his uncle \$150 to rent the one acre of land, as shown on the budget in the Fixed Costs section. Calculate the Total Costs and the Return Above Total Costs for this enterprise
9. Using your budget, would you recommend that Andy get into the tomato enterprise for the long run? Explain your answer.
10. What are 3-4 actions that Andy can take to improve the profitability of the tomato enterprise?

Fresh-Market Tomatoes (1 acre)						
		25 lbs/carton				
Revenues		Quantity	Units/Acre	Price	Total	
	Tomatoes	500	cartons	\$10.00 /carton		
	Other				\$0.00	
	Total Revenues					/acre
Variable Costs:						
	Fertilizer					
	Nitrogen	80	lbs	\$0.45 /lb		
	Phosphorus	100	lbs	\$0.32 /lb	\$32.00	
	Potassium	150	lbs	\$0.30 /lb	\$45.00	
	Lime	0.5	tons	\$30.00 /ton	\$15.00	
	Custom Application	1	acre	\$21.00 /acre	\$21.00	
	Pest Scouting	8	times	\$10.00 /time	\$80.00	
	Herbicides	1	acre	\$95.00 /acre	\$95.00	
	Fungicides	1	acre	\$500.00 /acre	\$500.00	
	Insecticides	1	acre	\$207.00 /acre	\$207.00	
	Land Preparation	1	acre	\$53.00 /acre	\$53.00	
	Plastic Mulch instal	1	acre	\$70.00 /acre	\$70.00	
	Plastic Mulch	1	acre	\$300.00 /acre	\$300.00	
	Drip Irrigation (tape	1	acre	\$150.00 /acre	\$150.00	
	Tomato Transplants	5000	acre	\$100.00 /1,000	\$500.00	
	Stakes	2500	acre	\$100.00 /1,000	\$250.00	
	Labor					
	Planting transplant	1	acre	\$90.00 /acre	\$90.00	
	Staking & tying	16	hours	\$8.50 /hour	\$136.00	
	Marketing & advert	1	acre	\$50.00 /acre	\$50.00	
	Hand harvest	1	acre	\$800.00 /acre	\$800.00	
	Pest Control	1	acre	\$17.00 /acre	\$17.00	
	Cartons, lids, shipping	500	cartons	\$1.50 /carton	\$750.00	
	Fuel	15	gallons	\$2.20 /gallon	\$33.00	
	Repairs - Tractors & i	1	acre	\$9.00 /acre	\$9.00	
	Interest o	6%	3 months	\$4,239.00 /acre		
	Total Variable Costs					/acre
	Return Above Variable Costs					/acre
	Minimum Yield Necessary to Cover Variable Costs					cartons/acre
	Minimum Price Necessary to Cover Variable Costs					/carton
Fixed Costs						
	Tractors & Implemen	1	acre	\$125 /acre	\$125.00	
	Drip Irrigation Equip	1	acre	\$500 /acre	\$500.00	
	Land Charge	1	acre	\$150 /acre	\$150.00	
	Total Fixed Costs				\$775.00	/acre
	Total Costs					/acre
	Return Above Total Costs					/acre
	Minimum Yield Necessary to Cover Total Costs					cartons/acre
	Minimum Price Necessary to Cover Total Costs					/carton

Enterprise Budget In-Class Exercise Advanced - KEY

Andy has been working for his neighbor, growing tomatoes, for the past 3 years. Now, Andy is thinking that he would like to start producing and selling fresh-market tomatoes at the local market. But he isn't quite sure whether he can make money at this or not. So, he has come to you for help.

You told Andy to make a list of all the inputs (fertilizer, transplants, mulch, etc.) that he would be using to produce tomatoes and what they will cost. He came up with this production information as shown on the attached enterprise budget. Please help him complete the budget and help him make the decision whether he should start growing tomatoes or not.

1. Calculate the **Revenue** (sales income) that Andy can earn by selling 500 cartons of tomatoes at \$10/carton. Enter your answer in the Total column of the budget.

$$(500 \text{ cartons} \times \$10/\text{carton} = \$5,000 \text{ revenue})$$

2. There are no other sources of revenue for the tomato enterprise. Calculate the **Total Revenues** that Andy can earn from growing and selling 1 acre of tomatoes. Enter your answer in the Total Column.

$$(\text{Total Revenue} = \$5,000 + \$0 \text{ other revenues} = \$5,000)$$

3. Andy thinks he will need 80 lbs. of nitrogen for his acre of tomatoes. Nitrogen costs \$0.45/lb. How much will Andy need to spend on **nitrogen** for his one acre of tomatoes? Enter your answer in the Total Column of the Nitrogen row of the budget.

$$(80 \text{ lbs/acre} \times \$0.45/\text{lb} = \$36/\text{acre})$$

4. Andy will have to borrow the money to buy the inputs necessary to grow one acre of tomatoes. He thinks it will cost him \$4,239 to grow one acre of tomatoes (by adding up the variable costs in the total column). He can borrow the money at a 6% annual interest rate from his lender. He will only need to money for 3 months, after which he will repay all of the money, plus interest, to the lender. Calculate the amount of interest Andy will owe for borrowing the money for 3 months at 6% interest. Enter your answer in the Total Column on the **Interest on Operating Capital** row of the budget.

Interest on	=	Amount	x	Interest	x	Portion of the Year the
Operating Capital		borrowed		rate		money is borrowed

$$(\$4,239 \times 6\% \times 3 \text{ months} / 12 \text{ months in a year}) = \$63.59$$

5. Calculate the Total Operating Costs for this tomato enterprise by adding all of the variable costs on the budget.

$$(\text{TVC} = \text{sum of all the operating costs} = \$4,302.59)$$

$$(\text{Shortcut method} = \$4239 \text{ from question 4} + \$63.59 = \$4,302.59)$$

6. Calculate the Return Above Variable Costs. This will tell you if Andy is making profits in “the short run”. We always want this to be a positive number if possible!

$$(RAVC = \$5,000 - \$4,302.59 = \$697.41)$$

7. Using the results of your calculations, do you think Andy should try to grow tomatoes this year or not (for the “short run”)? You can assume that he can borrow the equipment from his uncle for the upcoming year and that his uncle will let him use 1 acre of land for no charge. Explain your decision.

Yes, Andy should do it. He will be earning \$697.41/acre above the variable costs (RAVC). Assuming he has no fixed costs all of this \$697 can go towards paying himself. In the short run, you only focus on the variable costs – so you want your RAVC to be greater than \$0.

8. Andy needs your help determining whether he should get into this tomato enterprise for the long run (the next 5 years or so). He will have to purchase the necessary equipment and pay his uncle \$150 to rent the one acre of land, as shown on the budget in the Fixed Costs section. Calculate the Total Costs and the Return Above Total Costs for this enterprise.

$$(\text{Total Costs} = \$5,077.59; \text{RATC} = \$5,000 - \$5,077.59 = (\$77.59) < \$0)$$

$$\text{Minimum Yield} = \$5,077.59 / \$10/\text{carton} = 508 \text{ cartons}$$

$$\text{Minimum Price} = \$5,077.59 / 500 \text{ cartons} = \$10.16/\text{carton}$$

9. Using your budget, would you recommend that Andy get into the tomato enterprise for the long run? Explain your answer.

His RATC is less than \$0. This means he is not covering all of his costs; therefore, he should not get into tomato production for the long term. He will be losing money every year that he operates, and he won't be able to replace his equipment over time. He needs to make changes in his operation to be able to produce tomatoes for the long run.

10. What are 3-4 actions that Andy can take to improve the profitability of the tomato enterprise?

Try to charge a higher price

Try to get more cartons of tomatoes from his acreage

Try to reduce the top 5 expenses (Harvest labor, cartons, transplants, irrigation fixed costs, mulch) without hurting production of tomatoes.

Fresh-Market Tomatoes						
		25 lbs/carton				
Revenues		Quantity	Units/Acre	Price	Total	
	Tomatoes	500	cartons	\$10.00 /carton	\$5,000.00	
	Other				\$0.00	
	Total Revenues				\$5,000.00	/acre
Variable Costs:						
	Fertilizer					
	Nitrogen	80	lbs	\$0.45 /lb	\$36.00	
	Phosphorus	100	lbs	\$0.32 /lb	\$32.00	
	Potassium	150	lbs	\$0.30 /lb	\$45.00	
	Lime	0.5	tons	\$30.00 /ton	\$15.00	
	Custom Application	1	acre	\$21.00 /acre	\$21.00	
	Pest Scouting	8	times	\$10.00 /time	\$80.00	
	Herbicides	1	acre	\$95.00 /acre	\$95.00	
	Fungicides	1	acre	\$500.00 /acre	\$500.00	
	Insecticides	1	acre	\$207.00 /acre	\$207.00	
	Land Preparation	1	acre	\$53.00 /acre	\$53.00	
	Plastic Mulch instal	1	acre	\$70.00 /acre	\$70.00	
	Plastic Mulch	1	acre	\$300.00 /acre	\$300.00	
	Drip Irrigation (tape	1	acre	\$150.00 /acre	\$150.00	
	Tomato Transplants	5000	acre	\$100.00 /1,000	\$500.00	
	Stakes	2500	acre	\$100.00 /1,000	\$250.00	
	Labor					
	Planting transplant	1	acre	\$90.00 /acre	\$90.00	
	Staking & tying	16	hours	\$8.50 /hour	\$136.00	
	Marketing & advert	1	acre	\$50.00 /acre	\$50.00	
	Hand harvest	1	acre	\$800.00 /acre	\$800.00	
	Pest Control	1	acre	\$17.00 /acre	\$17.00	
	Cartons, lids, shippin	500	cartons	\$1.50 /carton	\$750.00	
	Fuel	15	gallons	\$2.20 /gallon	\$33.00	
	Repairs - Tractors & i	1	acre	\$9.00 /acre	\$9.00	
	Interest o	6%	3 months	\$4,239.00 /acre	\$63.59	
	Total Variable Costs				\$4,302.59	/acre
	Return Above Variable Costs				\$697.42	/acre
	Minimum Yield Necessary to Cover Variable Costs				430.3	cartons/acre
	Minimum Price Necessary to Cover Variable Costs				\$8.61	/carton
Fixed Costs						
	Tractors & Implemen	1	acre	\$125 /acre	\$125.00	
	Drip Irrigation Equip	1	acre	\$500 /acre	\$500.00	
	Land Charge	1	acre	\$150 /acre	\$150.00	
	Total Fixed Costs				\$775.00	/acre
	Total Costs				\$5,077.59	/acre
	Return Above Total Costs				(\$77.59)	/acre

Enterprise Budget Homework Exercise

Harold “Handy” Browning owns Handy’s Hardware Store. Handy has several different divisions (or enterprises) in his store. He sells hardware (nuts/ bolts, etc.), power tools, hand tools, lawn & garden equipment, and building supplies (lumber, paint, etc.). Handy is concerned that his lawn & garden division is not as profitable as he wants it to be. But he doesn’t know how to analyze its profitability. So he has asked you to help him develop an enterprise budget for the lawn & garden division. Here’s the information that he gave you:

Insurance	\$1,500/year
Depreciation	\$9,000/year

Riding Mowers Sold	100 mowers at \$1,500/mower
Push Mowers Sold	150 mowers at \$400/mower
String Trimmers Sold	200 trimmers at \$350/trimmer

Cost of buying his inventory:

Riding Mowers	100 mowers at \$1,200/mower
Push Mowers	150 mowers at \$300/mower
String Trimmers	200 trimmers at \$300/trimmer

Property Taxes	\$3,000/year
Office Expenses	\$2,500/year
Interest on his operating expenses	5% of total operating expenses for 4 months/year
Interest on his term loans	\$4,000/year
Hired Labor	\$8,000/year
Owner Labor	\$5,000/year
Legal & Professional Fees	\$2,000/year

1. Use this information to develop an enterprise budget for Handy’s lawn & garden division. All of the expenses represent the portion that is associated with just the lawn & garden division. Please use the attached budget form.
2. Using your lawn & garden enterprise budget, should Handy keep operating this division for the next several years? Please explain how you got your answer.

3. Use Handy's Power Tool enterprise budget that is on the spreadsheet. Let's look at the impact of some management decisions on the profitability of this enterprise. **Reset the spreadsheet to the original numbers after each question.**
- a. Handy thinks he was too optimistic in his projection of sales of riding mowers. He thinks he will only be able to sell 75 riding mowers. How will this impact Handy's Return Above Total Costs?
- b. Reset the number of Riding Mowers sold to 100. Handy has been looking at what his competitors are charging for riding mowers – they are selling the riding mowers at an average price of \$1,300 each. If Handy drops his riding mower price to \$1,300 each, will this lawn and garden division be profitable for the next several years? What is his expected Return Above Total Costs?
- c. Reset the Riding Mower price to \$1,500. Due to the economy, the cost of purchasing the lawn & garden equipment has increased as follows:

Riding Mowers – Handy will purchase them for \$1,350 each

Push Mowers – Handy will purchase them for \$350 each

String Trimmers – Handy will purchase them for \$325 each

Handy doesn't think he can increase his prices at all. If he does he will lose customers. What is the impact of these higher purchase costs of the lawn & garden equipment on Return Above Total Cost?

Handy's Hardware Store						
Lawn & Garden Enterprise						
Revenues			Quantity	Units	Price/Unit	Total
				units/year	/unit	
				units/year	/unit	
				units/year	/unit	
	Other					
	Total Revenues					
Operating (Variable) Costs:						
	Cost of Goods Sold:					
				units/year	/unit	
				units/year	/unit	
				units/year	/unit	
		%		months	/year	
	Total Operating Costs					
	Return Above Operating Costs					
Overhead Costs						
				year	/year	
				year	/year	
				year	/year	
				year	/year	
				year	/year	
				year	/year	
				year	/year	
				owner	/year	
	Total Overhead Costs					
	Total Costs					
	Return Above Total Costs					

Handy's Hardware Store							
Power Tool Enterprise							
			Quantity	Units	Price/Unit	Total	
Revenues							
	Power Saws		100	units/year	\$600.00 /unit	\$60,000.00	
	Planers		50	units/year	\$375.00 /unit	\$18,750.00	
	Drill Presses		35	units/year	\$325.00 /unit	\$11,375.00	
	Other					\$0.00	
	Total Revenues					\$90,125.00	/year
Operating (Variable) Costs:							
	Cost of Goods Sold:						
	Power Saws		100	units/year	\$350.00 /unit	\$35,000.00	
	Planers		50	units/year	\$275.00 /unit	\$13,750.00	
	Drill Presses		35	units/year	\$200.00 /unit	\$7,000.00	
	Interest on Operating Expenses	6%	4	months	\$55,750.00 /year	\$1,115.00	
	Total Operating Costs					\$56,865.00	/year
	Return Above Operating Costs					\$33,260.00	/year
Overhead Costs							
	Depreciation - equipment		1	year	\$3,000 /year	\$3,000.00	
	Interest on term loans		1	year	\$800 /year	\$800.00	
	Office expenses		1	year	\$2,000 /year	\$2,000.00	
	Advertising		1	year	\$1,500 /year	\$1,500.00	
	Insurance premiums		1	year	\$1,200 /year	\$1,200.00	
	Office rent		1	year	\$7,000 /year	\$7,000.00	
	Hired Labor		1	year	\$5,000 /year	\$5,000.00	
	Owner Labor		1	owner	\$8,000 /year	\$8,000.00	
	Total Overhead Costs					\$28,500.00	/year
	Total Costs					\$85,365.00	/year
	Return Above Total Costs					\$4,760.00	/year

Enterprise Budget Homework Exercise (KEY)

Harold “Handy” Browning owns Handy’s Hardware Store. Handy has several different divisions (or enterprises) in his store. He sells hardware (nuts/ bolts, etc.), power tools, hand tools, lawn & garden equipment, and building supplies (lumber, paint, etc.). Handy is concerned that his lawn & garden division is not as profitable as he wants it to be. But he doesn’t know how to analyze its profitability. So he has asked you to help him develop an enterprise budget for the lawn & garden division. Here’s the information that he gave you:

Insurance	\$1,500/year
Depreciation	\$9,000/year

Riding Mowers Sold	100 mowers at \$1,500/mower
Push Mowers Sold	150 mowers at \$400/mower
String Trimmers Sold	200 trimmers at \$350/trimmer

Cost of buying his inventory:

Riding Mowers	100 mowers at \$1,200/mower
Push Mowers	150 mowers at \$300/mower
String Trimmers	200 trimmers at \$300/trimmer

Property Taxes	\$3,000/year
Office Expenses	\$2,500/year
Interest on his operating expenses	5% of total operating expenses for 4 months/year
Interest on his term loans	\$4,000/year
Hired Labor	\$8,000/year
Owner Labor	\$5,000/year
Legal & Professional Fees	\$2,000/year

1. Use this information to develop an enterprise budget for Handy’s lawn & garden division. All of the expenses represent the portion that is associated with just the lawn & garden division. Please use the attached budget form.

2. Using your lawn & garden enterprise budget, should Handy keep operating this division for the next several years? Please explain how you got your answer.

Yes, Handy’s RATC for this enterprise is greater than zero. He should keep operating this division.

3. Use Handy's Power Tool enterprise budget that is on the spreadsheet. Let's look at the impact of some management decisions on the profitability of this enterprise. **Reset the spreadsheet to the original numbers after each question.**

- a. Handy thinks he was too optimistic in his projection of sales of riding mowers. He thinks he will only be able to sell 75 riding mowers. How will this impact Handy's Return Above Total Costs?

His initial Return Above Total Costs is \$16,250.

This will drop to \$9,250 if he can only buy & sell 75 riding mowers.

- b. Reset the number of Riding Mowers sold to 100. Handy has been looking at what his competitors are charging for riding mowers – they are selling the riding mowers at an average price of \$1,300 each. If Handy drops his riding mower price to \$1,300 each, will this lawn and garden division be profitable for the next several years? What is his expected Return Above Total Costs?

If he can only charge \$1,300/mower, his RATC will decrease to negative \$3,750.

- c. Reset the Riding Mower price to \$1,500. Due to the economy, the cost of purchasing the lawn & garden equipment has increased as follows:

Riding Mowers – Handy will purchase them for \$1,350 each

Push Mowers – Handy will purchase them for \$350 each

String Trimmers – Handy will purchase them for \$325 each

Handy doesn't think he can increase his prices at all. If he does he will lose customers. What is the impact of these higher purchase costs of the lawn & garden equipment on Return Above Total Cost?

RATC will decrease to negative \$11,708.33

Handy's Hardware Store							
Lawn & Garden Enterprise							
Revenues		Quantity	Units	Price/Unit		Total	
Riding Mowers		100	units/year	\$1,500.00	/unit	\$150,000.00	
Push Mowers		150	units/year	\$400.00	/unit	\$60,000.00	
String Trimmers		200	units/year	\$350.00	/unit	\$70,000.00	
Other						\$0.00	
Total Revenues						\$280,000.00	/year
Operating (Variable) Costs:							
Cost of Goods Sold:							
Riding Mowers		100	units/year	\$1,350.00	/unit	\$135,000.00	
Push Mowers		150	units/year	\$350.00	/unit	\$52,500.00	
String Trimmers		200	units/year	\$325.00	/unit	\$65,000.00	
Interest on Operating Expenses	5%	4	months	\$252,500.00	/year	\$4,208.33	
Total Operating Costs						\$256,708.33	/year
Return Above Operating Costs						\$23,291.67	/year
Overhead Costs							
Depreciation - equipment		1	year	\$9,000	/year	\$9,000.00	
Interest on term loans		1	year	\$4,000	/year	\$4,000.00	
Office expenses		1	year	\$2,500	/year	\$2,500.00	
Legal & Professional Fees		1	year	\$2,000	/year	\$2,000.00	
Insurance premiums		1	year	\$1,500	/year	\$1,500.00	
Property Taxes		1	year	\$3,000	/year	\$3,000.00	
Hired Labor		1	year	\$8,000	/year	\$8,000.00	
Owner Labor		1	owner	\$5,000	/year	\$5,000.00	
Total Overhead Costs						\$35,000.00	/year
Total Costs						\$291,708.33	/year
Return Above Total Costs						(\$11,708.33)	/year

Handy's Hardware Store							
Power Tool Enterprise							
			Quantity	Units	Price/Unit	Total	
Revenues							
	Power Saws		100	units/year	\$600.00 /unit	\$60,000.00	
	Planers		50	units/year	\$375.00 /unit	\$18,750.00	
	Drill Presses		35	units/year	\$325.00 /unit	\$11,375.00	
	Other					\$0.00	
	Total Revenues					\$90,125.00	/year
Operating (Variable) Costs:							
	Cost of Goods Sold:						
	Power Saws		100	units/year	\$350.00 /unit	\$35,000.00	
	Planers		50	units/year	\$275.00 /unit	\$13,750.00	
	Drill Presses		35	units/year	\$200.00 /unit	\$7,000.00	
	Interest on Operating Expenses	6%	4	months	\$55,750.00 /year	\$1,115.00	
	Total Operating Costs					\$56,865.00	/year
	Return Above Operating Costs					\$33,260.00	/year
Overhead Costs							
	Depreciation - equipment		1	year	\$3,000 /year	\$3,000.00	
	Interest on term loans		1	year	\$800 /year	\$800.00	
	Office expenses		1	year	\$2,000 /year	\$2,000.00	
	Advertising		1	year	\$1,500 /year	\$1,500.00	
	Insurance premiums		1	year	\$1,200 /year	\$1,200.00	
	Office rent		1	year	\$7,000 /year	\$7,000.00	
	Hired Labor		1	year	\$5,000 /year	\$5,000.00	
	Owner Labor		1	owner	\$8,000 /year	\$8,000.00	
	Total Overhead Costs					\$28,500.00	/year
	Total Costs					\$85,365.00	/year
	Return Above Total Costs					\$4,760.00	/year

Enterprise Budgets Take- Student Driven Activities

Student Driven Learning Activity: Work through the homework exercise with a partner. After completing this exercise on Handy's lawn and garden division take a look at his hardware enterprise. You and your partner come up with three things that could bring Handy's RATC below 0. Be sure to think about competition, economy etc... After naming and describing why these would affect his RATC be sure to identify if these are variable or fixed costs and how they could be adjusted.

Advanced Student Driven Learning: Give students the Take-Home Reading portions to go through and identify the necessary information that is needed to complete enterprise budgets for Greta's business. Have the partner up or work individually to develop their own problem set similar to Greta's farming situation. They will also need to use their problem set to create enterprise budgets for their business. For review they can trade budgets with another group to check their work and make sure all pieces are in place.

Enterprise Budgets Take-Home Reading

In Lesson 4 we talked about the Income Statement. The income Statement looks at the entire business. It includes the revenues from the sale of all products and services. It includes the expenses associated with everything the business does. The Income Statement is very important in analyzing the profitability of the entire business. But for businesses that sell several products or provide several services, it is hard to determine the profitability of these individual products/services from an Income Statement. Greta sells a variety of products – corn, tomatoes, beans, lettuce, baskets, bread, etc. It is difficult to see whether she is making money or losing money by selling corn, or tomatoes, etc. How does she know which products are making money for her and which products are losing money?

We use an Enterprise Budget to calculate the profits that we earn from each individual product/service. We refer to each product or service as an “enterprise” – one distinct aspect of the entire business. Greta has a corn enterprise, a tomato enterprise, a basket enterprise, and so on. A dairy farm that just sells milk also has several enterprises – the cow enterprise, the corn silage enterprise, the hay enterprise, the soybean enterprise, etc. An Enterprise Budget just looks at the revenues and expenses of one enterprise. This allows the manager to determine whether that enterprise is profitable or not. Greta can use enterprise budgets to determine whether she needs to raise her price on her corn, or whether she should stop selling bread because it is not profitable. Enterprise budgets allow the manager to examine each part of the business. You can think of an Enterprise Budget as an Income Statement for just one specific part of the business.

An Enterprise Budget has three main sections: the revenue section, the operating expense section, and the overhead expense section. It shows the profitability of the enterprise (revenues minus expenses). And it allows the manager to look at how sensitive that enterprise is to changes in the prices of the product, the expenses of the inputs, and the quantity of product that is sold each year – we call this Sensitivity Analysis.

The Revenue Section is the same as on an Income Statement, except that it only lists the revenues for that specific enterprise. Greta’s sweet corn budget will only list the revenues from the sale of sweet corn; it will not include revenues from the sale of tomatoes or beans or baskets. We list the quantity of product or service sold each year along with the selling price of that product/service. Total Revenue is simply the quantity sold times the selling price per unit:

$$\text{Total Revenue} = \text{Quantity Sold} \times \text{Selling Price/Unit}$$

If Greta thinks she will sell 500 dozen ears of corn this year at a price of \$5/dozen, her total revenues will be:

$$\text{Total Corn Revenue} = 500 \text{ dozen} \times \$5/\text{dozen} = \$2,500$$

If Greta were to sell her corn in two different methods – say, by the dozen and by the ear – she should list both of these methods in the revenue section. Assume that she plans to sell 450 dozen at \$5/dozen and 600 individual ears at \$0.50/ear. Her total revenue for the corn enterprise is:

Revenues

$$450 \text{ dozen} \times \$5/\text{dozen} = \$2,250$$

$$600 \text{ ears} \times \$0.50/\text{ear} = \$300$$

$$\text{Total Revenue} = \$2,250 + \$300 = \$2,550$$

The Operating Expense Section lists all of the operating expenses that are specifically related to that enterprise. Greta's operating expenses for the corn enterprise include the purchase cost of the corn (the cost of goods sold), packaging costs for the corn (bags, plastic wrap, etc.), and so on. We typically list the specific operating input, the amount of that input used by the enterprise, and the cost per unit of that input. The last entry in this section is called "Interest on Operating Expenses". This represents the cost of the money that Greta uses to pay the operating expenses for the corn enterprise. The easiest way to think about interest on operating expenses is to assume that Greta uses an operating loan to pay for all of her operating expenses. The interest on this loan is an operating expense. We calculate interest on operating expenses by multiplying the subtotal of operating expenses by the interest rate on the loan; we then multiply this by the portion of the year that the money is used in this enterprise. Here's an example:

Greta's subtotal of operating expenses is \$1,430

(\$1,250 to purchase the corn + \$30 for packaging + \$150 for corn advertising)

The annual interest rate (called APR) on the loan is 5%

Greta only has these expenses for 4 months out of the year – so she only pays interest for 4/12 of the year (4 months out of 12 months in the year)

$$\text{Interest on Operating Expenses} = \$1,430 \times 5\% \times 4/12 = \$23.83$$

Greta's operating expense section of her corn enterprise budget might look like this:

Operating Expenses			
Purchased Corn	500 dozen	\$2.50/dozen	\$1,250
Packaging	600 bags	\$0.05/bag	\$30
Advertising – Corn Only	3 ads	\$50/ad	\$150
Interest on Operating Expenses	5% 4 months	\$1,430	\$23.83
Total Operating Expenses			\$1,453.83

We can now determine how much profit Greta can expect to earn after she pays all of her operating expenses. We call this Return Above Operating Costs or Return Above Variable Costs. Another term for this is Gross Margin – don't you just love how the business world uses different terms for the same things? I know that it is frustrating to learn several terms that mean the same thing – hang in there, you'll get it! Return Above Operating Costs is calculated by subtracting the total operating expenses from the total revenues for the enterprise:

$$\text{Return Above Operating Costs} = \text{Total Revenues} - \text{Total Operating Expenses}$$

Return Above Operating Costs (RAOC) measures how much of your revenues are remaining after you pay all of your operating expenses. You always want the RAOC to be greater than zero. If RAOC is less than zero that means that you are losing money on every unit that you sell. If you sell more units, you will lose even more money. This means that you either have to increase your selling price (and hope that you don't chase away too many customers) or decrease your operating expenses, or both. If you cannot make changes so that your RAOC is greater than zero you should get completely out of that enterprise.

The final section of the Enterprise Budget is the Overhead (or Fixed) Expense section. Remember that overhead expenses do not change with the level of sales. The main overhead expenses are depreciation, interest on the money invested in non-current assets, insurance, and property taxes. Other overhead costs include rent, labor, utilities, and advertising for the entire business (not just for one enterprise). Some people will say that labor is an operating expense if you pay people by the hour; however, think about this – Greta hires Billy for \$10/hour, but no customers come in during the middle of the day. There were no sales, but Greta still has to pay Billy – that is why I classify it as an overhead expense.

Depreciation is an estimate of how much value your non-current assets lose each year. You don't actually pay this amount to anyone – it is simply a loss to the business. Think of depreciation as a block of ice – as time passes that block of ice melts and gets smaller. The same thing happens to your buildings and equipment – their value gets smaller each year because it's wearing out, it's getting older, and there are newer, more efficient models coming out every year. On an Enterprise Budget we only list the portion of the depreciation that is related to that enterprise. For example, if Greta only uses her 30% of her refrigerators for her corn enterprise, she only lists 30% of the annual depreciation of the refrigerators on her corn Enterprise Budget. If she doesn't use her freezers at all in the corn enterprise, she should not list any depreciation on the freezers on her corn budget.

Interest on the money invested in non-current assets is the cost of using that money to buy an asset. If Greta spends \$10,000 to buy a new freezer, she has \$10,000 “locked up” in that freezer – she can’t use that money for other purposes. Maybe the easiest way to think about this interest cost is to assume that she borrowed the entire amount to purchase the freezer, and she owes interest on that loan. Either way, there is a cost to having money invested in non-current assets. Just as with depreciation, we only list the portion of the interest that is related to that enterprise. So Greta would only list 30% of the interest cost of her refrigerators and 0% for the freezers on her corn budget.

The annual cost of the insurance and property taxes on the non-current assets should also be listed in proportion to their use in the enterprise. Rather than having to calculate the depreciation, interest, insurance and property taxes for each non-current asset we can use a shortcut. We can estimate the total overhead costs on these non-current assets by multiplying the purchase price of the asset by a percentage. Here’s a list of percentages that you can use:

- For machinery and equipment – use 20-25% of the purchase price
- For buildings and facilities – use 5-15% of the purchase price
- For breeding livestock – use 10-15% of the purchase price (or value)
- For land – use 5-10% of the purchase price
- Note, we do not calculate depreciation on land

You include these overhead expenses on non-current assets, as well as other overhead costs – advertising, labor, etc. – in proportion to its use in that enterprise. You can also include an estimate of how much Greta wants to “pay herself” for managing this enterprise – this is called a profit objective. However, most enterprise budgets do not include a “salary” or profit objective for the owner – they assume that the owner will receive the overall profit from the enterprise. Let’s look at Greta’s overhead costs for the corn enterprise. We can start with the value of the non-current assets on Greta’s balance sheet and use the percentages as shown:

Total machinery & equipment used in the corn enterprise = \$40,000
Total machinery overhead = \$40,000 x 20% = \$8,000/year
Percentage associated with the corn enterprise = 5%
Total machinery overhead in corn enterprise = \$8,000 x 5% = \$400

Total Building, Land, & other non-current asset used in corn enterprise = \$355,000
Total Building, Land & other overhead = \$355,000 x 5% = \$17,750/year
Percentage associated with the corn enterprise = 2%
Total Building, Land & other overhead in corn enterprise = \$17,750 x 2% = \$355

Once you have all of the overhead expenses listed for the enterprise, calculate the Total Overhead Expenses. Simply add them together. Then, calculate the Total Expenses:

Total Expenses = Total Operating Expenses + Total Overhead Expenses

Now we're ready to look at the profitability of the corn enterprise after all expenses (operating and overhead) are paid. We call this Return Above Total Costs (RATC). This is similar to the Net Income from the Income Statement. It represents how much profit you will earn from this enterprise this year.

You want your Return Above Total Cost to be greater than zero, and higher is better – that means more profits! But unlike Return Above Operating Costs, it is okay for the RATC to be less than zero occasionally. We don't like to see it less than zero for long, so the manager needs to make changes to the enterprise to try to raise it above zero. Here's a simple example of why it's okay for RATC to be less than zero one year (but not every year). Assume the following information is from your enterprise budget for baskets:

Total Revenues = \$1,000	
Total Operating Expenses = \$600	
Return Above Operating Costs = \$500	(\$1,000 – \$600)
Total Overhead Expenses = \$500	
Total Expenses = \$1,100	(\$600 + \$500)
Return Above Total Cost = negative \$100	(\$1,000 - \$1,100)

Your Return Above Operating Costs is greater than zero – that's a good sign! But your Return Above Total Costs is negative \$100. That means that you will lose \$100 after all expenses are paid. You cannot operate the business in this manner every year – you will run out of money eventually. But we need to look at whether you should operate this enterprise for the upcoming year. If you do operate, you will lose \$100 after all expenses are paid. If you decide not to operate this enterprise you will not have any revenues or operating expenses, but you will still have your overhead expenses of \$500. So your Return Above Total Costs will be negative \$500 if you do not operate. Maybe this will help you see what's going on:

	Do Not Operate	Operate
Total Revenues	\$1,000	\$0
Total Operating Expenses	\$600	\$0
Total Overhead Expenses	\$500	\$500
Total Expenses	\$1,100	\$500
Return Above Total Costs	negative \$100	negative \$500

Here are a few rules of thumb for deciding whether to continue to operate an enterprise or to shut it down:

1. Shut it down if the Return Above Operating Costs is less than zero (RAOC < \$0)
2. If the Return Above Operating Costs is greater than zero, go ahead and operate this year.
3. If the Return Above Total Costs is less than zero, you can keep operating as long as the Return Above Operating Costs is greater than zero – but you will have to make changes to improve the profitability to operate year after year.
4. If the Return Above Total Costs is greater than zero – GREAT! Stay in business!

Let's look at Greta's sweet corn enterprise budget for the upcoming year:

Sweet Corn
For the Year 2023

Revenues

Sold by the dozen	450 dozen	\$5/dozen	\$2,250
Sold by the ear	600 ears	\$0.50/ear	\$300
Total Revenue			\$2,550

Operating Expenses

Purchased Corn	500 dozen	\$2.50/dozen	\$1,250
Packaging	600 bags	\$0.05/bag	\$30
Advertising – Corn Only	3 ads	\$50/ad	\$150
Interest on Operating Expenses	5% 4 months	\$1,430	\$23.83
Total Operating Expenses			\$1,453.83

Return Above Operating Costs \$1,096.17

Overhead Expenses

Machinery & Equipment	\$400
Buildings & Land	\$355
Utilities	\$200
Labor	\$150
Insurance	\$50

Total Overhead Expenses

\$1,155

Total Expenses \$2,608.83

Return Above Total Costs negative \$58.83

What do you think about this sweet corn budget? Should Greta continue to sell sweet corn or should she concentrate on other products that are more profitable?

The first step is to look at her Return Above Operating Costs to see if it is greater than zero. In this case, it is a positive \$1,096.17 -- that means that Greta should continue to sell sweet corn this year.

Next, we look at the Return Above Total Costs to see if it is positive. Greta's Return Above Total Cost is negative \$58.83. That means Greta will not have enough revenues to pay for all of her expenses – she will be \$58.83 short of paying all of her expenses. And remember, she isn't paying herself anything for managing this enterprise. Many people would say that she should get out of business based on these factors. But from a financial standpoint she should stay in business this year and try to make changes to improve the profitability of her sweet corn enterprise. Why, you say? If she continues to sell corn she will lose \$58.83. If she does not

sell corn this year, she will not have any revenues or operating costs, but she will still have the overhead costs for the business. Whether or not she sells corn, she will still have the building and facilities and the equipment; she just won't be using them to sell corn. And those assets will be depreciating and have property taxes, whether or not she sells corn. If she does not sell corn she will lose \$1,155 this year. Which would you rather do – lose \$58.83 or lose \$1,155? Personally, I'd rather lose just the \$58.83!

Now Greta has to decide whether she wants to continue selling corn in the future. If she does, she has to figure out some ways to make the corn enterprise more profitable. What would you do if you were in Greta's position? Here are some possible actions that she can take to make the corn enterprise more profitable:

- She can increase her selling price. What would happen if she increased her selling price to \$5.50/dozen? If nothing else changes, her Return Above Total Costs would increase to a positive \$141.17 for the year. But, what might happen if she increases her price? Some of her customers might decide to buy their corn somewhere else, and Greta's corn revenues might actually decrease.
- She can try to reduce her five largest expenses. In this case, it would be:
 - Cost of the Purchased Corn (Cost of Goods Sold) (\$1,250)
 - She can try to find lower priced corn from other farmers. But lower price might mean that the quality of the corn is lower as well – and that's not good for sales! Or she can offer to pay the farmers less for their corn – and they may not sell to her, so she won't have any corn to sell at all.
 - Overhead costs of her Machinery & Equipment (\$400)
 - She can try to lower her overhead costs by getting rid of machinery that she doesn't need, or by purchasing used equipment instead of new equipment when it's time to replace them.
 - Overhead costs of her Buildings & Land (\$355)
 - Well, there's not much she can do to reduce these costs, other than to sell some of her land.
 - Utilities (\$200)
 - She can use energy-efficient appliances (like motion-sensing light switches), or maybe she can run her refrigerators at a slightly higher temperature to save electricity. She can also train her employees to be sure to close the doors completely. Or maybe she can put some of the corn on a display stand so that customers do not have to open the refrigerators to get their corn....
 - Labor or Advertising (\$150)
 - Greta can try to schedule her labor more efficiently so that her workers aren't standing around with nothing to do at certain times of the day. Or Greta can do more work herself and hire less labor.
 - Advertising is a confusing situation, just like charging a higher price – it's hard to determine what will happen if she reduces her advertising expenses. If she advertises less, she can save money, but what will happen to the amount of corn she sells? Or, what happens if she increases the advertising for her corn? It will cost her more, but she may sell a lot more corn because of the increased advertising. This is more proof that there isn't one correct way to do things in business – it is not an exact science!

