Amazing Soils

(4th - 5th grade)

1 hour (including cleanup time)

Objectives:

- Students will understand the difference between weathering and erosion
- Students will be able to describe ways to prevent erosion

Introduction:

- **Why is soil important? (gives us and plants a place to live, gives us all our food, cleans water)**

Introduction:

- What is soil made of? 45 % Rocks (minerals), 5% organic materials (make the soil healthy), 25% water, and 25% air
- Where does soil belong? On the ground, not in the air or in the water, or down the storm drains because soil in storm drains ends up in creeks and rivers.

Lecture:

- How is soil made?
- Weathering: the breaking down of rocks into smaller pieces
  1. Water Erosion, weathering, and deposition
  2. Wind
  3. Tree/plant roots
  4. "Big Events" like tsunamis, floods, hurricanes, volcanoes, earthquakes
- Erosion: the movement of the soil. Discuss BMP's farmers use to prevent erosion.
- Types of soil? Sand, silt and clay. Sizes of soil?
- Takes the Earth 500 years to make 1 inch of soil.

Activity:

- Demonstrate water movement through the three soils with the Imhoff Cones. Conduct the water race and have students predict which soil will water travel through the fastest. Explain why water travels through sand faster, clay slower. Describe pore spaces and permeability.
- Give each student a container with soil mixture (sand and silt) and have them separate into two types of soil using soil sieves. Place a small amount of clay on a separate plate. Investigate with their senses (sight and touch).
- Have students decide which is the sand, soil, and silt based on the order they are separated and their investigations.
- Discuss soil conservation and recycling by gathering soil back into containers so they can be used for next class.
- Clean up carefully and wipe all desks with water and paper towel
- Pass out storm drain flyers and discuss the impact of soil down storm drains.

Washington State Science Standards

The following table indicates which EALRs are met by the Amazing Soils lesson.

	Washington State Learning Standard
4-5 INQD	*Investigations* involve systematic collection and recording of relevant *observations* and data.
4-5 INQF	A scientific model is a simplified representation of an object, event, system, or process created to understand some aspect of the natural world. When learning from a model, it is important to realize that the model is not exactly the same as the thing being modeled.
4-5 ES2A	Earth materials include *solid* rocks and soil, water, and *gases* of the *atmosphere*. Materials have different physical and *chemical properties* which make them useful in different ways. Earth materials provide many of the resources that humans use.
4-5 ES2B	*Weathering* is the breaking down of rock into pebbles and sand caused by physical processes such as heating, cooling, and pressure, and chemical processes such as acid rain.
4-5 ES2C	*Erosion* is the movement of Earth materials by forces such as *wind*, moving water, ice forming, and *gravity*.
4-5 ES2D	Soils are formed by *weathering* and *erosion*, decay of plant *matter*, transport by rain through streams and rivers, and *deposition* of *sediments* in valleys, riverbeds, and lakes.
4-5 ES2F	*Erosion* plays an important role in the formation of soil, but too much *erosion* can wash away fertile soil from *ecosystems* and farms.