

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.
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:
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 ($\$5,000 \text{ payment} - \$3,000 \text{ interest} = \$2,000 \text{ principal}$).
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:

$$8\% \text{ for 20 years} - \text{factor} = 0.1019$$

$$4\% \text{ for 30 years} - \text{factor} = 0.0578$$

$$7\% \text{ for 8 years} - \text{factor} = 0.1675$$

- c. To calculate monthly payments, use Table 4 (Monthly Payments Required to Amortize a \$1,000 Loan)

- i. "Amortize" means to pay back the loan principal over the life of the loan

- ii. When you see the word "amortize", think "repay"

- iii. 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 = $i/(1-(1+i)^{-n})$											
	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

$$\text{FVA Factor} = \left[\frac{(1+i)^{n+1} - 1}{i} \right] - 1$$

n	Beginning 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	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	<u>\$15,000</u>
Annual Interest Rate (APR)	<u>6.00%</u>
Life of Loan	<u>4 years</u>
Number of Payments/Year	<u>1</u>
Loan Payment	
	\$4,328.87 /period

Loan Payment	Principal			Remaining Principal
	Outstanding	Interest Due	Principal Due	
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:
 - _____
 - Do not use all of your cash and savings
 - Leave enough cash to meet your monthly expenses & emergency needs!
- Leases
 - _____
 - You can lease:
 - Equipment
 - Structures and/or land
 - _____
 - Advantages
 - You can lease the exact asset that you need
 - You can lease it for a specified period of time
 - _____
 - 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.

- Disadvantages
 - You cannot make major alterations to leased assets
 - _____
 - Because you don't actually own the asset
 - It may be hard to lease the asset you want
 - There may be "over-use" fees
 - _____
 - These are usually expensive
 - Getting out of a lease may be very expensive
 - Versus simply selling an asset that you own

Terms

- _____
 - 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 = " _____ "
 - Principal is a liability on the balance sheet
- _____
 - 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
 - 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 _____ 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 x 20%)
 - Loan Principal = Purchase Price – Down Payment
= \$25,000 - \$5,000 = \$20,000 loan

Types of Loans

- _____
 - Auto Loans
 - Repaid over 3-7 years
 - _____
 - Repaid over 10-20 years
 - 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)
- Business Loans
 - _____
 - Repaid over 3-10 years
 - Real Estate Loans
 - To purchase land, buildings, facilities
 - Repaid over 15-30 years
 - _____
 - Used to purchase or pay for operating inputs
 - Repaid within a 1-year period
 - Operating Line of Credit
 - _____

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 (_____)
- Typically includes:
 - Balance Sheet(s)
 - Income Statement(s) or proof of income
 - _____
 - Credit score

Interest Payments

- Interest is the cost of borrowing money
 - Stated as APR (Annual Percentage Rate)
- _____
 - You only owe interest on the amount of principal you still owe the lender
- Interest calculation
 - _____ = 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 _____
= \$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 “_____”

- 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
 - _____
- 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)
 - Life of the loan in years (the “term” of the loan)
 - 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.

$$\text{Interest Due} = \text{Loan Principal} \times \text{Interest Rate}$$

$$\text{\$15,000} \times \text{6\% APR} = \text{\$900 interest due in the first year}$$

- b. Calculate the annual loan payment for this tractor loan.

$$\text{Factor for 6\% APR for 4 years (Table 3)} = \text{0.2886}$$

$$\text{Annual Loan Payment} = \text{\$15,000} \times \text{0.2886} = \text{\$4,329/year}$$

- 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.

$$\text{Step 1: Factor for 7\% APR for 30 years (Table 4)} = \text{6.65}$$

$$\text{Step 2: } \text{6.65} \times \text{\$150,000} / \text{\$1,000} = \text{\$997.50/month}$$

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.

$$\text{Factor for 6\% for 20 years} = \text{7.16} \quad \text{Loan Amount}/\text{\$1,000} = \text{250}$$

$$\text{Loan Payment} = \text{7.16} \times \text{250} = \text{\$1,790}$$

NOTE: the loan payments using the tables may be different from the spreadsheet due to rounding errors.

- 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

$$\begin{aligned} &= \text{Principal Owed at Beginning of Year} - \text{Principal Repaid This Year} \\ &= \$1,000 - \$490.20 = \$509.80 \end{aligned}$$

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

$$\begin{aligned} &= \text{Principal Owed at Beginning of Year} - \text{Principal Repaid This Year} \\ &= \$509.80 - \$509.80 = \$0.00 \end{aligned}$$

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:

$$\text{Total Interest Paid} = (\$530.20/\text{year} \times 2 \text{ years}) - \$1,000 \text{ borrowed} = \$60.40 \text{ of interest}$$

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:

$$\text{Loan Repayment Factor for 6\% for 20 years} = 0.0872$$

$$\text{Annual Payment} = 0.0872 \times \$200,000 = \$17,440/\text{year}$$

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!