A manager should have enterprise budgets for each enterprise in the business. This allows the manager to see more clearly where the business is making money and where it may be losing money. Budgets provide the information that is necessary to make sound financial decisions. And they're a great use of spreadsheets, too!

Lesson 6 – Breakeven & Sensitivity Analysis

Bell Ringer: Name 4 fixed costs in a vegetable enterprise, then identify 3 variable costs through the same business.

The 2nd Breakeven and Sensitivity Analysis Homework Exercise requires the use of a computer that can run an Excel spreadsheet. This can be done as an added learning exercise if you do not have access to a computer for everyone in the class that will open and utilize Excel.

A. Section 1 - Review main concepts from Lesson 5 (Enterprise budgets)

1. What is an enterprise budget?
2. What are the 3 main sections of an enterprise budget?
3. Why does a manager need to know the Return Above Operating Costs and the Return Above Total Costs?

B. Section 2 - Breakeven Analysis

1. Breakeven analysis tells a manager the “worst case situation” where they are just able to cover their costs. The most common types of breakeven analysis are:

a. Breakeven Quantity Sold

This is the lowest quantity you can sell, at a constant price, and still cover your costs. Again, we assume that all input use and prices remain constant. You should compare your breakeven quantity to the actual amount of production you expect. For example, if the breakeven number of mowing jobs is 5 lawns/week and you think you can reasonably mow 15 lawns/week, you are doing well!

b. Breakeven Selling Price

This is the lowest price per unit that a manager can get for his/her product and still cover the costs of the enterprise. We assume that everything else (all input use and prices, and quantity sold) remain constant. At this price, the total revenues for the enterprise are equal to the expenses (either operating or total). The breakeven selling price helps the manager determine the selling price for his/her products.

- c. From a personal aspect, you can use breakeven analysis to help make decisions. Assume you have living expenses of \$500/month. You can get a part-time job that pays \$10/hr after all taxes are deducted (that is, your “take home pay” is \$10/hr). How many hours do you need to work per month just to cover your living expenses (“to break even”)? (have students calculate this)

$$\text{\$500/month} / \text{\$10/hr} = 50 \text{ hrs/month}$$

Your “breakeven hours of work (breakeven quantity)” is 50 hours per month. If you work exactly 50 hours/month at \$10/hr you will earn exactly \$500 – just enough to cover your living expenses.

You can also calculate the minimum “take home pay” rate that you must get if you can only work 40 hours/month: (have students calculate this)

$$\text{\$500/month} / 40 \text{ hrs/month} = \text{\$12.50/hour}$$

You must be able to earn at least \$12.50/hour (take home) to cover your living expenses, assuming you can only work 40 hours/month

2. What is the minimum quantity sold (yield) you need to cover your costs?

- a. This is called the “breakeven yield” or “breakeven quantity” - a very important number for every manager to understand. When we calculate this, we assume that the only item that changes on the enterprise budget is the quantity sold – we hold everything else constant.
- b. It is useful to look at this from 2 different time frames – short run (over the next few years) and long run (over the next several years – 5 years or longer).
- c. Short-run breakeven yield only focuses on the total operating costs (TOC) of the enterprise. To calculate the short-run breakeven yield:

$$\text{Short-Run Breakeven Yield} = \text{Total Operating Costs} / \text{Selling Price per-unit}$$

For the lawn mowing business:

$$\text{SR BE Yield} = \$19,814.63 \text{ per year} / \$100/\text{lawn} = 198 \text{ lawns/year (rounded)}$$

This means the manager must be able to mow at least 198 lawns per year at an average price of \$100/lawn to cover the total operating costs of production. If you can mow more than 198 lawns/year you will earn short-run profits – that is, your RAOC will be greater than \$0; you will have some earnings to pay your fixed costs as well as yourself for your management & labor. If you do not think you can mow at least 198 lawns in one year, you will not be able to cover your total variable costs; therefore, you shouldn't plan to operate the lawn mowing business this year.

For the lawn mowing business, the manager is expecting to mow 750 lawns in one year. This is much higher than the 198 lawns that he/she needs to mow to cover the operating costs of the enterprise. You always want to see your planned (or actual) quantity sold **greater** than your breakeven quantity sold.

- Note: This method assumes that all of the variable costs will remain constant, regardless of the actual amount produced and sold. In the real world, some of the operating costs may actually decrease due to the lower yield – but to be conservative in our estimates, we assume that these costs remain at the planned levels.

- d. Long run breakeven yield focuses on total costs (operating costs and overhead costs), because we need to be able to cover all of these costs year after year to stay in business.

$$\text{Long Run Breakeven Yield} = \text{Total Costs} / \text{Selling Price per-unit}$$

For the lawn business:

$$\text{LR BE Yield} = \$61,314.63 \text{ per acre} / \$100 \text{ per lawn} = 613 \text{ lawns/year (rounded)}$$

This means the manager must be able to mow at least 613 lawns/year to cover all of the costs of the lawn mowing enterprise. If he/she can mow more than 613 lawns/year the enterprise will be earning long run profits, and the enterprise will be able to stay in business for the long run. If you are not able to mow at least 613 lawns/year, you will have to make changes to the enterprise to try to improve the profitability. Without changes, you will not earn enough profits to replace your equipment over time, thus making your enterprise even less profitable.

3. What is the minimum selling price/unit that I need to get to cover my costs?

- a. This is referred to as the breakeven selling price. Again, a very important number for the manager to understand.
- b. This number is crucial to managing the risk of your enterprise. If you know the minimum price you need to get, now you have important information on how to price your products, or what prices to accept if you are signing contracts for your products.
- c. Again, we look at short run and long run breakeven prices
- d. Short-run breakeven price only focuses on the total operating costs (TOC) of the enterprise. To calculate the short-run breakeven price:

$$\text{Short-Run Breakeven Price} = \text{Total Operating Costs} / \text{Amount Sold (or Yield)}$$

For the lawn mowing business:

$$\text{SR BE Price} = \$19,814.63 \text{ per year} / 750 \text{ lawns/year} = \$26.40/\text{lawn (rounded)}$$

This means the manager must be able to charge an average price of \$26.40/lawn, assuming he/she can mow 750 lawns per year, to cover the total operating costs of production. If you can charge a price that is higher than \$26.40/lawn you will earn short run profits – that is, your RAOC will be greater than \$0; you will have some earnings to pay your fixed costs as well as yourself for your management & labor. If you do not think you can sell your tomatoes for at least \$26.40/lawn, you will not be able to cover your total variable costs; therefore, you shouldn't plan to produce tomatoes this year.

Another term for the short-run breakeven price is the short-run “cost of production” for the enterprise. This tells the manager what it typically costs to produce 1 unit of the product or service. For the lawn mowing enterprise, it says that it typically costs around \$26.42 to mow 1 lawn. So, as long as the manager can charge more than \$26.42/lawn the enterprise will more than cover its operating expenses.

- e. Long-run breakeven price focuses on total costs (operating costs and overhead costs), because we need to be able to cover all of these costs year after year to stay in business.

$$\text{Long-Run Breakeven Price} = \text{Total Costs} / \text{Amount sold or Yield}$$

For Lawns:

$$\text{LR BE Yield} = \$61,314.63 \text{ per year} / 750 \text{ lawns} = \$81.75/\text{lawn (rounded)}$$

This means the manager must be able to charge at least \$81.75/lawn to cover all of the costs of the mowing enterprise. If he/she charges more than \$81.75/lawn the enterprise will be earning long run profits, and the enterprise will be able to stay in business for the long run. If you are not able to charge at least \$81.75/lawn, you will have to make changes to the enterprise to try to improve the profitability. Without changes, you will not earn enough profits to replace your equipment over time, thus making your enterprise even less profitable.

C. Section 3 - Sensitivity Analysis

1. Sensitivity analysis is just a fancy term for seeing how a business is affected by a change in one or more key areas. For example, we can look at how the Return Above Operating Costs (RAOC) changes if the selling price of the product increases or decreases by 10%. We can do this sensitivity analysis by hand, but it is very easy to do on spreadsheet.
 - a. Let's see what happens to Return Above Operating Costs if your Price/Unit drops by 10%. That means you are now charging only \$90/lawn ($\$100 - (\$100 \times 10\%)$)
 - Put your cursor in cell F5 – this is the cell where the price/lawn is entered. It currently says "\$100"
 - Type "90" into this cell
 - You do not need to type the "\$"
 - You do not need to delete the "\$100", simply type "90" and press Enter
 - What happened to your budget?
 - Total Revenues dropped from \$75,000 to \$67,500
 - Return Above Operating Costs dropped from \$55,185.37 to \$47,685.37
 - Thus, a 10% decrease in price/lawn leads to a \$7,500 decrease in RAOC
 - Minimum Yield Necessary to Cover Total Costs increased from 613 to 681 lawns per year
 - So, you will have to mow 68 more lawns just to cover your total costs.
 - A 10% decrease in price has a big impact on profitability!

It's just as easy to look at a change in quantity sold or input prices. Just change the one of the numbers with blue font and look at the results.

Tip – only change one item at a time to see how that will impact the profits of the enterprise. If you want to look at a change in another item, reset the first item to its original number, then change the new item.

Materials:

- Lawn Care Example**
- PowerPoint on Breakeven Analysis and Sensitivity Analysis**
- Note Organizer**
- In-class Exercise and Key**
- Homework Exercise and Key**
- Student Driven Activity**
- Take Home Reading**

Lawn Mowing Business Mowing Enterprise

Revenues	Quantity	Units	Price/Unit	Total
Mowing	750	lawns/year	\$100.00 /lawn	\$75,000.00
Other				\$0.00
Total Revenues				\$75,000.00 /year

Operating (Variable) Costs:

Fuel	0.60	gal/lawn	\$2.75 /gal	\$1,237.50
Oil	0.53	qts/year	\$3.00 /qt	\$1,200.00
Repairs	750	lawns/year	\$5.00 /lawn	\$3,750.00
Hired Labor	0.8	hours/lawn	\$18.00 /hour	\$10,800.00
Removal of grass - hauling	750	lawns/year	\$3.00 /lawn	\$2,250.00
Interest on Operating Capital	6%	6 months	\$19,237.50 /year	\$577.13
Total Operating Costs				\$19,814.63 /year
Return Above Operating Costs				\$55,185.37 /year
Minimum Yield Necessary to Cover Operating Costs				198.1 lawns/year
Minimum Price Necessary to Cover Operating Costs				\$26.42 /lawn

Overhead Costs

Depreciation - equipment	1	year	\$1,000 /year	\$1,000.00
Interest on equipment loans	1	year	\$800 /year	\$800.00
Office expenses	1	year	\$5,000 /year	\$5,000.00
Advertising	1	year	\$1,500 /year	\$1,500.00
Insurance premiums	1	year	\$1,200 /year	\$1,200.00
Office rent	1	year	\$7,000 /year	\$7,000.00
Owner Labor	1	owner	\$25,000 /year	\$25,000.00
Total Overhead Costs				\$41,500.00 /year
Total Costs				\$61,314.63 /year
Return Above Total Costs				\$13,685.37 /year
Minimum Yield Necessary to Cover Total Costs				613.1 lawns/year
Minimum Price Necessary to Cover Total Costs				\$81.75 /lawn

BREAKEVEN ANALYSIS & SENSITIVITY ANALYSIS



Breakeven Analysis

- Estimates the minimum performance a manager needs to cover the costs of an enterprise
- Main types:
 - Breakeven Quantity Sold
 - Breakeven Selling Price/Unit



Personal Breakevens

- You have living expenses of \$500/month
 - Your job pays \$10/hour (take-home)
 - You only have 40 hours/month that you can work
- What is the minimum number of hours you need to work to cover your living expenses ("breakeven quantity")?
 - $\$500/\text{month} / \$10/\text{hr} = 50 \text{ hours/month}$
 - But you can only work 40 hours/month - uh oh!



Personal Breakevens

- You have living expenses of \$500/month
 - Your job pays \$10/hour (take-home)
 - You only have 40 hours/month that you can work
- What is the minimum take-home wage that you must earn to cover your living expenses ("breakeven price")?
 - $\$500/\text{month} / 40 \text{ hrs/month} = \$12.50/\text{hour}$
 - You need a higher paying job to meet your needs!



Using Breakevens

- Compare your breakeven estimates to your planned sales quantity or price
 - If your breakeven is less than your planned - Good!
 - You are covering your expenses with money left over
 - If your breakeven is higher than your planned - Bad!
 - You need to make changes to improve your profits
 - Personal example:
 - You planned on \$10/hr but you NEED to earn \$12.50/hr
 - You planned on 40 hrs/month, but you need to work 50 hrs/month



Short Run vs Long Run

- Short Run
 - Refers to the next year or so
 - Only consider the operating expenses!
- Long Run
 - Refers to a long term decision (> 5 yrs)
 - Consider total expenses



Short Run Breakeven Quantity

- aka "SR Breakeven Yield"
- Use your enterprise budget
 - Assume the only thing that changes is quantity sold
 - Everything else stays the same
- SR BE Quantity
 - $\text{Total Operating Expenses} / \text{Selling Price/Unit}$
 - You need to sell this amount to cover your operating expenses



Lawn Care Example

- Short Run Breakeven Quantity
 - $\text{Total Operating Expenses} / \text{Selling Price/Lawn}$
 - $\$19,814/\text{year} / \$100/\text{lawn} = 198 \text{ lawns/year}$
 - You need to mow at least 198 lawns/year to cover your operating expenses
 - You plan to mow 750 lawns/year – good sign!
 - Assumes the total operating expenses will be \$19,814/yr
 - Assumes you've purchased most of the operating inputs already



Long Run Breakeven Quantity

- aka "LR Breakeven Yield"
- Use your enterprise budget
 - Assume the only thing that changes is quantity sold
 - Everything else stays the same
- LR BE Quantity
 - $\text{Total Expenses} / \text{Selling Price/Unit}$
 - You need to sell this amount to cover your total expenses



Lawn Care Example

- Long Run Breakeven Quantity
 - $\text{Total Expenses} / \text{Selling Price/Lawn}$
 - $\$61,315/\text{year} / \$100/\text{lawn} = 613 \text{ lawns/year}$
 - You need to mow at least 613 lawns/year to cover your total expenses
 - You plan to mow 750 lawns/year – good sign!



Short Run Breakeven Price

- aka "Breakeven Selling Price"
- Use your enterprise budget
 - Assume the only thing that changes is selling price
 - Everything else stays the same
- SR BE Price
 - $\text{Total Operating Expenses} / \text{Quantity Sold}$
 - You need to charge this price to cover your operating expenses
 - Assumes the quantity sold stays the same



Lawn Care Example

- Short Run Breakeven Price
 - $\text{Total Operating Expenses} / \text{Lawns/year}$
 - $\$19,814/\text{year} / 750 \text{ lawns} = \$26.40/\text{lawn}$
 - You need to charge at least \$26.40/lawn to cover your operating expenses
 - You plan to charge \$100/lawn – good sign!



Long Run Breakeven Price

- aka "LR Breakeven Selling Price"
- Use your enterprise budget
 - Assume the only thing that changes is selling price
 - Everything else stays the same
- LR BE Price
 - $\text{Total Expenses} / \text{Quantity Sold}$
 - You need to charge this price to cover your total expenses
 - Assumes the quantity sold stays the same



Lawn Care Example

- Long Run Breakeven Price
 - $\text{Total Expenses} / \text{Lawns/year}$
 - $\$61,315/\text{year} / 750 \text{ lawns} = \$81.75/\text{lawn}$
 - You need to charge at least \$81.75/lawn to cover your total expenses
 - You plan to charge \$100/lawn- good sign!



Know Your Breakevens!

- Every manager needs to have a good idea about the breakeven price and quantity
 - Helps make better decisions
 - Helps identify problems before it's too late
 - Helps get a loan from a lender



Sensitivity Analysis

- Looking at changes in profits due to changes in key areas of an enterprise
 - Selling price
 - Quantity sold
 - Input prices
- Look at changes of 10-25%
 - Individually, not everything at once!



Lawn Care Example

- Look at a 10% decrease in selling price
 - Currently charging \$100/lawn
- 10% decrease
 - $\$100 - (\$100 \times 10\%) = \$90/\text{lawn}$
 - Or $\$100 \times (100\% - 10\%) = \$90/\text{lawn}$
- At 750 lawns/year
 - Revenue = $\$90/\text{lawn} \times 750 \text{ lawns} = \$67,500$
 - A decrease of \$7,500 per year!



Lawn Care Example

- Impact on gross margin (RAOC)
 - Decreases from \$55,185 to \$47,685
 - Decrease of \$7,500
 - Simply due to charging a lower price/lawn
- But!
 - Will you gain more customers by charging a lower price?



Using the Spreadsheet

- Look at the Lawn Mowing Business enterprise budget
- Change the selling price from \$100 to \$90
 - Move your cursor to cell "F5"
 - Type in 90
- The spreadsheet automatically does the calculations
 - Revenue drops to \$67,500
 - Return Above Operating Costs drops to \$47,685



Other Sensitivity Analysis

- Reset the price to \$100/lawn
- Let's look at a 10% increase in the number of lawns mowed
 - You get 10% more customers than you planned!
- Move the cursor to cell "D5"
 - Enter 900 for the number of lawns mowed
 - Look at the impact on revenues and RAOC



Breakeven Analysis & Sensitivity Analysis- Notes Organizer

Breakeven Analysis

- Estimates the minimum performance a manager needs to cover the costs of an enterprise
- Main types:
 - _____
 - Breakeven Selling Price/Unit
- Personal Breakevens
 - You have living expenses of \$500/month
 - Your job pays \$10/hour (take-home)
 - You only have _____ that you can work
 - What is the minimum number of hours you need to work to cover your living expenses (“breakeven quantity”)?
 - $\$500/\text{month} / \$10/\text{hr} = \underline{\hspace{2cm}}$
 - But you can only work 40 hours/month – uh oh!
 - You have living expenses of \$500/month
 - Your job pays \$10/hour (_____)
 - You only have 40 hours/month that you can work
 - What is the minimum take-home wage that you must earn to cover your living expenses (“breakeven price”)?
 - $\$500/\text{month} / 40 \text{ hrs/month} = \underline{\hspace{2cm}}$
 - You need a higher paying job to meet your needs!
- Using Breakevens
 - Compare your breakeven estimates to your planned sales quantity or price
 - If your breakeven is **less** than your planned – Good!
 - _____
 - If your breakeven is higher than your planned – Bad!
 - _____
 - Personal example:
 - You planned on \$10/hr but you NEED to earn \$12.50/hr
 - You planned on 40 hrs/month, but you need to work 50 hrs/month

- Short Run vs Long Run
 - _____
 - Refers to the next year or so
 - Only consider the _____ expenses!
 - Long Run
 - Refers to a long term decision (> 5 yrs)
 - Consider _____ expenses
- Short Run Breakeven Quantity
 - aka “_____”
 - Use your enterprise budget
 - Assume the only thing that changes is quantity sold
 - _____
 - $\text{Total Operating Expenses} / \text{Selling Price/Unit}$
 - You need to sell this amount to cover your _____
- Lawn Care Example
 - Short Run Breakeven Quantity
 - $\text{Total Operating Expenses} / \text{Selling Price/Lawn}$
 - $\$19,814/\text{year} / \$100/\text{lawn} = 198 \text{ lawns/year}$
 - You need to mow at least 198 lawns/year to cover your operating expenses
 - You plan to mow 750 lawns/year – good sign!
 - Assumes the total operating expenses will be \$19,814/yr
 - Assumes you’ve purchased most of the operating inputs already
- Long Run Breakeven Quantity
 - aka “LR Breakeven Yield”
 - _____
 - Assume the only thing that changes is quantity sold
 - _____
 - $\text{Total Expenses} / \text{Selling Price/Unit}$
 - You need to sell this amount to cover your total expenses
- Lawn Care Example
 - Long Run Breakeven Quantity
 - _____ / $\text{Selling Price} / \text{_____}$
 - $\$61,315/\text{year} / \$100/\text{lawn} = 613 \text{ lawns/year}$

- You need to mow at least 613 lawns/year to cover your total expenses
 - You plan to mow 750 lawns/year – good sign!
- Short Run Breakeven Price
 - aka “_____”
 - Use your enterprise budget
 - Assume the only thing that changes is selling price
 - Everything else stays the same
 - Total Operating Expenses / _____
 - You need to charge this price to cover your operating expenses
 - Assumes the quantity sold stays the same
- Lawn Care Example
 - Short Run Breakeven Price
 - Total Operating Expenses / _____/year
 - \$19,814/year / 750 lawns = \$26.40/lawn
 - You need to charge at least \$26.40/lawn to cover your operating expenses
 - You plan to charge _____ – good sign!
- Long Run Breakeven Price
 - aka “LR Breakeven Selling Price”
 - _____
 - Assume the only thing that changes is selling price
 - Everything else stays the same
 - Total Expenses / _____
 - You need to charge this price to cover your total expenses
 - Assumes the quantity sold stays the same
- Lawn Care Example
 - Long Run Breakeven Price
 - Total Expenses / Lawns/year
 - \$61,315/year / 750 lawns = \$81.75/lawn
 - You need to charge at least \$81.75/lawn to cover your total expenses
 - You plan to charge \$100/lawn – good sign!
- Know Your Breakevens!
 - Every manager needs to have a good idea about the breakeven price and quantity
 - _____

- Helps identify problems before it's too late
- Helps get a loan from a lender
- Sensitivity Analysis
 - Looking at changes in profits due to changes in key areas of an enterprise
 - _____
 - Quantity sold
 - _____
 - Look at changes of _____%
 - Individually, not everything at once!
 - Lawn Care Example
 - Look at a 10% decrease in selling price
 - Currently charging \$100/lawn
 - 10% decrease
 - $\$100 - (\$100 \times 10\%) = \$90/\text{lawn}$
 - Or $\$100 \times (100\% - 10\%) = \$90/\text{lawn}$
 - At 750 lawns/year
 - Revenue = $\$90/\text{lawn} \times 750 \text{ lawns} = \$67,500$
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 - Lawn Care Example
 - Impact on gross margin (RAOC)
 - Decreases from \$55,185 to \$47,685
 - Decrease of \$7,500
 - Simply due to charging a lower price/lawn
 - But!
 - Will you gain more customers by charging a lower price?
- Using the Spreadsheet
 - Look at the Lawn Mowing Business enterprise budget
 - Change the selling price from \$100 to \$90
 - Move your cursor to cell "F5"
 - Type in 90
 - The spreadsheet automatically does the calculations
 - Revenue drops to \$67,500
 - Return Above Operating Costs drops to \$47,685

- Other Sensitivity Analysis
 - Reset the price to \$100/lawn
 - Let's look at a 10% increase in the number of lawns mowed
 - You get 10% more customers than you planned!
 - Mover the cursor to cell "D5"
 - Enter 900 for the number of lawns mowed
 - Look at the impact on revenues and RAOC

Break-even and Sensitivity Analysis In-Class Exercise

Let's look at Andy's Fresh-Market Tomato enterprise budget.

1. Andy isn't quite sure that all of his production estimates are accurate, so he wants to know how much "wiggle room" he has with this operation. Calculate the lowest tomato yield that Andy can get and still be able to pay ("cover") all of his operating costs.

Minimum Yield Necessary to Cover Operating Costs = Total Operating Costs / Price/carton

2. Andy isn't sure what price (\$/carton) to charge for his tomatoes. What is the lowest price than Andy needs to charge to cover all of his operating costs?

Minimum Price Necessary to Cover Operating Costs = Total Operating Costs / Cartons Sold

3. Andy is thinking long term. What is the lowest price that he can charge for his tomatoes and still cover all of the expenses of growing tomatoes?

Long-Run Break-even Price = Total Costs / Cartons Sold/acre

4. What is the lowest number of cartons that Andy needs to grow and sell per acre to cover all of the expenses of growing tomatoes?

Long-Run Breakeven Price = Total Costs / Selling Price/carton

5. There has been a bumper crop of tomatoes this year. This greater supply of tomatoes has caused the selling price of tomatoes to drop significantly. What is the change in Return Above Operating Costs if Andy's selling price drops by 20%?

Fresh-Market Tomatoes (1 acre)

25 lbs/carton

Revenues	Quantity	Units/Acre	Price	Total
Tomatoes	500	cartons	\$10.00 /carton	\$5,000.00
Other				\$0.00
Total Revenues				\$5,000.00 /acre

Variable Costs:

Fertilizer				
Nitrogen	80	lbs	\$0.45 /lb	\$36.00
Phosphorus	100	lbs	\$0.32 /lb	\$32.00
Potassium	150	lbs	\$0.30 /lb	\$45.00
Lime	0.5	tons	\$30.00 /ton	\$15.00
Custom Application	1	acre	\$21.00 /acre	\$21.00
Pest Scouting	8	times	\$10.00 /time	\$80.00
Herbicides	1	acre	\$95.00 /acre	\$95.00
Fungicides	1	acre	\$500.00 /acre	\$500.00
Insecticides	1	acre	\$207.00 /acre	\$207.00
Land Preparation	1	acre	\$53.00 /acre	\$53.00
Plastic Mulch installation & removal	1	acre	\$70.00 /acre	\$70.00
Plastic Mulch	1	acre	\$300.00 /acre	\$300.00
Drip Irrigation (tape & labor)	1	acre	\$150.00 /acre	\$150.00
Tomato Transplants	5000	acre	\$100.00 /1,000	\$500.00
Stakes	2500	acre	\$100.00 /1,000	\$250.00
Labor				
Planting transplants	1	acre	\$90.00 /acre	\$90.00
Staking & tying	16	hours	\$8.50 /hour	\$136.00
Marketing & advertising	1	acre	\$50.00 /acre	\$50.00
Hand harvest	1	acre	\$800.00 /acre	\$800.00
Pest Control	1	acre	\$17.00 /acre	\$17.00
Cartons, lids, shipping	500	cartons	\$1.50 /carton	\$750.00
Fuel	15	gallons	\$2.20 /gallon	\$33.00
Repairs - Tractors & implements	1	acre	\$9.00 /acre	\$9.00
Interest on Operating Capital	6%	3 months	\$4,239.00 /acre	\$63.59
Total Variable Costs				\$4,302.59 /acre
Return Above Variable Costs				\$697.41 /acre
Minimum Yield Necessary to Cover Variable Costs				
Minimum Price Necessary to Cover Variable Costs				

Fixed Costs

Tractors & Implements	1	acre	\$125 /acre	\$125.00
Drip Irrigation Equipment	1	acre	\$500 /acre	\$500.00
Land Charge	1	acre	\$150 /acre	\$150.00
Total Fixed Costs				\$775.00 /acre
Total Costs				\$5,077.59 /acre
Return Above Total Costs				(\$77.59) /acre
Minimum Yield Necessary to Cover Total Costs				
Minimum Price Necessary to Cover Total Costs				

Breakeven and Sensitivity Analysis In-Class Exercise (KEY)

Let's look at Andy's Fresh-Market Tomato enterprise budget.

1. Andy isn't quite sure that all of his production estimates are accurate, so he wants to know how much "wiggle room" he has with this operation. Calculate the lowest tomato yield that Andy can get and still be able to pay ("cover") all of his operating costs.

Minimum Yield Necessary to Cover Operating Costs = Total Operating Costs / Price/carton

Short-run BE Yield = \$4,302.59 / \$10/carton = 430.3 cartons/acre

Note, this is less than the expected 500 cartons/acre, which is a good sign!

2. Andy isn't sure what price (\$/carton) to charge for his tomatoes. What is the lowest price than Andy needs to charge to cover all of his operating costs?

Minimum Price Necessary to Cover Operating Costs = Total Operating Costs / Cartons Sold

Short-run BE Price = \$4,302.59 / 500 cartons = \$8.61/carton

Note, this is less than the expected \$10/carton selling price, which is a good sign!

3. Andy is thinking long term. What is the lowest price that he can charge for his tomatoes and still cover all of the expenses of growing tomatoes?

Long-Run Breakeven Price = Total Costs / Cartons Sold/acre

Long-Run BE Price = \$5,077.59 / 500 cartons/acre = \$10.16/carton

Note – this is greater than the expected selling price – that means Andy needs to charge a higher price/carton than expected. Will his customers pay the higher price?

4. What is the lowest number of cartons that Andy needs to grow and sell per acre to cover all of the expenses of growing tomatoes?

Long-Run Breakeven Quantity Sold = Total Costs / Selling Price/carton

Long-Run BE Quantity = \$5,077.59 / \$10/carton = 507.8 cartons/acre

Note – this is greater than the expected yield/acre – that means Andy needs to get a higher yield/acre than he is expecting, if he only charges \$10/carton. Can he get a higher yield/acre without increasing his expenses too much?

5. There has been a bumper crop of tomatoes this year. This greater supply of tomatoes has caused the selling price of tomatoes to drop significantly. What is the change in Return Above Operating Costs if Andy's selling price drops by 20%?

A 20% decrease in price means his new selling price is \$8/carton ($\$10 - (\$10 * 20\%)$). At \$8/carton, with no other changes in yield or inputs, the new Return Above Operating Costs is (\$302.59) (that's a negative \$302.59). That is a \$1,000 decrease in profitability due to the lower selling price.

Fresh-Market Tomatoes

25 lbs/carton

Revenues	Quantity	Units/Acre	Price	Total
Tomatoes	500	cartons	\$8.00 /carton	\$4,000.00
Other				\$0.00
Total Revenues				\$4,000.00 /acre

Variable Costs:

Fertilizer				
Nitrogen	80	lbs	\$0.45 /lb	\$36.00
Phosphorus	100	lbs	\$0.32 /lb	\$32.00
Potassium	150	lbs	\$0.30 /lb	\$45.00
Lime	0.5	tons	\$30.00 /ton	\$15.00
Custom Application	1	acre	\$21.00 /acre	\$21.00
Pest Scouting	8	times	\$10.00 /time	\$80.00
Herbicides	1	acre	\$95.00 /acre	\$95.00
Fungicides	1	acre	\$500.00 /acre	\$500.00
Insecticides	1	acre	\$207.00 /acre	\$207.00
Land Preparation	1	acre	\$53.00 /acre	\$53.00
Plastic Mulch installation & removal	1	acre	\$70.00 /acre	\$70.00
Plastic Mulch	1	acre	\$300.00 /acre	\$300.00
Drip Irrigation (tape & labor)	1	acre	\$150.00 /acre	\$150.00
Tomato Transplants	5000	acre	\$100.00 /1,000	\$500.00
Stakes	2500	acre	\$100.00 /1,000	\$250.00
Labor				
Planting transplants	1	acre	\$90.00 /acre	\$90.00
Staking & tying	16	hours	\$8.50 /hour	\$136.00
Marketing & advertising	1	acre	\$50.00 /acre	\$50.00
Hand harvest	1	acre	\$800.00 /acre	\$800.00
Pest Control	1	acre	\$17.00 /acre	\$17.00
Cartons, lids, shipping	500	cartons	\$1.50 /carton	\$750.00
Fuel	15	gallons	\$2.20 /gallon	\$33.00
Repairs - Tractors & implements	1	acre	\$9.00 /acre	\$9.00
Interest on Operating Capital	6%	3 months	\$4,239.00 /acre	\$63.59
Total Variable Costs				\$4,302.59 /acre

Return Above Variable Costs

Minimum Yield Necessary to Cover Variable Costs

537.8 cartons/acre

Minimum Price Necessary to Cover Variable Costs

\$8.61 /carton

697.415 \$1,000.00

Fixed Costs

Tractors & Implements	1	acre	\$125 /acre	\$125.00
Drip Irrigation Equipment	1	acre	\$500 /acre	\$500.00
Land Charge	1	acre	\$150 /acre	\$150.00
Total Fixed Costs				\$775.00 /acre

Total Costs

\$5,077.59 /acre

Return Above Total Costs

(\$1,077.59) /acre

Minimum Yield Necessary to Cover Total Costs

634.7 cartons/acre

Minimum Price Necessary to Cover Total Costs

\$10.16 /carton

Breakeven and Sensitivity Analysis Homework Exercise

Use the attached Horse Boarding Enterprise Budget to answer the following questions. Nellie has estimated the revenues and expenses of her horse boarding operation on this enterprise budget. But she didn't know a few of the numbers so she had to make some "educated guesses". Help Nellie make management decisions for her horse boarding operation. **Show your work to receive full credit.**

1. What is the minimum monthly boarding price that Nellie must charge her customers to breakeven in the short run?

(Hint: Total Revenues = Number of Head x 12 months x Monthly Boarding Price)

2. What is the minimum number of horses that Nellie needs to board per month so that she can cover her operating costs. Assume that she charges \$500/horse per month and that all costs remain the same.
3. Nellie wants to be able to cover her total costs so that she can stay in business for many years (the long run). What monthly price per horse does she need to charge her customers so that she can cover her total costs?

4. Calculate the minimum monthly rate per horse that Nellie needs to charge so that she can cover her total costs and pay herself a salary of \$20,000 per year.

5. It is supposed to be a very dry year, so Nellie expects her grass hay price to increase. What will happen to her Return Above Variable Costs if her grass hay price increases by 20%? Use the spreadsheet to do the calculations for you.
 - a. What is her new grass hay price going to be if it increases by 20%?

 - b. What is her new Return Above Variable Costs after you plug in the new grass hay price?

 - c. How much did her Return Above Variable Costs decrease due to the higher grass hay price?

6. What will happen to Nellie's Return Above Total Cost if she can reduce the hours of labor needed per horse by 15%? (Assume her grass hay price is the original \$185/ton)
- a. What is her new labor per horse (hours) going to be if it decreases by 15%?
- b. What is her new Return Above Variable Costs after you plug in the new labor needs?
- c. How much did her Return Above Variable Costs increase due to the lower labor needs?

Extra Credit

Use Goal Seek in Excel to answer the following questions.

- A. Calculate the minimum boarding price that Nellie needs to charge so that she can cover her total costs in the long run. Show the information you entered into Goal Seek:

Set Cell: _____ (enter the correct cell reference – example: H5)

Equal To: _____ (enter the correct number – example \$0)

By Changing Cell: _____ (enter the correct cell reference)

Minimum Boarding Price: \$_____/month

- B. Calculate the minimum boarding price that Nellie must charge to earn a Return Above Total Costs of \$30,000/year.

Set Cell: _____ (enter the correct cell reference – example: H5)

Equal To: _____ (enter the correct number – example \$0)

By Changing Cell: _____ (enter the correct cell reference)

Minimum Boarding Price: \$_____/month

- C. We haven't done an example like this, but I know that you can figure it out on your own. Nellie expects that she will have to pay a higher price for her grass hay this year. What is the maximum price (\$/ton) that she can pay for grass hay and still be able to cover her total variable costs?

