

Roots & Shoots Soil Crayons Roots & Shoots for Elementary Lesson 2: Soils



Time needed

Classroom Activity:

50 Minutes

Preparation:

60 Minutes

Cost

Less than \$5.00
(slightly more if
supplies cannot be
borrowed)

Weather consideration

Ground must **not**
be frozen in order
to obtain soil

Advance preparation

Collect materials
and soil samples

Overview

In the EcoTeam Soils lesson, students learn about different soils' texture and capacity to retain water. Another property of soils that students can explore is soil color. The Roots & Shoots activity for this lesson draws upon the diversity of soil color as inspiration for artwork. Students will make soil crayons and create drawings that reflect their appreciation for soils to share with the community. Sending artwork and poems to a children's hospital or nursing home allows students to connect to other people while sharing their knowledge of and appreciation for the environment.

Background Information for Facilitator

A cross section of soil, or a *soil horizon*, contains several layers of differing colors. The colors of the layers help to classify the soils. Color may reflect the soil's mineral composition, amount of organic matter present, and/or moisture level. Color can influence plant growth because of its effect on soil temperature; dark soils absorb more energy from the sun's radiation and provide a warm environment for plants to grow.

Each state in the U.S. has selected a "state soil" that is characteristic of that particular state. You can learn about your state soil at <http://www.statlab.iastate.edu/soils/photogal/statesoils/list1.htm>. Identifying your state soil with students will help foster a connection to and appreciation for your local environment. Comparing your state soil to other states will show the diversity of color in soils. You can utilize this diversity of soil colors to make "soil crayons." If time and resources are not available to make crayons, you can have students create artwork inspired by soil colors. Crayola's® Multicultural Crayons provide a good color palette, and students can still gather a soil sample from their schoolyard for inspiration.

Materials

Part One: For each group of four students you will need:

- Soil samples of various colors (approximately 2 tablespoons of each)
- Hard rubber mallet (or other object to break soil into small pieces)
- Small bowl and spoon to grind soil into powder
- Four paper or plastic cups that can be labeled with student names
- Knee-high or piece of nylon hose

Part Two: Other materials to make crayons include:

- Paraffin wax
- Sharp knife to cut wax
- Hotplate (or stovetop) and medium sized saucepan
- 15 ml (milliliter) pointed centrifuge tubes (hard plastic)
- Small beaker or Pyrex measuring cup to hold centrifuge tubes
- Wood stir sticks (Popsicle sticks)
- Funnel (coffee filter or paper will also work)
- Ice bath
- Paper and pencils
- Trowel or small shovel to collect soil and container for soil
- Vegetable oil

Note on obtaining materials:
You can find paraffin wax in the canning aisle at a grocery store; 8 ounces will make about 30 crayons. A laboratory or university could be your source for the centrifuge tubes. Since you will need a relatively small number of tubes (one for each student), it is reasonable to ask your source to donate them.

Procedures

Part One: Preparing the Soil

1. Collect the soil samples. Collecting soil from your schoolyard is ideal; you can also use soil from the EcoTeam lesson to give some variation in color.
2. Divide students into groups of approximately four. Suggest that one student read the directions to the others, and they take turns doing the steps. Do a quick demonstration of the steps they will go through to prepare the soil. Students will follow the directions on their journal page. Preparing the soil will take approximately 20 minutes.
3. Have students bring the soil powder to you when they are finished preparing each type. Set their cups with their names on them aside. Explain to the students how you will be melting the wax and mixing their soil in. Go over the directions on the students' journal page and allow time for them to complete the exercises.

Part Two: Making the Crayons

1. Pour a small amount (about 1/2 tsp.) of vegetable oil in each tube. Replace the cap and, holding the tube horizontally, turn it slowly so that the oil coats the inside of the tube. Remove the cap and place the tube, open side down, on paper to drain the excess oil.
2. Cut the paraffin wax into small (1 mm or less) pieces with a sharp knife or razor blade. Fill the centrifuge tubes up to about the 12 ml mark with loosely packed pieces of wax.
3. Place approximately 2 inches of water in a saucepan on a hotplate or stovetop. Place the small beaker or Pyrex measuring cup half full of water into the pan (you are essentially making a double boiler). When the water starts to boil, turn the heat source down to medium.
4. Place the centrifuge tubes with the wax into the beaker or glass bowl in the saucepan and wait for the wax to melt. The wax turns clear as it melts. When the wax is completely melted, add one teaspoon of soil to each tube. Stir wax and soil with wooden stir stick.
5. Remove the tubes from the saucepan while continuing to stir the mixture and place them in an ice bath. Remove the stirring sticks and let them cool for approximately 10 minutes.
6. Take the cooled tubes out of the bath. Tap the sides of the tube to loosen the crayon. Turn tube upside down and tap until crayon slides out.



