

## Soil Crayons

### Teaching Objective

"To gain a deeper appreciation of soils -- one of our most important natural resources."

[Click here](#) for an example of artwork done with Soil Crayons.



### Introduction

Soils are one of our most important natural resources. They also are important for the beauty their many colors add to our landscapes. Most of us overlook this natural beauty because we see it every day. Often these colors blend with vegetation, sky, water, etc. Soil colors serve as pigments in bricks and pottery. Soil crayons, a mixture of soil and wax, provide an opportunity for observation of a variety of colorful soils. This natural beauty can be interesting to art students and others who want to create a natural look in their artwork.

### Materials

soil (dried in air)  
hammer/mallet  
sharp knife/razor blade  
plastic ziplock bag  
mortar and pestle (rubber-tipped)  
paper cups (8 oz.)  
knee-high nylon hose (white preferred)  
paraffin wax  
hot plate  
saucepan (medium)  
15-ml (milliliter) pointed centrifuge tube (hard plastic)  
small beaker/rack to hold centrifuge tubes  
small glass funnel  
wood stir sticks (popsicle sticks)  
teaspoon  
ice bath  
metal spatula/scrapper (thin blade pocket knife)

### Procedure

1. Prepare the soil:
  - a. Place dried soil on a piece of brown paper and crush into pieces with a hammer or mallet.  
[Figure, Step 1a](#)

- b. Place some of the crushed soil into a mortar. Use a rubber-tipped pestle to crush the soil into a fine powder. Repeat to crush all of the soil.  
[Figure, Step 1b](#)
- c. Place cup of powdered soil in a paper cup. Wrap a knee-high nylon hose over the top three times.  
[Figure, Step 1c](#)
- d. Turn the cup upside down over a piece of paper and gently shake to sprinkle out the finest powder onto the paper. Use this soil powder to make the soil crayons.

Prepare each of the soils in this manner.

2. Prepare the wax:
  - a. Cut the wax into small (1mm or less) pieces with knife or razor blade or place a block of wax into a heavy duty ziplock bag and crush with a mallet.
3. Make the crayon:
  - a. Heat approximately 2 inches of water in a saucepan on a hotplate. Place rack or small beaker with water in the pan. When the water starts to boil, turn the hotplate down to a simmer.
  - b. While the water is heating, place enough small pieces of wax into a 15-ml centrifuge tube (packed slightly) to about 12 ml.
  - c. Place the centrifuge tube with the wax into the rack or beaker in the saucepan and wait for the wax to melt.  
[Figure, Step 3c](#)
  - d. When the wax is completely melted, place the glass funnel into the top of the centrifuge tube and spoon in approximately 1 teaspoon of prepared soil. Remove funnel. Stir melted wax and soil mixture with a wooden stir stick. Continue stirring while removing the tube with the wax and soil mixture to an ice bath and remove stick.
  - e. Let the centrifuge tube sit in the ice bath about 15 minutes. Take the tube out of the bath and scrape the inside of the tube to remove any excess soil or wax along the rim edge of the crayon to help release it.  
[Figure, Step 3e](#)
  - f. Turn the centrifuge tube upside down and gently tap on counter to release crayon.
  - g. Color and have fun.



## Helpful Hints

1. The best temperature for melting the wax is right at its melting point. If the water is too hot, the wax becomes runny and the soil settles to the bottom quickly.
2. The higher the clay content in the soil, the less problem with settling (the finer particles settle more slowly).
3. The 12 ml of unmelted wax in the tube melts down to about 6 ml. Adding the spoonful of soil brings the volume to approximately 9 ml.
4. Network with others to get a variety of soil colors.
5. Handle hot items with caution. The hot wax step may not be suitable for younger children.
6. The 15-ml centrifuge tubes may be acquired from a medical supply store.

## Activity Time

The estimated time is about 45 minutes.

For more information, contact your local USDA, Natural Resources Conservation Service office.