Set Cell: _____ (enter the correct cell reference – example: H5)

Equal To: _____ (enter the correct number – example \$0)

By Changing Cell: _____ (enter the correct cell reference)

Maximum Grass Hay Price: \$_____/ton

Virginia Cooperative Extension

2023

Nellie's Horse Boarding Operation (Full Service)

20 Horses

90% Occupancy Rate

ITEM		UNIT	PRICE	QUANTITY	TOTAL	Your Estimate
1. GROSS RECEIPTS						
				Months		
Number Boarded	18 Head	12 Months	\$500.00 Per Month	12	\$108,000.00	
Lessons	0 /month	12 Months	\$35.00 Per Lesson	12	\$0.00	
Training	0 /month	12 Months	\$800.00 Per Horse	12	\$0.00	
Other: _____	0 /unit	0 Months	\$0.00 Per Unit	0	\$0.00	
2. TOTAL GROSS RECEIPTS					\$108,000.00	
3. VARIABLE COSTS						
	Feed Loss					
Alfalfa Hay	5.0%	Ton	\$225.00	0.00	\$0.00	
Timothy Hay	5.0%	Ton	\$180.00	0.00	\$0.00	
Mixed Hay	5.0%	Ton	\$175.00	0.00	\$0.00	
Grass Hay	5.0%	Ton	\$185.00	56.91	\$10,528.84	
Mixed Feed	2.0%	Ton	\$480.00	18.43	\$8,845.85	
Rolled Oats	2.0%	Cwt	\$24.00	0.00	\$0.00	
Other Feed	5.0%	Ton	\$0.00	0.00	\$0.00	
Grinding & Mixing		Cwt	\$1.40	0.00	\$0.00	
Salt & Mineral	91.00 Lbs per Horse	Cwt	\$30.00	18.20	\$546.00	
Vet & Medicine	\$/Horse	Head	\$156.22	20	\$3,124.40	
Farrier	8 Trips/year	Trip	\$0.00	0	\$0.00	
Supplies		Head	\$27.00	20	\$540.00	
Replacement Tack	15.0% Annually	Head	\$0.00	0	\$0.00	
Pasture Rent	Acres per Horse	Acre	\$21.00	0	\$0.00	
Pasture Clipping	0.20 Acres per Horse	Acre	\$17.50	4	\$70.00	
Fertilizer & Lime	2.00 Acres per Horse	Acre	\$32.00	0	\$0.00	
Building & Fence Repairs	5.0% of Facility Value	Head	\$210.00	20	\$4,200.00	
Haul to Ride		Miles	\$0.48	0	\$0.00	
Utilities		Head	\$60.00	20	\$1,200.00	
Insurance - horses	10.0% of Value	Head	\$570.00	0	\$0.00	
Bedding		Head	\$200.00	20	\$4,000.00	
Property Insurance		Year	\$2,000.00	1	\$2,000.00	
Liability Insurance	\$2 Millions of Coverage	Per Mil \$	\$500.00	2	\$1,000.00	
Lessons Horses Upkeep	0 Horses	Head	\$2,400.00	0	\$0.00	
Other: Marketing/Advertising		Year	\$1,500.00	1	\$1,500.00	
Other: _____		Head	\$0.00	20	\$0.00	
Labor	300 Hours per Horse	Hours	\$10.00	5400	\$54,000.00	
Unexpected Expenses	5.0% of variable costs (except labor)			\$37,555.08	\$1,877.75	
Operating Interest	6 Months	Dollars	6.00%	\$93,433.00	\$2,802.99	
4. TOTAL VARIABLE COSTS					\$96,235.83	
5. RETURN ABOVE VARIABLE COSTS					\$11,764.17	
6. ANNUAL OVERHEAD COSTS					\$20,000.00	
7. TOTAL COSTS					\$116,235.83	
8. RETURN ABOVE TOTAL COSTS					(\$8,235.83)	

NOTE: This budget is for the stable owner.

Developed by Virginia Cooperative Extension Farm Business Management Staff

Breakeven and Sensitivity Analysis Homework Exercise (KEY)

Use the attached Horse Boarding Enterprise Budget to answer the following questions. Nellie has estimated the revenues and expenses of her horse boarding operation on this enterprise budget. But she didn't know a few of the numbers so she had to make some "educated guesses". Help Nellie make management decisions for her horse boarding operation. **Show your work to receive full credit.**

1. What is the minimum monthly boarding price that Nellie must charge her customers to breakeven in the short run?

(Hint: Total Revenues = Number of Head x 12 months x Monthly Boarding Price)

Total Revenues = Total Variable Costs

Number of Head x 12 months x Monthly Boarding Price = Total Variable Costs

Monthly Boarding Price = Total Variable Costs / (Number of Head x 12 months)

Monthly Boarding Price = \$96,235.83 / (18 head x 12 months) = \$445.54/month

2. What is the minimum number of horses that Nellie needs to board per month so that she can cover her operating costs. Assume that she charges \$500/horse per month and that all costs remain the same.

Total Revenues = Total Variable Costs

Number of Head x 12 months x Monthly Boarding Price = Total Variable Costs

Number of Head = Total Variable Costs / (12 months x Monthly Boarding Price)

Number of Head = \$96,235.83 / (12 months x \$500/month) = 16 horses

3. Nellie wants to be able to cover her total costs so that she can stay in business for many years (the long run). What monthly price per horse does she need to charge her customers so that she can cover her total costs?

Total Revenues = Total Costs

Number of Head x 12 months x Monthly Boarding Price = Total Costs

Monthly Boarding Price = Total Costs / (Number of Head x 12 months)

Monthly Boarding Price = \$116,235.83 / (18 head x 12 months) = \$538.13/month

4. Calculate the minimum monthly rate per horse that Nellie needs to charge so that she can cover her total costs and pay herself a salary of \$20,000 per year.

Total Revenues = Total Costs + Desired Profit

Number of Head x 12 months x Monthly Boarding Price = Total Costs + Desired Profit

Monthly Boarding Price = (Total Costs + Desired Profit) / (Number of Head x 12 months)

Monthly Boarding Price = (\$116,235.83+\$20,000) / (18 head x 12 months) = \$630.72/month

5. It is supposed to be a very dry year, so Nellie expects her grass hay price to increase. What will happen to her Return Above Variable Costs if her grass hay price increases by 20%? Use the spreadsheet to do the calculations for you.

- a. What is her new grass hay price going to be if it increases by 20%?

New Grass Hay Price = \$185/ton x (1 + 20%) = \$222/ton

- b. What is her new Return Above Variable Costs after you plug in the new grass hay price?

New RAVC = \$9,486.79

- c. How much did her Return Above Variable Costs decrease due to the higher grass hay price?

\$11,764.17 - \$9,486.79 = \$2,277.38 decrease

6. What will happen to Nellie's Return Above Total Cost if she can reduce the hours of labor needed per horse by 15%? (Assume her grass hay price is the original \$185/ton)

- a. What is her new labor per horse (hours) going to be if it decreases by 15%?

$$\text{New Hours/Horse} = 300 \text{ hours} \times (1 - 15\%) = 255 \text{ hours/horse}$$

- b. What is her new Return Above Variable Costs after you plug in the new labor needs?

$$\text{New RAVC} = \$20,107.17$$

- c. How much did her Return Above Variable Costs increase due to the lower labor needs?

$$\$20,107.17 - \$11,764.17 = \$8,343 \text{ increase}$$

Extra Credit

Use Goal Seek in Excel to answer the following questions.

- A. Calculate the minimum boarding price that Nellie needs to charge so that she can cover her total costs in the long run. Show the information you entered into Goal Seek:

Set Cell: I48 (enter the correct cell reference – example: H5)

Equal To: \$0 (enter the correct number – example \$0)

By Changing Cell: F10 (enter the correct cell reference)

Minimum Boarding Price: \$ \$445.54/month

- B. Calculate the minimum boarding price that Nellie must charge to earn a Return Above Total Costs of \$30,000/year.

Set Cell: I51 (enter the correct cell reference – example: H5)

Equal To: \$30,000 (enter the correct number – example \$0)

By Changing Cell: F10 (enter the correct cell reference)

Minimum Boarding Price: \$ 677.02 /month

- C. We haven't done an example like this, but I know that you can figure it out on your own. Nellie expects that she will have to pay a higher price for her grass hay this year. What is the maximum price (\$/ton) that she can pay for grass hay and still be able to cover her total variable costs?

Set Cell: I48 (enter the correct cell reference – example: H5)

Equal To: \$0 (enter the correct number – example \$0)

By Changing Cell: F20 (enter the correct cell reference)

Maximum Grass Hay Price: \$ \$376.13/ton

Break-even & Sensitivity Analysis – Student Driven Activity

Student Driven Learning Activity: You will have to have access to a computer and the excel program per group or per student to complete this exercise.

Utilizing the additional reading portion of the lesson have students divide into groups and read through the exercise and develop several scenarios that will test the sensitivity of Greta's enterprise. Be sure to test the sensitivity for the good (increased price/decreased inputs) and for the bad (decreased price/increased inputs). Be sure to lay out the scenario that caused these prices to fluctuate. Share your scenarios with the rest of the class and utilize the excel file that is associated with this lesson. Show the class how simply adjusting the numbers how it will affect the break-even.

Breakeven & Sensitivity Analysis – Take Home Reading

Nothing is certain in the business world - input prices can change dramatically; your competitors can lower their prices or have “doorbuster sales” to pull in new customers. In businesses that are affected by weather, such as agriculture and construction, poor weather can lead to lower crop yields or slower building times. Managers take their best estimates (“guesses”) of how many units they will sell in the upcoming year and of the average price they will charge for their goods and services. They use these estimates to build their income statements and enterprise budgets for the upcoming year. But they have no way of knowing how good their estimates are until the end of the year. For these reasons, managers like to do “breakeven analysis” and “sensitivity analysis” to see how sensitive their business profits are to changes in key items.

Breakeven analysis is a way to estimate the lowest selling price that you can charge so that you earn enough revenues to cover your costs. It can also be used to estimate the lowest amount of units that you need to sell at a certain price to cover your costs. Or, we can get fancy and calculate the highest price that you can afford to pay for one of your key inputs (labor, fertilizer, raw materials, etc.).

Sensitivity analysis is just a fancy term for estimating how your business’ profits are going to be impacted by changes in one or more key factors, such as the purchase cost of an input or the amount of units you actually sell. There are no “hard and fast rules” for doing sensitivity analysis. I would recommend that you keep it simple – choose one main factor to change at a time, then, change that factor by 10-25%. For example, you can analyze how your profits (return above operating costs or return above total costs) are hurt by a 10% decrease in the number of units you actually sell. Computer spreadsheets are great tools to use for sensitivity analysis.

Let’s look at the basics of breakeven analysis. “Breakeven” means that your revenues are just equal to your costs – so you’re just breaking even – you’re not making money, but you’re not losing money either. We can calculate breakevens for the upcoming year (the short run) or for the next several years (the long run).

It might be easier to understand breakeven analysis if we apply it to your personal life. Let’s assume that your monthly living expenses (rent, food, etc.) are \$1,000. You are working at a local business that pays you \$10/hour. For you to “breakeven”, your monthly earnings must be equal to your monthly expenses. How many hours do you need to work per month so that you can breakeven?

Total Earnings = \$10/hour x Hours Worked/month

Total Expenses = \$1,000/month

Total Earnings = Total Expenses

$$\text{\$10/hour} \times \text{Hours Worked/Month} = \text{\$1,000/Month}$$

$$\text{Hours Worked/Month} = \text{\$1,000} / \text{\$10/hour} = 100 \text{ hours/month}$$

So, your breakeven number of hours worked per month is 100 hours. If we assume that there are an average of 4 weeks per month you will need to work 25 hours/week (100 hours/ month / 4 weeks/month) to breakeven. We call this your “breakeven quantity”.

What if you know that you can only work 80 hours/month? What is the minimum wage rate that you have to earn to breakeven? Let’s start with the same basic formula:

$$\text{Total Earnings} = \text{Total Expenses}$$

$$\text{Wage Rate/Hour} \times 80 \text{ Hours Worked/Month} = \text{\$1,000/Month}$$

$$\text{Wage Rate/Hour} = \text{\$1,000/Month} / 80 \text{ Hours Worked/Month} = \text{\$12.50/Hour}$$

Your breakeven wage rate is \$12.50/hour if you can only work 80 hours per month. We call this your “breakeven price”.

In the business world we only use operating expenses for the “short run” (the upcoming year). In the short run, breakeven means that our total revenues are just equal to our total operating expenses. Let’s create a formula that will help you learn how to calculate short run breakevens. In the short run (the upcoming year), Total Revenues are equal to Total Operating Expenses. But, we can rewrite Total Revenues as follows: Total Revenues = Units Sold x Price/Unit. So, our main short run breakeven formula is:

$$\text{Units Sold} \times \text{Price/Unit} = \text{Total Operating Costs}$$

To calculate the minimum price that you need to charge to cover your operating costs, simply rearrange this formula to solve for Price/Unit:

$$\text{Price/Unit} = \text{Total Operating Costs} / \text{Units Sold}$$

Let’s calculate the breakeven price for Greta’s squash enterprise. She typically sells 100 pounds of squash per month. The operating expenses of her squash enterprise are \$550 per month. Greta’s breakeven price is:

$$\text{Price/Unit} = \text{Total Operating Costs} / \text{Units Sold}$$

$$\text{Price/Unit} = \text{\$550} / 100 \text{ pounds} = \text{\$5.50/pound}$$

Greta needs to charge at least \$5.50/pound for her squash. At this price her total revenues will be just equal to her total operating expenses.

$$\text{Total Revenues} = 100 \text{ pounds of squash} \times \text{\$5.50/pound} = \text{\$550}$$

$$\text{Total Operating Expenses} = \text{\$550}$$

$$\text{So, Total Revenues} = \text{Total Operating Expenses when the selling price is } \text{\$5.50/pound}$$

Let's calculate the minimum number of pounds of squash that Greta needs to sell to breakeven if she charges \$6.00/pound. We call this the "breakeven quantity". Assume that Greta has already purchased the squash and that her total operating expenses are still \$550 for the month. Her breakeven quantity of squash is:

$$\text{Units Sold} \times \text{Price/Unit} = \text{Total Operating Costs}$$

$$\text{Units Sold} \times \$6.00/\text{pound} = \$550$$

$$\text{Units Sold} = \$550 / \$6.00/\text{pound} = 91.67 \text{ pounds of squash sold}$$

Let's double-check our math:

$$\text{Total Revenues} = 91.67 \text{ pounds} \times \$6/\text{pound} = \$550$$

$$\text{Total Operating Expenses} = \$550$$

So, Total Revenues = Total Operating Expenses at 91.67 pounds sold per month.

How does Greta use these breakevens in managing her business? Greta looks at her competitor's prices for squash and sees that they are all charging an average of \$3.50/pound. But she must be able to charge \$5.50/pound to cover her operating costs. How can she compete with the other grocery stores if she has to charge \$2.00/pound more than they do? This helps Greta see that she needs to either reduce the operating costs of her squash enterprise so that she can charge closer to \$3.50/pound, or maybe she should think about not selling squash at all. Remember, we said that a business must always be able to cover its operating expenses in the short run. Breakeven analysis helps the manager make short run decisions.

Let's get a little more realistic. Most managers do not want to simply break even – they want to earn profits over their expenses. We can calculate the lowest price we need to charge, or the minimum amount of units we need to sell at a given price, that allows us to earn a desired profit. Now our total revenues must be equal to our total operating expenses plus our desired profit:

$$\text{Total Revenues} = (\text{Total Operating Costs} + \text{Desired Profit})$$

Assume that Greta wants to earn at least \$200 of profit per month from her squash enterprise if she sells an average of 100 pounds per month. Let's calculate the minimum selling price and quantity sold for her to earn \$200 of profit:

$$\text{Total Revenues} = (\text{Total Operating Costs} + \text{Desired Profit})$$

$$\text{Units Sold} \times \text{Price/Unit} = (\text{Total Operating Costs} + \text{Desired Profit})$$

$$100 \text{ pounds} \times \text{Price/Unit} = (\$550 + \$200)$$

$$\text{Price/Unit} = (\$750) / 100 \text{ pounds} = \$7.50/\text{pound}$$

Greta must charge \$7.50/pound to earn a profit of \$200/month.

$$\text{Units Sold} \times \text{Price/Unit} = (\text{Total Operating Costs} + \text{Desired Profit})$$

$$\text{Units Sold} \times \$7.50/\text{pound} = (\$550 + \$200)$$

$$\text{Units Sold} = (\$750) / \$5/\text{pound} = 150 \text{ pounds sold per month}$$

Greta must sell 150 pounds/month to earn a profit of \$200/month under these assumptions.

Managers are not just concerned about the short run. They need to think about staying in business for several years – the long run. In the long run the business must generate enough revenues to cover its total costs (operating costs plus overhead costs). This is the only thing that is different between short run and long run breakeven. Here's the general long run equation:

$$\text{Units Sold} \times \text{Price/Unit} = (\text{Total Operating Costs} + \text{Total Overhead Costs})$$

Greta's overhead costs for the squash enterprise are \$150/month. If she sells 100 pounds per month, with operating costs of \$550/month, her breakeven long run selling price is:

$$\text{Units Sold} \times \text{Price/Unit} = (\text{Total Operating Costs} + \text{Total Overhead Costs})$$

$$\text{Price/Unit} = (\text{Total Operating Costs} + \text{Total Overhead Costs}) / \text{Units Sold}$$

$$\text{Price/Unit} = (\$550 + \$150) / 100 \text{ pounds} = \$7.00/\text{pound}$$

Greta must charge a minimum of \$7.00/pound for her squash for her to stay in business for more than a few years (the long run). This will allow her to just cover her total expenses. If she wants to earn a profit above those total costs, we can add in the desired profit to this calculation like we did for the short run.

Greta's minimum level of sales (units) for the long run is she charges \$5.00/pound is:

$$\text{Units Sold} \times \text{Price/Unit} = (\text{Total Operating Costs} + \text{Total Overhead Costs})$$

$$\text{Units Sold} = (\text{Total Operating Costs} + \text{Total Overhead Costs}) / \text{Price/Unit}$$

$$\text{Units Sold} = (\$550 + \$150) / \$5.00/\text{pound} = 140 \text{ pounds of squash sold per month}$$

We can use a computer spreadsheet to calculate our breakeven prices and quantities. There are 2 ways to calculate breakevens with a spreadsheet. First, we can enter formulas:

$$\text{Short Run Breakeven Price} = \text{Total Operating Costs} / \text{Units Sold}$$

$$\text{Short Run Breakeven Units Sold} = \text{Total Operating Costs} / \text{Price/Unit}$$

$$\text{Long Run Breakeven Price} = \text{Total Costs} / \text{Units Sold}$$

$$\text{Long Run Breakeven Units Sold} = \text{Total Costs} / \text{Price/Unit}$$

In this spreadsheet, we use "cell references" instead of actual numbers. To enter a formula for short run selling price, we need to divide the cell that contains the total operating costs by the cell that contains the units sold. The Total Operating Costs are in cell "H29" – Column H, row 29. Units Sold are in cell "D5" – Column D, row 5. So our formula should look like this:

$$\text{Short Run Breakeven Price} = \text{H29} / \text{D5}$$

Click on cell H32 to see this formula for short run breakeven price. Now, look in the “formula bar” which is toward the top of the screen. You will see a formula that looks like:

$$= H29/D5$$

That’s all there is to it! This formula will automatically take whatever number is in cell H29 (Greta’s total operating costs) and divide it by the pounds sold (cell D5). Change the pounds sold to 200 pounds and see what happens to the breakeven selling price. Pretty neat, huh?!

We can do the same thing for the other breakeven formulas. Look at these cells to see the formulas:

Cell H31 is Short Run Breakeven Units Sold = $H29/F5$

Cell H32 is Short Run Breakeven Selling Price = $H29/D5$

Cell H42 is Long Run Breakeven Units Sold = $H39/F5$

Cell H43 is Long Run Breakeven Selling Price = $H39/D5$

The second method of calculating breakevens on a spreadsheet is by using a function called “Goal Seek”. The Goal Seek function is found on the “Data tab” – click on the Data tab. Now click on the “What-If Analysis” button. Then select “Goal Seek” from the menu.

Goal Seek basically need 3 pieces of information to calculate a breakeven:

1. The cell that contains the Return Above Operating Costs (RAOC) for short run breakevens, or the cell for Return Above Total Costs (RATC) for long run breakevens,
2. What you want to set the RAOC or RATC equal to. Use zero (\$0) to calculate the breakeven. Or, use the desired profit to calculate the minimum price or quantity needed to earn that profit,
3. The cell containing the factor you want to calculate. For breakeven selling price, choose the cell that contains the current selling price; for breakeven units sold, enter the cell that contains the current level of sales.

Here’s how to use Goal Seek to calculate the short run breakeven selling price for Greta’s Squash Enterprise:

Open Greta’s squash enterprise budget spreadsheet

Click on the Data tab

Click on the “What-If Analysis” button

Select “Goal Seek” from the dropdown menu

A box will appear that asks you for the 3 pieces of information that are needed:

1. Set cell – this is the RAOC or RATC cell reference
2. To value – this is what you want RAOC or RATC to be equal to
3. By changing cell – this is what you are solving for

To calculate Greta's short run breakeven selling price, enter the following information in the input box:

1. Set cell: H30
- H30 is the cell reference for Greta's Return Above Operating Costs
2. To value: \$0
- this tells the spreadsheet to set the RAOC to \$0
3. By changing cell: F5
- F5 is the cell reference for the current selling price

Once you have this information entered into the box press the "OK" button to solve for the short run breakeven selling price. You will get a message that says "Goal Seeking with Cell H30 found a solution." This means that it solved for the breakeven price. If you look at cell H30, it will show a value of \$0 – this means that Greta earned just enough revenue to cover her operating costs. Now, look at cell F5 to see what the breakeven selling price is – you will see that the price changed from \$5.00/pound to \$5.50/pound. This means that Greta's short run breakeven selling price is \$5.50/pound. This is what we calculated by hand and with the spreadsheet formula – if nothing else, Goal Seek will help you double-check your answers to your formulas!

Click "Cancel" to return the selling price to the original value of \$5.00/pound. If you accidentally click "OK" the spreadsheet will keep the \$5.50/pound price instead of the original \$5.00/pound --- not a problem, just type "5" into cell F5 to go back to the original price.

If you want to calculate the short run breakeven units sold, do the exact same thing we just did, except in enter the cell for the units sold (D5) in the "By changing cell" box. You should get 110 pounds as your short run breakeven units sold.

Reset your units sold back to the original 100 pounds and be sure that your price is \$5.00/pound. You can calculate the long run breakevens in the same fashion – the only difference is that you want to use the cell reference for the Return Above Total Cost (RATC) for the "Set cell" input. Everything else is the same! Try it and see if you get the same results as we got by hand.

Now, what if Greta wants to determine the price she needs to charge to earn a Return Above Operating Costs of \$200. This is a short run decision because she is only interested in covering her operating costs. The only thing that we have to do differently is enter \$200 instead of \$0 in the "To value:" input box. Here's what it will look like:

- | | | |
|-------------------|-------|------------------------------------|
| Set cell: | H30 | (cell reference for RAOC) |
| To value: | \$200 | (Greta's desired profit) |
| By changing cell: | F5 | (Cell reference for selling price) |

Press OK to solve. You should get a selling price of \$7.50/pound.

Sensitivity analysis is similar to breakeven analysis, but it's a lot easier. All you have to do is select a key factor that you want to analyze, and change the original value to something new. Again, I usually look at changes of 10-25% in these factors. Let's do some sensitivity analysis for Greta. Let's look at how a 10% decrease in units sold will impact her Return Above Operating Costs. Simply change the value in cell D5 (Units Sold) from 100 to 90. This represents a 10% decrease in the number of pounds of squash that are sold. ($100 \times (100\% - 10\%) = 90$). When you change the units sold from 100 to 90 you should see the following changes:

Total Revenues drops from \$500 to \$450

Total Operating Expenses remain the same at \$550

Return Above Operating Costs drops from negative \$50 to negative \$100

Minimum Price Necessary to Cover Operating Costs increases from \$5.50 to \$6.11/pound.

This sensitivity analysis tells Greta that if her sales drop from 100 pounds to 90 pounds (a 10% decrease), her short run profits will decrease by another \$50 to a total short run loss of \$100.

We can look at other changes besides price and units sold. Change the units sold back to 100 and the price to \$5.00 so that you are at the original numbers. What if Greta can reduce her labor for transplanting and for hand harvest to \$40/acre for each? How will this impact her short run profits? Change the price for "planting transplants" to \$40/acre. Change the price for "hand harvest" to \$40/acre. What happens to Greta's short run profits? With this change her Return Above Operating Costs is now \$31.20/acre (positive) instead of negative \$50/acre. This tells Greta that labor is an important resource that she needs to be able to control to make profits!

Here are a few tips for doing sensitivity analysis:

1. Always start from the original situation. This way you can easily compare the impact of all the changes.
2. Don't change too many factors at the same time. I usually look at 1 or 2 changes at a time. This makes it easier to see how sensitive the business is to those 1-2 changes. If you change 5-10 factors at the same time it is hard to determine what is really causing the changes. Keep it simple!
3. Focus on the most important factors of the business: selling price, units sold, and a few of the most expensive inputs.

Good managers always have an idea of their breakeven selling prices and/or breakeven units sold. This helps them make day-to-day decisions much more easily. For example, a local restaurant has a breakeven units sold of 50 breakfasts per day. If the manager doesn't expect to sell at least 50 breakfasts in a day he may think about not offering breakfasts anymore; instead, he will focus on the busier lunch and dinner times. Or, assume the restaurant has breakeven daily sales of 200 meals, and the restaurant is located in a college town. When the students leave for holiday break the restaurant may only have sales of 50 meals per day. If this is the case, the manager may decide to close the restaurant until the students come back into town.

Greta's Squash Enterprise

Revenues	Quantity	Units/Acre	Price	Total
Squash	100	pounds	\$5.00 /pound	\$500.00
Other				\$0.00
Total Revenues				\$500.00 /acre
Operating Expenses				
Fertilizer				
Nitrogen	80	lbs	\$0.45 /lb	\$36.00
Phosphorus	100	lbs	\$0.32 /lb	\$32.00
Potassium	150	lbs	\$0.30 /lb	\$45.00
Lime	0.5	tons	\$30.00 /ton	\$15.00
Custom Application	1	acre	\$21.00 /acre	\$21.00
Pest Scouting	2	times	\$10.00 /time	\$20.00
Herbicides	1	acre	\$25.00 /acre	\$25.00
Fungicides	1	acre	\$25.00 /acre	\$25.00
Insecticides	1	acre	\$25.00 /acre	\$25.00
Labor				
Planting transplants	1	acre	\$80.00 /acre	\$80.00
Marketing & advertising	1	acre	\$50.00 /acre	\$50.00
Hand harvest	1	acre	\$80.00 /acre	\$80.00
Pest Control	1	acre	\$33.00 /acre	\$33.00
Cartons, lids, shipping	50	cartons	\$0.20 /carton	\$10.00
Fuel	15	gallons	\$2.20 /gallon	\$33.00
Repairs - Tractors & implements	1	acre	\$11.87 /acre	\$11.87
Interest on Operating Capital	6%	3 months	\$541.87 /acre	\$8.13
Total Operating Expenses				\$550.00 /acre
Return Above Operating Costs				(\$50.00) /acre
Minimum Yield Necessary to Cover Operating Costs				110.0 pounds/acre
Minimum Price Necessary to Cover Operating Costs				\$5.50 /pound
Fixed Costs				
Tractors & Implements	1	acre	\$75 /acre	\$75.00
Land Charge	1	acre	\$75 /acre	\$75.00
Total Fixed Costs				\$150.00 /acre
Total Costs				\$700.00 /acre
Return Above Total Costs				(\$200.00) /acre
Minimum Yield Necessary to Cover Total Costs				140.0 pounds/acre
Minimum Price Necessary to Cover Total Costs				\$7.00 /pound

Interest on Operating Capital	6%	3 months	\$461.87 /acre	\$6.93
Total Operating Expenses				\$468.80 /acre
Return Above Operating Costs				\$31.20 /acre
Minimum Yield Necessary to Cover Operating Costs				93.8 pounds/acre
Minimum Price Necessary to Cover Operating Costs				\$4.69 /pound
Fixed Costs				
Tractors & Implements		1 acre	\$75 /acre	\$75.00
Land Charge		1 acre	\$75 /acre	\$75.00
Total Fixed Costs				\$150.00 /acre
Total Costs				\$618.80 /acre
Return Above Total Costs				(\$118.80) /acre
Minimum Yield Necessary to Cover Total Costs				123.8 pounds/acre
Minimum Price Necessary to Cover Total Costs				\$6.19 /pound

Lesson 7 - Introduction to Loans

Bell Ringer: Consider your life goals for the next 10 years. What might you need to get a loan for? What would make you eligible for that loan?

A. Section 1 - Review breakevens (give them a simple problem to calculate)

1. You own a shoe store. The total operating costs of the store are typically \$10,000/month. The total overhead costs are \$5,000/month. You sell shoes for an average price of \$100/pair. You plan to sell 300 pairs of shoes per month
2. For short term decisions, only look at your operating (variable) costs
 - Short Term Breakeven Quantity = Total Operating Costs / Price/unit
BE Quantity Sold = \$10,000/month / \$100/pair = 100 pairs sold/month
 - Short Term Breakeven Price = Total Operating Costs / Quantity sold
BE Price = \$10,000/month / 300 pairs sold/month = \$33.33/pair
3. For longer term decisions, look at the total costs
 - Long Term Breakeven Quantity = Total Costs / Price/unit
- BE Quantity Sold = \$15,000/month / \$100/pair = 150 pairs sold/month
 - Long Term Breakeven Price = Total Costs / Quantity sold
- BE Price = \$15,000/month / 300 pairs sold/month = \$50/pair

B. Section 2 - What are loans?

1. A loan is a debt (liability) provided by a lender to a borrower
2. Loans are used by borrowers to purchase assets
 - a. business assets
 - land, buildings, equipment, inventories, operating inputs
 - b. personal assets
 - house, auto, student loans, credit cards
 - c. A loan is usually repaid in installments (regular payments) over a stated period
 - may be annual payments, monthly, quarterly, semi-annual

C. Section 3 - Why do business owners get loans?

1. To buy expensive assets when they don't have enough cash to pay for those assets
2. To buy assets today rather than waiting to save enough cash to buy them
3. For emergencies (when they don't have enough cash)
4. To improve the profitability of the business
 - this is called "financial leverage"
5. Many times the lender requires the borrower to make a "down payment". The "down payment" is cash that is applied towards the purchase price at the time of purchase. The borrower will then get a loan for the remaining amount to purchase the asset. A typical down payment ranges between 10-20% of the purchase price of the asset.
 - Example – you want to purchase a new trailer. The purchase price of the trailer is \$25,000. You will make a 20% down payment and get a loan for the remainder.

Down Payment = Purchase Price x Down Payment Percentage (%)

- Down Payment = \$25,000 x 20% = \$5,000

Loan Amount (or Principal) = Purchase Price – Down Payment

- Loan Amount = \$25,000 - \$5,000 = \$20,000 loan (principal)

D. Section 4 - Types of Loans

1. Personal Loans

a. auto loans

auto loans allow buyers to purchase a vehicle without having to save up the entire amount and pay in cash. Buyers usually make a down payment and then get an auto loan for the remainder of the price to purchase the vehicle. Auto loans are usually repaid over a 3- to 7-year period. They are non-current liabilities.

b. Student loans

student loans are used to pay the cost of education (tuition & fees). These are usually repaid over a 10- to 20-year period, making them non-current liabilities.

c. Home Mortgages

A mortgage is a loan to buy a house and/or land. Because houses are expensive, most people cannot pay cash to buy a house. They have to borrow money to buy the house. Mortgages are usually repaid over a 15- to 30-year period, making them non-current liabilities.

d. Credit Cards

-Credit cards are a form of a loan that people use to pay for everyday expenses (food, gas, travel) and smaller assets (TVs, appliances, etc.). Credit cards should be viewed as short-term credit – it should be paid off as quickly as possible without hurting your emergency savings.

-Credit cards typically have relatively high interest rates. The average credit card interest rate in the US is near 17% while auto loans and home loans have interest rates closer to 5%. This is why credit cards should be paid as quickly as possible. Credit cards are listed as current liabilities

2. Business Loans

a. Equipment Loans

Business use loans to purchase equipment (vehicles, tractors, tools, etc.). Usually repaid between 3-10 years, depending on the asset. These are classified as non-current liabilities on the balance sheet

b. Real Estate loans

Real Estate loans are used to purchase land and buildings to help the business grow. These are similar to mortgages. Typically repaid over 10-30 years. These are non-current liabilities

c. Operating loans and operating lines of credit

- Operating loans are used to purchase operating inputs for the business. They may be used to purchase inputs such as fertilizer, fuel, parts, or inventory to be resold. Operating loans may also be used to pay for operating expenses such as hired labor, utilities, and repairs. Operating loans are made for a stated dollar amount and usually repaid within 1-2 years when the owner has enough cash to repay the amount in full. They are listed as current liabilities on a balance sheet.

- Operating line of credit is very similar to an operating loan, except it is not made for a stated dollar amount. Instead, an operating line of credit will have a credit limit (the maximum amount that you can borrow). You can borrow up to that limit, but not exceed it. You can borrow the funds anytime throughout the year and repay them as you have the money. They operate very much like a credit card. They are listed as current liabilities because they should be repaid within a 1-year period.

E. Section 5 - Loan Application

1. Borrowers have to apply for loans. Lenders use these loan applications to determine whether the borrower can successfully repay the loan on time.

2. A typical loan application includes:
 - a. a current balance sheet
 - b. an income statement or proof of income (paystubs)
 - c. a credit history (your credit report)
 - d. your credit score (a higher credit score is better!)

F. Section 6 - Interest Payments

1. "Interest" is the cost of borrowing money. The term "APR" stands for "Annual Percentage Rate". APR represents the annual interest rate on the loan.
2. To calculate the annual interest on a loan that is due in the upcoming year:
 - Multiply the APR (%) times the amount of the loan principal that is remaining
 - Example: You have a \$50,000 loan to purchase a delivery truck. The annual interest rate (APR) on the loan is 5%. Calculate the interest due within the next year.
 $\text{Interest Due This Year} = 5\% \times \$50,000 = \$2,500$
 - Example Part 2: Assume that you have been paying your delivery truck loan for 2 years and you currently owe the lender a total of \$26,200 of principal. Calculate the interest due this year:
 $\text{Interest Due This Year} = 5\% \times \$26,200 = \$1,310$
3. Notice that interest is calculated on the amount of principal you still owe the lender, NOT the original amount that you borrowed. Because of this, the amount of interest you pay each year should decrease each year. In this case, it decreased from \$2,500 to \$1,310.

G. Section 7 - Loan Payments

1. There are several different methods of repaying loans. The most common method is called the "level payment" method. With this method, the payment you make each period remains the same (level). If your car payment is \$400/month, it will be \$400/month for the entire loan.
2. This payment contains all of the interest that you owe since you made your last payment and a portion of principal that you are paying back on the loan. For example, assume your annual payment is \$5,000 and you owe \$3,000 of interest since your last annual payment was made. This shows that you will be paying back \$2,000 of principal on the loan in this payment (\$5,000 payment - \$3,000 interest = \$2,000 principal).
3. To calculate "level payment" loan payments, you have 4 main choices:
 - a. Use a mathematical formula
 - b. Use the time value of money (TVM) tables
 - c. Use a spreadsheet
 - d. Use a financial calculator

****We will be using the TVM tables**
4. For annual loan payments, use Table 3 "Annuity Factors" or "Annual Loan Payments"
 - a. To use the table, you need to know 3 pieces of information:
 - i. The amount of the loan principal borrowed ("the loan amount")
 - ii. The interest rate (APR) on the loan
 - iii. The number of years over which the loan will be repaid ("the term" of the loan)
 - b. Let's calculate the annual loan payment on a \$40,000 loan with a 6% APR. The loan will be repaid over 10 years.
 - Go across the top row of the table until you find the APR of the loan – 6%
 - Now, go down that column until you get to the row that says "10"
 - You will see a factor of 0.1359

- To calculate the annual loan payment, multiply the loan principal (\$40,000) by the factor (0.1359)

$$\text{Annual Loan Payment} = \$40,000 \times 0.1359 = \$5,436/\text{year}$$

- Calculate the interest that will be due in the 1 payment (1 year from today)

$$\$40,000 \times 6\% = \$2,400 \text{ interest}$$

- Calculate the amount of principal that you will be paying in this 1st payment:

$$\$5,436 - \$2,400 = \$3,036 \text{ of principal paid in the 1st payment}$$

- The \$3,036 will be listed as a current liability on the balance sheet because it is scheduled to be repaid within the next year.

- Calculate the amount of principal you will owe after you make this first payment:

$$\$40,000 \text{ original principal} - \$3,036 \text{ principal due this year} = \$36,964$$

- The \$36,964 will be listed as a non-current liability on the balance sheet

Have the students look up the factors for a few other loans so they get used to using this table:

$$8\% \text{ for 20 years} - \text{factor} = 0.1019$$

$$4\% \text{ for 30 years} - \text{factor} = 0.0578$$

$$7\% \text{ for 8 years} - \text{factor} = 0.1675$$

- To calculate monthly payments, use Table 4 (Monthly Payments Required to Amortize a \$1,000 Loan)

- "Amortize" means to pay back the loan principal over the life of the loan

- When you see the word "amortize", think "repay"

- This table is slightly different than Table 3 (Annual Loan Payments)

Let's calculate the monthly loan payment for a \$20,000 car loan. The loan is at 5.5% APR for 5 years.

- To use this table, you need to know the same information as before:

- Original loan principal

- Interest Rate (APR)

- Number of years (the term of the loan)

Step 1. Get your factor from the table – same as before.