Making soil crayons with students

Sharing your work

Learning about and connecting to nature can offer us an opportunity to connect to other people. Students can draw pictures with crayons (including their soil crayon) to give to children in hospitals or senior citizens in nursing homes. They can also include their soil poems, crayon names, a brief description of what they learned about soil, or the story of how they made their soil crayons. You can find a nursing home in your community in the phone book. Most large cities have a children's hospital which you can call.

Sources

National Soil Survey Center. "Soil Science Education Website." *Soil Crayons*.

<http://www.statlab.iastate.edu/soils/nssc/educ/crayon.htm> (8 July 2002).

National Soil Survey Center. *State Soils*.

<http://www.statlab.iastate.edu/soils/photogal/statesoils/list1.htm> (15 July 2002).

Saskatchewan Interactive. *What is Soil?*

<http://interactive.usask.ca/skinteractive/modules/agriculture/soils/soilswht/index.html>.

(12 July 2002)

Name _____

roots&shoots



roots&shoots

the Jane Goodall Institute

Roots & Shoots for Elementary

Lesson 2:

Soil Crayons

SMOOTH...ROUGH...SLICK...SOFT...STICKY...we used these words to describe your soil samples. Soils vary in the size of their grains and the space between their grains. This causes them to feel different. For example, silt feels smooth and soft. Did you notice that the different types of soils also look different?

We often describe soils by how they look. Soils from various areas are many different colors: red, black, yellow, white, and gray. So many colors are under your feet! You will work in groups to prepare your own soils to make soil crayons.

Preparing your soil:

STEP 1: Place one type of soil on a piece of paper and crush into pieces with a mallet.

STEP 2: Place the crushed soil into a bowl. Use the bottom of a spoon to crush the soil into a fine powder. Press down with the spoon while moving it around.

STEP 3: Spoon the powdered soil into a cup. Wrap the nylon hose over the top of the cup. Turn the cup upside down over a piece of paper and gently shake to sprinkle out the finest powder onto the paper. Have one person take this to your teacher.

STEP 4: Repeat with each type of soil. Your teacher will mix your soil powder into a special kind of heated wax.

STEP 5: After your soil crayons are mixed and cool, you can draw with them!





Do you have a favorite crayon color? Many crayons take their names from nature: Robin Egg Blue, Purple Mountain, Jungle Green and Carnation Pink are a few. Think of a name for your crayon that describes the color and its source. Then tell why you picked that name.

The name of my soil crayon is _____

because _____

_____ .



Many people write poems about subjects they care for or respect. You can describe the soil you have worked with and how you feel about it through a poem. A **cinquain** is a five-line poem with the following pattern:

Line 1: one word – noun (person, place or thing)

Line 2: two words – describe the noun

Line 3: three words – actions

Line 4: two words – feelings

Line 5: one word – another word for the noun in Line 1

Soil Cinquain Example	
Soil	Soil
Soft, brown	Mudpie, floor
Holds tree roots	Feeds our plants

In the space below, write your own cinquain. Be sure to capitalize the first word in every line. Line 1 will be “Soil,” but the rest is up to you!



roots&shoots

the Jane Goodall Institute

Dear Parent or Guardian,

As part of the EcoTeam curriculum, your child is learning about different types of soils. Students demonstrate their appreciation of soil through artwork and poems. Some of this artwork was made using "soil crayons" that we made from soil from our schoolyard. We are donating these creations to a local Children's hospital and nursing home to share with community members who might not have had similar experiences. Learning about and connecting to nature offers us the opportunity to connect with other people as well.

You can ask your child to describe his/her soil crayon (including what it was named) and what was created with it. You can also make the treat below to extend the soil lesson to your home!

DIRT DESSERT

Here's what you'll need:

- 3 ½ cups milk
- 2 small packages of instant pudding
- 10 ounces dessert whipped topping
- gummy worms
- 1 bag chocolate layer cookies crushed
- plastic pail and shovel

Here's how you do it:

Mix together 3 ½ cups milk with 2 small packages of instant pudding. Fold in 10 ounces of dessert whipped topping. Fold in some of the gummy worms. Finely crush a bag of chocolate layer cookies with a rolling pin, or put the cookies in a food processor (this is the dirt).

Alternate pudding and dirt layers in the plastic pail and finish with a layer of dirt and gummy worms on top. To serve, shovel into individual cups (make sure everyone gets some worms!). This recipe will serve ten hungry kids!

Source: http://www.co.richmond.ga.us/beautiful/dirt_dessert.htm

Sincerely,