

## Painting with Soils!

<b>Grade Level:</b>	2-5, 6-8, 9-12
<b>Estimated Time:</b>	2 hours
<b>Purpose:</b>	
<p>By the end of the lesson, students will not only have created vibrant paintings using soils but will also carry with them a newfound appreciation for the intricate and colorful world beneath our feet, coupled with a sense of responsibility to contribute to soil conservation efforts. Through the integration of art and science, this lesson seeks to inspire a deeper understanding of soils and a commitment to preserving the beauty and functionality of our environment.</p>	
<b>Student Learning Objectives:</b>	
<ol style="list-style-type: none"> <li>1. Students will gain an appreciation for the importance of soil conservation and demonstrate an understanding of their role in caring for the soil by engaging in discussions on sustainable practices and environmental stewardship throughout the lesson.</li> </ol>	
<b>Materials Needed:</b>	
<ul style="list-style-type: none"> <li>• Soil (if possible find samples in a variety of colors)</li> <li>• A surface to dry your soil</li> <li>• Tools to crush soil</li> <li>• A sieve and/or panty hose to sift soil</li> <li>• Glue</li> <li>• Water</li> <li>• Cups and plates</li> <li>• Watercolor paper</li> <li>• Paintbrushes of any size</li> </ul>	
<b>Vocabulary:</b>	
<ul style="list-style-type: none"> <li>• Soil</li> <li>• Dirt</li> <li>• Soil Scientist</li> </ul>	
<b>Preparation:</b>	

### **1-2 days before the activity:**

1. Gather soil samples from your yard or schoolyard or ask students to bring in a bag of dirt. Try to find soil in a variety of colors. The amount you collect will be determined by the size and quantity of paintings you want to complete. Remove any large particles and soil life you find and return them outside.
2. Dry soil completely on an old baking sheet or plates for 1-2 days or in an oven on low heat.
3. Once dry, crush the soil to make it as fine as possible.

### **Engage:**

- Show the video, "[The Art of Soil: Painting with Earth](#)" (9:20)
- Additional optional video, "['Finger Lakes Bounty' soil painting time lapse](#)" (:55)
- **Introduce** the activity, emphasizing that soil is a critical natural resource, as important to our quality of life as clean air and water. We need to protect it and improve it.

### **Grow:**

**While students are painting, ask questions to facilitate discussion. Some possible questions include:**

- **Question:** What causes this variety of colors in soils?
  - **Answer:** "Soils with high amounts of organic matter are darker, even black. Soils with high amounts of lime are white. Red or orange soils have lots of iron. Soils with a green tinge have higher amounts of copper. Yellow soils usually come from sandstone." ([Soil Science Society of America](#))
- **Question:** Why do you think soil is disappearing, as mentioned in the video?
  - **Answer** (variable): "Human-induced soil degradation like erosion, intensive cultivation, over-grazing, land clearing, salinization, and desertification are estimated to affect almost 40% of the world's agricultural land." ([Tata-Cornell Institute - Cornell University](#))
- **Question:** What are some ways that soil can be protected?
  - **Answer** (variable): "Farmers can implement conservation practices like reduced tillage, cover crops, and nutrient management in their fields. Everyone can play a part in protecting soils by simply treating and recognizing soils as a living ecosystem."

**This can be a great time to review soil science questions from previous units, such as soil texture, soil classification, soil composition, and soil formation.**

## Activity:

### **Preparing the Soils (the day of the activity):**

1. Once the collected soil is dry (see the “Preparation” section), have the students crush the soil to make it as fine as possible or crush it before the activity, depending on the classroom dynamics.

Place dried soil on pieces of paper or individual paper plates. Use a large tool like a hammer or mallet to crush the soil to make it as fine as possible.

Repeat to crush all of the different colored soils.

2. Sieve the soils by placing the powdered soil in a paper cup. Wrap a knee-high stocking over the top two or three times. Turn the cup upside down over a piece of paper or a paper plate and gently shake out the finely powdered soil.
3. Store the different soils in paper cups – notice the different colors and textures.