- Look up the factor for 5.5% for 5 years = \$19.10

- This factor indicates that the monthly loan payment to repay a \$1,000 loan at 5.5% for 5 years is \$19.10/month

Step 2. Divide the original loan principal by \$1,000 (this is different from annual payments)

$$-\ \$20,000 / \$1,000 = 20$$

Step 3. Multiply the factor from Step 1 x the answer from Step 2

$$\text{Monthly Loan Payment} = \$19.10 \times 20 = \$382/\text{month}$$

Materials:

- Loan Tables**
- Loan Payment Calculator**
- PowerPoint on Introduction to Loans**
- Note Organizer**
- In-class Exercise and Key**
- Homework Exercise and Key**
- Student Driven Learning Activity/Lesson**
- Take Home Reading**

Table 3

Annual Loan Payments

n	Annuity Factor = $i/(1-(1+i)^{-n})$											
	End of Period											
	1%	2%	3%	4%	5%	6%	7%	8%	9%	10%	11%	12%
1	1.0100	1.0200	1.0300	1.0400	1.0500	1.0600	1.0700	1.0800	1.0900	1.1000	1.1100	1.1200
2	0.5075	0.5150	0.5226	0.5302	0.5378	0.5454	0.5531	0.5608	0.5685	0.5762	0.5839	0.5917
3	0.3400	0.3468	0.3535	0.3603	0.3672	0.3741	0.3811	0.3880	0.3951	0.4021	0.4092	0.4163
4	0.2563	0.2626	0.2690	0.2755	0.2820	0.2886	0.2952	0.3019	0.3087	0.3155	0.3223	0.3292
5	0.2060	0.2122	0.2184	0.2246	0.2310	0.2374	0.2439	0.2505	0.2571	0.2638	0.2706	0.2774
6	0.1725	0.1785	0.1846	0.1908	0.1970	0.2034	0.2098	0.2163	0.2229	0.2296	0.2364	0.2432
7	0.1486	0.1545	0.1605	0.1666	0.1728	0.1791	0.1856	0.1921	0.1987	0.2054	0.2122	0.2191
8	0.1307	0.1365	0.1425	0.1485	0.1547	0.1610	0.1675	0.1740	0.1807	0.1874	0.1943	0.2013
9	0.1167	0.1225	0.1284	0.1345	0.1407	0.1470	0.1535	0.1601	0.1668	0.1736	0.1806	0.1877
10	0.1056	0.1113	0.1172	0.1233	0.1295	0.1359	0.1424	0.1490	0.1558	0.1627	0.1698	0.1770
11	0.0965	0.1022	0.1081	0.1141	0.1204	0.1268	0.1334	0.1401	0.1469	0.1540	0.1611	0.1684
12	0.0888	0.0946	0.1005	0.1066	0.1128	0.1193	0.1259	0.1327	0.1397	0.1468	0.1540	0.1614
13	0.0824	0.0881	0.0940	0.1001	0.1065	0.1130	0.1197	0.1265	0.1336	0.1408	0.1482	0.1557
14	0.0769	0.0826	0.0885	0.0947	0.1010	0.1076	0.1143	0.1213	0.1284	0.1357	0.1432	0.1509
15	0.0721	0.0778	0.0838	0.0899	0.0963	0.1030	0.1098	0.1168	0.1241	0.1315	0.1391	0.1468
16	0.0679	0.0737	0.0796	0.0858	0.0923	0.0990	0.1059	0.1130	0.1203	0.1278	0.1355	0.1434
17	0.0643	0.0700	0.0760	0.0822	0.0887	0.0954	0.1024	0.1096	0.1170	0.1247	0.1325	0.1405
18	0.0610	0.0667	0.0727	0.0790	0.0855	0.0924	0.0994	0.1067	0.1142	0.1219	0.1298	0.1379
19	0.0581	0.0638	0.0698	0.0761	0.0827	0.0896	0.0968	0.1041	0.1117	0.1195	0.1276	0.1358
20	0.0554	0.0612	0.0672	0.0736	0.0802	0.0872	0.0944	0.1019	0.1095	0.1175	0.1256	0.1339
21	0.0530	0.0588	0.0649	0.0713	0.0780	0.0850	0.0923	0.0998	0.1076	0.1156	0.1238	0.1322
22	0.0509	0.0566	0.0627	0.0692	0.0760	0.0830	0.0904	0.0980	0.1059	0.1140	0.1223	0.1308
23	0.0489	0.0547	0.0608	0.0673	0.0741	0.0813	0.0887	0.0964	0.1044	0.1126	0.1210	0.1296
24	0.0471	0.0529	0.0590	0.0656	0.0725	0.0797	0.0872	0.0950	0.1030	0.1113	0.1198	0.1285
25	0.0454	0.0512	0.0574	0.0640	0.0710	0.0782	0.0858	0.0937	0.1018	0.1102	0.1187	0.1275
26	0.0439	0.0497	0.0559	0.0626	0.0696	0.0769	0.0846	0.0925	0.1007	0.1092	0.1178	0.1267
27	0.0424	0.0483	0.0546	0.0612	0.0683	0.0757	0.0834	0.0914	0.0997	0.1083	0.1170	0.1259
28	0.0411	0.0470	0.0533	0.0600	0.0671	0.0746	0.0824	0.0905	0.0989	0.1075	0.1163	0.1252
29	0.0399	0.0458	0.0521	0.0589	0.0660	0.0736	0.0814	0.0896	0.0981	0.1067	0.1156	0.1247
30	0.0387	0.0446	0.0510	0.0578	0.0651	0.0726	0.0806	0.0888	0.0973	0.1061	0.1150	0.1241
31	0.0377	0.0436	0.0500	0.0569	0.0641	0.0718	0.0798	0.0881	0.0967	0.1055	0.1145	0.1237
32	0.0367	0.0426	0.0490	0.0559	0.0633	0.0710	0.0791	0.0875	0.0961	0.1050	0.1140	0.1233
33	0.0357	0.0417	0.0482	0.0551	0.0625	0.0703	0.0784	0.0869	0.0956	0.1045	0.1136	0.1229
34	0.0348	0.0408	0.0473	0.0543	0.0618	0.0696	0.0778	0.0863	0.0951	0.1041	0.1133	0.1226
35	0.0340	0.0400	0.0465	0.0536	0.0611	0.0690	0.0772	0.0858	0.0946	0.1037	0.1129	0.1223
40	0.0305	0.0366	0.0433	0.0505	0.0583	0.0665	0.0750	0.0839	0.0930	0.1023	0.1117	0.1213
45	0.0277	0.0339	0.0408	0.0483	0.0563	0.0647	0.0735	0.0826	0.0919	0.1014	0.1110	0.1207
50	0.0255	0.0318	0.0389	0.0466	0.0548	0.0634	0.0725	0.0817	0.0912	0.1009	0.1106	0.1204
55	0.0237	0.0301	0.0373	0.0452	0.0537	0.0625	0.0717	0.0812	0.0908	0.1005	0.1104	0.1202
60	0.0222	0.0288	0.0361	0.0442	0.0528	0.0619	0.0712	0.0808	0.0905	0.1003	0.1102	0.1201

Table 4

Monthly Payments Required to Amortize a \$1,000 Loan

term in years	Annual Interest Rate														
	5.0%	5.5%	6.0%	6.5%	7.0%	7.5%	8.0%	8.5%	9.0%	9.5%	10.0%	10.5%	11.0%	11.5%	12.0%
1	85.61	85.84	86.07	86.30	86.53	86.76	86.99	87.22	87.45	87.68	87.92	88.15	88.38	88.62	88.85
2	43.87	44.10	44.32	44.55	44.77	45.00	45.23	45.46	45.68	45.91	46.14	46.38	46.61	46.84	47.07
3	29.97	30.20	30.42	30.65	30.88	31.11	31.34	31.57	31.80	32.03	32.27	32.50	32.74	32.98	33.21
4	23.03	23.26	23.49	23.71	23.95	24.18	24.41	24.65	24.89	25.12	25.36	25.60	25.85	26.09	26.33
5	18.87	19.10	19.33	19.57	19.80	20.04	20.28	20.52	20.76	21.00	21.25	21.49	21.74	21.99	22.24
6	16.10	16.34	16.57	16.81	17.05	17.29	17.53	17.78	18.03	18.27	18.53	18.78	19.03	19.29	19.55
7	14.13	14.37	14.61	14.85	15.09	15.34	15.59	15.84	16.09	16.34	16.60	16.86	17.12	17.39	17.65
8	12.66	12.90	13.14	13.39	13.63	13.88	14.14	14.39	14.65	14.91	15.17	15.44	15.71	15.98	16.25
9	11.52	11.76	12.01	12.25	12.51	12.76	13.02	13.28	13.54	13.81	14.08	14.35	14.63	14.90	15.18
10	10.61	10.85	11.10	11.35	11.61	11.87	12.13	12.40	12.67	12.94	13.22	13.49	13.78	14.06	14.35
11	9.86	10.11	10.37	10.62	10.88	11.15	11.42	11.69	11.96	12.24	12.52	12.80	13.09	13.38	13.68
12	9.25	9.50	9.76	10.02	10.28	10.55	10.82	11.10	11.38	11.66	11.95	12.24	12.54	12.83	13.13
13	8.73	8.99	9.25	9.51	9.78	10.05	10.33	10.61	10.90	11.19	11.48	11.78	12.08	12.38	12.69
14	8.29	8.55	8.81	9.08	9.35	9.63	9.91	10.20	10.49	10.78	11.08	11.38	11.69	12.00	12.31
15	7.91	8.17	8.44	8.71	8.99	9.27	9.56	9.85	10.14	10.44	10.75	11.05	11.37	11.68	12.00
16	7.58	7.84	8.11	8.39	8.67	8.96	9.25	9.54	9.85	10.15	10.46	10.77	11.09	11.41	11.74
17	7.29	7.56	7.83	8.11	8.40	8.69	8.98	9.28	9.59	9.90	10.21	10.53	10.85	11.18	11.51
18	7.03	7.30	7.58	7.87	8.16	8.45	8.75	9.05	9.36	9.68	10.00	10.32	10.65	10.98	11.32
19	6.80	7.08	7.36	7.65	7.94	8.24	8.55	8.85	9.17	9.49	9.81	10.14	10.47	10.81	11.15
20	6.60	6.88	7.16	7.46	7.75	8.06	8.36	8.68	9.00	9.32	9.65	9.98	10.32	10.66	11.01
21	6.42	6.70	6.99	7.28	7.58	7.89	8.20	8.52	8.85	9.17	9.51	9.85	10.19	10.54	10.89
22	6.25	6.54	6.83	7.13	7.43	7.75	8.06	8.38	8.71	9.04	9.38	9.73	10.07	10.42	10.78
23	6.10	6.39	6.69	6.99	7.30	7.61	7.93	8.26	8.59	8.93	9.27	9.62	9.97	10.33	10.69
24	5.97	6.26	6.56	6.87	7.18	7.50	7.82	8.15	8.49	8.83	9.17	9.52	9.88	10.24	10.60
25	5.85	6.14	6.44	6.75	7.07	7.39	7.72	8.05	8.39	8.74	9.09	9.44	9.80	10.16	10.53
26	5.73	6.03	6.34	6.65	6.97	7.29	7.63	7.96	8.31	8.66	9.01	9.37	9.73	10.10	10.47
27	5.63	5.93	6.24	6.56	6.88	7.21	7.54	7.88	8.23	8.58	8.94	9.30	9.67	10.04	10.41
28	5.54	5.84	6.15	6.47	6.80	7.13	7.47	7.81	8.16	8.52	8.88	9.25	9.61	9.99	10.37
29	5.45	5.76	6.07	6.39	6.72	7.06	7.40	7.75	8.10	8.46	8.82	9.19	9.57	9.94	10.32
30	5.37	5.68	6.00	6.32	6.65	6.99	7.34	7.69	8.05	8.41	8.78	9.15	9.52	9.90	10.29
31	5.29	5.61	5.93	6.26	6.59	6.93	7.28	7.64	8.00	8.36	8.73	9.11	9.48	9.87	10.25
32	5.23	5.54	5.86	6.19	6.53	6.88	7.23	7.59	7.95	8.32	8.69	9.07	9.45	9.84	10.22
33	5.16	5.48	5.81	6.14	6.48	6.83	7.18	7.54	7.91	8.28	8.66	9.04	9.42	9.81	10.20
34	5.10	5.42	5.75	6.09	6.43	6.78	7.14	7.50	7.87	8.25	8.63	9.01	9.39	9.78	10.18
35	5.05	5.37	5.70	6.04	6.39	6.74	7.10	7.47	7.84	8.22	8.60	8.98	9.37	9.76	10.16
40	4.82	5.16	5.50	5.85	6.21	6.58	6.95	7.33	7.71	8.10	8.49	8.89	9.28	9.68	10.08
45	4.66	5.01	5.36	5.73	6.10	6.47	6.86	7.24	7.64	8.03	8.43	8.83	9.23	9.64	10.05
50	4.54	4.90	5.26	5.64	6.02	6.40	6.79	7.19	7.59	7.99	8.39	8.80	9.21	9.61	10.03
55	4.45	4.82	5.19	5.57	5.96	6.35	6.75	7.15	7.55	7.96	8.37	8.78	9.19	9.60	10.01
60	4.39	4.76	5.14	5.53	5.92	6.32	6.72	7.13	7.53	7.94	8.35	8.77	9.18	9.59	10.01

Table 5

Quarterly Payments Required to Amortize a \$1,000 Loan

term in years	Annual Interest Rate														
	5.0%	5.5%	6.0%	6.5%	7.0%	7.5%	8.0%	8.5%	9.0%	9.5%	10.0%	10.5%	11.0%	11.5%	12.0%
1	257.86	258.65	259.44	260.24	261.03	261.83	262.62	263.42	264.22	265.02	265.82	266.62	267.42	268.22	269.03
2	132.13	132.86	133.58	134.31	135.04	135.78	136.51	137.25	137.98	138.72	139.47	140.21	140.96	141.71	142.46
3	90.26	90.97	91.68	92.40	93.11	93.84	94.56	95.29	96.02	96.75	97.49	98.23	98.97	99.71	100.46
4	69.35	70.05	70.77	71.48	72.20	72.92	73.65	74.38	75.12	75.86	76.60	77.35	78.10	78.85	79.61
5	56.82	57.53	58.25	58.97	59.69	60.42	61.16	61.90	62.64	63.39	64.15	64.91	65.67	66.44	67.22
6	48.49	49.20	49.92	50.65	51.39	52.13	52.87	53.62	54.38	55.14	55.91	56.69	57.47	58.26	59.05
7	42.55	43.27	44.00	44.74	45.48	46.23	46.99	47.75	48.53	49.30	50.09	50.88	51.68	52.48	53.29
8	38.11	38.84	39.58	40.32	41.08	41.84	42.61	43.39	44.17	44.97	45.77	46.58	47.39	48.22	49.05
9	34.67	35.40	36.15	36.91	37.68	38.45	39.23	40.02	40.83	41.63	42.45	43.28	44.11	44.95	45.80
10	31.92	32.67	33.43	34.19	34.97	35.76	36.56	37.36	38.18	39.00	39.84	40.68	41.53	42.39	43.26
11	29.69	30.44	31.21	31.99	32.78	33.58	34.39	35.21	36.04	36.88	37.73	38.59	39.46	40.34	41.23
12	27.83	28.60	29.37	30.16	30.97	31.78	32.60	33.44	34.28	35.14	36.01	36.88	37.77	38.67	39.58
13	26.27	27.04	27.83	28.63	29.45	30.27	31.11	31.96	32.82	33.69	34.57	35.47	36.37	37.29	38.22
14	24.94	25.72	26.52	27.33	28.16	29.00	29.85	30.71	31.59	32.47	33.37	34.28	35.21	36.14	37.08
15	23.79	24.58	25.39	26.22	27.05	27.90	28.77	29.65	30.54	31.44	32.35	33.28	34.22	35.17	36.13
16	22.79	23.60	24.42	25.25	26.10	26.96	27.84	28.73	29.63	30.55	31.48	32.43	33.38	34.35	35.33
17	21.92	22.73	23.56	24.41	25.27	26.14	27.03	27.94	28.85	29.79	30.73	31.69	32.66	33.65	34.64
18	21.15	21.97	22.81	23.66	24.54	25.42	26.33	27.24	28.18	29.12	30.08	31.06	32.04	33.04	34.05
19	20.46	21.29	22.14	23.01	23.89	24.79	25.71	26.64	27.58	28.55	29.52	30.51	31.51	32.52	33.55
20	19.85	20.69	21.55	22.43	23.32	24.23	25.16	26.10	27.06	28.04	29.03	30.03	31.04	32.07	33.11
21	19.30	20.15	21.02	21.91	22.81	23.74	24.68	25.63	26.60	27.59	28.59	29.61	30.64	31.68	32.73
22	18.80	19.66	20.54	21.44	22.36	23.29	24.24	25.21	26.20	27.20	28.21	29.24	30.28	31.34	32.40
23	18.35	19.22	20.11	21.02	21.95	22.89	23.86	24.84	25.84	26.85	27.87	28.92	29.97	31.04	32.12
24	17.95	18.82	19.72	20.64	21.58	22.54	23.51	24.51	25.51	26.54	27.58	28.63	29.70	30.78	31.87
25	17.57	18.46	19.37	20.30	21.25	22.22	23.20	24.21	25.23	26.26	27.31	28.38	29.45	30.54	31.65
26	17.24	18.13	19.05	19.99	20.95	21.93	22.92	23.94	24.97	26.01	27.08	28.15	29.24	30.34	31.45
27	16.92	17.83	18.76	19.71	20.67	21.66	22.67	23.70	24.74	25.79	26.87	27.95	29.05	30.16	31.29
28	16.64	17.55	18.49	19.45	20.43	21.43	22.44	23.48	24.53	25.60	26.68	27.78	28.88	30.00	31.14
29	16.38	17.30	18.24	19.21	20.20	21.21	22.24	23.28	24.34	25.42	26.51	27.62	28.74	29.86	31.01
30	16.13	17.06	18.02	19.00	19.99	21.01	22.05	23.10	24.17	25.26	26.36	27.48	28.60	29.74	30.89
31	15.91	16.85	17.81	18.80	19.80	20.83	21.88	22.94	24.02	25.12	26.23	27.35	28.49	29.63	30.79
32	15.70	16.65	17.62	18.61	19.63	20.67	21.72	22.80	23.88	24.99	26.11	27.24	28.38	29.53	30.70
33	15.51	16.46	17.44	18.45	19.47	20.52	21.58	22.66	23.76	24.87	26.00	27.14	28.29	29.45	30.62
34	15.33	16.29	17.28	18.29	19.33	20.38	21.45	22.54	23.65	24.77	25.90	27.05	28.20	29.37	30.55
35	15.16	16.13	17.13	18.15	19.19	20.25	21.33	22.43	23.54	24.67	25.81	26.97	28.13	29.30	30.49
40	14.48	15.49	16.53	17.58	18.66	19.76	20.88	22.01	23.16	24.32	25.49	26.67	27.86	29.06	30.27
45	14.00	15.04	16.10	17.19	18.31	19.44	20.58	21.74	22.92	24.10	25.30	26.50	27.71	28.93	30.15
50	13.64	14.71	15.80	16.92	18.06	19.22	20.39	21.57	22.77	23.97	25.18	26.40	27.62	28.85	30.08
55	13.37	14.47	15.59	16.73	17.89	19.07	20.26	21.46	22.67	23.89	25.11	26.34	27.57	28.81	30.05
60	13.17	14.29	15.43	16.60	17.78	18.97	20.17	21.39	22.61	23.84	25.07	26.30	27.54	28.78	30.02

Table 6

Future Value of Annuity Factors

Payments made at Beginning of Period

$$\text{FVA Factor} = \left[\frac{(1+i)^{n+1} - 1}{i} \right] - 1$$

Beginning of Period

n	1%	2%	3%	4%	5%	6%	7%	8%	9%	10%	11%	12%
1	1.0100	1.0200	1.0300	1.0400	1.0500	1.0600	1.0700	1.0800	1.0900	1.1000	1.1100	1.1200
2	2.0301	2.0604	2.0909	2.1216	2.1525	2.1836	2.2149	2.2464	2.2781	2.3100	2.3421	2.3744
3	3.0604	3.1216	3.1836	3.2465	3.3101	3.3746	3.4399	3.5061	3.5731	3.6410	3.7097	3.7793
4	4.1010	4.2040	4.3091	4.4163	4.5256	4.6371	4.7507	4.8666	4.9847	5.1051	5.2278	5.3528
5	5.1520	5.3081	5.4684	5.6330	5.8019	5.9753	6.1533	6.3359	6.5233	6.7156	6.9129	7.1152
6	6.2135	6.4343	6.6625	6.8983	7.1420	7.3938	7.6540	7.9228	8.2004	8.4872	8.7833	9.0890
7	7.2857	7.5830	7.8923	8.2142	8.5491	8.8975	9.2598	9.6366	10.0285	10.4359	10.8594	11.2997
8	8.3685	8.7546	9.1591	9.5828	10.0266	10.4913	10.9780	11.4876	12.0210	12.5795	13.1640	13.7757
9	9.4622	9.9497	10.4639	11.0061	11.5779	12.1808	12.8164	13.4866	14.1929	14.9374	15.7220	16.5487
10	10.5668	11.1687	11.8078	12.4864	13.2068	13.9716	14.7836	15.6455	16.5603	17.5312	18.5614	19.6546
11	11.6825	12.4121	13.1920	14.0258	14.9171	15.8699	16.8885	17.9771	19.1407	20.3843	21.7132	23.1331
12	12.8093	13.6803	14.6178	15.6268	16.7130	17.8821	19.1406	20.4953	21.9534	23.5227	25.2116	27.0291
13	13.9474	14.9739	16.0863	17.2919	18.5986	20.0151	21.5505	23.2149	25.0192	26.9750	29.0949	31.3926
14	15.0969	16.2934	17.5989	19.0236	20.5786	22.2760	24.1290	26.1521	28.3609	30.7725	33.4054	36.2797
15	16.2579	17.6393	19.1569	20.8245	22.6575	24.6725	26.8881	29.3243	32.0034	34.9497	38.1899	41.7533
16	17.4304	19.0121	20.7616	22.6975	24.8404	27.2129	29.8402	32.7502	35.9737	39.5447	43.5008	47.8837
17	18.6147	20.4123	22.4144	24.6454	27.1324	29.9057	32.9990	36.4502	40.3013	44.5992	49.3959	54.7497
18	19.8109	21.8406	24.1169	26.6712	29.5390	32.7600	36.3790	40.4463	45.0185	50.1591	55.9395	62.4397
19	21.0190	23.2974	25.8704	28.7781	32.0660	35.7856	39.9955	44.7620	50.1601	56.2750	63.2028	71.0524
20	22.2392	24.7833	27.6765	30.9692	34.7193	38.9927	43.8652	49.4229	55.7645	63.0025	71.2651	80.6987
21	23.4716	26.2990	29.5368	33.2480	37.5052	42.3923	48.0057	54.4568	61.8733	70.4027	80.2143	91.5026
22	24.7163	27.8450	31.4529	35.6179	40.4305	45.9958	52.4361	59.8933	68.5319	78.5430	90.1479	103.6029
23	25.9735	29.4219	33.4265	38.0826	43.5020	49.8156	57.1767	65.7648	75.7898	87.4973	101.1742	117.1552
24	27.2432	31.0303	35.4593	40.6459	46.7271	53.8645	62.2490	72.1059	83.7009	97.3471	113.4133	132.3339
25	28.5256	32.6709	37.5530	43.3117	50.1135	58.1564	67.6765	78.9544	92.3240	108.1818	126.9988	149.3339
26	29.8209	34.3443	39.7096	46.0842	53.6691	62.7058	73.4838	86.3508	101.7231	120.0999	142.0786	168.3740
27	31.1291	36.0512	41.9309	48.9676	57.4026	67.5281	79.6977	94.3388	111.9682	133.2099	158.8173	189.6989
28	32.4504	37.7922	44.2189	51.9663	61.3227	72.6398	86.3465	102.9659	123.1354	147.6309	177.3972	213.5828
29	33.7849	39.5681	46.5754	55.0849	65.4388	78.0582	93.4608	112.2832	135.3075	163.4940	198.0209	240.3327
30	35.1327	41.3794	49.0027	58.3283	69.7608	83.8017	101.0730	122.3459	148.5752	180.9434	220.9132	270.2926
31	36.4941	43.2270	51.5028	61.7015	74.2988	89.8898	109.2182	133.2135	163.0370	200.1378	246.3236	303.8477
32	37.8690	45.1116	54.0778	65.2095	79.0638	96.3432	117.9334	144.9506	178.8003	221.2515	274.5292	341.4294
33	39.2577	47.0338	56.7302	68.8579	84.0670	103.1838	127.2588	157.6267	195.9823	244.4767	305.8374	383.5210
34	40.6603	48.9945	59.4621	72.6522	89.3203	110.4348	137.2369	171.3168	214.7108	270.0244	340.5896	430.6635
35	42.0769	50.9944	62.2759	76.5983	94.8363	118.1209	147.9135	186.1021	235.1247	298.1268	379.1644	483.4631
40	49.3752	61.6100	77.6633	98.8265	126.8398	164.0477	213.6096	279.7810	368.2919	486.8518	645.8269	859.1424
45	57.0459	73.3306	95.5015	125.8706	167.6852	225.5081	305.7518	417.4261	573.1860	790.7953	1095.1688	1521.2176
50	65.1078	86.2710	116.1808	158.7738	219.8154	307.7561	434.9860	619.6718	888.4411	1280.2994	1852.3360	2688.0204
55	73.5810	100.5583	140.1538	198.8055	286.3482	417.8223	616.2436	916.8371	1373.5001	2068.6506	3128.2067	4744.3257
60	82.4864	116.3326	167.9450	247.5103	371.2629	565.1159	870.4668	1353.4704	2119.8234	3338.2980	5278.1231	8368.2380

Loan Payment Calculator				
Original Loan Principal			\$15,000	
Annual Interest Rate (APR)			6.00%	
Life of Loan			4	years
Number of Payments/Year			1	
Loan Payment			\$4,328.87	/period

Loan Payment	Principal Outstanding	Interest Due	Principal Due	Remaining Principal
1	\$15,000.00	\$900.00	\$3,428.87	\$11,571.13
2	\$11,571.13	\$694.27	\$3,634.60	\$7,936.53
3	\$7,936.53	\$476.19	\$3,852.68	\$4,083.85
4	\$4,083.85	\$245.03	\$4,083.84	\$0.01
5	\$0.01	\$0.00	\$4,328.87	\$0.00
6	\$0.00	\$0.00	\$0.00	\$0.00
7	\$0.00	\$0.00	\$0.00	\$0.00
8	\$0.00	\$0.00	\$0.00	\$0.00
9	\$0.00	\$0.00	\$0.00	\$0.00
10	\$0.00	\$0.00	\$0.00	\$0.00
11	\$0.00	\$0.00	\$0.00	\$0.00
12	\$0.00	\$0.00	\$0.00	\$0.00
13	\$0.00	\$0.00	\$0.00	\$0.00
14	\$0.00	\$0.00	\$0.00	\$0.00
15	\$0.00	\$0.00	\$0.00	\$0.00
16	\$0.00	\$0.00	\$0.00	\$0.00
17	\$0.00	\$0.00	\$0.00	\$0.00
18	\$0.00	\$0.00	\$0.00	\$0.00
19	\$0.00	\$0.00	\$0.00	\$0.00
20	\$0.00	\$0.00	\$0.00	\$0.00

Introduction to Loans



What is a Loan?

- A loan is a debt (liability) to purchase an asset
 - Provided by a lender
 - To a borrower
 - Repaid in regular payments (installments) over time
- Loans are used to:
 - Purchase personal assets
 - House, car, college education, personal assets
 - Purchase business assets
 - Land, buildings, vehicles, equipment, inventories
 - Pay certain business expenses
 - Rent, utilities, hired labor



Why Do Businesses Use Loans

- To purchase expensive assets
 - Most businesses don't have enough money to pay in cash
- To purchase assets today vs waiting to save enough money
- For emergencies
 - When you don't have enough cash
- To improve the profitability of the business
 - This is called "financial leverage"



Alternatives to Loans

- Instead of loans, a manager can use:
 - Cash on hand
 - Do not use all of your cash and savings
 - Leave enough cash to meet your monthly expenses & emergency needs!
 - Leases
 - A lease is a rental agreement
 - You can lease:
 - Equipment
 - Structures and/or land
 - Livestock



Leases

- Advantages
 - You can lease the exact asset that you need
 - You can lease it for a specified period of time
 - And then return it to the leasing company
 - Ex. You only need a delivery van for 6 months out of the year
 - You can lease it for 6 months instead of buying it and having it sit idle for the rest of the year
 - You may get more tax advantages by leasing vs buying
 - Leasing may require less out-of-pocket cash
 - Lower down payment, fees, etc.



Leases

- Disadvantages
 - You cannot make major alterations to leased assets
 - Paint it, add new fixtures, etc.
 - Because you don't actually own the asset
 - It may be hard to lease the asset you want
 - There may be "over-use" fees
 - Mileage limits, hour limits, etc.
 - These are usually expensive
 - Getting out of a lease may be very expensive
 - Versus simply selling an asset that you own



Terms

- Down Payment
 - Cash that is paid by the borrower at the time of purchase
 - Down payments are usually 10-20% of the purchase price
- Principal
 - Principal is the term for the amount of the loan
 - Principal = "loan amount"
 - Principal is a liability on the balance sheet



Terms

- Collateral
 - The assets that are "pledged" to the lender in case the borrower cannot repay the loan
 - If so, these assets will be "repossessed" by the lender
 - Example: You have an auto loan for your car. The car is the collateral for the loan.
 - If you cannot make your loan payments, the lender may repossess the car.
- NOTE: Lenders do NOT want to repossess assets. They want borrowers to be able to repay the loans in full.



Down Payments

- Lenders usually require the borrower to make a down payment
 - Usually between 10-20% of the purchase price
- Example: You want to buy a \$25,000 trailer.
 - The lender requires a 20% down payment.
- Down payment = \$5,000 ($\$25,000 \times 20\%$)
- Loan Principal = Purchase Price - Down Payment
 - $\$25,000 - \$5,000 = \$20,000$ loan



Types of Loans

- Personal Loans
 - Auto Loans
 - Repaid over 3-7 years
 - Student Loans
 - Repaid over 10-20 years
 - Home Mortgages
 - Repaid over 15-30 years
 - Credit Cards
 - A "credit limit" is set - the maximum you can borrow
 - You can borrow up to that limit and repay the principal on in a flexible manner
 - Should be repaid as soon as possible (< 1 year)



Types of Loans

- Business Loans
 - Equipment Loans
 - Repaid over 3-10 years
 - Real Estate Loans
 - To purchase land, buildings, facilities
 - Repaid over 15-30 years
 - Operating Loan
 - Used to purchase or pay for operating inputs
 - Repaid within a 1-year period
 - Operating Line of Credit
 - Acts like a credit card



Loan Applications

- Borrowers need to submit a loan application
 - Helps determine their ability to repay the loan
 - Determines if the loan is a good idea for both parties (borrower and lender)
- Typically includes:
 - Balance Sheet(s)
 - Income Statement(s) or proof of income
 - Credit history
 - Credit score



Interest Payments

- Interest is the cost of borrowing money
 - Stated as APR (Annual Percentage Rate)
- Simple Interest
 - You only owe interest on the amount of principal you still owe the lender
- Interest calculation
 - Interest = Principal Owed x APR



Interest Calculation Example

- You borrow \$50,000 to buy a delivery truck
- The loan is at 5% APR for 4 years
- Interest = Principal Owed x APR
 - = \$50,000 x 5% = \$2,500
- 2 years later, you still owe \$26,200 on the loan
- Interest = \$26,200 x 5% = \$1,310



Loan Payments

- Several types of loan repayment plans
 - Most common is "level payment"
 - The payment stays the same each period
 - Example: Car loan has payments of \$400/month
 - \$400/month for the life of the loan
- Loan payments consist of interest and principal
 - All of the interest owed since the last payment
 - A portion of the principal



Components of a Loan Payment

- Assume your annual loan payment is \$5,000 and you owe \$3,000 of interest since the last loan payment was made
- Payment = \$5,000
- Interest = \$3,000
- Principal = \$3,000 (\$5,000 - \$3,000)



Calculating Annual Loan Payments

- Using the Time Value of Money Tables
- Table 3 Annuity Factors: Annual Loan Payments
- Need to know:
 - Interest Rate (APR)
 - Life of the loan in years (the "term" of the loan)
 - Amount of the loan (principal)
- Find the loan payment factor in Table 3
 - Example: 10-year loan at 6% APR
 - Find the 6% column of the table
 - Go down to the 10 row (n = 10 in left column)
 - Factor = 0.1359



Calculating Loan Payments

- Multiply the loan principal by the factor
 - For a \$40,000 loan at 6% for 10 years
 - Annual Payment = \$40,000 x 0.1359 = \$5,436/year
 - You will repay the loan and all interest in full if you pay \$5,436/year for the next 10 years
 - This is called "amortizing" the loan
 - "Amortizing" = paying back the principal slowly over time



Practice Using Table 3

- Find the annual loan payment factors for the following loans:
- 8% APR for 20 years
- 4% for 30 years
- 7% for 8 years



Practice Using Table 3

- Find the annual loan payment factors for the following loans:
- 8% APR for 20 years factor = 0.1019
- 4% for 30 years factor = 0.0578
- 7% for 8 years factor = 0.1675



Breaking Down a Loan Payment

- Remember, loan payments contain interest and principal
- For the \$40,000 loan at 6% for 10 years
- For the 1st loan payment:
 - Annual Loan Payment = \$5,436
 - Interest Due = $\$40,000 \times 6\% = \$2,400$
 - Principal Due = $\$5,436 - \$2,400 = \$3,036$
- You will still owe \$36,964 after you make this first payment
 - \$40,000 principal borrowed - \$3,036 principal due



Monthly Loan Payments

- Use Table 4
 - Monthly Payments Required to Amortize a \$1,000 Loan
 - NOTE: we use this table differently than Table 3
- Step 1. Find the factor in the same manner
 - Assume a 5-year loan at 5.5% APR
 - Monthly Payment Factor = 19.10
 - This means the monthly payment for a \$1,000 loan at 5.5% APR for 5 years is \$19.10/month



Monthly Loan Payments

- Step 2. Divide the loan principal by 1,000
 - Example: \$20,000 car loan
 - $\$20,000 / \$1,000 = 20$
- Step 3. Multiply the factor from Step 1 by the answer from Step 2.
 - Monthly Payment = $19.10 \times 20 = \$382/\text{month}$



Using a Spreadsheet

- It is easy to calculate loan payments on a spreadsheet
 - Just enter the information for the loan
 - The spreadsheet does the rest!
- Find the monthly payment for a \$55,000 tractor loan at 5.25% APR for 6 years
 - Loan Principal = \$55,000
 - Interest Rate = 5.25
 - Life of Loan = 6 Payment = \$892.16
 - Payments/Year = 12



Using a Spreadsheet

- Calculate the quarterly payment for a \$30,000 loan at 6.25% APR for 4 years
 - Loan Principal = \$30,000
 - Interest Rate = 6.25
 - Life of Loan = 4 Payment = \$2,133.67
 - Payments/Year = 4
- Look at the table below the calculator to see how the interest and principal payments change for each payment.



Introduction to Loans- Notes Organizer

What is a Loan?

- A loan is a debt (liability) to purchase an asset
 - _____
 - To a borrower
 - Repaid in regular payments (installments) over time
- Loans are used to:
 - _____
 - House, car, college education, personal assets
 - Purchase business assets
 - Land, buildings, vehicles, equipment, inventories
 - Pay certain _____
 - Rent, utilities, hired labor

Why Do Businesses Use Loans

- To purchase expensive assets
 - Most businesses don't have enough money to pay in cash
- To purchase assets today vs waiting to save enough money
- _____
 - When you don't have enough cash
- To improve the profitability of the business
 - This is called " _____ "

Alternatives to Loans

- Instead of loans, a manager can use:
 - _____
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 - Leave enough cash to meet your monthly expenses & emergency needs!
- Leases
 - _____
 - You can lease:
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 - Structures and/or land
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 - Advantages
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 - You can lease it for a specified period of time
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 - Ex. You only need a delivery van for 6 months out of the year
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 - Leasing may require less out-of-pocket cash
 - Lower down payment, fees, etc.

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 - You cannot make major alterations to leased assets
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 - Because you don't actually own the asset
 - It may be hard to lease the asset you want
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 - Principal is the term for the amount of the loan
 - Principal = " _____ "
 - Principal is a liability on the balance sheet
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 - The assets that are "pledged" to the lender in case the borrower cannot repay the loan
 - If so, these assets will be " _____ " by the lender
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 - If you cannot make your loan payments, the lender may repossess the car.
 - NOTE: Lenders do NOT want to repossess assets. They want borrowers to be able to repay the loans in full.

