Lesson Plan 4:

Edible Soil

A simple, fun activity; enjoyable for kids of all ages.

Please be aware of any allergies the students may have to food prior to conducting this activity.

Basic Principles:

- Healthy rangelands depend on maintaining the water, soil, plant, and animal resources.
- The aspects of an ecosystem (soil, water, vegetation, animals, etc.) impact and rely upon each other.

Fundamental Concepts:

- Ecosystems
- Natural resource ecology
- Erosion
- Connectivity

Montana Content Standards Met By This Lesson:

End of Grade 4

- Science #4: benchmark 2
- Math #1: benchmark 4
- Math #5: benchmarks 1, 2, 3, & 4
- Reading #4: benchmarks 2 & 6
- Workplace #2: benchmark 1

End of Grade 8

- Math #5: benchmarks 2 & 3
- Reading #4: benchmark 7
- Workplace #2: benchmark 1

Upon Graduation-End of Grade 12

- Workplace #2: benchmark 1

Student Inquiries:

- What are the components of soil?
- How does overgrazing wear out rangeland resources?
- How do the parts of an ecosystem rely upon each other?

Instructional Objectives:

- Students will identify the main soil layers.
- Students will collaborate their measurement and interpersonal skills to complete a task.

Materials:

- 8-inch clay or plastic flowerpot (or: one smaller-sized pot per group of students)
- tin foil or waxed paper
- 1 large package of Oreo Cookies
- 3/4 lb. package of gummy worms
- 1 package of miniature chocolate chips
- green-colored coconut
- 4 tbs. butter or margarine
- 1 - 8 oz. package of cream cheese
- 1 cup powdered sugar
- 3 1/2 cups milk
- 2 - 3 oz. packages of vanilla instant pudding
- 12 oz. container of whipped topping (bowl-sized plastic container)
- stirring spoons (two for whole-class process; two per group for group process)
- electric mixer
- large bowls for mixing (two for whole-class process; two per group for group process)
- sink
- refrigerator
- bowls and spoons for serving
- small spade
- measuring spoons
- measuring cups

The idea for this lesson plan came from a Learning Through Discovery activity at the Montana Natural Resources Youth Camp.

Lesson Activities

This lesson is written as a whole class activity; however, students could be divided into groups and given smaller portions of the ingredients so they can have more of a personal hands-on role in the activity. In the group scenario, many smaller-sized pots would be needed instead of one large pot.

1) Line an 8-inch clay or plastic flowerpot with tin foil or waxed paper.

2) Crush 1 large package of Oreo cookies (the cookie portion only) and set aside.

3) Put aside for later a half-pound package of gummy worms, 1 package miniature chocolate chips, and some green-colored coconut.

4) Cream together 4 tbs. of butter or margarine, one 8-oz. package of cream cheese, and 1 cup of powered sugar. (If students are working in groups, the teacher may want to do all the creaming with the mixer for safety reasons).

5) Mix together 3 1/2 cups of milk, two 3-oz. packages of vanilla instant pudding, and a 12-oz. container of whipped topping. (If students are working in groups, the teacher may want to do all the mixing with the mixer for safety reasons).

6) Stir together the creamed mixture and the pudding mixture.

7) Place the whipped topping container lid in the bottom of the flowerpot.

8) Bottom Layer (Parent Material) – Begin with a layer of crushed cookies (about 1/3 of crushed cookies). Then mix chocolate chips with half of the creamed pudding mixture and smooth it over the cookies. Tell the students what each layer is as it is placed into the pot.

9) Second Layer (Subsoil) – Add more crushed cookies (another 1/3), then a creamed pudding layer and the gummy worms. (Save one worm for the top layer!)

10) Top Layer (Topsoil) – Finish with a layer of crushed cookies (the remaining). Sprinkle with green coconut for 'grass' and poke a gummy worm through the top to peek out of your 'soil.'

11) Refrigerate overnight.

12) Dish it up using a small (clean!) spade. An extra touch could be adding rock candy as a 'garnish.'

Assessment:

- before serving the treats, ask each student to identify what each layer represents (i.e., parent material, subsoil, topsoil)
- ask the students what is in the soil that plants depend on and why soil benefits from having plants grow
- ask how rancher Bob Lee manages his grazing lands to maintain the soil resource (refer to the Lee Ranch story in Amazing Grazing)

Ascending Levels of Intellectual Demand:

- Take the students to a near-by new construction site during the excavation phase so they can see the layers of soil below the surface. Allow closer inspection by students only if safety is assured.