California Foundation for Agriculture in the Classroom

I'm Superb Soil, Not Dirty Dirt!

For each student:

- *Superb Soil* handout (page 61)
- *What is Soil Made Of?* handout (page 62)
- *What Superb Soil Has* handout (page 63)
- 1 toothpick
- 1 pair of scissors

Content Standards

Grade 2

Science
Life Sciences 3c, 3e
Earth Sciences 3e
Investigation & Experimentation 4c, 4d, 4f, 4g

Next Generation Science
Defining and Delimiting Engineering Problems
2-ETS1.A

English Language Arts
Informational Text 1,7
Writing 8
Speaking & Listening 1a

Grade 3

Science
Investigation & Experimentation 5d

English Language Arts
Informational Text 1,7
Writing 8
Speaking & Listening 1b

Procedure

1. Distribute the *Superb Soil* handout to each student. Tell students to close their eyes and imagine that they are outside digging a hole in the soil. What would they find as they dig? In the space for Jar #1, have students draw and label a detailed picture of what the soil would look like and what it would contain.
2. Divide students into pairs. Using shovels and small milk containers, take students outside and spread them out so each pair can dig up a small sample of soil from different areas. Students should dig at least 4 inches down. Tell students that they will be returning the soil to the place where they dug it up after the experiment. Monitor students to avoid digging in inappropriate areas.
3. Have students spread newspaper out on their desks or the ground outside. Soil samples should be dumped out on the newspaper for inspection. Students should use the hand lens to find as many different things as they can. Tell them that the little rock-like pieces of sand are the mineral content of the soil. Little bits of twigs and decomposing leaves are organic matter. Some students may find decomposers in their soil. Instruct students to draw and write a description of their soil samples in the space for Jar #2.
4. Make a list on the board of every different thing that has been found by the student groups. Examples:
   - Small mineral particles: clay or silt
   - Larger mineral particles: sand
   - Rocks
   - Dead plant parts: leaves, twigs, etc.
   - Live plants
   - Seeds
   - Humus: a soft type of dirt of decomposed material, organic matter
   - Water
   - Garbage
   - Air
5. Have students fill in the holes they dug by returning their soil samples.
6. Discuss the actual components of soil. Have students build a soil model by coloring and cutting out the pictures provided then gluing them onto *What Superb Soil Has* handout.

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Grade 4

Science
Life Sciences 2c
Investigation & Experimentation 6f

English Language Arts
Informational Text 1,7
Writing 8
Speaking & Listening 1b

7. Ask students to think about what would happen if all decomposers disappeared from Earth. What would happen with waste materials? Would plants be able to get the nutrients they need to grow? Discuss ideas as a class.

8. **Edible Soil Demonstration** – reinforce student knowledge of soil components by making a delicious edible soil model. Place the clean, large jar at the front of the class. Ask students to list, one at a time, an item that is part of soil. As they list the item, choose one snack to represent that item and pour it into the jar. As you fill the jar, discuss with students that soil is made of many components, many of which cannot be seen with the unaided eye. What are some examples of things the students could not see in their soil without a microscope? Make a list on the board. After all the items have been listed and the jar is full, seal it and place it on display. Serve the snack to students at an appropriate time.

Edible Soil Demonstration (possible ingredients)

Soil Component	Candy	Other Snack Item
Air	Pop Rocks	Coconut flakes
Rocks	Large jawbreakers	Dried pears
Pebbles	Gumballs	Dried apricots
Sand	Jelly Beans	Chocolate covered peanuts
Clay/silt	Red Hots	Sunflower seeds
Animals	Animal cookies	Goldfish crackers
Decomposers (worms, fungi, bacteria, etc.)	Gummy Worms, gum drops, Nerds	Yogurt covered raisins
Water	Blue candy	Fruit roll-ups bits
Seeds	Peanut M&Ms	Peanuts
Organic matter	Crushed chocolate cookies	Raisins
Plants	Orange slices, candy corns	Spearmint leaves

9. On the back of one of their handouts, have students write down five things that they did to get ready for school today. Use a flow chart to describe and illustrate how those things can be traced back to the soil. Examples:

   - Rode skateboard to school ⇨ wood deck of skateboard ⇨ trees ⇨ forest soil
   - Drank milk at breakfast ⇨ cow ⇨ ate alfalfa/grass ⇨ grew in soil
   - Remember… even oil and gas originate from organic materials that were once the remains of dead plants from ages ago: plastic ⇨ oil extraction ⇨ decay of plants ⇨ oil under layers of rock and soil

Variation

- If digging outside is not an option, bring in a few containers of various soil samples for students to investigate.