Down Payments

- Lenders usually require the borrower to make a down payment
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- Example: You want to buy a \$25,000 trailer.
 - The lender requires a 20% down payment.
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 - Loan Principal = Purchase Price – Down Payment
= \$25,000 - \$5,000 = \$20,000 loan

Types of Loans

- _____
 - Auto Loans
 - Repaid over 3-7 years
 - _____
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 - Home Mortgages
 - Repaid over 15-30 years

- Credit Cards
 - A “credit limit” is set – _____
 - You can borrow up to that limit and repay the principal on in a flexible manner
 - Should be repaid as soon as possible (< 1 year)
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 - To purchase land, buildings, facilities
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 - Repaid within a 1-year period
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- Borrowers need to submit a loan application
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Interest Payments

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= \$50,000 x 5% = \$2,500
 - 2 years later, you still owe \$26,200 on the loan
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Loan Payments

- Several types of loan repayment plans
 - Most common is “_____”

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- Example: Car loan has payments of \$400/month
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 - All of the interest owed since the last payment
 - _____
- Components of a Loan Payment
 - Assume your annual loan payment is \$5,000 and you owe \$3,000 of interest since the last loan payment was made
 - Payment = \$5,000
 - Interest = \$3,000
 - Principal = \$3,000 (\$5,000 - \$3,000)

Calculating Annual Loan Payments

- Using the Time Value of Money Tables
- Table 3 Annuity Factors: Annual Loan Payments
- Need to know:
 - _____ (APR)
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 - Amount of the loan (_____)
- Find the loan payment factor in Table 3
 - Example: 10-year loan at 6% APR
 - Find the 6% column of the table
 - Go down to the 10 row (n = 10 in left column)
 - Factor = 0.1359
- Multiply the loan principal by the factor
 - For a \$40,000 loan at 6% for 10 years
 - Annual Payment = $\$40,000 \times 0.1359 = \$5,436/\text{year}$
 - You will repay the loan and all interest in full if you pay \$5,436/year for the next 10 years
 - This is called “amortizing” the loan
 - _____ = paying back the principal slowly over time
- Practice Using Table 3
 - Find the annual loan payment factors for the following loans:
 - 8% APR for 20 years
 - 4% for 30 years
 - 7% for 8 years
- Practice Using Table 3
 - Find the annual loan payment factors for the following loans:
 - 8% APR for 20 years factor = 0.1019
 - 4% for 30 years factor = 0.0578
 - 7% for 8 years factor = 0.1675

Breaking Down a Loan Payment

- Remember, loan payments contain interest and principal
- For the \$40,000 loan at 6% for 10 years
- _____:

- Annual Loan Payment = \$5,436
- Interest Due = $\$40,000 \times 6\% = \$2,400$
- Principal Due = $\$5,436 - \$2,400 = \$3,036$
- You will still owe \$36,964 after you make this first payment
 - $\$40,000$ principal borrowed - $\$3,036$ principal due

Monthly Loan Payments

- Use Table 4
 - Monthly Payments Required to Amortize a \$1,000 Loan
 - NOTE: we use this table differently than Table 3
- Step 1. Find the factor in the same manner
 - Assume a 5-year loan at 5.5% APR
 - Monthly Payment Factor = 19.10
 - This means the monthly payment for a \$1,000 loan at 5.5% APR for 5 years is \$19.10/month
- Step 2. Divide the loan principal by \$1,000
 - Example: \$20,000 car loan
 - $\$20,000 / \$1,000 = 20$
- Step 3. Multiply the factor from Step 1 by the answer from Step 2.
 - Monthly Payment = $19.10 \times 20 = \$382/\text{month}$

Using a Spreadsheet

- It is easy to calculate loan payments on a spreadsheet
 - _____
 - The spreadsheet does the rest!
- Find the monthly payment for a \$55,000 tractor loan at 5.25% APR for 6 years
 - Loan Principal = \$55,000
 - Interest Rate = 5.25
 - Life of Loan = 6 Payment = \$892.16
 - Payments/Year = 12
- Calculate the quarterly payment for a \$30,000 loan at 6.25% APR for 4 years
 - Loan Principal = \$30,000
 - Interest Rate = 6.25
 - Life of Loan = 4 Payment = \$2,133.67
 - Payments/Year = 4
- Look at the table below the calculator to see how the interest and principal payments change for each payment

Loans and Loan Payments In-Class Exercise

1. Jack borrowed \$15,000 to purchase a used tractor. The loan is for 4 years at 6% APR.
 - a. Estimate how much interest Jack will owe in the first year.
 - b. Calculate the annual loan payment for this tractor loan.
 - c. Calculate how much principal Jack will be repaying in the 1st loan payment.
2. Emily borrowed \$150,000 to buy a house. The mortgage is for 30 years at 7% APR. Calculate the monthly payment on Emily's mortgage.
3. Dustin wants to start his veterinary practice. He will need to borrow \$300,000 to get the necessary equipment and facilities. He will make a down payment of \$50,000 and borrow the remaining amount at 6% for 20 years.
 - a. Calculate the amount of the loan Dustin will be borrowing.
 - b. Calculate the monthly loan payment on Dustin's loan.

Loans and Loan Payments In-Class Exercise (KEY)

Use the spreadsheet to show how easy it is to calculate payments. Have the students use the spreadsheet to get them used to it.

1. Jack borrowed \$15,000 to purchase a used tractor. The loan is for 4 years at 6% APR.
 - a. Estimate how much interest Jack will owe in the first year.

$$\text{Interest Due} = \text{Loan Principal} \times \text{Interest Rate}$$

$$\text{\$15,000} \times 6\% \text{ APR} = \text{\$900 interest due in the first year}$$

- b. Calculate the annual loan payment for this tractor loan.

$$\text{Factor for 6\% APR for 4 years (Table 3)} = 0.2886$$

$$\text{Annual Loan Payment} = \text{\$15,000} \times 0.2886 = \text{\$4,329/year}$$

- c. Calculate how much loan principal Jack will be repaying in the 1st loan payment.

$$\text{Loan Principal Due w/i 1 Year} = \text{Annual Loan Payment} - \text{Interest Due This Year}$$

$$\text{Loan Principal Due w/i 1 Year} = \text{\$4,329} - \text{\$900} = \text{\$3,429}$$

2. Emily borrowed \$150,000 to buy a house. The mortgage is for 30 years at 7% APR. Calculate the monthly payment on Emily's mortgage.

$$\text{Step 1: Factor for 7\% APR for 30 years (Table 4)} = 6.65$$

$$\text{Step 2: } 6.65 \times \text{\$150,000} / \$1,000 = \text{\$997.50/month}$$

3. Dustin wants to start his veterinary practice. He will need to borrow \$300,000 to get the necessary equipment and facilities. He will make a down payment of \$50,000 and borrow the remaining amount at 6% for 20 years.

- a. Calculate the amount of the loan Dustin will be borrowing.

$$\begin{aligned} \text{Loan Amount} &= \text{Purchase Price} - \text{Down Payment} \\ &= \text{\$300,000} - \text{\$50,000} = \text{\$250,000 loan} \end{aligned}$$

- b. Calculate the monthly loan payment on Dustin's loan.

$$\text{Factor for 6\% for 20 years} = 7.16 \qquad \text{Loan Amount}/\$1,000 = 250$$

$$\text{Loan Payment} = 7.16 \times 250 = \text{\$1,790}$$

NOTE: the loan payments using the tables may be different from the spreadsheet due to rounding errors.

Loans and Loan Payments Homework Exercise

Use the Loan Repayment Tables (Tables 3-5) to answer these questions. Feel free to use the spreadsheet to double-check your answers.

1. Ally just borrowed \$28,000 to purchase a small shed and some honey-extracting equipment. The loan is for 5 years at 6.5% APR with annual payments.
 - a. Estimate how much interest Ally will owe in the first year.
 - b. Calculate the annual loan payment for this car loan.
 - c. Calculate how much principal Ally will be repaying in the 1st loan payment.
2. Bob & Jane borrowed \$135,000 to buy some farm land. The mortgage is for 25 years at 7% APR.
 - a. Calculate the monthly payment on Bob & Jane's mortgage.
 - b. Estimate how much interest Bob & Jane will pay over the 25-year life of this loan.
3. Andrew really wants to buy a car for \$17,000. The car dealer has offered him 2 different loans. Loan A is a 5-year loan at 6.5% APR with monthly payments. Loan B is a 3-year loan at 5.5% APR with monthly payments.

- a. Calculate the monthly loan payment for Loan A. Show your work.
 - b. Calculate the monthly loan payment for Loan B. Show your work.
 - c. Which loan would you choose if you were in Andrew's position? Briefly explain why you chose either Loan A or Loan B.
4. Greta needs help with the Liabilities section of her balance sheet. She has just taken out a loan for \$45,000 to buy a new refrigerator. The loan is for 5 years at 5% APR. It has annual payments. Help Greta determine what to list on her balance sheet for this loan. Use the 3-Step Process
- a. Calculate the annual loan payment for this loan.
 - b. Calculate the amount of interest she is supposed to pay this year. (Step 1)
 - c. Calculate the amount of principal due within 1 year (the current liability portion of this loan). (Step 2)
 - d. Calculate the amount of principal Greta will owe after this payment is made (the non-current liability). (Step 3)

Loans and Loan Payments Homework Exercise (KEY)

Use the Loan Repayment Tables (Tables 3-5) to answer these questions. Feel free to use the spreadsheet to double-check your answers.

1. Ally just borrowed \$28,000 to purchase a small shed and some honey-extracting equipment. The loan is for 5 years at 6% APR with annual payments.

- a. Estimate how much interest Ally will owe in the first year.

$$\begin{aligned}\text{Annual Interest} &= \text{Annual Interest Rate} \times \text{Principal Owed} \\ &= 6.0\% \times 28,000 = \$1,680 \text{ of interest}\end{aligned}$$

- b. Calculate the annual loan payment for this car loan.

$$\text{Factor for 6\% for 5 years} = 0.2374$$

$$\text{Annual Payment} = 0.2374 \times \$28,000 = \$6,647.20 \quad (\$6,647.10 \text{ using the spreadsheet})$$

- c. Calculate how much principal Ally will be repaying in the 1st loan payment.

$$\begin{aligned}\text{Principal Due} &= \text{Annual Payment} - \text{Annual Interest Due} \\ &= \$6,647.20 - \$1,680 = \$4,967.20\end{aligned}$$

2. Bob & Jane borrowed \$135,000 to buy some farm land. The mortgage is for 25 years at 7% APR.

- a. Calculate the monthly payment on Bob & Jane's mortgage.

$$\text{Monthly Payment Factor for 7\% APR for 25 years} = 7.07$$

$$\text{Monthly Payment} = 7.07 \times \$135,000 / \$1,000 = \$954.45/\text{month}$$

- b. Estimate how much interest Bob & Jane will pay over the 25-year life of this loan.

$$(\text{Monthly Payment} \times \text{Total Number of Months}) - \text{Original Principal} = \text{Total Interest Paid}$$

$$(\$954.45/\text{month} \times 300 \text{ months}) - \$135,000 = \$151,335 \text{ of total interest paid}$$

3. Andrew really wants to buy a car for \$17,000. The car dealer has offered him 2 different loans. Loan A is a 5-year loan at 6.5% APR with monthly payments. Loan B is a 3-year loan at 5.5% APR with monthly payments.

- a. Calculate the monthly loan payment for Loan A. Show your work.

Monthly Loan Repayment Factor for 6.5% APR for 5 years = 19.57

Monthly Payment = $19.57 \times \$17,000 / \$1,000 = \$332.69/\text{month}$

- b. Calculate the monthly loan payment for Loan B. Show your work.

Monthly Loan Repayment Factor for 5.5% APR for 3 years = 30.20

Monthly Payment = $30.20 \times \$17,000 / \$1,000 = \$513.40/\text{month}$

- c. Which loan would you choose if you were in Andrew's position? Briefly explain why you chose either Loan A or Loan B.

There's not one right answer. Loan A has a smaller monthly payment that's easier to make, but you will pay more total interest over the life of the loan. Loan B has a much higher payment that is harder to pay, but you will pay a lot less interest over the life of this loan.

4. Greta needs help with the Liabilities section of her balance sheet. She has just taken out a loan for \$45,000 to buy a new refrigerator. The loan is for 5 years at 5% APR. It has annual payments. Help Greta determine what to list on her balance sheet for this loan. Use the 3-Step Process
- a. Calculate the annual loan payment for this loan.

Annual Loan Payment = $0.2310 \times \$45,000 = \$10,395/\text{year}$

- b. Calculate the amount of interest she is supposed to pay this year. (Step 1)

Annual Interest = APR x Principal Owed
= $5\% \times \$45,000 = \$2,250$ of interest due

- c. Calculate the amount of principal due within 1 year (the current liability portion of this loan). (Step 2)

Principal Due = Annual Loan Payment – Annual Interest Due
= $\$10,395 - \$2,250 = \$8,145$ principal due within 1 year (current liability)

- d. Calculate the amount of principal Greta will owe after this payment is made (the non-current liability). (Step 3)

Principal Remaining = Principal Outstanding – Principal Due This Year
= $\$45,000 - \$8,145 = \$36,855$ Principal Remaining after this payment

Introduction to Loans Student Driven Activity

Student Driven Learning Activity: Work with your local branch and secure a loan officer to come meet with your students and go over the parts of a loan, what they look for when writing loans and discuss the differences between payments, calculating interest, etc... After the presentation from the loan officer have students write up their takeaways and make a visual to display to the class on the parts of a loan and the repayment process. Visuals can include charts, picture depictions, flow charts, etc...

ALTERNATIVE Student Driven LESSON: Have the students divide into 4 groups. Have all groups read through the alternative reading and develop a lesson to present to the rest of the class with one of the following sections. Students will need to have some type of note organizer for the rest of the students they will be presenting the lesson to.

Group presentations:

1. What are Loans and why to businesses get loans?
2. Types of loans
3. Loan Application and Interest payments
4. Loan Payments

Introduction to Loans Take Home Reading

Think back to Lesson 3 where we talked about balance sheets. We made a very simple statement about how you pay for the assets you purchase – you can either use your money (we called that equity or net worth) or you can use someone else's money (we called that liabilities). Many of a business' liabilities are either operating loans or term loans. Let's talk more about loans because chances are you will need a loan to purchase a house or a car in the future.

A loan is simply money that you borrow from someone with the intent of paying it back over time. You might use a loan to purchase land or a house or a car or business assets. Loans have become more necessary over time because assets have gotten more expensive, which makes it harder to purchase assets with cash. Your great-grandparents probably paid cash for everything that they owned. But as land values and house values increased it became much harder to save enough money to purchase these items. In today's economy an average house might have a selling price well over \$150,000 – it might take a very long time to save enough money to purchase a house if you do not get a loan.

Business owners often use loans to purchase some of their assets. The main reasons that they use loans include:

- they don't have enough cash to purchase expensive assets (land, buildings, etc.)
- they want to purchase these assets today rather than waiting until they save enough cash
- they would rather use their cash to pay their operating expenses instead of using their cash to purchase assets
- loans provide cash in emergency situations when they are short on cash
- using loans can improve the profitability of the business by allowing the purchase of assets that will make the business more efficient.

For example, Greta is thinking about purchasing a new refrigerator so that she can have more produce to sell. Greta has \$45,000 in her business checking account. The new refrigerator will cost \$45,000. If Greta pays for the refrigerator in cash she will not have any money available to pay for the operating expenses of the refrigerator, and she will not have money to purchase the produce that she plans to store in the refrigerator. For her business it might make more sense to borrow money to purchase the refrigerator. This will allow her to purchase more produce with her cash.

How do loans work? In most cases the loan is obtained from a lender, such as a bank, credit union, or possibly an individual. Farm Credit is an example of a business that makes loans to people who are involved in agriculture and rural communities. The business owner will need to apply for the loan. A typical loan application includes:

- the reason for the loan (how the money will be used)
- how the borrower plans on repaying the money (your income statement or pay stub)

- a balance sheet
- a check of your credit history and credit score

Lenders usually require a borrower to make a “down payment” of cash to qualify for the loan. This shows the lender that you are serious enough to invest your own money into the purchase of the asset. The down payment also reduces the risk that the lender will have because they don’t have to lend as much money. Down payments are usually based on a percentage of the purchase price of the asset. Lenders typically require a 20% down payment on home loans. For a house with a purchase price of \$200,000, this would require a \$40,000 ($\$200,000 \times 20\%$) down payment. The down payment percentages will be different for various types of assets, and the percentages will vary between different lenders.

Here’s an example of using a loan to purchase a new refrigerator. The purchase price of the refrigerator is \$45,000. Greta’s lender would like for her to make a 20% down payment – that would be \$9,000 ($\$45,000 \times 20\%$). That means she will need a loan for the remaining amount - \$36,000 ($\$45,000$ purchase price - \$9,000 down payment). This \$36,000 is called the “loan principal”, or simply the “principal”. So Greta will pay the seller the entire \$45,000 purchase price using \$9,000 of her money and \$36,000 of the lender’s money. Then, Greta will make regular payments to the lender over the next few years to repay the loan principal plus any interest that she owes on the loan.

There are several different types of loans, but most of the loans work in the same general manner: you borrow the principal from the lender, then make regular payments of principal and interest to the lender until it is repaid in full. From a personal standpoint you might use an auto loan to purchase a car or truck; you might use a mortgage to purchase a house or land; you might use a student loan to pay for your education; or you might use a credit card to purchase smaller items. Credit cards tend to have the highest interest rates (currently averaging close to 17% APR versus 4-6% for mortgages and auto loans) – thus, credit card debts should be repaid as quickly as possible so that you don’t have to pay too much interest over time.

From a business standpoint we classify loans into two main types: operating loans and term loans. Operating loans are used to purchase your inventory and to pay the main operating expenses of the business. Greta might use an operating loan to purchase the produce and items that she sells. She may also use an operating loan to pay for her largest operating or overhead expenses such as utilities, rent, or hired labor. Operating loans are usually paid back to the lender in full within one year. Just to make loans more confusing, lenders usually have two different types of operating loans. One is called an “operating loan” and the other is called an “operating line of credit”. Here’s the difference – when you get an operating loan the lender gives you a specific amount of money that you have to pay back, usually within one year. With an “operating line of credit”, the lender tells you that you can borrow up to a certain dollar amount (called a “credit limit”), but you do not have to borrow the entire amount. However much you borrow, you still need to repay the principal within one year. Operating lines of credit are very similar to credit cards. Operating lines of credit are very useful for purchasing your inputs like fertilizer, feed, or your inventory of items that you sell.

Term loans are used to purchase assets that will be used by the business for several years (over a longer “term” than operating loans). Greta might use term loans to purchase delivery vehicles, refrigerators, land, or other buildings, and pay these loans back over a 3-year to 30-year period (“term”). Equipment is usually repaid over a 3-year to 10-year term. Land and building (known together as “real estate”) loans are usually repaid over 10-year to 30-year terms.

When you borrow money with a term loan, the lender usually states very clearly how you are to repay to loan. The lender will specify the number of payments per year, the number of years, the annual interest rate (known as the “APR” – Annual Percentage Rate), and the dollar amount of each payment. Greta’s refrigerator loan might have the following details:

- \$36,000 of principal borrowed for a 5-year term
- 5% APR interest rate
- 4 payments per year – January 1, April 1, July 1, and October 1
- each payment will be \$2,045.53

When you think about loans, you normally think about the “interest” that you will pay on the loan. Interest is the cost of borrowing money. The interest expense is usually calculated on the amount of principal that you owe the lender. To calculate the amount of interest you owe the lender for the year, simply multiply the annual interest rate (the APR) times the amount of principal you owe the lender.

The math behind loans can be confusing, but here’s a way to simplify it. We call it “The 3-Step Process”. The first step is to calculate the interest that you will pay this year. The second step calculates how much loan principal you will repay this year. The third step calculates how much principal you still owe the lender after this payment is made:

- Step 1: Calculate the interest that you will pay this year
- = Annual Interest Rate x Principal That You Owe the Lender
- This amount will be listed as an Overhead Expense on the Income Statement
- Step 2: Calculate the amount of principal you will repay this year
- = Annual Loan Payment – Interest Paid (from Step 1)
- This amount will be listed as a Current Liability on the Balance Sheet
- Step 3: Calculate how much principal you will owe the lender after this payment is made
- = Principal Owed at Beginning of Year – Principal Paid This Year (from Step 2)
- This amount will be listed as a Non-Current Liability on the Balance Sheet

As an example, assume that on January 1, 2016 you borrow \$1,000 at 4% interest for a 2-year term. You will make one payment per year. Your annual payment will be \$530.20/year (you’ll learn how to calculate this payment soon!). It is now January 1, 2017, one full year later. You owe the lender interest for one full year. Here’s how you calculate the interest that you owe the lender:

- Step 1: Annual Interest Expense = Annual Interest Rate x Principal Owed to the Lender
- Annual Interest Expense = 4% APR x \$1,000 = \$40 of interest

Step 2: Principal Repaid This Year = Annual Loan Payment – Annual Interest Expense

$$\text{Principal Repaid This Year} = \$530.20 - \$40 = \$490.20$$

Step 3: Principal Owed After This Payment

$$= \text{Principal Owed at Beginning of Year} - \text{Principal Repaid This Year}$$

$$= \$1,000 - \$490.20 = \$509.80$$

Move ahead one more year to January 1, 2018. You owe the lender \$509.80 of principal. Let's repeat the 3-Step Process for the second year of this loan:

Step 1: Annual Interest Expense = Annual Interest Rate x Principal Owed to the Lender

$$\text{Annual Interest Expense} = 4\% \text{ APR} \times \$509.80 = \$20.40 \text{ of interest}$$

Step 2: Principal Repaid This Year = Annual Loan Payment – Annual Interest Expense

$$\text{Principal Repaid This Year} = \$530.20 - \$20.40 = \$509.80$$

Step 3: Principal Owed After This Payment

$$= \text{Principal Owed at Beginning of Year} - \text{Principal Repaid This Year}$$

$$= \$509.80 - \$509.80 = \$0.00$$

You see, at the end of two years you have repaid the loan principal (the \$1,000) in full and you have paid the lender all of the interest that you owed. A couple of things to notice:

- The amount of interest you pay in each payment will get smaller with each payment. In the example you paid \$40 of interest in the first payment but only \$20.40 of interest in the second payment.
- The amount of principal that you repay in each payment will get larger with each payment. You paid \$490.20 of principal in the first payment, and \$509.80 of principal in the second payment.

Here's a quick way to estimate the total amount of interest that you will pay over the life of a loan. Rather than working through the 3-Step Process for each payment, we can take this shortcut:

Total Interest Paid Over the Life of the Loan

$$= (\text{Scheduled Payment} \times \text{Total Number of Payments}) - \text{Initial Principal Borrowed}$$

For the \$1,000 loan example:

$$\text{Total Interest Paid} = (\$530.20/\text{year} \times 2 \text{ years}) - \$1,000 \text{ borrowed} = \$60.40 \text{ of interest}$$

$$\text{That is exactly equal to what we calculated above } (\$40 + \$20.40 = \$60.40)!$$

Now let's calculate the total amount of interest you will owe on a 30-year mortgage with monthly payments. That's a total of 360 payments (30 years x 12 payments/year). Assume that you borrow \$200,000 to purchase a house. The interest rate is 5% APR. Your monthly payment will be \$1,073.65/month. Rather than doing the 3-Step Process 360 times, let's estimate the total interest you will pay over the 30-year period:

(Monthly Payment x 360 Months) – Initial Loan Principal = Total Lifetime Interest

(\$1,073.65/month x 360 months) - \$200,000 = \$185,511.57 of interest

In this example you will pay \$185, 511.57 of interest if you make all of your loan payments on schedule. That is the cost of borrowing the money! Hopefully the value of your house increased by more than \$185,511.57 over this 30-year period to make this a good investment!

How do I calculate the amount of the loan payments? There are four methods of calculating loan payments:

- using a mathematical formula
- using a financial calculator
- using loan repayment tables
- using an Excel spreadsheet

We will focus on using the loan repayment tables and the Excel spreadsheet. To use the loan repayment tables (Tables 3-5) you need to know the following information:

- The annual interest rate (the APR)
- The number of years (the term) of the loan
- The amount of principal borrowed

You will use Table 3 “Annual Loan Payments” to calculate the amount of each annual loan payment for a loan that has just one payment per year. Let’s use Table 3 to calculate the loan payment for the \$1,000 loan example. The loan was at 4% for 2 years. On Table 3, the interest rates are listed at the top of each column – they range from 1% to 12%. The row headings on the left side of Table 3 show the number of years (the term of the loan). Go across the table until you get to the 4% Interest Rate Column. Now, go down that column until you get to the row labelled “2” at the left side of the table. You should see a loan repayment factor of 0.5302 at the intersection of the 4% column and the “2” row. Calculate the annual loan payment by multiplying this factor by the amount of loan principal that you borrowed:

$0.5302 \times \$1,000 = \$530.20/\text{year}$

What if Greta gets a 20-year loan to purchase a new storage building. The loan is for \$200,000 for 20 years at 6% APR. Calculate the annual payment on this loan:

Loan Repayment Factor for 6% for 20 years = 0.0872

Annual Payment = $0.0872 \times \$200,000 = \$17,440/\text{year}$

We use a very similar method of calculating monthly payments (12 payments/year) and quarterly payments (4 payments/year). There is just one difference – we need to divide the principal amount by \$1,000. That’s because the factors for these loans are very small and would have lots of decimal places if we didn’t make any adjustments. Let’s calculate the monthly loan payment on a \$20,000 auto loan – 5 years at 7% APR. Use Table 4:

Monthly Loan Repayment Factor for 7% for 5 years = 19.80

Monthly Loan Payment = $19.80 \times \$20,000 / \$1,000 = \$396.00/\text{month}$

Greta is considering making monthly payments instead of annual payments for the new storage building. Calculate her monthly payment for a \$200,000 loan at 7% for 20 years:

Monthly Loan Repayment Factor for 7% for 20 years = 7.75

Monthly Loan Payment = $7.75 \times \$200,000 / \$1,000 = \$1,550/\text{month}$

You use the exact same method for quarterly payments. Use Table 5 to get the repayment factors for quarterly loans.

Computer spreadsheets are an easy way to calculate loan payments. Open the Lesson 7 – Loan Payments spreadsheet. This spreadsheet calculates loan payments for you. All you need to do is enter the following information in the cells with the blue font:

Original Loan Principal

Annual Interest Rate (APR)

Life of the Loan (the loan term)

Number of Payments/Year

After you enter this information the spreadsheet will calculate the loan payment for you. It also contains a table that shows the math involved with the 3-Step Process. The table shows how much principal you owe the bank at the beginning of the period (“principal outstanding”), the amount of interest you will pay that period, the amount of principal you will repay that period, and how much principal you still owe the lender after that payment is made (“remaining principal”). This table only looks at the first 20 payments of the loan.

Let’s do some examples. Calculate the annual loan payment for a \$50,000 loan for 5 years at 5% APR. Enter this information:

Original Loan Principal	\$50,000 (you don’t have to enter the \$)
Annual Interest Rate (APR)	5% (you don’t have to enter the %)
Life of the Loan (the loan term)	5
Number of Payments/Year	1

The spreadsheet shows that your annual payment will be \$11,548.74/year. If you were to use the loan repayment factors from Table 3, you should get \$11,550/year instead of \$11,548.74. This small difference is due to rounding of the factors on Table 3. The spreadsheet answer is more exact because it doesn’t round the calculations.

Now, look at the table on the spreadsheet to see how you will be repaying this loan over the next 5 years. You should see that the amount of “Interest Due” gets smaller every year and the “Principal Due” gets larger each year. Also, the “Remaining Principal” gets smaller each year as you pay down the loan.

Play around with the spreadsheet to see what the loan payments would be for several loans. Use the spreadsheet to double check your answers that you get by using Table 3-6. Remember, there might be a small difference due to rounding – don't worry about the small stuff!

Lesson 8 - Time Value of Money

Bell Ringer: Uncle Joe is giving you \$100 for your Birthday. Would you rather have that money tomorrow or would you rather wait, let Uncle Joe invest it and get it 1 year from now? Why?

Instructors please read through the Take Home Reading to get some interesting ways to teach this material that sometimes is an abstract concept to students. There are some great resources there and great ways and nuisances that may help students remember.

A. Section 1 - Review Loans and Loan Payments

1. What is “interest” (cost of borrowing money)
2. what is “principal” (the money you actually borrow)
3. why do business managers or individuals get loans?
4. Calculate the monthly loan payment for a \$10,000 car loan at 7.5% APR for 5 years

Factor for 7.5% APR for 5 years is 20.04

$\$10,000 / \$1000 \times 20.04 = \$200.40/\text{month}$

B. Section 2 - Time Value of Money

1. People would rather have \$10 today rather than waiting to get \$10 sometime in the future
2. 3 main reasons:
 - a. Risk – you may not receive that \$10 in the future. This means you might settle for less money today rather than risking getting more money in the future. For example, would you rather have \$90 in your hands today or wait 1 year to maybe receive \$100? If you wait for 1 year, you may not receive any money at all.
 - b. Inflation – inflation is the rise in the general price level
As prices rise, that \$10 will buy you less over time. So you can buy more if you have that \$10 today. For example, if a gallon of milk costs \$3.33/gal your \$10 will buy you 3 gallons of milk. But if the price of milk increases to \$4/gal you can only buy 2.5 gallons with your \$10. Inflation is reducing your purchasing power, so you would rather have that money in your hands today so you can buy more with it.
 - c. Opportunities – that \$10 is more valuable to you today because you can do different things with it. You can:
 - Put it in your savings account
 - Spend it
 - Invest it for future goals
 - Pay down your debts
 - Donate it to church or charityYou cannot do these things if you do not have the money in hand today. So, money in hand today is worth more to you because you can use it.
 - d. For these 3 reasons, we say that money has a “time value” – money in hand today is worth more than the promise of money in the future!

C. Section 3 - Compound Interest

1. “Compounding” means that you are earning interest on top of interest that you have already earned. This is a powerful financial concept!

Example: Assume you invest \$1,000 (principal) in an account that earns 10% annual return.

- After 1 year, you will earn \$100 of interest ($\$1,000 \times 10\%$)
- You now have \$1,100 in your account ($\$1,000 + \100)
- From now on, this entire amount is treated as principal
- After year 2, you will earn \$110 of interest ($\$1,100 \times 10\%$)
- After year 3, you will earn \$121 of interest ($\$1,210 \times 10\%$) and so on...

D. Section 4 - There are several types of Time Value of Money problems to solve. The main ones are:

1. Future Value of a lump sum (a one-time investment)
This estimates how much money you will have in the future if you invest money today
2. Present Value of a lump sum (a one-time investment)
This is used when you are supposed to receive money in the future (one time). We use Present Value to estimate how much you would rather have in hand today vs waiting to hopefully receive that promised amount in the future.
3. Future Value of a stream of investments (annuities)
An annuity is a stream of constant payments over time. Monthly car loan payments are an example of an annuity – you make the same payment every month for a given number of years. We use Future Value of Annuities to estimate how much money you will have in your account if you make regular investments into that account over time. For example, how much money you will have in your account if you invest \$100/month for the next 5 years.
4. We can solve these problems in several ways:
 - a. Time Value of Money tables
 - b. Spreadsheets
 - c. Financial Calculators
 - d. Formulas
5. We will focus on Time Value of Money tables and spreadsheets

E. Section 5 - Future Value of a Lump Sum

1. A “lump sum” is a one-time investment – you only pay or receive the money one time
For example, assume that you deposit \$1,000 today into an investment that earns a 5% rate of return (“it pays 5%”). The \$1,000 is a lump sum since you are only investing the money one time.
2. Future Value means that we are trying to find out how much your money will be worth in the future.
3. To calculate how much money you will have in your account after 5 years, we will calculate the Future Value of this Lump Sum
 - Using the Time Value Tables, go to Table 1 “Future Value of Lump Sum Factors”
 - Step 1: Find the Future Value factor from Table 1
 - Use this table just like you used the annual loan payment tables
 - Look across the top row to find the 5% column
 - Go down that column until you reach the “n = 5” row.
 - The factor for 5% for five years is 1.2763
 - Step 2: Multiply the lump sum by the factor
 - $\$1,000 \times 1.2763 = \$1,276.30$

- If you invest \$1,000 today in an investment that earns a 5% rate of return, your money will grow to \$1,276.30 over the next 5 years. That is, you earned \$276.30 (\$1,276.30 - \$1,000) of returns by just letting your money sit in the account.
- What will your account grow to after 40 years?
Factor for 5% for 40 years = 7.0400
 $\$1,000 \times 7.0400 = \$7,040$ at the end of 40 years
Your initial \$1,000 deposit grew to \$7,040 over these 40 years

Work some other problems of your own – or work through the Future Value problems on the exercise to give the students practice using the tables

F. Section 6 - Present Value of a Lump Sum

1. Present Value calculates how much money you need to invest today to reach a future goal. We can also use Present Value to determine how much money you would rather have in your hands today rather than waiting to hopefully receive money in the future (you may not receive it due to risk!)
2. This is basically the “opposite” of Future Value
3. We solve Present Value problems in a very similar manner to Future Value
Example: You want to have \$10,000 in your account after 5 years so that you can make a down payment on a piece of land. Your account earns a 6% rate of return.
 - Step 1. Find the Present Value factor from Table 2
 - Factor for 6% for 5 years is 0.7473
 - Step 2 . Multiply the lump sum by the factor
 - $\$10,000 \times 0.7473 = \$7,473$
So, if you invest \$7,473 today in an account that pays 6% per year, you will have \$10,000 in the account after 5 years.

Work some other problems of your own – or work through the Present Value problems on the exercise to give the students practice using the tables

G. Section 7 - Future Value of an Annuity (stream of payments)

1. An annuity is a regular stream of payments – like monthly car loan payments.
 2. We use Future Value of an Annuity to estimate how much money will be in your account after a certain time period if you are making regular investments during that time period.
For example – assume that you want to invest \$1,000/year in an account that earns 7% per year. How much will you have in your account after 30 years?
 - You might think, “I’m investing \$1,000/year for 30 years – I should have around \$30,000.”
 - But don’t forget about the earnings on your account!!
- Step 1. Find the Future Value of Annuity factor from Table 6
 - Factor for 7% for 30 years is 101.0730
 - Step 2. Multiply the Annuity (\$1,000/year) by the factor
 - $\$1,000 \times 101.0730 = \$101,073$
- So, you invested a total of \$30,000 of principal into your account over time (\$1,000/yr x 30 years). But you end up with over \$100,000!! This is due to the compound earnings on the account. This is a powerful tool for business managers!

H. Section 8 - Using a Spreadsheet for Time Value of Money Calculations

- Spreadsheets are great tools for time value of money calculations. All you need to do is enter your information and let the spreadsheet do the calculations.
- Using the Future Value Calculator
 - Enter your data in the cells with the BLUE font
 - Example: You want to invest \$300/year into an account that earns 6%. How much will you have in your account after 5 years?

Number of Years	5	Cell C3
Annual Rate	6	Cell C7
Payment to be Made	300	Cell C9
Present Value (Lump Sum)	0	Cell C10
Future Value		\$1,792.60

What if you wanted to look at an annual return of 10%?

- Simply change the 6 to 10 in the Annual Rate cell (C7)
 - At 10%, the Future Value is \$2,014.68

I. Section 9 - Using the Present Value Calculator

- Click on the tab named "PV Calculator" at the bottom of the spreadsheet
- You'll see a Present Value Calculator very similar to the Future Value Calculator
- Enter your data in the cells with the BLUE font
- Example: You want to have \$40,000 at the end of 10 years. Your account that earns 7%. How much will you need to invest today (lump Sum) to reach your goal?

Number of Years	10	Cell C3
Annual Rate	7	Cell C7
Payment to be Made	0	Cell C9
Future Value (Lump Sum)	40,000	Cell C10
Present Value		\$20,333.97

What if you wanted to look at an annual return of 10%?

- Simply change the 6 to 10 in the Annual Rate cell (C7)
 - At 10%, the Present Value is \$15,421.73

Materials: **PowerPoint on Time Value of Money**
 Note Organizer
 In-class Exercise and Key
 Homework Exercise and Key
 Student Driven Learning Activity
 Take Home Reading



\$10 Today vs. \$10 Next Year?

- Most people would rather have \$10 today rather than waiting to be paid \$10 next year
- 3 main reasons:
 - Risk
 - You may not get paid in the future!
 - Inflation
 - As prices increase, that \$10 will buy less in the future
 - Opportunities
 - You can do something with that \$10 today
 - Save, pay down loans, invest, spend, donate, etc.

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Time Value of Money

- Having money in hand today is more valuable than waiting to maybe receive money in the future
 - RIO (Risk, Inflation, Opportunities)
- This is called the "time value of money"

FARM CREDIT
KNOWLEDGE CENTER

Compound Interest

- Powerful financial tool
- Compounding means:
 - "Earning interest on top of interest"
 - The interest you earn in period 1 will earn interest in period 2...
- Example: You invest \$1,000 today in an account that earns 10% annual return
 - How much will you earn over the next 3 years?

