



Science Unit: *Soils, Plants, and First Nations*

Lesson 1: *Making a Soil Separator*

School year: 2007/2008

Developed for: Britannia Elementary School, Vancouver School District

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Grade level: Presented to grades 1, 2 and 3; appropriate for Grades 1 to 5.

Duration of lesson: 1 hour and 20 minutes

Notes: This lesson requires extra adults for younger children.

This lesson is an extension to Lesson 8, *Under our Feet*, in the Temperate Forest unit, available from the Scientist in Residence Program website <http://www.scientistinresidence.ca>.

Objectives

1. Learn about experimental design.
2. Learn how to make a soil separator (sieve).

Vocabulary

Soil separator: A container with specific sized holes to separate large and small particles of soil.

Sieve: A container with holes in it to separate out large and small materials

Clay: Very fine particles made of minerals that are about 100x smaller than grains of sand, sticky to the touch

Sand: Small grains of ground rock which feel gritty to the touch

Silt: Very small particles made of minerals, deposited by moving water, between sand and clay particles in size. Feels smooth and silky to the touch

Materials

- Variety of containers, including aluminum pie plates, small milk cartons, Styrofoam soup bowls, plastic cups
- Nails of different sizes with some very large nails
- Large tacks
- Sharpened pencils to make holes in the containers
- Safety glasses
- Hammers or rubber mallets
- 2 foot square pieces of plywood or a wooden block to protect table surfaces
- Forest soil samples (about one liter per group)

Introductory Discussion

1. How can we try and sort what is in this soil sample? How can we separate the little bits from the bigger bits? When you are cooking noodles at home, how do your parents separate the water from the noodles when the noodles are cooked?



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2. We can use a sieve to separate the little bits of soil from the bigger bits of soil. Today we are going to make our own sieves. We have many different containers here and some different objects to make holes in the containers. You have to think about what containers would make the best sieves or soil separators, what size holes you will need, and how many holes you need.

Science Activity/Experiment

Safety Rules: When using hammers and nails student must use safety goggles and use extreme caution not to injure themselves or others with the nails and tacks. Younger children will need supervision or alternately may choose to use ready-made sieves.

1. Each group of students (2-3 students) will choose one container and one size of nail or sharp object to make the holes.
2. Then using a hammer or mallet and safety goggles, students can begin to make the holes in the containers, using a piece of wood underneath to prevent damage to the tables.
3. When students are ready, they may place 1-2 cups of forest soil in their soil separator and begin to gently shake the contents back and forth. Large sheets of butcher paper or white paper should be placed beneath the separator to catch the small particles. See Temperate Forest, Lesson 8, Under our Feet for additional informaton.

Closure Discussion

How did your soil separators work? What would you like to change in your design. How could you make it better? What went through the separator and what stayed in the top of the separator? What have you learned about soils today?

References

B.C. Agriculture in the Classroom Foundation. 1993. Soil Secrets: An Integrated Intermediate Science Resource. Pacific Edge Publishing. Gabriola, B.C.

Stewart, Melissa. 2004 Down to Earth: Investigate Science. Compass Point Books, Minneapolis.

Wortzman, Ricki. 2000. Soil: Science and Technology 3: Earth and Space Systems. Addison Wesley. Toronto.

Extensions

Watch a video on soils such as "Dirt- Nature's Sandbox" Primary Video 13 minutes. Available at VSB Media Services. #541708.

What is soil made of?

Name of Scientist _____
