Carrie Nalisonick
Earth Science
Grade:  3
Soil and Erosion

Objective/Purpose: The purpose of this lab is to allow students to observe the characteristics of different types of soil. The students will also see how adding water changes each soil. The second part of this project will help students understand erosion and how plants and rocks affect erosion, and also how different types of soil erode differently.

Materials/Time Required:
1. Different types of soil (examples: potting soil, clay, sand)
2. Containers to hold the different types (enough for each student or group of students to have one sample of each type of soil)
3. Water bottle or paper cup with a hole in it
4. Wooden board/piece of strong cardboard/cake pan (to hold soil)
5. Rocks, sticks, plants, etc.
6. This can be squeezed into one class period, but would be better split over two days, especially if the erosion demonstration is done with more than one type of soil.

Background Information: The idea for this lesson was from the Harcourt Science Book as well as various activities I found online. The initial part of the experiment serves to help the students distinguish between different types of soil. Soil is made of humus, water, air, and minerals. Three types of soil are loam, clay, and sand. Clay has very small grains so it has little air, and water does not flow through easily and causes the clay to clump together. Sand has very little humus, and the grains of sand are big so it contains lots of air, and water flows through it very easily. Loam has large amounts of humus and minerals. It is composed of both large and small grains, so water is held in. Erosion is when soil and other materials are washed away from the earth's surface. Erosion is a problem because soil as well as pollutants in soil can be washed into rivers and lakes, polluting the water. Also, many organisms, including humans need soil to survive, and erosion damages the soil by washing nutrients and minerals away.

Preparation: Collect different soil samples for the class to observe. Also, collect rocks, plants, and sticks, or other materials to block erosion. Before class, enough containers of each type of soil should be prepared to give one sample of each type of soil to each group of students. A cake pan of soil should be prepared for the erosion demonstration and a bottle of water should be on hand.

Safety Issues: This experiment is not very hazardous. The students should be instructed to wash their hands thoroughly after handling the soil.

Activity Outline/Teacher Procedure: Divide the students into small groups. Have them observe the different types of soil and write down what they see, feel, and smell.
Pour a small amount of water in the soil and observe again. Discuss the observations with the class.

Combine groups to make several larger groups to do the erosion demonstration. Have the students predict what will happen when it “rains.” Drizzle water onto the soil. Next, have the students pack the rocks and plants into the soil, or have a pre-prepared sample of soil with plants in it already. Have them make predictions again and drizzle water onto the soil. Note the erosion each time. Make sure there is a place to discard wet soil and that extra dry soil is available so that the experiment can be repeated for other groups.

**Possible Questions:**
1. What is each type of soil? (clay, loam, or sand)
2. Which sample of soil is best for growing plants and why?
3. Why are the other types of soil not as good for growing plants?
4. What prevents erosion?
5. Which type of soil would erode the most? The least? Why?

**Assessment/Evaluation:** One effective method of evaluation is a KWL chart, which is a method I learned from my teacher. Beforehand, ask what students Know and what they Want to know about erosion and types of soil. After the lesson fill in the section on what they Learned. The observations the students wrote down about the sand can be written down and turned in, as well as answers to the above questions.