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Compound Interest

- Year 1: $\$1,000 \times 10\% = \100 of interest
- Year 2: $(\$1,000 + \$100) \times 10\% = \$110$ of interest
 - Notice you earned \$10 more dollars of interest in Year 2
 - The \$100 of interest in Year 1 is treated as principal for the Year 2 calculation
- Year 3: $(\$1,000 + \$100 + \$110) \times 10\% = \121 of interest

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Compound Interest

- Year 1 = \$100 earned
- Year 2 = \$110 earned
- Year 3 = \$121 earned
- Total interest earned = \$331
- If you earned "simple interest" you would only earn \$300 of interest
 - $\$1,000 \times 10\% \times 3 \text{ years} = \300

FARM CREDIT
KNOWLEDGE CENTER

Terms

- Lump Sum = a one-time investment
 - Ex. You invest \$500 today and invest nothing else after that
- Annuity = stream of regular payments
 - Ex. Car loan payments – they are the same amount every month for a stated number of years
- Future Value = what you will have in your account in the future
- Present Value = what something is worth today



Types of Time Value Problems

- Future Value of a Lump Sum
 - Determines how much money an investment will be worth in the future if you invest money today
- Present Value of a Lump Sum
 - Determines how much you would rather have today instead of waiting to be paid (maybe) in the future
 - Also, it determines how much you need to invest today to reach a specific future value



Types of Time Value Problems

- Future Value of an Annuity
 - Determines how much you will have in your account in the future if you invest regularly over time
 - Example: You invest \$500/year into a retirement account that earns 8% return. How much will you have in your account after 50 years?



Solving Time Value Problems

- 4 methods:
 - Time Value of Money tables
 - Excel spreadsheets
 - Financial calculators
 - Time Value of Money formulas
 - We will focus on the tables and spreadsheets



Using the Time Value Tables

- Same as the annual loan payment table
- Look up the column with the interest rate
- Follow the column down to the row with the number of years
- Multiply that factor by the dollar amount of the investment



Future Value of a Lump Sum

- Use Table 1
- Example: You invest \$1,000 today in an account that earns 5%. How much will you have in your account after 5 years?
- Factor for 5% for 5 years = 1.2763
- $FV = 1.2763 \times \$1,000 = \$1,276.30$
 - Your \$1,000 grew to almost \$1,300 in 5 years!!



Future Value of a Lump Sum

- Assume that you leave your money in the account for 40 years – you do Not add any more money. How much will you have in your account after 5 years at a 5% return?
- Factor for 5% for 40 years = 7.0400
- $FV = 7.0400 \times \$1,000 = \underline{\$7,040.00}$
 - Your initial investment of \$1,000 grew to more than \$7,000!!



Present Value of a Lump Sum

- Use Table 2
- PV is the “opposite” of FV
- Example: You want to have \$10,000 available after 5 years for a down payment on some land. How much do you need to invest today to reach this goal at a 6% return?
- Factor for 6% for 5 years = 0.7473
- $PV = 0.7473 \times \$10,000 = \underline{\$7,473}$



Present Value of a Lump Sum

- From this example:
 - If you invest \$7,473 today
 - It earns 6% each year (compound interest)
 - It will grow to \$10,000 in 5 years



Future Value of an Annuity

- Use Table 6
- Example: You invest \$1,000/yr for 30 years. It earns 7% return. How much will you have after 30 years?
 - You might think somewhere around \$30,000
 - $\$1,000/\text{yr} \times 30 \text{ yr} = \$30,000$
- Factor for 7% for 30 years = 101.0730
- $FV = \$101.0730 \times \$1,000/\text{yr} = \underline{\$101,073}$
 - That’s a lot more than the \$30,000 you invested!!



Using a Time Value Spreadsheet

- Spreadsheets are great for analysis
 - You can change key factors to see the impact
- For Future Value calculations
 - Click on the “FV Calculator” tab
 - You can change any number with a blue font
 - It will automatically recalculate the FV



Future Value Spreadsheet

- Example: You want to invest \$300/yr at 6%. What will you have after 5 years?
 - Number of Years Cell C3 Enter 5
 - Annual Rate (%) Cell C7 Enter 6
 - Annuity Cell C9 Enter 300
 - Present Value Cell C10 Enter 0
 - $FV = \$1,792.60$
 - What is your FV if you earn 10% instead of 6%?
 - Simply change Cell C7 (Annual Rate) to 10



Present Value Spreadsheet

- Click on the "PV Calculator" tab
- Use the same as the FV calculator
- Example: You want to have a future value of \$40,000 after 10 years. How much do you need to invest today earning 7%?
 - Years = 10
 - Annual Rate = 7%
 - Annuity = 0
 - FV (Lump Sum) = 40,000
 - PV = \$20,333.97



Keep in Mind

- Lump sum = only investing 1 time
- Annuity = several constant investments
- If you know the FV, solve for the PV
- If you know the PV, solve for the FV
- If it helps, draw a timeline
 - This can help you figure out what to solve for!



Time Value of Money- Note Organizer

\$10 Today vs. \$10 Next Year?

- Most people would rather have \$10 today rather than waiting to be paid \$10 next year
- 3 main reasons:
 - _____
 - You may not get paid in the future!
 - Inflation
 - As prices increase, that \$10 will buy less in the future
 - _____
 - You can do something with that \$10 today
 - Save, pay down loans, invest, spend, donate, etc.

Time Value of Money

- Having money in hand today is more valuable than waiting to maybe receive money in the future
 - RIO (Risk, Inflation, Opportunities)
- This is called the “_____”

Compound Interest

- Powerful financial tool!
- _____:
 - “Earning interest on top of interest”
 - The interest you earn in period 1 will earn interest in period 2...
- Example: You invest \$1,000 today in an account that earns 10% annual return
 - How much will you earn over the next 3 years?
 - Year 1: $\$1,000 \times 10\% = \100 of interest
 - Year 2: $(\$1,000 + \$100) \times 10\% = \$110$ of interest
 - Notice you earned \$10 more dollars of interest in Year 2
 - The \$100 of interest in Year 1 is treated as principal for the Year 2 calculation
 - Year 3: $(\$1,000 + \$100 + \$110) \times 10\% = \121 of interest
 - Compound Interest
 - Year 1 = \$100 earned
 - Year 2 = \$110 earned
 - Year 3 = \$121 earned
 - Total interest earned = \$331
 - If you earned “simple interest” you would only earn \$300 of interest
 - $\$1,000 \times 10\% \times 3 \text{ years} = \300

Terms

- _____ = a one-time investment
 - Ex. You invest \$500 today and invest nothing else after that
- Annuity = stream of regular payments
 - Ex. Car loan payments – they are the same amount every month for a stated number of years
- _____ = what you will have in your account in the future
- Present Value = what something is worth today

Types of Time Value Problems

- _____
 - Determines how much money an investment will be worth in the future if you invest money today
- Present Value of a Lump Sum
 - Determines how much you would rather have today instead of waiting to be paid (maybe) in the future
 - Also, it determines how much you need to invest today to reach a specific future value
- _____
 - Determines how much you will have in your account in the future if you invest regularly over time
 - Example: You invest \$500/year into a retirement account that earns 8% return. How much will you have in your account after 50 years?

Solving Time Value Problems

- 4 methods:
 - Time Value of Money tables
 - _____
 - Financial calculators
 - Time Value of Money formulas
- **We will focus on the tables and spreadsheets**

Using the Time Value Tables

- Same as the annual loan payment table
- Look up the column with the _____
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 - $FV = 7.0400 \times \$1,000 = \underline{\$7,040.00}$
 - Your initial investment of \$1,000 grew to more than \$7,000!!

Present Value of a Lump Sum

- Use Table 2
- PV is the “_____” of FV
- Example: You want to have \$10,000 available after 5 years for a down payment on some land. How much do you need to invest today to reach this goal at a 6% return?
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- Present Value Cell C10 Enter 0

- FV = \$1,792.60
- What is your FV if you earn 10% instead of 6%?
 - Simply change Cell C7 (Annual Rate) to 10

- Present Value Spreadsheet

- Click on the “PV Calculator” tab
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- Example: You want to have a future value of \$40,000 after 10 years. How much do you need to invest today earning 7%?
 - Years = 10
 - Annual Rate = 7%
 - Annuity = 0
 - FV (Lump Sum) = 40,000
 - PV = \$20,333.97

Keep in Mind

- Lump sum = only investing 1 time
- _____ = several constant investments
- If you know the FV, _____
- If you know the PV, solve for the FV
- If it helps, draw a timeline
 - This can help you figure out what to solve for!

Time Value In-Class Exercise

1. You deposit \$1,000 in a mutual fund (a one-time deposit) that earns 8% compounded annually.
 - a. How much will you have in your account at the end of 10 years?
 - b. At the end of 40 years?
 - c. What if you had invested the \$1,000 in a savings account that earned 2% annually – how much would you have in your account after 40 years?
2. You just bought a plot of land for \$4,000/acre in hopes that it will increase in value 7% each year.
 - a. How much will the land be worth in 10 years assuming it increases in value by 7% each year?
 - b. How much will it be worth after 40 years?

- 3a. You want to have \$50,000 at the end of 10 years in order to make a down payment on your business. How much do you need to invest today (today only), earning 8% per year, to have \$50,000 in your account after 10 years?
- 3b. Similar to 3a, you want to have \$50,000 at the end of 10 years. You can invest \$4,000/year for each of the next 10 years. Your investment will earn a return of 8% per year. Will you be able to reach your goal?
4. You want to contribute \$5,000/year to an IRA (Individual Retirement Account) – investing in assets that earn about 8 percent annually. How much will you have in the IRA after 20 years? 40 years?
5. The average America family has annual living expenses (food, rent, utilities, etc.) of \$50,000 per year. Let's assume that the annual inflation rate is 3% per year. How much will it cost an average American family to have the same level of living (\$50,000/year) 50 years from now? (50 years is approximately when you will be retiring!)

Time Value In-Class Exercise (Key)

1. You deposit \$1,000 in a mutual fund (a one-time deposit) that earns 8% compounded annually.

- a. How much will you have in your account at the end of 10 years?

FV Factor (Table 1) for 8% for 10 years = 2.1589

$\$1,000 \times 2.1589 = \$2,158.90$ Your money more than doubled in 10 years!

- b. At the end of 40 years?

FV Factor (Table 1) for 8% for 40 years = 21.7245

$\$1,000 \times 21.7245 = \$21,724.50$ Your \$1,000 grew to almost \$22,000!!

- c. What if you had invested the \$1,000 in a savings account that earned 2% annually – how much would you have in your account after 40 years?

FV Factor (Table 1) for 2% for 40 years = 2.2080

$\$1,000 \times 2.2080 = \$2,208$ Your \$1,000 only grew to \$2,200. Compare this result to part c. where it grew to \$22,000!!

2. You just bought a plot of land for \$4,000/acre in hopes that it will increase in value 7% each year.

- a. How much will the land be worth in 10 years assuming it increases in value by 7% each year?

FV Factor (Table 1) for 7% for 10 years = 1.9672

$\$4,000 \times 1.9672 = \$7,868.80$

- b. How much will it be worth after 40 years?

FV Factor (Table 1) for 7% for 40 years = 14.9745

$\$4,000 \times 14.9745 = \$59,898$

- 3a. You want to have \$50,000 at the end of 10 years in order to make a down payment on your business. How much do you need to invest today (today only), earning 8% per year, to have \$50,000 in your account after 10 years?

This is a Present Value of a Lump Sum problem

PV Factor (Table 2) for 8% for 10 years = 0.4632

$\$50,000 \times 0.4632 = \$23,160$

If you invest \$23,160 today, it will grow to \$50,000 at the end of 10 years if you earn an annual return of 8%.

- 3b. Similar to 3a, you want to have \$50,000 at the end of 10 years. You can invest \$4,000/year for each of the next 10 years. Your investment will earn a return of 8% per year. Will you be able to reach your goal?

This is a Future Value of an Annuity problem

FVA Factor (Table 6) for 8% for 10 years = 15.6455

$$\$4,000 \times 15.6455 = \$62,582$$

Yes, if you invest \$4,000/yr for the next 10 years, it will grow to \$62,582. This is greater than the \$50,000 you wanted to have.

4. You want to contribute \$5,000/year to an IRA (Individual Retirement Account) – investing in assets that earn about 8 percent annually. How much will you have in the IRA after 20 years? 40 years?

This is a Future Value of an Annuity problem

FVA Factor (Table 6) for 8% for 20 years = 49.4229

$$\$5,000 \times 49.4229 = \$247,115 \text{ (but you only invested \$100,000 over this time!)}$$

FVA Factor (Table 6) for 8% for 40 years = 279.7810

$$\$5,000 \times 279.7810 = \$1,398,905 \text{ (but you only invested \$200,000 over this time!)}$$

5. The average America family has annual living expenses (food, rent, utilities, etc.) of \$50,000 per year. Let's assume that the annual inflation rate is 3% per year. How much will it cost an average American family to have the same level of living (\$50,000/year) 50 years from now? (50 years is approximately when you will be retiring!)

This is a Future Value of a Lump Sum question

FV Factor (Table 1) for 3% for 50 years = 4.3839

\$50,000 x 4.3839 = \$219,195 (it will cost over 4 times as much for the same level of living – just due to inflation!!)

Time Value of Money Homework Exercise

Use the Time Value of Money tables to answer the following questions. Show your work!

1. You just purchased a house for \$130,000. Similar houses in your area are going up in value at a rate of 5% per year.
 - a. How much will your house be worth at the end of 15 years?

 - b. How much will it be worth at the end of 30 years?

2. Your elderly neighbor just told you that he purchased his first new car for \$1,500 about 50 years ago. That has you wondering how much a new car will cost you when you are older. Car prices today average \$20,000. It appears that car prices increase at a rate of 6% every year. How much will a new car cost 50 years from today?

3. You just won a prize!! The company that sponsored the prize will pay you \$4,000, but you won't get this \$4,000 until 3 years from today. Rather than waiting 3 years to collect this money, you are thinking of selling your rights to this prize to someone else so that you will receive some cash today. You can earn a return of 8% on your money. What is the lowest amount of money that you would sell your rights to this prize?

4. What are the three main reasons that money has a time value?
5. Your church wants to build a new community education center, so they have set a goal of collecting \$250,000 over the next 8 years to pay for the building. They can invest their money in account that earns 5% each year. They hope to collect contributions of \$25,000/year over the next 8 years. Will the church be able to reach their goal? (Assume BGN payments)
6. Your grandparents started investing for your college tuition as soon as you were born. They invested \$2,000/year every year since you were born. Their college investment account earned a return of 7% each year. How much money will be in your college education account after 18 years of contributions? (Assume BGN payments)
7. Use the TVM Calculator spreadsheet to double-check your answers. List the answers to each question that you get from using the spreadsheet:

Question 1: _____

Question 2: _____

Question 3: _____

Question 5: _____

Question 6: _____

Time Value of Money Homework Exercise - KEY

Use the Time Value of Money tables to answer the following questions. Show your work!

1. You just purchased a house for \$130,000. Similar houses in your area are going up in value at a rate of 5% per year.

- a. How much will your house be worth at the end of 15 years?

$$N = 15$$

$$I = 5\%$$

$$PV = \$130,000$$

$$PMT = \$0$$

$$FV = ?? = \$270,257$$

Table 1 – FV of a Lump Sum

Factor for 5%, 15 years = 2.0789

$$FV = \$130,000 \times 2.0789 = \$270,257$$

- b. How much will it be worth at the end of 30 years?

$$N = 30$$

$$I = 5\%$$

$$PV = \$130,000$$

$$PMT = \$0$$

$$FV = ?? = \$561,847$$

Table 1 – FV of a Lump Sum

Factor for 5%, 30 years = 4.3219

$$FV = \$130,000 \times 4.3219 = \$561,847$$

2. Your elderly neighbor just told you that he purchased his first new car for \$1,500 about 50 years ago. That has you wondering how much a new car will cost you when you are older. Car prices today average \$20,000. It appears that car prices increase at a rate of 6% every year. How much will a new car cost 50 years from today?

$$N = 50$$

$$I = 6\%$$

$$PV = \$20,000$$

$$PMT = \$0$$

$$FV = ?? = \$368,404 \text{ is the purchase price for a new car 50 years from now}$$

Table 1 – FV of a Lump Sum

Factor for 6%, 50 years = 18.4202

$$FV = \$20,000 \times 18.4202 = \$368,404$$

3. You just won a prize!! The company that sponsored the prize will pay you \$4,000, but you won't get this \$4,000 until 3 years from today. Rather than waiting 3 years to collect this money, you are thinking of selling your rights to this prize to someone else so that you will receive some cash today. You can earn a return of 8% on your money. What is the lowest amount of money that you would sell your rights to this prize?

$$N = 3$$

$$I = 8\%$$

$$PV = ?? = \$3,175.20 \text{ is the minimum price you would take}$$

$$PMT = \$0$$

$$FV = \$4,000$$

Table 2 – PV of a Lump Sum

Factor for 8%, 3 years = 0.7938

$$PV = \$4,000 \times 0.7938 = \$3,175.20$$

4. What are the three main reasons that money has a time value?

Risk

Inflation

RIO

Opportunity Cost

5. Your church wants to build a new community education center, so they have set a goal of collecting \$250,000 over the next 8 years to pay for the building. They can invest their money in account that earns 5% each year. They hope to collect contributions of \$25,000/year over the next 8 years. Will the church be able to reach their goal? (Assume BGN payments)

N = 8

I = 5%

PV = \$0

PMT = \$25,000

FV = ?? = \$250,665

Table 7 – FV of an Annuity

Factor for 5%, 8 years = 10.0266

FV = \$25,000 x 10.0266 = \$250,665

Yes, they will be able to meet their goal because the FV is greater than the \$250,000 goal.

6. Your grandparents started investing for your college tuition as soon as you were born. They invested \$2,000/year every year since you were born. Their college investment account earned a return of 7% each year. How much money will be in your college education account after 18 years of contributions? (Assume BGN payments)

N = 18

I = 7%

PV = \$0

PMT = \$2,000

FV = ?? = \$72,758

Table 7 – FV of an Annuity

Factor for 7%, 18 years = 36.3790

FV = \$2,000 x 36.3790 = \$72,758

**Your college education account will have \$72,758 after 18 years of contributions by your grandparents.
Thank you, grandparents!**

7. Use the TVM Calculator spreadsheet to double-check your answers. List the answers to each question that you get from using the spreadsheet:

Question 1: **a. \$270,260.66 b. \$561,852.51**

Question 2: **\$368,403.09**

Question 3: **\$3,175.33**

Question 5: **\$250,664.11**

Question 6: **\$72,757.93**

Time Value of Money- Student Driven Activity

Student Driven Learning Activity: Have students complete the in class exercises together as a group with the teacher as the facilitator. Then have the students break into groups and complete the homework exercises together. After completing the exercises have each group come up and solve the exercise for the rest of the class. After completing that have each group come up with 3 scenarios/exercises on their own, make copies and hand out to the remainder of the class to solve. After completing all the exercises the original group will lead the rest of the class through how to come up with the answer to their scenario/exercise.

Lesson 8 – Time Value of Money Take-Home Reading

Stop and think for a moment – what is the most powerful thing on Earth? Depending on whom you ask, you will get a variety of answers. A scientist might answer with “water, or maybe wind, or the atom.” A philosopher might say “time”. A religious person might say “faith.” An engineer will answer with, “leverage.” But someone familiar with financial principles will undoubtedly answer that question with the phrase, “time value of money.” But what exactly is time value of money (TMV)?

The phrase “time value of money” very simply refers to the fact that most people would rather at least some money in their hands today (“cash on the barrelhead”) rather than waiting to possibly receive a larger amount of money in the future. That is, money has a different value depending on the time that you receive it. Ask yourself this question, “Would you rather have \$90 of cash in your hands today or would you prefer to wait 1-2 years to receive \$100?” Most people would rather have \$100 than \$90 because it’s more money. The problem is that you have to wait to receive that \$100. And what can happen during that waiting period?

There are three main reasons that you might prefer to have the \$90 today instead of the \$100 in the future:

- Risk
- Inflation
- Opportunity Cost

An easy way to remember these three factors is the acronym “RIO”, as in Rio Grande. Risk is the easiest to remember – there is a risk that you will not receive the \$100 in the future. The person with whom you made the deal may have left town, or simply forgotten, or possibly he is bankrupt and cannot pay you the \$100. So, would you rather have \$90 in your hands today or wait to maybe receive \$100 in the future? You must think about the risks that are involved.

Inflation is a term that means that prices are increasing over time. Think about food prices. A cartful of groceries might cost \$90 today. But one year from now it might cost \$95. It’s the same groceries, but they cost more. This is called inflation. If you only had \$90 today you could purchase that cart of groceries. But 1 year from now if you had that same \$90 you would not be able to purchase that cart of groceries. This means that \$90 is more valuable to you today than \$90 one year from today – you can buy more with it today because of the rising prices over time.

The last term, “Opportunity Cost” can be a little confusing at first, but it’s a relatively easy concept. “Opportunity” means that you have possibilities for what you can do with that \$90 if you have it in hand today. You can spend it on something (like groceries); you can save it for emergencies; you can use it to pay down one of your loans; you can give it to someone (church, charity, gifts); or you can invest it to try to have more money in the future. These are your “opportunities” if you have the cash in hand today. The “Cost” part of the term indicates that there is a cost for using that \$90 for any of these opportunities. If you spend it, you cannot use it to pay down your debts or invest for the future. If you save it for emergencies, you can’t take advantage of lower prices by spending it today; and so on. In a nutshell, “opportunity cost” is what you are giving up by

using your money. Because you always want to use your money in the best way possible, we consider the opportunity cost to be the “next best use” of the money.

Here’s an example for Opportunity Cost. You just received \$1,000 as a graduation gift from your grandparents. To keep it simple, assume that you have the following options:

- keep it in your savings account where it earns 1% interest each year
- use it to pay down your car loan which has an interest rate of 5%

If you keep the money in your savings account, you will earn a 1% rate of return by the end of the year. But, if you use the money to pay down your car loan you will be saving yourself 5% this year. So, the opportunity cost of keeping the money in your savings account is roughly 5% - what you could have saved yourself by paying down your loan. If you use the money to pay down your loan, the opportunity cost is the 1% that you could have earned in your savings account. Which would you rather do, 1) earn 1% or 2) save 5%? Another way to ask this question is, “which option has the **lowest** opportunity cost?” You always want to use your money (or any asset) so that you have the lowest opportunity cost. That is, you want to use your money so that you give up the least amount possible. An easy way to remember this is that Opportunity Cost is a cost, and you always want to have the lowest costs possible.

Please note – it is hard to put a dollar value or percent return on many of the opportunities that you have for your money. For example, let’s look at two possibilities. Assume that you received \$1,000 from your grandparents. But in the first situation you have no money in your savings account. If you have a financial emergency (car breaks down, computer dies, etc.) you might have to get an emergency loan (possibly at a high interest rate) – and you don’t like to owe money to others. In the second situation you already have \$2,000 in your savings account, enough to cover most of your financial emergencies. This means that you can sleep much easier and you have fewer financial worries. It is hard to put a dollar value on what that “peace of mind” is worth from the first situation to the second situation.

So, RIO – Risk, Inflation, Opportunity Cost – are the main reasons that money is more valuable today than in the future. This is just another way of saying that you’d rather have a dollar in hand today rather than the promise of receiving a dollar in the future. That seems pretty simple. But why is this such a powerful force in the financial arena? The answer is “compound interest.” Compounding is a term that indicates how often the interest that you earn on an investment is converted into principal. When the interest that you earn is converted into principal, your money begins to snowball. You are “earning interest on interest.” Here’s an example – assume that you invest that \$1,000 you received from your grandparents into an account that will pay you 5% interest one time per year (we call this “annual compounding”) at the end of each year. After 1 year your account will be worth \$1,050:

\$1,000 of principal invested into the account
5% Interest rate (rate of return)

Interest earned in the first year = $\$1,000 \times 5\% = \50

Account value = \$1,000 of principal + \$50 of interest = \$1,050

Because you had \$1,000 in your account and then you earned \$50 of interest, your account is now worth \$1,050. Here's where it gets exciting! From now on, the bank will treat that \$50 of interest as principal. That means you will earn interest on the entire \$1,050 this year, not just on the \$1,000 you initially invested. So how much will your account be worth after the second year?

Interest earned in the second year = $(\$1,050) \times 5\% = \52.50

Account value = $\$1,050 + \$52.50 = \$1,102.50$ after the second year

Notice that you earned more interest in the second year ($\$52.50 > \50) because of the compounding. I know, you're saying, "big whoop, it's only \$2.50 more. Who cares?" Here's why you should care – let's leave that money in the account for the next 40 years. If it earns 5% each year your initial \$1,000 will grow to over \$7,000!! (\$7,040 to be exact). Your money increased by 600% over that 40 years, and all you had to do was sit there and watch it grow. If you could have earned an annual return of 10%, your \$1,000 would have grown to more than \$45,250 over the 40-year period. If that's not worth a "big whoop", I don't know what is!

Here's another reason that time value of money is such a powerful force. Let's assume that you invest \$500 each year into an account that will earn a return of 8%, compounded annually (one time per year). After 5 years your account will be worth \$2,933 – you've invested \$2,500 ($\$500/\text{year} \times 5 \text{ years} = \$2,500$), so you have earned \$433 interest over that time. Now assume that you invest \$500/year for the next 50 years. You will have invested \$25,000 of principal over that time, but your account will have grown to over \$286,000 due to compound interest!! Yes, you read that correctly; your \$25,000 grew to over \$286,000 over that 50-year period. And it's all due to compound interest.

If you are good at math, you will see that compound interest grows exponentially each year. If you aren't good at math, think of it this way – think of a jet airplane taking off from the runway. At first it climbs very slowly (like the \$2.50 increase in interest from above). But as it gains some speed it starts to shoot up into the sky (like the \$286,000!). That is how compound interest works – slow growth for the first 10-15 years, and then it really takes off!

There are a lot of different calculations that we can do with time value of money. We can look at what our money in hand today will grow to in the future. Or we can look at how much we would rather have in hand today instead of waiting to receive money in the future. And lots of other different variations. You already know how to calculate loan payments – that is also a time value of money calculation. But let's just focus on three main uses of time value of money:

Future Value (FV) of a Lump Sum

Present Value (PV) of a Lump Sum

Future Value of an Annuity (FVA)

Wait a minute, there are some terms here that we haven't defined yet. Don't worry, here are the definitions:

Future Value (FV) = what the money you have today will be worth in the future

Present Value (PV) = how much money you would rather have today (the present) instead of waiting to receive money sometime in the future

Lump Sum = a one-time investment; money only changes hands one time

Annuity = a stream of constant payments over a period of time (like loan payments)

There are several ways to calculate time value of money problems:

- Time Value of Money tables (just like the loan factor tables)
- Spreadsheets
- Financial calculators
- Time Value of Money formulas

We are going to focus on using the tables and a spreadsheet. For both methods it is helpful to develop a chart of information. This will help you identify the information that you know, and it will also help you determine what you are solving for.

Future Value of a Lump Sum

Like the name says, we use Future Value of a Lump Sum to determine how much the money you invest today (and today only) will be worth in the future. The example of calculating what your \$1,000 investment today (and today only) would grow to after 40 years is a Future Value of a Lump Sum problem. We use Table 1 Future Value of a Lump Sum for these calculations. The tables are set up exactly the same as the annual loan payment table you used in the previous module – find the column with your interest rate (rate of return) and the row with the number of periods to determine the FV factor. The easiest way to learn is to work some problems.

Example 1. George wants to invest \$5,000 in an account that will earn a 6% annual rate of return (interest rate). How much will he have in his account 10 years from now? First, let's build a chart of the information:

N = Number of periods

I = Interest rate

PV = Present Value, or what you are investing today (lump sum)

PMT = Payment, or how much you will be investing or receiving every period (annuity)

FV = Future Value, or what your account will be worth in the future (lump sum)

N = 10 years

I = 6% per year (this needs to be in the same units as N. In this case, both are in "years")

PV = \$5,000 lump sum invested today

PMT = \$0 (George is not making or receiving payments each year other than the interest)

FV = ?? This is what we are solving for

Using Table 1, the FV factor for 6% for 10 years is 1.7908. We calculate the FV of the lump sum by multiplying the PV by the factor:

$$\text{FV of Lump Sum} = \$5,000 \times 1.7908 = \$8,954$$

George's \$5,000 investment will grow to \$8,954. He will earn interest worth \$3,954 (\$8,954 - \$5,000) over this 10-year period.

To solve this problem using the spreadsheet, open the Lesson 8 TVM Calculator spreadsheet and click on the "FV Calculator" worksheet (at the bottom of the screen). Then, you simply enter the information from your chart into the spreadsheet.

Number of Years (N) = 10

Annual Rate (I) = 6%

Present Value (PV Lump Sum) = \$5,000

Payment to be Made (PMT or Annuity) = \$0

The END or BGN (0/1) is not needed for lump sum calculations; you only need to worry about this for PMT problems. END means that the payments are made at the end of the period. BGN means that the payments are made at the beginning of the period (starting today).

When you enter the information into the spreadsheet you will see the Future Value is automatically calculated. The result is \$8,954.24. The spreadsheet will give you more accurate answers than the tables because the tables round off the factors to 4 decimal places; the spreadsheet does not round the factors at all.

The nice part of using the spreadsheet is that you can change one factor at a time to see how your answer will change. Change N to 40 years to see what George's account will be worth at the end of 40 years. Wow! It'll be worth \$51,428.59

Example 2. Let's look at the impact of inflation. Current gasoline prices are around \$2.00/gal. What will the price of gas be in 15 years if prices increase (inflate) at a rate of 4% each year?

N = 15 years

I = 4% per year

PV = \$2.00 (current price of gas)

PMT = \$0 (we aren't making any other payments)

FV = ??

Using Table 1, we can see the FV factor for 4% and 15 years is 1.8009. So we can estimate the future gas price to be:

$$\text{FV of Gas Price} = \$2.00/\text{gal} \times 1.8009 = \$3.60/\text{gal in 15 years}$$

Present Value of a Lump Sum

This is the opposite of FV of a Lump Sum. The only difference is that we will use Table 2 or the “PV Calculator” of the spreadsheet. PV of a Lump Sum calculates how much money you would rather have in hand today instead of waiting to receive money in the future. Another way to use PV of a lump sum is to determine how much you need to invest today to reach a certain goal (for example, a down payment on a house). This is also an excellent way of determining the maximum you should be willing to pay for something today.

Example 3. You want to have \$20,000 in an account for a down payment on a house at the end of 10 years. Your account earns 5% annually. How much do you need to invest today to reach your goal of \$20,000 after 10 years?

N = 10 years

I = 5% per year (the annual inflation rate)

PV = ?? (this is what we are solving for)

PMT = \$0 (we aren't making any other payments)

FV = \$20,000 (what we want to have)

Using Table 2 we see that the PV factor for 5% for 10 years is 0.6139. To calculate how much we have to invest today to reach our goal, simply multiply the FV by the factor:

$$\text{PV to Invest Today} = \$20,000 \times 0.6139 = \$12,278$$

If you were to invest \$12,278 today, it would grow to \$20,000 after 10 years.

Example 4. Mary thinks that a certain piece of land will be worth \$10,000/acre at the end of 5 years. She wants to purchase the land, but only if she can earn a profit (return) of 8% per year. What is the maximum that Mary can afford to pay for this land today?

N = 5 years

I = 8% per year (the annual rate of return she wants to earn)

PV = ??

PMT = \$0

FV = \$10,000 (what Mary expects the land to be worth)

Using Table 2, the factor for 8% for 5 years is 0.6806. This means that the maximum price that Mary can afford to pay for the land is:

$$\text{Maximum Purchase Price} = \$10,000 \times 0.6806 = \$6,806/\text{acre}$$

Mary can earn an 8% rate of return on this land if she pays less than \$6,806/acre. Pretty neat, huh?! Now, use the spreadsheet to determine the maximum purchase price if Mary wants to earn a 5% rate of return.

You can always double-check your answers in time value of money problems by working backwards. For example, if you are working a Present Value question, you can use Future Value to check your answer (and the other way around!). Let's do this for Mary's example. We have calculated that the maximum purchase price (the PV) is \$6,806/acre if she wants to earn an 8% return. To double-check this answer, let's use the \$6,806 as the PV and solve for the FV.

$$N = 5$$

$$I = 8\%$$

$$PV = \$6,806 \text{ (the PV you just calculated)}$$

$$PMT = \$0$$

$$FV = ?? \text{ (your answer should be very close to \$10,000, the FV from the original situation)}$$

The FV factor for 8% for 5 years is 1.4693. So the future value of the property should be:

$$FV = \$6,806 \times 1.4693 = \$10,000 \quad \text{It works!!}$$

Future Value of an Annuity

An annuity is a constant payment over a certain number of years. A great example would be investing money for a down payment on a house, or for your retirement. The difference between annuities (payments) and lump sums is that with annuities you are making (or receiving) a payment every year; with lump sums you are only investing money one time. The process of calculating the Future Value of an Annuity (FVA) is exactly the same as above. Simply multiply the annual payment you are making by the FVA factor. Here are some examples:

Example 5. Greta's business has been successful, so she has money that she wants to invest for her retirement. She thinks she can invest \$5,000/year for the next 30 years. Her investment should earn an annual return of 7%. How much money will Greta have in her retirement account at the end of 30 years?

$$N = 30 \text{ years}$$

$$I = 7\% \text{ per year}$$

$$PV = \$0 \text{ (there is no lump sum, only payments)}$$

$$PMT = \$5,000 \text{ per year}$$

$$FV = ??$$

Use Table 6 Future Value of Annuity Factors to get the correct factor. For 7% over 30 years the factor is 101.0730. So, if Greta invests \$5,000/year for the next 30 years her retirement account will have:

$$FVA = \$5,000 \times 101.0730 = \$505,365$$

This can't be correct, can it? She only invested \$150,000 (\$5,000/year x 30 years). How can it grow to over \$500,000? The answer is "compound interest". And an important thing for you to remember is that "time is on your side." The earlier you can start investing for a goal, the less money you actually need to invest!

Here's a good place to talk about the END and BGN cells in the TVM Calculator spreadsheet. END indicates that you wait until the end of the period to make your payments. Rather than making the first payment today you will wait until the end of the year to make that first payment. BGN (Beginning) indicates that you will start making payments today, and at the beginning of every period. You will end up with more money over time if you make your payments at the beginning of each period because you will have one more period of compound interest on your side. Just so you know, the Future Value of Annuity Factor table (Table 6) assumes that all payments are made at the beginning of each period.

Use the spreadsheet to see how big of a difference it will make if Greta makes either END or BGN payments. Here's how you do it. Let's start with BGN payments:

N = 30 years
 I = 7% per year
 PV = \$0
 PMT = \$5,000 per year
 END or BGN = 1 (use 1 for BGN payments; use 0 for END payments)
 FV = \$505,365.21 (the same answer we got using factor)

To look at END payments, simply change the END or BGN cell to 0 (zero).

N = 30 years
 I = 7% per year
 PV = \$0
 PMT = \$5,000 per year
 END or BGN = 0 (use 1 for BGN payments; use 0 for END payments)
 FV = \$472,303.93 (the same answer we got using factor)

Now you can see that Greta will have \$472,303.93 in her retirement account at the end of 30 years – a difference of more than \$33,000 just because Greta waited one year to start investing! Do you see why it is important to start investing today rather than waiting?!

There are lots of other calculations we can do with Time Value of Money, but these examples (along with calculating loan payments) are the most common ones. TVM is a powerful concept that will come in useful to a business manager in many ways!

Lesson 9 - Financial Analysis – Lecture Notes

Bell Ringer: Going back to our question from the last lesson, Uncle Joe is giving you \$100 for your birthday. Would you rather have that money tomorrow or would you rather wait, let Uncle Joe invest it and get it one year from now? Now that you know about Future Value and Present Value of money what are factors you need to consider when answering this question?