### **Painting:**

1. Students may lightly draw a design on watercolor paper with a pencil. Then trace the lines with ink for permanent lines.

*Optional: Use masking tape to carefully tape the edges of the paper to the table or easel. This will allow the artwork to dry flat.*

2. Mix your soil with glue and water until you get a consistency that resembles paint or a runny paste (add just a little bit at a time so that it does not become too runny).
3. Time to paint! Watercolor paper works well for earth paints.

### **Painting Tips:**

- Experiment with the depth of color by adding more or less soil and create new colors by mixing different soils.
- Use different sizes and kinds of paint brushes, sponges, or rags to apply the soil paint to your “canvas.” Experiment and have fun!
- When your artwork is dry, you may want to apply another layer of soil paint.
- You can also use a black ink pen to make finishing touches on your artwork.

## Expand:

### **Connect with other classrooms:**

Connect with other classrooms in different parts of the state, or even in other states. Request the penpal schools to send soil samples from their area, along with information about the crops or plants usually grown there.

Upon receiving the samples, instruct students to categorize and label the soils. Utilize a large laminated map of the state to visually represent the variations in soils across different regions. Affix a small amount of soil onto the map to indicate its origin.

Have the students send thank you cards and share project results with the participating classrooms. to participating classrooms and sharehave the option to express gratitude to participating schools through thank-you notes and may also share their project results.

### **Examine under a microscope:**

For each sample, keep a small amount — about 1 tablespoon — of uncrushed soil for students to examine under a microscope or magnifying glass

## References & Resources:

Adapted from:

- <https://www.earthsciweek.org/classroom-activities/painting-soil>
- <https://kidsgardening.org/resources/garden-activities-soil-art/> \* This resource includes example pictures of the process and final products.
- <https://www.kyreadysetgrow.org/curriculum/painting-with-soil>
- <https://www.nrcs.usda.gov/resources/education-and-teaching-materials/painting-with-soil>
- <https://www.soils.org/files/sssaiys/paint-with-soil.pdf>

Additional Resources and References:

- <https://soilhealthlab.cals.cornell.edu/soil-painting/>
- [https://www.youtube.com/watch?v=G0FRhn4q0\\_E](https://www.youtube.com/watch?v=G0FRhn4q0_E)
- [https://www.youtube.com/watch?v=fuAbbeSy02k&list=PLHPXm2Es8aQC2SGfdDfIDpNxW\\_zMDcXE\\_&index=4](https://www.youtube.com/watch?v=fuAbbeSy02k&list=PLHPXm2Es8aQC2SGfdDfIDpNxW_zMDcXE_&index=4)
- [Smithsonian Environmental Research Center - soil color matching game](#)
- [www.soils4teachers.org](http://www.soils4teachers.org)
- [www.soils4kids.org](http://www.soils4kids.org)

## Standards and Connections:

### 5-ESS2: Earth's Systems

- 5-ESS2-1 Develop a model using an example to describe ways in which the geosphere, biosphere, hydrosphere, and/or atmosphere interact.

### 5-ESS3: Earth and Human Activity

- 5-ESS3-1 Obtain and combine information about ways individual communities use science ideas to protect the Earth's resources and environment.

### 5-PS1: Matter and Its Interactions

- 5-PS1-3 Make observations and measurements to identify materials based on their properties.

### NCSS 3 (Grades 3-5): People, Places, and Environments

- *Objective 5:* Physical changes in community, state, and region, such as seasons, climate, and weather, and their effects on plants and animals.
- *Objective 7:* Benefits and problems resulting from the discovery and use of resources.

CS.02.02. Examine the components of the AFNR systems and assess their impact on the local, state, national and global society and economy.

CS.04.01. Demonstrate stewardship of natural resources in AFNR activities.

NRS.01.02. Classify different types of natural resources to enable protection, conservation, enhancement and management in a particular geographical region.