

## Soil Erosion in Action

We've all driven past that field that has just been tilled, that area that has just been cleared to build a house (or houses) or that section of forest that has just been clear cut. The bare dirt, or more accurately soil, that is left behind after one of these activities can be unsightly - but it is a larger problem that just aesthetics.

Soil is an essential component to life for everyone. It is what grows the food that we eat and other resources that we need to survive. When soil is left bare, it can easily erode, meaning that the wind, rain or other elements move the soil from where it is to another location. This causes several different issues. First, quite frequently if the soil erodes off the land it ends up in the water - which causes pollution and problems for aquatic life. Second, The top 2-3 inches (in most locations) of soil is referred to as top soil - that is the soil which contains more organic matter and nutrients and is suitable for sustaining plant life. Once the top soil erodes, it can take more than 500 years to create another inch of top soil through natural processes, which means that the land from which it eroded will have a difficult time sustaining any significant amount of plant matter for hundreds of years. The current land available for farming is already shrinking, and combined with a growing population, it is very important that more arable land(land that can be used to grow crops) not be lost due to soil erosion.

Farmers help to cut down on erosion by using several different conservation practices – activities that are specifically geared towards reducing erosion, runoff and pollution to preserve soil health and water quality. Those include:

**No-till farming** – not tilling or plowing up the land between crops

**Cover crops** – planting some type of winter crop after the harvest of the main cash crop to keep a living cover on the land throughout the year.

Examples of this include planting wheat or rye after harvesting corn or soybeans

**Residue** – leaving the corn stalks or other plant residue on the land after harvest to help hold the soil in place

There are several other practices that can also be used, including converting row crops to grass (either pasture or hay land), but these touch on some of the more popular practices.

Below is a simple exercise that can be used to demonstrate soil erosion and the impact that plants or residue can have on reducing erosion. This can be used for a variety of ages, and depending on the age group, students can be asked to brainstorm different ideas or ways that the environment in general, and they themselves may be impacted by different scenarios. Students can also be encouraged to hypothesize what they think will happen in each different circumstance.

### What you will need:

Three different large plastic containers with lids (milk jugs work well for this exercise)

A board or other flat surface large enough to hold all three containers

Soil (either from your yard or from a bag of potting soil purchased at the store if you don't want to dig up your yard)

Grass seed or already established plants (potted flowers, some grass dug up from your yard, etc)

Leaves, twigs and other ground cover  
Three clear containers that can hold water  
A measuring cup  
A small watering can with a sprinkler head

1. Start by cutting the top off of the milk jug or other container (be sure to leave the spout part of the bottle attached). Do this for all three containers



2. Fasten all three containers to your board (super glue or hot glue works well for this)



3. Fill all three with soil to just below the level of the spout
4. Plant grass seed or put your established plants in one of the containers
5. Cover a second one with the ground cover
6. Leave the third bare...they should look similar to this when you are done.



7. To demonstrate soil erosion, make sure they are on a slightly elevated surface. You can either place clear containers under each of the spouts, or you can have a student hold the container as you go through the exercise.
8. Measure out 2 cups of water (this may need to be adjusted depending on the size of the containers holding the soil). Put the water in the watering can, and then “water” the container with the bare soil

9. Measure out another 2 cups of water and repeat the process by “watering” the container with ground cover
10. Measure out a final 2 cups and “water” the container with the plants.
11. Then discuss with students the difference in the “run off” from each of the three containers.

Have fun with this! There are several different variations that you can do, including changing how hard the water falls on the surface, repeat “rain” and more!