Extensions

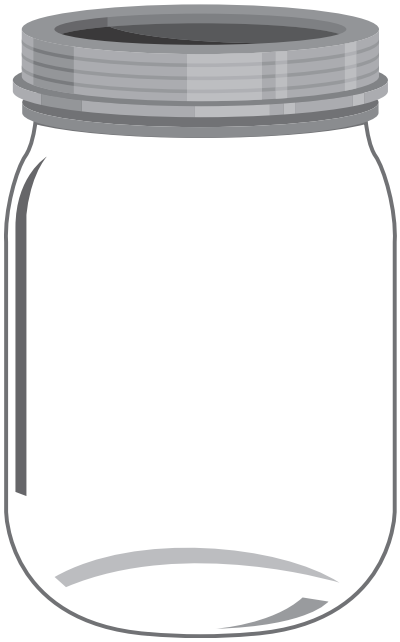
- Write a paragraph about how one of the following organisms depends upon the soil: apple tree, earthworm, mushroom, you, farmer, ant, etc.
- Have students fill baby food jars half full with soil. Fill the jars with water and secure lids. Shake the jars vigorously for five minutes. Let the jars sit overnight and observe the soil profile over the next couple of days. For more information, see "Shake, Rattle, and Roll" from WE Garden lesson packet at *www.LearnAboutAg.org/wegarden*.

ELL Adaptations

- This lesson incorporates hands-on activities. Kinesthetic learning events provide an excellent learning environment for English language learners.
- Demonstrate how student groups should dig and inspect their soil samples. Pair ELL students with other students who will model instructions.
- Add new vocabulary to a word wall and match photos to the new words.

Superb Soil

Name: _____



Jar #1

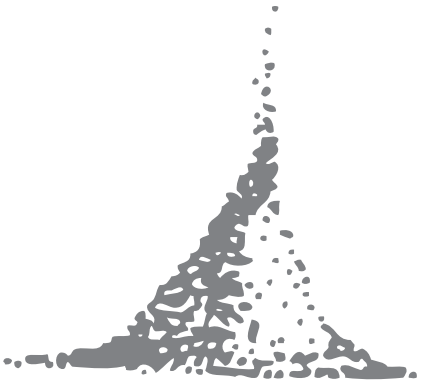
I think soil is made of:

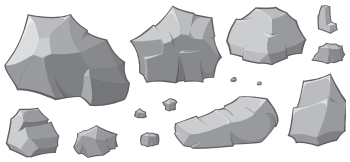
Jar #2

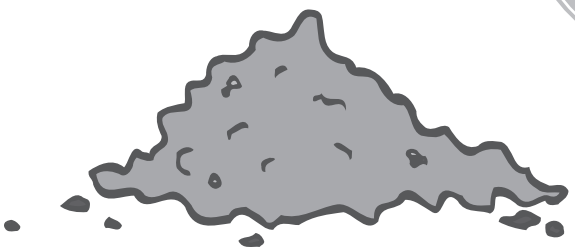
I found the following things in my soil sample:

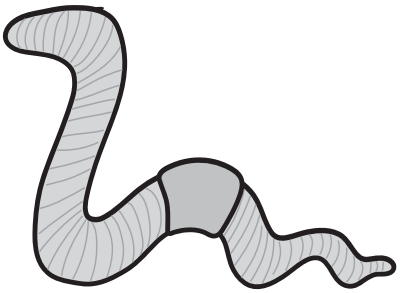
What is Soil Made Of?

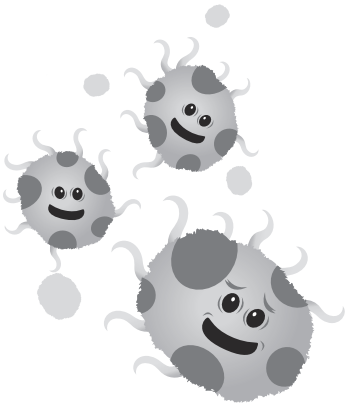
Directions: Color and cut out the pictures and glue them in onto Jar 3.











What Superb Soil Has

Name: _____