A. Section 1 - Review Time Value of Money

1. Future Value of a Lump Sum
2. Present Value of a Lump Sum
3. Future Value of an Annuity (stream of cash flows)

B. Section 2 - What is Financial Analysis?

1. Managers and lenders should understand the strengths and weaknesses of the business. Most managers focus on the production aspect of the business (growing the crop, producing the product, raising the cattle, etc.) and end up ignoring the “financial” aspects of the business. Good managers realize that the production aspects and the financial aspects go hand-in-hand – you need to pay close attention to both!
2. Financial analysis uses the tools we’ve discussed (balance sheet, income statement, enterprise budgets, etc.) to make the business better/stronger. Financial analysis helps the manager identify methods of improving the overall business – through changes in the production aspects and/or through financial moves
3. 2 main Types of Financial Analysis
 - a. Ratio analysis
 - We look at key figures (net income, RATC, etc.) and ratios
 - Compare those figures and ratios to “benchmarks” to see if they are above average, average, or below average
 - “Benchmarks” are basically the goals that a manager should shoot for
 - Trend Analysis
 - With trend analysis we look at how the individual figures and ratios are changing over time. Are they improving or getting worse.
 - Ratio and trend analysis help a manager identify potential problem areas (weaknesses) in the business. They also help the manager identify the strengths of the business
 - b. For a basic financial analysis we look at 4 main areas: (refer to lesson 2, 3, 4 as a refresher)
 - Liquidity
 - Liquidity refers to the ability of the business to pay its bills that are due in the near future without having to disrupt the business (by selling productive assets)
 - Solvency
 - Solvency refers to the business’ ability to cover all of its liabilities (debts) with its assets. If the liabilities are greater than the assets, we say that the business is “insolvent”.
 - Profitability
 - Profitability refers to whether the business is “making money” – that is, is the business generating enough revenues to cover its expenses.
 - Financial efficiency
 - Financial efficiency examines how well the business can control its costs and how well it is using its assets

C. Section 3 - Liquidity Analysis

1. We use the balance sheet to analyze the liquidity of a business
2. Because we are looking to see if the business can cover all of its liabilities for the near future without disrupting the business, we just look at the Current Assets and the Current Liabilities
3. Current Ratio is a common ratio to measure liquidity
 - $\text{Current Ratio} = \text{Current Assets} / \text{Current Liabilities}$
 - A Current Ratio of 3 says "I have \$3 in current assets for every \$1 of liabilities due within the next year"
 - At a minimum, we like to see the Current Ratio greater than 1
 - If it is less than 1, that means we do not have enough current assets (that we can turn into cash) to pay all of the liabilities due within 1 year.
 - Ideally, we like to see the Current Ratio greater than 2
 - This would indicate that we have at least two times as much Current Assets available to pay our Current Liabilities
4. For the Example balance sheet (from lesson 3 exercise on Balance Sheets)
 - The Current Ratio for August 30, 2016 is:

Current Assets / Current Liabilities (have the students calculate this ratio)

$\$63,800 / \$29,500 = 2.2$ (ask the students if this is poor, okay, or strong)

This is greater than 2, so we would consider it to be strong – this firm has good liquidity. This is a strength of the business

- The Current Ratio for August 30, 2017 is:

$\$69,200 / \$37,700 = 1.8$ (have the students calculate this ratio)

The Current Ratio is greater than zero, but it is now less than 2. This means that the business' liquidity is "okay, but not as strong as it was in 2015".

- Trend analysis looks at the change from 2016 to 2017. The Current Ratio decreased over this time. (Ask the students if this is a good sign or a bad sign). This is not a good sign. That indicates a potential problem for the business. The manager should look at ways to improve the liquidity of the business.

- What are possible causes of this decrease?
 - Increase in the operating loan – they had to borrow more money
 - Increased accrued interest – due to the larger operating loan
 - increased wages payable
 - manager should ask, "why did wages payable increase"

D. Section 4 - Solvency

1. We use the Balance Sheet to measure Solvency of a business
 - a. Solvency looks at whether the business has enough assets to repay all of its liabilities
 - So we look at Total Assets and Total Liabilities
 - b. We use the Debt/Asset ("Debt to Asset") Ratio to measure Solvency

- c. Debt/Asset Ratio = Total Liabilities / Total Assets
 - We like to see this ratio less than 70% for a new (start-up) business
 - We like to see it less than 40% for an established business
 - We like to see this ratio getting smaller over time
 - The lower it is, the less risk the business faces
 - A high Debt/Asset Ratio means the firm is:
 - Less Solvent
 - In a much riskier position
- d. A Debt/Asset Ratio of 40% means that you borrowed 40% of the purchase price of your assets. Another way to look at this ratio is that your lenders “own” 40% of your assets and you own the remaining 60% (you have paid for 60% out of pocket)

- For the example:

- Have the students calculate the Debt/Asset Ratio for August 30, 2016 and 2017:

2016: $\$274,500 / \$403,800 = 68\%$

2017: $\$268,700 / \$409,200 = 66\%$

Have the students rate these ratios as poor, okay, or strong. Assume it is a new, start-up business.

Because 70% is the highest we want to see this ratio, it can be rated as either “poor” or “okay” – it is fairly high, which means the firm is in a risky solvency position

Have the students use Trend Analysis and look at how the Debt/Asset Ratio has changed over the past year. Has it improved or gotten worse?

The Debt/Asset Ratio has improved over the past year – this is a good sign!

E. Section 5 - Profitability

1. Profitability analysis measures whether a business is making enough revenues to pay all of its expenses. We can measure profitability using the enterprise budgets and income statements – looking at:
 - Return Above Variable (Operating) Costs or Gross Margin
 - Return Above Total Costs or Net Income
2. We like to see these numbers greater than zero, as discussed in earlier lessons
3. We need to use the Balance Sheet and the Income Statement for profitability analysis
4. But it is useful to compare these numbers to the total amount of assets that you are using to operate the business. We call this the Rate of Return on Assets, or ROA. There are several formulas for calculating ROA – we will stick with the easiest:
5. $ROA = (\text{Net Income} + \text{Interest Expense}) / \text{Total Assets}$
 - ROA tells us how much profits we are making in relation to the assets we use in the business. Why do we do this? Consider this – 2 businesses each earn a Net Income of \$100,000 for the year. Business A uses \$500,000 of assets. Business B uses \$1 million of assets. Which business is more profitable? They both earn \$100,000, but let’s look at their ROA:

Business A's ROA = $\$100,000 / \$500,000 = 20\%$

Business B's ROA = $\$100,000 / \$1,000,000 = 10\%$

From this analysis, Business A is twice as profitable as Business B – even though they both earned \$100,000 of profits. Business A earned the same profits using less assets – that means less investment was necessary and lower overhead expenses than for Business B.

6. How to interpret ROA:

- If a business' ROA is 10%, we say "that business earned \$0.10 of profit for every \$1 of assets it used".
- We like to see ROA greater than zero – that means we made profits!
- We really like to see ROA greater than the interest rate on the liabilities of the business
 - If we borrow money at 5% APR and we earn an ROA of less than 5%, that means we aren't earning enough profits to pay the interest on the loans.
 - If we borrow money at 5% APR and earn an ROA of 8%, that means we have profits left over AFTER we have paid our interest
 - Remember the phrase, "if it costs more than it's worth, don't do it"? If the interest rate is higher than the ROA, it costs more than it is worth!
- For ROA, the higher the number, the better!

Have students calculate the ROA for 2016 and 2017:

$ROA = (\text{Net Income} + \text{Interest Expense}) / \text{Total Assets}$

2016: $(\$6,000 + \$8,000) / \$403,800 = 3.5\%$

2017: $(\$20,000 + \$7,000) / \$409,200 = 6.6\%$ (rounded)

Assume the APR on the business loans is 6% APR. Have the students rate the ROA as poor, okay, or strong.

For 2016: Poor – the ROA is less than the APR. You might say that it is "okay" because it is greater than zero, but it is not as high as the APR.

For 2017: Strong – the ROA is greater than the APR.

For Trend Analysis – the ROA increased from 2016 to 2017 – that means the profitability of the business improved over the year – good sign!

F. Section 6 - Financial Efficiency

1. There are many ways to measure the financial efficiency of a business. We will focus on how good they are at controlling their costs. The better a manager is at cost control, the greater the opportunity for profits!
2. We will use the Operating Expense/Receipt Ratio to measure financial efficiency
 - We use the Income Statement for this analysis
3. $\text{Op. Expense/Receipt Ratio} = (\text{Total Expenses} - \text{Interest} - \text{Depreciation}) / \text{Total Revenues}$

4. We like to see this ratio less than 75%
 - An Operating Expense/Receipt Ratio of 75% indicates that the business spends \$0.75 (in operating and overhead expenses) to generate \$1 of revenue
 - The lower this ratio, the better
 - We do NOT want to see it greater than 100%

For the Example: Calculate the Operating Expense/Receipt Ratio for 2016 and 2017:

Op. Expense/Receipt Ratio = (Total Expenses – Interest – Depreciation) / Total Revenues

2016: $(\$25,000 + \$69,000 - \$8,000 - \$5,000) / \$100,000 = 81\%$

2017: $(\$40,000 + \$75,000 - \$7,000 - \$5,000) / \$135,000 = 76\%$ (rounded)

Have the students rate each ratio and do a trend analysis:

2016: The Operating Expense/Receipt Ratio above 75% - this is poor. The manager should find ways of reducing the expenses without hurting the revenues

2017: The ratio is just above 75% (okay/poor).

Trend: The ratio decreased from 81% to 76%, this shows an improvement in the business. Good job by the manager! But he/she should find other ways to improve this ratio.

G. Section 7 - Summary

1. Let's look at all of the areas of analysis and determine the business' strengths and weaknesses:
2. For the example floral business:

Liquidity:	Okay – has been decreasing – potential problem	~ strength
Solvency:	Poor/Okay for new business – has been improving	~ weakness
Profitability:	Okay – has been improving	~ weakness
Financial Efficiency:	Okay – but has been improving	~ weakness

Although this firm “made money” (had profits), it has some financial problems that the manager must address. In this case, the financial efficiency appears to be the biggest weakness – this is where the manager should focus his/her attention.

- If he/she can improve the Operating Expense Receipt ratio by reducing unnecessary costs or improving revenues, that will improve profitability even more. It should also improve the liquidity (more profits = more money available = higher liquidity).

3. Lenders look at this same analysis when they are reviewing a loan application. They will identify the strengths and weaknesses of the business in the same manner. If the manager knows what the strengths and weaknesses are ahead of time, he/she can:

- work to improve those weaknesses (improve the overall business!)
- address the lender's concerns about those weaknesses

Materials: **PowerPoint on Financial Analysis**
 Note Organizer
 In-class Exercise and Key
 Homework Exercise and Key
 Take Home Reading

FINANCIAL ANALYSIS



What is Financial Analysis?

- Using financial tools:
 - Enterprise budgets
 - Balance sheets
 - Income statements
- To identify a business' strengths and weaknesses
 - Helps the manager improve the business



Why is it Necessary?

- Financial Analysis:
 - Helps a manager take actions to improve the business
 - Identifies potential problems before they occur
 - Helps lenders analyze loan applications for strengths, weaknesses, and risks
 - Helps the manager understand the business more fully



Types of Financial Analysis

- Ratio Analysis
 - Use ratios and figures (net income, RAVC, etc.)
 - Compare those ratios and figures to "benchmarks"
 - Benchmarks are "goals" or "standards"
- Trend Analysis
 - Look at changes in ratios and figures over time
 - Are they improving or getting worse?



Main Areas of Analysis

- Liquidity
 - Having enough current assets to cover your current liabilities
- Solvency
 - Having enough total assets to cover your total liabilities
- Profitability
 - "Are we making money above our expenses?"
- Financial Efficiency
 - How well are we controlling our costs?



Liquidity Analysis

- Use the Balance Sheet
- Current Ratio is the main measure
 - $\text{Current Ratio} = \text{Current Assets} / \text{Current Liabilities}$
- Like to see:
 - A minimum ratio of 1.0
 - Greater than 2.0 is strong
- Interpretation:
 - A Current Ratio of 2 means that you have \$2 of current assets for every \$1 of liabilities that are due within the next year (current liabilities)



Solvency Analysis

- Use the Balance Sheet
- Debt/Asset Ratio is the main measure
 - $\text{Debt/Asset Ratio} = \text{Total Liabilities} / \text{Total Assets}$
- Like to see:
 - Less than 40% for an existing business
 - Less than 70% for a new or start-up business
 - Decreasing over time
 - The lower it is, the less risk you face



Solvency Analysis

- Interpretation:
 - A Debt/Asset Ratio of 40% shows that you owe your lenders 40% of the value of your assets
 - Or - that you have paid for 60% of your assets
 - Another way to look at it:
 - Your lenders "own" 40% of your assets
 - You own 60% of your assets



Profitability Analysis

- Use the Income Statement or Enterprise Budget
 - Gross Margin or Return Above Variable Costs
 - Net Income or Return Above Total Costs
- Also need the Balance Sheet
- Main ratio is Rate of Return on Assets (ROA)
 - $\text{ROA} = (\text{Net Income} + \text{Interest}) / \text{Total Assets}$



Profitability Analysis

- Like to see:
 - ROA > 0% at a minimum
 - ROA > interest rate (APR) on your loans
 - ROA > 8% is strong
 - Growing over time
 - The higher, the more profitable your business

- Interpretation:
 - An ROA of 10% means that you earned \$0.10 of profit for every \$1 of asset used in your business.



Financial Efficiency Analysis

- We're just focusing on cost control here
- Use the Income Statement
- Operating Expense/Receipt Ratio
 - $\text{Op. Exp/Rec} = (\text{Total Exp.} - \text{Int.} - \text{Dep.}) / \text{Total Revenue}$
- Like to see:
 - Less than 75%
- Interpretation:
 - A ratio of 75% means that the business spends \$0.75 in expenses to generate \$1 of revenue



Summary

- Look at your ratings for each area

Area	Rating	Strength or Weakness?
Liquidity	Strong/Okay	→ Strength
Solvency	Poor/Okay	→ Weakness
Profitability	Poor/Okay	→ Weakness
Financial Efficiency	Poor/Okay	→ Weakness



Summary

- Now the manager can see what areas need to be improved!
- Main ways to improve a business:
 - Reduce the top 5 expenses
 - Without hurting production
 - Increase revenues
 - More units produced & sold
 - Different price
 - Get rid of unneeded or un-used assets



Summary

- A manager must look at the financial and the production aspects of the business
 - They are directly related!!
 - Too often the financial aspects are ignored
- Lenders use this same analysis to review loan applications
 - Managers should know their own strengths and weaknesses BEFORE meeting with the lender!



Financial Analysis- Notes Organizer

What is Financial Analysis?

- Using financial tools:
 - Enterprise budgets
 - _____
 - Income statements
- To identify a business' strengths and weaknesses
 - Helps the manager improve the business

Why is it Necessary?

- Financial Analysis:
 - Helps a manager take actions to improve the business
 - Identifies potential problems before they occur
 - Helps lenders analyze loan applications for _____
 - Helps the manager understand the business more fully

Types of Financial Analysis

- _____
 - Use ratios and figures (net income, RAVC, etc.)
 - Compare those ratios and figures to "benchmarks"
 - Benchmarks are "goals" or "standards"
- Trend Analysis
 - Look at changes in ratios and figures over time
 - _____

Main Areas of Analysis

- Liquidity
 - Having enough current assets to cover your current liabilities
- _____
 - Having enough total assets to cover your total liabilities
- Profitability
 - "Are we making money above our expenses?"
- _____
 - How well are we controlling our costs?

Liquidity Analysis

- Use the Balance Sheet
- Current Ratio is the main measure
 - $\text{Current Ratio} = \text{Current Assets} / \text{Current Liabilities}$
- Like to see:
 - _____
 - Greater than 2.0 is strong
- Interpretation:
 - A Current Ratio of 2 means that you have \$2 of current assets for every \$1 of liabilities that are due within the next year (current liabilities)

Solvency Analysis

- Use the Balance Sheet
- Debt/Asset Ratio is the main measure
 - $\text{Debt/Asset Ratio} = \text{Total Liabilities} / \text{Total Assets}$
- Like to see:
 - Less than 40% for an existing business
 - Less than 70% for a new or start-up business
 - _____
 - The lower it is, the less risk you face
- Interpretation:
 - A Debt/Asset Ratio of 40% shows that you owe your lenders 40% of the value of your assets
 - Or – _____
 - Another way to look at it:
 - Your lenders “own” 40% of your assets
 - You own 60% of your assets

Profitability Analysis

- Use the Income Statement or Enterprise Budget
 - _____ or Return Above Variable Costs
 - Net income _____ or Return Above Total Costs
- _____
- Main ratio is Rate of Return on Assets (ROA)
 - $\text{ROA} = (\text{Net Income} + \text{Interest}) / \text{_____}$
- Like to see:
 - $\text{ROA} > 0\%$ at a minimum
 - $\text{ROA} > \text{interest rate (APR)}$ on your loans
 - $\text{ROA} > 8\%$ is strong

- Growing over time
 - The higher, the more profitable your business
- Interpretation:
 - An ROA of 10% means that you earned \$0.10 of profit for every \$1 of asset used in your business.

Financial Efficiency Analysis

- We're just focusing on cost control here
- _____
- Operating Expense/Receipt Ratio
 - $\text{Op. Exp/Rec} = (\text{Total Exp.} - \text{Int.} - \text{Dep.}) / \text{Total Revenue}$
- Like to see:
 - _____
- Interpretation:
 - A ratio of 75% means that the business spends \$0.75 in expenses to generate \$1 of revenue

Summary

- Look at your ratings for each area
- For the Floral Shop example:

Area	Rating	Strength or Weakness?
Liquidity	Strong/Okay	~ Strength
Solvency	Poor/Okay	~ Weakness
Profitability	Poor/Okay	~ Weakness
Financial Efficiency	Poor/Okay	~ Weakness

- Now the manager can see what areas need to be improved!
- Main ways to improve a business:
 - _____
 - Without hurting production
 - Increase revenues
 - More units produced & sold
 - _____
 - Get rid of unneeded or un-used assets

- A manager must look at the financial and the production aspects of the business
 - _____
 - Too often the financial aspects are ignored
- Lenders use this same analysis to review loan applications
 - Managers should know their own strengths and weaknesses _____ meeting with the lender!

Financial Analysis – In-Class Exercise

Floral Business Balance Sheet

As of: August 30

Assets			Liabilities		
	2022	2023		2022	2023
Current Assets			Current Liabilities		
<u>Cut Flowers</u>	<u>\$800</u>	<u>\$1,200</u>	<u>Operating Loan</u>	<u>\$20,000</u>	<u>\$25,000</u>
<u>Cash</u>	<u>\$3,000</u>	<u>\$5,000</u>	<u>Wages Payable</u>	<u>\$5,000</u>	<u>\$7,500</u>
<u>Seed & Fertilizer inventory</u>	<u>\$25,000</u>	<u>\$23,000</u>	<u>Accrued Interest</u>	<u>\$4,500</u>	<u>\$5,200</u>
<u>Accounts Receivable</u>	<u>\$35,000</u>	<u>\$40,000</u>			
Total Current Assets	<u>\$63,800</u>	<u>\$69,200</u>	Total Current Liabilities	<u>\$29,500</u>	<u>\$37,700</u>
Non-Current Assets			Non-Current Liabilities		
<u>Greenhouse, Land, Bldings</u>	<u>\$265,000</u>	<u>\$265,000</u>	<u>Mortgage Remainin</u>	<u>\$200,000</u>	<u>\$193,000</u>
<u>Equipment</u>	<u>\$75,000</u>	<u>\$75,000</u>	<u>Equipment Loans Re</u>	<u>\$45,000</u>	<u>\$38,000</u>
Total Non-Current Assets	<u>\$340,000</u>	<u>\$340,000</u>	Total Non-Current Liabili	<u>\$245,000</u>	<u>\$231,000</u>
			Total Liabilities	<u>\$274,500</u>	<u>\$268,700</u>
			Net Worth (Owners Equi	<u>\$129,300</u>	<u>\$140,500</u>
			(Total Assets - Total Liabilities)		
Total Assets	<u>\$403,800</u>	<u>\$409,200</u>	Total Liabilities & Net W	<u>\$403,800</u>	<u>\$409,200</u>
	2022	2023			
Current Ratio					
(Current Assets/Current Liabilities)					
Debt/Asset Ratio					
(Total Liabilities/Total Assets)					

Income Statement Floral Business

For the Years Ending December 31

	2022	2023
Revenues		
Cut Flowers	\$30,000	\$40,000
Arrangements	\$70,000	\$95,000
Total Revenues	\$100,000	\$135,000
Cost of Goods Sold:	\$25,000	\$40,000
Gross Margin	\$75,000	\$95,000
Overhead Expenses:		
Administrative	\$10,000	\$10,000
Labor (wages)	\$30,000	\$35,000
Rent	\$12,000	\$12,000
Interest	\$8,000	\$7,000
Depreciation	\$5,000	\$5,000
Other	\$4,000	\$6,000
Total Overhead Expenses	\$69,000	\$75,000
Total Expenses	\$94,000	\$115,000
Net Income	\$6,000	\$20,000

	2022	2023
Rate of Return on Assets (ROA)	_____	_____
(Net Income + Interest Expense)/Total Assets		
Operating Expense/Receipt	_____	_____
(Total Expenses - Interest - Depreciation)/Total Revenues		

Financial Analysis – In-Class Exercise (KEY)

Floral Business Balance Sheet

As of: August 30

Assets			Liabilities		
	2022	2023		2022	2023
Current Assets			Current Liabilities		
Cut Flowers	\$800	\$1,200	Operating Loan	\$20,000	\$25,000
Cash	\$3,000	\$5,000	Wages Payable	\$5,000	\$7,500
Seed & Fertilizer inventory	\$25,000	\$23,000	Accrued Interest	\$4,500	\$5,200
Accounts Receivable	\$35,000	\$40,000			
Total Current Assets	\$63,800	\$69,200	Total Current Liabilities	\$29,500	\$37,700
Non-Current Assets			Non-Current Liabilities		
Greenhouse, Land, Bldings	\$265,000	\$265,000	Mortgage Remainin	\$200,000	\$193,000
Equipment	\$75,000	\$75,000	Equipment Loans Re	\$45,000	\$38,000
Total Non-Current Assets	\$340,000	\$340,000	Total Non-Current Liab	\$245,000	\$231,000
			Total Liabilities	\$274,500	\$268,700
			Net Worth (Owners Eq	\$129,300	\$140,500
			(Total Assets - Total Liabilities)		
Total Assets	\$403,800	\$409,200	Total Liabilities & Net W	\$403,800	\$409,200
	2022	2023			
Current Ratio	<u>2.2</u>	<u>1.8</u>			
(Current Assets/Current Liabilities)					
Debt/Asset Ratio	<u>68%</u>	<u>66%</u>			
(Total Liabilities/Total Assets)					

Income Statement Floral Business

For the Years Ending December 31

	2022	2023
Revenues		
Cut Flowers	\$30,000	\$40,000
Arrangements	\$70,000	\$95,000
Total Revenues	\$100,000	\$135,000
Cost of Goods Sold:	\$25,000	\$40,000
Gross Margin	\$75,000	\$95,000
Overhead Expenses:		
Administrative	\$10,000	\$10,000
Labor (wages)	\$30,000	\$35,000
Rent	\$12,000	\$12,000
Interest	\$8,000	\$7,000
Depreciation	\$5,000	\$5,000
Other	\$4,000	\$6,000
Total Overhead Expenses	\$69,000	\$75,000
Total Expenses	\$94,000	\$115,000
Net Income	\$6,000	\$20,000

	2022	2023
Rate of Return on Assets (ROI)	3.5%	6.6%
(Net Income + Interest Expense)/Total Assets		
Operating Expense/Receipt	81.0%	76.3%
(Total Expenses - Interest - Depreciation)/Total Revenues		

Financial Analysis - Homework

Use the information on the attached financial statements to identify the strengths and weaknesses of this restaurant business. Calculate the main financial ratios on each balance sheet and income statement. Compare the ratios to the appropriate benchmark, and look at the trend in ratios over the past 3 years.

Restaurant Business

	2020		2021		2022	
	Ratio	Rating	Ratio	Rating	Ratio	Rating
Liquidity (Current Ratio)						
Solvency (Debt/Asset)						
Profitability (ROA)						
Financial Efficiency (Op. Exp/Rec)						

How would you rate this restaurant's overall financial condition?

Liquidity

Solvency

Profitability

Financial Efficiency

Overall

Restaurant Balance Sheet

As of: August 30

Assets	2020	2021	2022
Current Assets			
<u>Cash</u>	<u>\$10,000</u>	<u>\$28,000</u>	<u>\$25,000</u>
<u>Food & Drink Inventory</u>	<u>\$75,000</u>	<u>\$68,000</u>	<u>\$70,000</u>
<u>Supplies</u>	<u>\$25,000</u>	<u>\$23,000</u>	<u>\$26,000</u>
<u>Accounts Receivable</u>	<u>\$15,000</u>	<u>\$14,000</u>	<u>\$12,000</u>
Total Current Assets	<u>\$125,000</u>	<u>\$133,000</u>	<u>\$133,000</u>
Non-Current Assets			
<u>Building & facilities</u>	<u>\$750,000</u>	<u>\$750,000</u>	<u>\$750,000</u>
<u>Equipment</u>	<u>\$325,000</u>	<u>\$320,000</u>	<u>\$315,000</u>
Total Non-Current Assets	<u>\$1,075,000</u>	<u>\$1,070,000</u>	<u>\$1,065,000</u>
Total Assets	<u><u>\$1,200,000</u></u>	<u><u>\$1,203,000</u></u>	<u><u>\$1,198,000</u></u>

Liabilities

Current Liabilities			
<u>Operating Loan</u>	<u>\$60,000</u>	<u>\$50,000</u>	<u>\$55,000</u>
<u>Wages Payable</u>	<u>\$12,000</u>	<u>\$14,000</u>	<u>\$15,000</u>
<u>Accrued Interest</u>	<u>\$7,500</u>	<u>\$5,200</u>	<u>\$6,300</u>
Total Current Liabilities	<u>\$79,500</u>	<u>\$69,200</u>	<u>\$76,300</u>
Non-Current Liabilities			
<u>Mortgage Remaining</u>	<u>\$350,000</u>	<u>\$294,000</u>	<u>\$225,000</u>
<u>Equipment Loans Remaining</u>	<u>\$75,000</u>	<u>\$48,000</u>	<u>\$22,000</u>
Total Non-Current Liabilities	<u>\$425,000</u>	<u>\$342,000</u>	<u>\$247,000</u>
Total Liabilities	<u>\$504,500</u>	<u>\$411,200</u>	<u>\$323,300</u>
Net Worth (Owners Equity)	<u>\$695,500</u>	<u>\$791,800</u>	<u>\$874,700</u>
(Total Assets - Total Liabilities)			
Total Liabilities & Net Worth	<u><u>\$1,200,000</u></u>	<u><u>\$1,203,000</u></u>	<u><u>\$1,198,000</u></u>

	2020	2021	2022
Current Ratio	<u> </u>	<u> </u>	<u> </u>
(Current Assets/Current Liabilities)			
Debt/Asset Ratio	<u> </u>	<u> </u>	<u> </u>
(Total Liabilities/Total Assets)			

Income Statement

Restaurant

For the Years Ending December 31

	2020	2021	2022
Revenues			
Food Sales	\$450,000	\$550,000	\$575,000
Beverage Sales	\$240,000	\$270,000	\$265,000
Total Revenues	\$690,000	\$820,000	\$840,000
Cost of Goods Sold:	\$425,000	\$435,000	\$440,000
Gross Margin	\$265,000	\$385,000	\$400,000
Overhead Expenses:			
Administrative	\$25,000	\$35,000	\$35,000
Labor (wages)	\$80,000	\$82,500	\$85,000
Rent	\$40,000	\$45,000	\$45,000
Interest	\$22,000	\$20,000	\$18,000
Depreciation	\$15,000	\$15,000	\$15,000
Other	\$10,000	\$12,000	\$9,000
Total Overhead Expenses	\$192,000	\$209,500	\$207,000
Total Expenses	\$617,000	\$644,500	\$647,000
Net Income	\$73,000	\$175,500	\$193,000

	2020	2021	2022
Rate of Return on Assets (ROA)			
(Net Income + Interest Expense)/Total Assets			
Operating Expense/Receipt			
(Total Expenses - Interest - Depreciation)/Total Revenues			

Financial Analysis – Homework (KEY)

Restaurant Balance Sheet

As of: August 30

Assets	2020	2021	2022		2020	2021	2022
Current Assets							
<u>Cash</u>	<u>\$10,000</u>	<u>\$28,000</u>	<u>\$25,000</u>	Current Ratio	<u>1.6</u>	<u>1.9</u>	<u>1.7</u>
<u>Food & Drink Inventory</u>	<u>\$75,000</u>	<u>\$68,000</u>	<u>\$70,000</u>	(Current Assets/Current Liabilities)			
<u>Supplies</u>	<u>\$25,000</u>	<u>\$23,000</u>	<u>\$26,000</u>	Debt/Asset Ratio	<u>42%</u>	<u>34%</u>	<u>27%</u>
<u>Accounts Receivable</u>	<u>\$15,000</u>	<u>\$14,000</u>	<u>\$12,000</u>	(Total Liabilities/Total Assets)			
Total Current Assets	<u>\$125,000</u>	<u>\$133,000</u>	<u>\$133,000</u>				
Non-Current Assets							
<u>Building & facilities</u>	<u>\$750,000</u>	<u>\$750,000</u>	<u>\$750,000</u>				
<u>Equipment</u>	<u>\$325,000</u>	<u>\$320,000</u>	<u>\$315,000</u>				
Total Non-Current Assets	<u>\$1,075,000</u>	<u>\$1,070,000</u>	<u>\$1,065,000</u>				
Total Assets	<u><u>\$1,200,000</u></u>	<u><u>\$1,203,000</u></u>	<u><u>\$1,198,000</u></u>				
Liabilities							
Current Liabilities							
<u>Operating Loan</u>	<u>\$60,000</u>	<u>\$50,000</u>	<u>\$55,000</u>				
<u>Wages Payable</u>	<u>\$12,000</u>	<u>\$14,000</u>	<u>\$15,000</u>				
<u>Accrued Interest</u>	<u>\$7,500</u>	<u>\$5,200</u>	<u>\$6,300</u>				
Total Current Liabilities	<u>\$79,500</u>	<u>\$69,200</u>	<u>\$76,300</u>				
Non-Current Liabilities							
<u>Mortgage Remaining</u>	<u>\$350,000</u>	<u>\$294,000</u>	<u>\$225,000</u>				
<u>Equipment Loans Remaining</u>	<u>\$75,000</u>	<u>\$48,000</u>	<u>\$22,000</u>				
Total Non-Current Liabilities	<u>\$425,000</u>	<u>\$342,000</u>	<u>\$247,000</u>				
Total Liabilities	<u>\$504,500</u>	<u>\$411,200</u>	<u>\$323,300</u>				
Net Worth (Owners Equity)	<u>\$695,500</u>	<u>\$791,800</u>	<u>\$874,700</u>				
(Total Assets - Total Liabilities)							
Total Liabilities & Net Worth	<u><u>\$1,200,000</u></u>	<u><u>\$1,203,000</u></u>	<u><u>\$1,198,000</u></u>				

Income Statement Restaurant

For the Years Ending December 31

	2020	2021	2022
Revenues			
Food Sales	\$450,000	\$550,000	\$575,000
Beverage Sales	\$240,000	\$270,000	\$265,000
Total Revenues	\$690,000	\$820,000	\$840,000
Cost of Goods Sold:	\$425,000	\$435,000	\$440,000
Gross Margin	\$265,000	\$385,000	\$400,000
Overhead Expenses:			
Administrative	\$25,000	\$35,000	\$35,000
Labor (wages)	\$80,000	\$82,500	\$85,000
Rent	\$40,000	\$45,000	\$45,000
Interest	\$22,000	\$20,000	\$18,000
Depreciation	\$15,000	\$15,000	\$15,000
Other	\$10,000	\$12,000	\$9,000
Total Overhead Expenses	\$192,000	\$209,500	\$207,000
Total Expenses	\$617,000	\$644,500	\$647,000
Net Income	\$73,000	\$175,500	\$193,000

	2020	2021	2022
Rate of Return on	7.9%	16.3%	17.6%
(Net Income + Interest Expense)/Total Assets			
Operating Expens	84%	74%	73%
(Total Expenses - Interest - Depreciation)/Total Revenues			

Restaurant Business Overall Financial Analysis

	2020		2021		2022	
	Ratio	Rating	Ratio	Rating	Ratio	Rating
Liquidity	1.57	Good	1.92	Very Good	1.74	Good
Solvency	42%	A little high	34%	Good	27%	Very Good
Profitability	7.9%	Good	16.3%	Excellent	17.6%	Excellent
Financial Efficiency	84%	Too high	74%	Average/Good	73%	Good

Financial Analysis- Student Driven Activity

Student Driven Learning Activity: Have students complete the financial breakdown chart independently. After completing have them divide into 4 groups and assign each one of the areas of the financial analysis. The students need to develop ways to reinforce the concepts to the rest of the class. It can be through examples they come up with on their own, visuals, etc...

Financial Analysis Breakdown

Areas	Definition	What financial sheet to use	Ratio equation	Needs to be greater than (minimum):	Ideal Ratio:
Liquidity					
Solvency					
Profitability					
Financial Efficiency					

Financial Analysis Reading

Now that you know the basics of financial statements (balance sheets, income statements, enterprise budgets, cash flow statements), it's time to use them to make better management decisions. We don't create these statements just to create them and keep them in a folder – we use them to identify the strengths and weaknesses of our business. This allows us to improve our business so that it can continue well into the future.

Think about Greta's Green Grocery for a minute. How does she know if she has a problem in her produce section? Obviously, she looks at the vegetables to be sure they are high quality. If Greta looks in her produce section and sees that the lettuce is wilted and turning brown, she knows she has a problem. And now that she knows she has a problem she can come up with ways to solve the problem. Maybe she is buying produce that is too old. Maybe her cooling system isn't keeping the produce at the proper temperature. Maybe her prices are too high and the produce is staying on the shelf too long. By simply looking at the produce Greta gathers important information that will help her improve her business. That's the goal of financial analysis – improving the “money side” of the business.

There are two main forms of financial analysis: **Ratio analysis** and **Trend analysis**. Remember when we said that financial records are similar to the medical records your doctor uses to look at your health? Well, your doctor is also doing ratio analysis and trend analysis. Ratio analysis is where we calculate financial ratios and compare them to “benchmarks.” Your doctor compares your heart rate (pulse) to the average heart rate (benchmark) for healthy people. In this case, the doctor might use a benchmark of 70 beats per minute – if your heart rate is higher than this, say 90 beats per minute, that might indicate that you have a health problem.

Trend analysis is where we look at the financial ratios over a period of time, say 3-4 years, to see if we can see trends. Are we becoming more profitable over time? Is our equity (net worth) improving or getting worse over time? Your doctor looks at your medical records to see how your current heart rate compares to your heart rate from last year and the year before. If she sees that your heart rate is getting higher each year, that might indicate that you have a potential problem.

Financial analysis looks at four main areas of your business finances. Those four areas are:

- Liquidity

Liquidity refers to the business' ability to pay its bills on time without having to sell some of its productive assets (land, machinery, etc.)

- Solvency

Solvency refers to how the value of its assets compares to the value of its liabilities. If its liabilities are greater than the value of its assets we say that the business is “insolvent” – it can't repay all of its loans by selling its assets.

- Profitability

Profitability analysis shows us if the business is making money after paying all of its expenses.

- Financial Efficiency

Financial Efficiency analysis helps determine how good we are at controlling our costs and how good we are at using our assets to generate revenues.

Let's do some basic financial analysis for Greta's Green Grocery. The starting point for financial analysis is looking at Greta's balance sheet and income statement:

Greta's Green Grocery

Balance Sheet

July 1, 2023

Assets		Liabilities	
Current Assets		Current Liabilities	
Inventory of Produce	\$5,000	Wages Payable	\$2,000
Inventory of Crafts	\$15,000	Sales Tax Payable	\$1,500
Cash in the cash registers	\$2,000	Accounts Payable	\$25,000
Cash in her checking account	\$45,000	Portion of Mortgage	
Accounts Receivable	\$10,000	due this year	\$25,000
Total Current Assets	\$77,000	Total Current Liabilities	\$53,500
Non-Current Assets		Non-Current Liabilities	
Land	\$100,000	Mortgage Remaining	\$185,000
Building	\$250,000		
Refrigerators & Freezers	\$75,000		
Office equipment & furniture	\$5,000		
Total Non-Current Assets	\$430,000	Total Non-Current Liab.	\$185,000
		Total Liabilities	\$238,500
		Net Worth	\$268,500
Total Assets	<u>\$507,000</u>	Total Liab. & Net Worth	<u>\$507,000</u>

**Greta's Green Grocery
Income Statement
For the year 2022**

Revenues:

Produce	\$325,000
Crafts	<u>\$175,000</u>
Total Revenues	\$500,000

Operating Expenses:

Produce	\$150,000
Crafts	<u>\$80,000</u>
Total Operating Expenses	\$230,000

Overhead Expenses:

Business License	\$1,000
Utilities (electricity, water, etc.)	\$15,000
Liability Insurance	\$5,000
Supplies	\$10,000
Interest on her loans	\$14,000
Labor	\$70,000
Office Expenses	\$6,000
Property Taxes	\$15,000
Advertising	\$25,000
Professional Fees (lawyer, accountant)	\$4,000
Depreciation	<u>\$30,000</u>
Total Overhead Expenses	\$195,000

Total Expenses **\$425,000**

Net Income (Profit) **\$75,000**

Liquidity Analysis

The balance sheet is the main source of information for liquidity analysis. Specifically, we look at the Total Current Assets and the Total Current Liabilities. Current liabilities show us the debts of the business that will be paid within the next year. Current assets show the value of all the business' assets that will be sold or used within the next year. Ideally, we would like to have more in Current assets than we have in Current liabilities. To make this comparison easier we calculate the Current Ratio:

$$\text{Current Ratio} = \text{Total Current Assets} / \text{Total Current Liabilities}$$

This ratio tells us how many dollars we have in current assets for every one dollar that we have in current liabilities. For example, a Current Ratio of 2.0 indicates that we have \$2 of current assets for every \$1 of current liabilities on the day of the balance sheet. When the Current Ratio is greater than 1.0 we say that the business is "liquid", which is good! That is, a business that is liquid should be able to pay its obligations without having to sell any non-current assets. A business that is not liquid may have trouble paying their bills on time.

The benchmark for the Current Ratio is 1.0. We like to see this ratio GREATER than 1.0. Higher is better when it comes to the Current Ratio. Most lenders would like to see the Current Ratio close to 2.0.

Let's calculate the Current Ratio for Greta's business. Her Total Current Assets are \$77,000 and her Total Current Liabilities are \$53,500 on the day of her balance sheet. That means Greta's Current Ratio is:

$$\text{Current Ratio} = \$77,000 / \$53,500 = 1.4$$

Greta's business can be considered to be liquid. Her Current Ratio is greater than 1.0. Her ratio signifies that she has \$1.40 in current assets (cash, accounts receivable, inventory) for every \$1 of debt that she will pay within the next year. For a trend analysis we would compare Greta's Current Ratio from the previous years to 1.4. If her Current Ratio is either increasing or holding steady around 1.4, she is in good shape when it comes to liquidity. If her Current Ratio is falling over time, that would tell us that she is having some financial problems – we would have to look deeper to find the actual problem.

Solvency Analysis

We also use the balance sheet to examine the Solvency of the business. Solvency analysis compares the value of all of the assets of the business to the total amount of debts. A business that has more assets than liabilities is said to be "solvent"; a business whose assets are worth less than its liabilities is "insolvent." Needless to say, we want our business to be solvent!

We use the Debt/Asset Ratio to look at the solvency of a business. In a nutshell, the Debt/Asset ratio tells us the percentage of our assets that are "owned" by the lenders. For example, a Debt/Asset Ratio of 40% tells us that we owe the lender an amount that is equal to 40% of our total assets. Looking at this from the other side, it also tells us that we have paid for (we "own") 60% of our assets outright.

There are two benchmarks for the Debt/Asset Ratio. Ideally, we like to see the Debt/Asset Ratio less than 40% for most businesses. If our ratio gets much higher than 40% we are in a much riskier position because we owe so much to the lenders. The maximum we ever want to see our Debt/Asset Ratio is 70%. When our Debt/Asset Ratio is higher than 70% the business owes so much money to its lenders that most of the

revenues of the business will be used to make the large loan payments – that doesn't leave much money for our operating expenses and for our own salary!

Greta's Debt/Asset Ratio is calculated using her Total Assets of \$507,000 and her Total Liabilities of \$238,500. That means her Debt/Asset Ratio is:

$$\text{Debt/Asset Ratio} = \$238,500 / \$507,000 = 47\%$$

How would you rate Greta's solvency? Her ratio of 47% says that she owes \$0.47 of debts for every \$1 of assets in her business – or, that her lenders "own" 47% of her business and she owns 53% of the business. Because her Debt/Asset Ratio is higher than 40% I would rate her solvency as "okay, but not great" – she would be in a less risky situation if her Debt/Asset Ratio were lower; but, she's not in "the danger zone" with a Debt/Asset Ratio greater than 70%.

When we look at Greta's historical financial records we can see her Debt/Asset Ratio over the past 4 years:

July 2013	57%
July 2014	53%
July 2015	49%
July 2016	47%

Using trend analysis, what can you say about Greta's solvency over time? Greta's Debt/Asset Ratio is steadily falling over the past 4 years. That is a good sign. Although her Debt/Asset Ratio is slightly higher than our 40% benchmark, this shows that her solvency is improving each year. As a manager or as a lender, I would not be too concerned about Greta's solvency.

Profitability Analysis

Okay, let's admit it – most managers are primarily concerned with earning profits. And I can't blame them. After all, a business must earn profits year in and year out to be able to stay in business. If it doesn't earn profits, it can't pay its operating expenses or repay all of its loans – and those are not good! So we need to look closely at the profitability of a business.

Remember that profits are simply "revenues minus expenses". In the enterprise budget lesson we looked at short-run and long-run profits:

Short-run Profits = Return Above Variable Costs aka Gross Margin

Long-run Profits = Return Above Total Costs

On the Income Statement we simply referred to the Net Income (or Profit) of the business. It shows how much of your revenues are left over after you pay all of your expenses. Net Income is a useful number – we can easily see if our profits increased or decreased since last year. But it's hard to know if that Net Income is good for the size of a business. To do this we calculate the Rate of Return on Assets, or the ROA of the business.

$$\text{ROA} = (\text{Net Income} + \text{Interest Expense}) / \text{Total Assets}$$

We get this information from the Income Statement and the Balance Sheet. For Greta's business the ROA is:

$$\begin{aligned}\text{Net Income} &= \$75,000 \\ \text{Interest Expense} &= \$14,000 \\ \text{Total Assets} &= \$507,000 \\ \text{ROA} &= (\$75,000 + \$14,000) / \$507,000 = 17.5\%\end{aligned}$$

What does 17.5% mean? The easy way to think about ROA is that every \$1 of Greta's assets is earning \$0.175 of profit. Now we need to know – is that good or bad? For ROA, the higher the number, the better! There are a few benchmarks for ROA:

- We want ROA to be greater than 0% -- that means we made some profits
- We want the ROA to be greater than the interest rate (APR) on our liabilities
(Remember the saying "If it costs more than it's worth, don't do it"? If the APR is greater than the ROA, the cost of the interest is greater than the profits we will earn.)
- Ideally, we would like for the ROA to be greater than 6%.

How would you rate Greta's ROA of 17.5%? Assuming that most of her loans have an interest rate (APR) of 5%, we can easily say that Greta's ROA is very good! It is greater than 0%; it is greater than her APR; and it is greater than 6%. Greta's business seems to be very profitable!

Again, we should look at her ROA over the past 3-4 years to look for trends. If her ROA is holding steady around 17.5% or increasing over time, she is doing a great job managing the profitability of her business. If her ROA is decreasing over time that would indicate that she may have some potential problems. We should look at her financial efficiency to try to uncover the actual reason for her decreasing profitability.

Financial Efficiency Analysis

Financial Efficiency refers to how well we are using our financial assets. The more efficiently we use our resources, the greater the chance that we will be able to earn profits. One of the most commonly used ratios for Financial Efficiency is the Operating Expense/Receipt Ratio. This ratio estimates how much money we are spending for operating expenses (variable expenses) to generate one dollar of revenue. We calculate this ratio as follows:

$$\text{Operating Expense/Receipt Ratio} = (\text{Total Expenses} - \text{Interest} - \text{Depreciation}) / \text{Total Revenues}$$

All of this information comes from the income statement. Let's calculate this ratio for Greta's business:

$$\begin{aligned}\text{Total Expenses} &= \$425,000 \\ \text{Interest Expense} &= \$14,000 \\ \text{Depreciation} &= \$30,000 \\ \text{Total Revenues} &= \$500,000\end{aligned}$$

$$\text{Operating Exp./Rec. Ratio} = (\$425,000 - \$14,000 - \$30,000) / \$500,000 = 76\%$$

This tells us that Greta is spending approximately \$0.76 on operating expenses to generate \$1 of sales revenue. That leaves her with \$0.24 to pay for her interest, depreciation, and her salary. As you can see, the lower this ratio, the better! The benchmark for the Operating Expense/Receipt Ratio is 75%. We like to see the ratio be less than 75%. When it gets up near 85% the business may have problems paying its bills on time, and there won't be much money left over for Greta to live on!

Because Greta's ratio is close to the benchmark of 75% we can say that she is doing a good job of controlling her costs but she could do slightly better. If she wants to improve this ratio she needs to find ways to spend less money on her operating expenses or she needs to find ways to increase her sales revenues. A trend analysis over the past 3-4 years will give Greta a better idea of how she is doing on cost control. We would hope to see her ratio holding steady around 76% or decreasing over time. If her ratio is increasing over time she will need to determine why this is happening.

Summary

After we calculate these ratios we should go back and look at the financial condition of the entire business. We need to look at how the business rates in each of the four main areas: Liquidity, Solvency, Profitability, and Financial Efficiency. An easy way to do this is to create a chart that shows your ratings for each area. Let's do this for Greta:

Greta's Green Grocery	
Financial Analysis	
Liquidity	Good, could improve slightly
Solvency	Average, needs to improve
Profitability	Strong. Excellent job!
Financial Efficiency	Average, could improve slightly
Overall Rating	Better than Average

This chart helps us see where Greta should focus her management efforts. The 2 main areas where she can improve are Financial Efficiency and Solvency. Now she knows where to look to solve her problems and improve her business!

Financial analysis is a powerful tool for managers and lenders. Managers can determine how they can make their business stronger and safer. Lenders can identify the risks of lending money to the managers – thereby helping the managers!

Lesson 10 - Introduction to Personal Banking

Bell Ringer: What personal banking features do you use now? What do you think you might use as an adult?

A. Section 1 - Review financial analysis

1. What are the 4 main areas of analysis
2. What is the main measure for each area

B. Section 2 - Personal Banking

1. The same business principles apply to personal banking as they do to businesses
2. You need to monitor your assets and liabilities (balance sheet)
3. You need to monitor your income and expenses (income statement)
 - You can also do this through your checkbook register
4. You need to have personal “liquidity” (emergency funds)
5. You will probably apply for loans for autos or houses at some point in your life
 - The loan application will include balance sheets and income statements

C. Section 3 - Your personal liquidity

1. A large portion of your personal liquidity will probably be kept in cash, checking accounts, and savings accounts
2. Have a goal of starting each month with at least 1 month’s worth of your living expenses in a checking account. This way you will be able to meet your monthly bills on time.
3. Set a goal of having a savings account with at least 2 months of living expenses in it. This is your “emergency fund”. When you are out of work, or your car breaks down, or your refrigerator breaks, you can pay for it with cash from your savings account instead of using a credit card or getting an emergency loan (high interest rates!).
4. Checking accounts
 - a. Most people over the age of 18 should have a checking account
 - b. Many employers require that your paycheck be direct-deposited into a checking account
 - c. It will help you track your cash flows (income and expenses)
 - d. Types of checking accounts:
 - Personal checking accounts (non-student)
 - more features than a student account
 - may or may not earn interest on your account
 - probably has a debit card
 - may come with a credit card
 - may have monthly maintenance fees
 - has higher minimum balances than a student account
 - Student checking accounts
 - a simple checking account, with no bells or whistles
 - probably does not earn interest on the amount in your account
 - probably no maintenance fees or very low fees
 - probably has a minimum balance that you need to keep in the account
 - probably comes with a “debit card”

- Business checking accounts
 - similar to personal checking accounts, but for businesses
 - But it may take several months!
- e. Using a checking account
 - Open the account at your bank
 - Make your initial deposit
 - You will get a checkbook full of blank checks and a checkbook register
 - Write down all of your transactions in your checkbook register
 - Compare your entries to the monthly statement you will get from your bank
 - This is called “balancing your check book”

Work through the checkbook balancing exercise

- f. Tips on writing checks:
 - always record the checks in your register
 - check number, who it is written to (payee), date, amount (numbers and written)
 - sign your check
 - write a memo on the memo line
 - start your written dollar amount entries at the far left edge of the check
 - draw a line from the last word to the far right edge of the check
 - start your dollar amount (numbers) at the far left edge of the box
 - use a decimal point and the cents afterward
 - g. Why not just use cash instead of writing checks
 - carrying cash is dangerous
 - loss, theft
 - you tend to spend cash when you have it
 - you spend less with a check because of the trouble of writing all of the information
 - some businesses do not accept cash
 - you shouldn't put cash in the mail to pay bills
 - ATMs and online banking tied to your checking accounts is very convenient
 - Most checking accounts are insured against failure of the bank
 - FDIC = Federal Deposit Insurance Corporation
 - Insures your checking account up to \$250,000
 - If the bank fails (goes bankrupt), you will get your money back through FDIC
 - h. Disadvantages of Checking Accounts
 - may have a monthly or annual maintenance fee
 - it is less convenient than paying with cash or credit
 - You may not be able to get your cash out of the checking account when the bank is closed
5. Savings Accounts
- a. a savings account is used to store your emergency money
 - b. it typically pays a rate of return (interest) on your account
 - although the returns are usually quite low
 - do not worry that your savings account doesn't earn a high return

- the purpose of the savings account is to be able to get to your money quickly in the event of a financial emergency
 - c. you can get money out of your savings account quickly and easily
 - by writing a check
 - by transferring the money to your checking account
 - by using online banking services
 - d. Savings accounts operate very much like a checking account
 - treat the savings account register like a checkbook register
 - write down every transaction
 - balance your savings account register every month
 - e. It is usually insured by FDIC
 - f. Disadvantages of a savings account – same as for checking accounts
 - may have a monthly or annual maintenance fee
 - it may require higher minimum monthly balances than a checking account
 - it doesn't pay a very high return
 - you may have trouble getting your cash outside of regular banking hours
6. Certificates of Deposit (CDs)
- a. CDs are an alternative place to keep your emergency funds
 - b. a CD is basically a loan that you make to the bank
 - You write a check to the bank for a stated amount (principal)
 - The bank promises (in writing) to pay you a stated return (interest or yield) over a stated time period (term)
 - At the end of the term, the bank gives you your initial amount (principal)
 - c. CDs are usually 100% insured
 - You will get your initial money back in the event of a bank failure
 - d. CDs come in different terms
 - 1 month to 10 years is a common range
 - typically, the longer the term (the more years) of the CD, the higher the return (interest or yield)
 - e. There is usually an early withdrawal penalty with CDs
 - if you take your money out before the end of the term, the bank will charge you 2-3 months worth of interest as a penalty
 - This makes them good places to keep your emergency money
 - If you know there's a penalty for taking the money out, you are less likely to use that money for foolish purchases!

Materials: **PowerPoint on Introduction to Personal Banking**
 In-class Exercise and Key
 Take Home Reading

INTRODUCTION TO PERSONAL BANKING



Personal Vs Business

- Same principles apply to personal and business finances
 - Balance sheets
 - Income statement or personal budget
 - Liquidity
 - Loan applications
- Requires balance sheets and income statements



Personal Liquidity

- Most of your personal liquidity will be in:
 - Cash
 - Cash you carry for day-to-day expenses
 - Checking account
 - To pay your regular monthly bills
 - Savings account or CDs
 - Places to hold your emergency money



Personal Liquidity Goals

- Goal 1: Start each month with at least 1 month of living expenses in your checking account
 - So you can pay your regular bills on time
- Goal 2: Try to have at least 2 months of living expenses in your savings account
 - For financial emergencies
 - When you need to get cash quickly
 - Avoids the need to get a high-interest loan or rely on a credit card



Checking Accounts

- Most people over age 18 should have one
- Many employers require that your paycheck be direct-deposited into a checking account
- It helps you track your spending
- Main Types:
 - Personal
 - Student
 - Business



Personal Checking Accounts

- For individuals or families
- May have a monthly maintenance fee
- May pay you a monthly return (interest)
- May have a minimum monthly balance
- You need to keep at least this much in your account, or you will pay a fee
- Probably comes with a debit card
 - "Electronic checks"
- May come with a credit card



Student Checking Accounts

- Less “bells & whistles” than a personal account
- Probably does not pay you a return (interest)
- Probably does not have a monthly fee
- Probably has a minimum monthly balance
- Probably comes with a debit card



Business Checking Accounts

- Similar to personal accounts, but are for businesses
 - If you have a business, have a separate business checking account!
- May have a “non-use” fee
 - If you don’t write X checks per month, you are charged a fee...



Using a Checking Account

- Open an account at your bank
 - Read all of the details
- Make your initial deposit
- You get a checkbook & a register
 - You will have to pay for these
- Write down all of your transactions in the register
 - Compare your monthly statement from the bank to your register – look for differences
 - This is called “balancing your checkbook”



Checkbook Exercise

- Write all of your transactions in the register
- Follow the directions for balancing your checkbook register



Tips on Writing Checks

- Always record your checks in the register
 - Check number
 - Date
 - Payee (who it is written to)
 - Amount
- Fill out every section of your check
 - Date
 - Payee
 - Amount – in writing and in number format
 - Memo
 - Sign your check



Tips on Writing Checks

- Written dollar amounts
 - Ex. “Twenty-five and 75/100 ———”
 - Start at the very left edge of the line
 - Draw a line from the cents to the right edge of the line
- Number amounts:
 - Ex. “\$25.75”
 - Start at the very left edge of the box
 - Include the decimal point and the cents
 - Even if it is an even dollar amount (\$5.00 vs \$5)



Advantages of Checking Accounts

- Safe than carrying cash
- Tend to spend less when writing checks
 - Compared to using cash or credit cards
- Some businesses do not accept cash
- You shouldn't put cash in the mail to pay bills
- ATMs and online banking are very convenient
 - For after-hours or out-of-town cash needs
- Most accounts are insured by FDIC
 - Up to \$250,000 per account!



Disadvantages

- May have a monthly maintenance fee
- Writing checks is less convenient
 - Need to write everything down twice!
 - Cash or credit cards are more convenient
- You may not be able to get your cash after banking hours



Savings Accounts

- For quick access to your emergency money
 - At least 2 months of living expenses
- Typically pays a low return (interest)
 - Currently paying less than 1% annually
 - Don't worry about this
 - Purpose is quick access to your money for emergencies
- Savings accounts operate just like checking accounts
 - Write down each transaction
 - Balance your account each month



Accessing Your Savings Account

- You can get your money by:
 - Writing a check from your savings account
 - Transferring funds from your savings to your checking account - and then writing a check
 - Online transfers from savings to checking
 - Writing a check from your savings account and depositing it in your checking account



Certificates of Deposit (CDs)

- Alternative place to keep your emergency money
- Basically a loan you are making to your bank
 - You write a check for a stated amount (principal)
 - The bank agrees, in writing, to:
 - Pay you a stated rate of return
 - For a stated period of time (term)
 - Return your initial principal at the end of that term



Certificates of Deposit (CDs)

- CDs are usually 100% insured
 - You will get your original principal back
- CDs come in different terms
 - 1 month to 10-years is a common range
 - Longer term CDs tend to have higher returns
- Early withdrawal penalty
 - If you take your money back before the end of the term
 - Usually pay a penalty of 2-3 months of interest
 - This keeps you from using this money for non-emergencies!



Introduction to Personal Banking- Notes Organizer

Introduction to Personal Banking			
Personal Liquidity	Details	Advantages	Disadvantages
1. Checking Accounts			
2. Student Checking Accounts			
3. Business Checking Account			
4. Savings Account			
5. Cash			
6. Certificates of Deposit (CD)			

Checkbook Balancing Exercise

You opened a checking account on Feb 1, 2023. Your opening balance was \$835.25. During the month you had the following activity in your checking account:

Feb 2	Check #1001 – rent	\$500.00
Feb 2	Deposit	\$100.00
Feb 5	Check # 1002 – insurance	\$65.50
Feb 12	Check # 1003 – groceries	\$45.35
Feb 15	ATM withdrawal	\$50.00
Feb 20	Check #1004 – credit card	\$120.85
Feb 20	Service charge – bank	\$5.00
Feb 28	Deposit	\$25.00

First thing to do is enter all of these transactions into your checkbook register – see the next page. Keep a running total of your checking account balance – do this for each of the transactions. You should end up with \$173.55 as the ending balance in your register.

It's Feb. 23, 2023 and you've just received your monthly statement from the bank, along with 2 canceled checks (checks that have cleared your account). Now it's time to balance your check book. Use the following monthly statement to balance your checkbook. Here's how:

1. In the "X" column of your checkbook register, clearly mark (with an X) all of the transactions that are listed on your monthly statement.
2. Use the checkbook balancing worksheet on the monthly statement.
 - a. Write the ending balance from the statement on the first line (Line A) of the worksheet.
 - b. Total all deposits to your account that have NOT cleared (are not listed on your statement). Write this total on Line B.
 - c. Add Lines A and B to calculate the subtotal and enter the result on Line C.

- d. Total all withdrawals from your account that are not listed on your monthly statement. Enter the total on Line D.
- e. Subtract Line D from Line C. This amount should be exactly equal to the ending balance in your checkbook register. If not, you have made a mistake – go back and do it again!

[illegible]

Canceled Checks

Joe Smith		1001
SSN: 215-66-1098		Feb 2 _____ 20 23__
Phone: (919) 515-6092		
3500 Broadway		
Verona, VA 24588		
 Pay to the		
Order of	<u>Foxridge Apartments</u>	\$ <u>500.00</u>
	<u>Five Hundred and 00/100</u>	DOLLARS
 First State Bank of Virginia 5000 Hillsborough St. Abingdon, VA 23665		
 FOR _____		

Joe Smith		1002
SSN: 215-66-1098		Feb 5 _____ 20 23__
Phone: (919) 515-6092		
3500 Broadway		
Verona, VA 24588		
 Pay to the		
Order of	<u>Farm State Insurance</u>	\$ <u>65.50</u>
	<u>Sixty-five and 50/100</u>	DOLLARS
 First State Bank of Virginia 5000 Hillsborough St. Abingdon, VA 23665		
 FOR _____		

First State Bank of Virginia

Monthly Bank Statement for the Period Jan 20 - Feb 20, 2023

Beginning Balance:	\$835.25
Deposits:	\$100.00
Withdrawals:	\$620.50
Ending Balance:	\$314.75

Transactions

Deposits:	Feb 5	\$100.00	
Checks:	Feb 4	\$500.00	# 1001
	Feb 8	\$65.50	# 1002

Service Charges & ATM Withdrawals:

Feb 15	\$50.00
Feb 20	\$5.00

Checkbook Balancing Worksheet

- | | | |
|----|---|---------|
| A. | Ending Balance from Monthly Statement: | _____ |
| B. | Add Any deposits made, but not
Recorded on Monthly Statement: | + _____ |
| C. | Subtotal: | = _____ |
| D. | Minus Any Checks Written, but not
Recorded on Monthly Statement: | - _____ |
| E. | Ending Balance: | = _____ |

Checkbook Balancing Exercise (KEY)

You opened a checking account on Feb 1, 2023. Your opening balance was \$835.25. During the month you had the following activity in your checking account:

Feb 2	Check #1001 – Foxridge Apartments - rent	\$500.00
Feb 2	Deposit	\$100.00
Feb 5	Check # 1002 – Farm State Insurance	\$65.50
Feb 12	Check # 1003 – Kroger - groceries	\$45.35
Feb 15	ATM withdrawal	\$50.00
Feb 20	Check #1004 – Townie-corp - credit card	\$120.85
Feb 20	Service charge – bank	\$5.00
Feb 28	Deposit	\$25.00

First thing to do is enter all of these transactions into your checkbook register – see the next page. Keep a running total of your checking account balance – do this for each of the transactions. You should end up with \$173.55 as the ending balance in your register.

It's Feb. 23, 2023 and you've just received your monthly statement from the bank, along with 2 canceled checks (checks that have cleared your account). Now it's time to balance your check book. Use the following monthly statement to balance your checkbook. Here's how:

1. In the "X" column of your checkbook register, clearly mark (with an X) all of the transactions that are listed on your monthly statement.
2. Use the checkbook balancing worksheet on the monthly statement.
 - a. Write the ending balance from the statement on the first line (Line A) of the worksheet.

- b. Total all deposits to your account that have NOT cleared (are not listed on your statement). Write this total on Line B.
- c. Add Lines A and B to calculate the subtotal and enter the result on Line C.
- d. Total all withdrawals from your account that are not listed on your monthly statement. Enter the total on Line D.
- e. Subtract Line D from Line C. This amount should be exactly equal to the ending balance in your checkbook register. If not, you have made a mistake – go back and do it again!

[illegible]

Canceled Checks

Joe Smith		1001
SSN: 215-66-1098 Phone: (919) 515-6092 3500 Broadway Verona, VA 24588		Feb 2 _____ 20 23__
<i>Pay to the</i>		
<i>Order of</i>	_____ Foxridge Apartments	\$ _____ 500.00
	_____ Five Hundred and 00/100	_____ DOLLARS
First State Bank of Virginia 5000 Hillsborough St. Abingdon, VA 23665		
FOR _____		

Joe Smith		1002
SSN: 215-66-1098 Phone: (919) 515-6092 3500 Broadway Verona, VA 24588		Feb 5 _____ 20 23__
<i>Pay to the</i>		
<i>Order of</i>	_____ Farm State Insurance	\$ _____ 65.50
	_____ Sixty-five and 50/100	_____ DOLLARS
First State Bank of Virginia 5000 Hillsborough St. Abingdon, VA 23665		
FOR _____		

First State Bank of Virginia

Monthly Bank Statement for the Period Jan 20 - Feb 20, 2023

Beginning Balance:	\$835.25
Deposits:	\$100.00
Withdrawals:	\$620.50
Ending Balance:	\$314.75

Transactions

Deposits:	Feb 5	\$100.00	
Checks:	Feb 4	\$500.00	# 1001
	Feb 8	\$65.50	# 1002

Service Charges & ATM Withdrawals:

Feb 15	\$50.00
Feb 20	\$5.00

Checkbook Balancing Worksheet

A.	Ending Balance from Monthly Statement:	<u>\$314.75</u>
B.	Add Any deposits made, but not Recorded on Monthly Statement:	<u>+ 25.00</u>
C.	Subtotal:	<u>= \$339.75</u>
D.	Minus Any Checks Written, but not Recorded on Monthly Statement:	<u>- 166.20</u>
E.	Ending Balance:	<u>= \$173.55</u>

Personal Finance- Student Driven Activities

Student Driven Learning Activity: After going through the PPT and utilizing the chart for the students to fill out as the teacher reviews the information divide the students up to complete the activity below.

Student Driven Lesson: Have the students read through the take home reading and fill out the chart. Students will then be divided into groups and create advertisements for the bank and market their product to the rest of the class utilizing the information they read about. They may want to include advantages/disadvantages, special features and if they have used the product before. They can design a radio ad, TV ad or flier just as examples.

Personal Finance Take-home Reading

We've spent most of our time talking about the finances of a business. Now, let's spend some time talking about the basics of your personal finances. There is a lot to know about personal financial management, but we will just be talking about personal banking in this lesson.

Many of the financial principles and tools that you've learned for businesses apply to your personal finances as well. Just like a business, you should build a balance sheet for your personal life each year. This personal balance sheet will list all of your Current Assets (checking account, savings account, etc.) and your Non-Current Assets (personal belongings, cars, house, etc.). It will also list your Current Liabilities (credit card balances, portion of non-current liabilities due this year) and your Non-Current Liabilities (auto loans, student loans, home loans). You should track your personal Net Worth (Equity) on a regular basis to see how your financial condition is changing over time. Just like a business, hopefully your personal Net Worth is increasing every year! Another reason to have a personal balance sheet is that it will come in very handy if you ever apply for a personal loan (auto loan, student loan, home loan). Lenders want to evaluate your liquidity and solvency, the same as they do for businesses. The better your liquidity and solvency, the more likely you are to obtain the loan.

Instead of a business Income Statement, you should track your household income and expenses. You can use a format similar to the Income Statement or Enterprise Budgets. Simply list all of your sources of income each month (wages, salary, gifts) and all of your living expenses (rent, food, utilities, loan payments, etc.). The "bottom line" of your monthly budget should show you how much money you have available after you pay all of your expenses – exactly like we did for the business. Again, lenders are interested in seeing your monthly budget so that they can determine whether you will be able to repay a loan.

Personal Liquidity

Businesses need to have cash on hand or in their checking accounts to meet their expenses. The same applies to your personal life. You should try to keep at least 1-2 months of living expenses in your personal checking account. This will allow you to meet your living expenses without having to dip into your emergency savings. Believe me, just doing this takes a lot of financial pressure off of your shoulders. You can sleep a lot better at night when you know that you have enough money in your checking account to pay your bills on time!

Emergency Savings

Sometimes, life happens. Unexpected events seem to pop up at the worst time. Your refrigerator dies right before a big holiday meal. The battery in your car dies on a cold morning. Your appendix decides that it doesn't like you anymore and you have to go to the hospital. All of these require cash – you have to pay for them. For this reason you should try to build your savings account up to at least two months of living expenses. When you have two months of living expenses in your savings account, you can handle a lot of the unexpected events that life throws at you. If you don't have much money in your savings account you will have to rely on credit cards, emergency loans, or the sale of some of your assets (car, house, etc.) to pay these bills. Once you settle down and start a family, you might want to increase the amount you keep in your

savings account to 3-6 months on living expenses. This will be your financial “safety net” in case something bad or unexpected occurs. Trust me, having enough money in your savings account is a great stress reducer!!

Here’s a simple example. Assume that Greta’s personal monthly living expenses (not her business expenses) are \$3,000/month. How much money should Greta keep in her checking personal account and personal savings account? She would be wise to keep at least \$3,000 in her checking account to meet her monthly bills. That is, if she can start each month with approximately \$3,000 in her checking account she will be able to pay her bills without any trouble. Greta should set a goal of having at least \$6,000 in her savings account – this is equal to 2 months of living expenses. If she were to get sick and have to close down her business temporarily she would be able to meet her living expenses for roughly 2 months – she has about 2 months to get better and get back to work.

Checking Accounts

Most adults over the age of 18 should have a checking account. It is easier to pay your monthly bills with a check instead of using cash or money orders. Also, most employers today are requiring their employees to have a checking account so that they can “direct-deposit” their paychecks. This makes it easier and less expensive for the employer. Here are some other reasons that you should use checking accounts to pay your bills or hold your cash:

- You tend to spend less money when you write checks versus using a credit card or a debit card. The reason – it’s too easy to use a credit card or debit card, and you don’t actually see the money changing hands. When you write a check you realize instantly that you spent money when you record it in your checkbook register.
- Carrying cash around to pay your bills is dangerous. If you lose the money or get robbed, that money is gone. If you lose your checkbook, simply call your bank and tell them – they will not process any checks after that date, and they will help you get a new checkbook and register. Also, the money in your checking account is insured by the bank. If the bank were to go bankrupt you would still get your money back.
- You should NEVER put money in the mail to pay your bills. Only put checks in the mail to pay your bills.
- Most checking accounts are linked to Automated Teller Machines (ATMs). This makes it convenient for you to get cash from your account whenever you need it.

Most banks offer basic checking accounts with no monthly or annual fees. You pay for your checks (maybe \$35 every few years) and that’s about all. Most checking accounts do not pay any interest to the accountholder – if they do the interest rate they pay is very small. Don’t worry about this – the main reason to have a checking account is to easily pay your living expenses and get your hands on your money when you need it.

At this stage of your life you might open a student checking account with your bank. Student accounts are very basic. Here’s how they work - You deposit money into the account when you open the account. You will probably have to order some checks – it takes a week or so to receive your checks. The account may have a “debit card” associated with it. A debit card is basically an electronic check – you swipe your card to pay for something, and the money comes out of your checking account immediately. Your student account may have a “minimum balance” requirement. A minimum balance of \$200 is common. This means that you must keep

at least \$200 in your checking account at all times; if your balance goes below \$200 you might have to pay a fee. So – keep your balance about the minimum balance!!

Banks offer personal checking accounts for non-students, too. These accounts may have a few more “bells and whistles” associated with them than a student account. They may pay interest to the account holder. They may have slightly different minimum balances and fees than a student account.

Using Your Checking Account

Once you have opened a checking account and deposited money into the account, it’s time to start using it. You will get a supply of checks and a checkbook register. The checkbook register is used to record every deposit you make into your account, every check that you write, and to keep a running balance of how much money is in your account. You should write down EVERY transaction related to your checking account – this is very important!

At the end of each month you will receive a statement from your bank. This statement shows all of the activity in your account that the bank has processed. It will show all of the deposits that have been processed by the bank and all of the checks that the bank has paid out of your account. It will also give you the Ending Balance for your account. The Ending Balance shows how much money is actually in your account at the end of the month.

The Ending Balance of your account may be different from the running balance you have in your checkbook register. This is because some of the checks you wrote have not been cashed or processed yet, or some of the deposits you made have not been processed by the bank yet. For example, if you deposited \$100 into your account at the end of the month it may not have been processed before the bank sent out your monthly statement – that \$100 is not included in the bank’s Ending Balance for your account, even though the funds may actually be in your account.

Well, how do I know if the bank’s Ending Balance is correct or if my checkbook register has an accurate balance in it? Good question! To do this we need to “balance your account.” You should balance your account every month to be sure that neither you nor the bank has made a mistake. Here’s how:

1. When you get your monthly statement from the bank, get out your checkbook register and grab a calculator.
2. In your checkbook register, place an “X” next to every check and deposit that the bank has listed on your monthly statement. We say that these transactions have “cleared the bank”. That just means that the bank has processed those transactions.
3. Use the checkbook balancing worksheet that is usually on the last page of the monthly statement.
 - a. Write the ending balance **from the statement** on the first line of the worksheet (Line A).
 - b. Total all deposits to your account that have NOT cleared (are not listed on your statement). These will be all of the deposits in your checkbook register that do NOT have an “X” next to them. Write this total on next line of the worksheet (Line B).
 - c. Add Lines A and B to calculate the subtotal and enter the result on Line C.

- d. Total all checks from your account that are not listed on your monthly statement. These are the checks or withdrawals that do NOT have an “X” next to them in your checkbook register. Enter the total on Line D.
- e. Subtract Line D from Line C. This amount should be exactly equal to the **ending balance in your checkbook register**. If not, you have made a mistake – go back and do it again!

Savings Accounts

You should think about using a savings account to hold your emergency money. Remember we said that you should have at least 2 months of living expenses in your savings accounts? A savings account is slightly different from a checking account in a couple of ways:

- Most savings accounts pay an interest rate (a rate of return) to the accountholder. This interest rate is usually relatively low, but it’s better than earning nothing on your account. Most checking accounts do not pay interest to the accountholder.
- Savings accounts usually do not provide very many checks. Most people transfer money from their savings account to their checking account to pay their bills. But you should still balance your savings account each month in the same way that you balance your checking account.

It is a good idea to link your savings account to your checking account. This will allow you to easily transfer money from one account to the other. It may also offer a service called “over-draft protection”. You may have heard the phrase “bouncing a check.” This means that you wrote a check for an amount greater than you had in your checking account. For example, your checking account has a balance of \$100 and you wrote a check for \$150. There isn’t enough money in the account to pay the check – you end up “bouncing” the check. Over-draft protection automatically moves enough money from your savings account to your checking account to prevent bouncing a check.

Certificates of Deposit (CDs)

Another place that you can store your emergency money is something called a Certificate of Deposit, or a CD. A CD is basically a loan that you are making to the bank. You write a check to the bank and you sign the CD’s certificate (the paperwork). The certificate clearly lays out the terms of this loan. It will clearly specify:

- the amount your loaned the bank (the principal)
- the interest rate the bank will pay you and how often they will pay interest
- the “term” of the loan (length of time)
 - at the end of the term the bank will pay you all of your initial principal and all of the interest it owes you
- any penalty for getting your money before the end of the term
 - the penalties are usually 1-3 months of interest earnings

CDs are usually 100% insured by the bank. This means that you will receive your money (principal and interest) in the slim chance that the bank has financial problems.

The “terms” of CDs typically range from one month to 10 years. CDs with longer terms usually earn a slightly higher rate of interest than the shorter term CDs.

CDs are good places to keep your emergency money. They usually pay a higher interest rate than savings accounts. They are insured – you will be able to get your money back if your bank has to go out of business. And, because they have penalties for taking your money out before the end of the term, they make you think before you pull your money out of the CD – this reduces the probability that you take money out of your emergency savings for something that’s not really an emergency!

Summary

To wrap up this lesson, remember that most of the principles you learned for businesses apply to your personal finances. You should keep good records, especially a personal balance sheet and a personal budget. Liquidity is important for your household as well – try to keep at least 1 month of living expenses in your checking account. And preparing for the unexpected is a smart thing to do – try to keep at least 2 months of living expenses in your emergency savings (3-6 months is better than 2months!).

Take time to learn about your personal finances. The earlier you learn, the better your life will be!