

**What's in Soil?      Grade 3 – Understanding Space & Earth Systems**

<h2 style="margin: 0;">Lesson Plan</h2>	Assessment	Experiment, artifact
	Cross-curricular	Science, Language

<p><b>Big Ideas</b></p> <ul style="list-style-type: none"> <li>Soil is made up of living and non-living things.</li> <li>The composition, characteristics, and condition of soil determine its capacity to sustain life.</li> <li>Soil is an essential source of life and nutrients for many living things.</li> <li>Living things, including humans, interact with soils and can cause positive or negative changes.</li> </ul> <p><b>Overall Expectations</b></p> <ul style="list-style-type: none"> <li>Investigate the composition and characteristics of different soils;</li> <li>Demonstrate an understanding of the composition of soils, the types of soils, and the relationship between soils and other living things.</li> </ul>	<p><b>Specific Expectations</b></p> <ul style="list-style-type: none"> <li><b>2.2</b> investigate the components of soil, the condition of soil, and additives found in soil, using a variety of soil samples from different local environments, and explain how the different amounts of these components in a soil sample determine how the soil can be used.</li> <li><b>2.3</b> use scientific inquiry/experimentation skills and knowledge and skills acquired from previous investigations, to determine which type(s) of soil will sustain life.</li> <li><b>2.5</b> use appropriate science and technology vocabulary, including clay, sand, loam, pebbles, earth materials, and soil, in oral and written communication.</li> <li><b>3.1</b> identify and describe the different types of soils well as clay.</li> <li><b>3.3</b> describe the interdependence between the living and non-living things that make up soil.</li> </ul>
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**Description**  
 In this lesson, students will explore different types of soil and through inquiry, determine which type of soil is best suited to grow a radish or another quick germinating seed.

<p><b>Materials</b></p> <ul style="list-style-type: none"> <li><i>Soils – Student Handouts</i> document</li> <li>Magnifying glasses</li> <li>Containers for soil sample collections</li> <li>Radish seeds</li> <li>Students may request additional materials to ensure their soil is optimal.</li> </ul>	<p><b>Safety Notes</b></p> <p>While exploring and experimenting with soils, it is essential that students use gloves and/or safety goggles to protect themselves. It is important that surfaces are also protected and/or thoroughly cleaned if soils have been in contact with them.</p>
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## Introduction

Start the lesson by having students independently complete the first two sections of the KWL chart so that they can identify what they know and what they want to know about soils. After 10 minutes, have students meet in groups of 3 or 4 to collectively complete the same sections of a KWL chart. As students progress through the activity, provide them with opportunities to refer back to their KWL chart so that they can complete the final section about what they learned. Once the first two sections of the KWL chart are complete, head outdoors so that each student can collect soil samples from three different locations. The samples can also be collected by yourself or your class ahead of time. Alternatively, you may contact a landscaping company and enquire if they will provide you with three different samples of soil.

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## Action

In the classroom, have students investigate their three soil samples using the *Soil Observations* handout and a magnifying glass. Ask the students to describe the different soil samples and consider what they may be made of and the purpose of soil. Students will learn that soil has living and non-living components and be able to identify the components of soil that are essential for plant growth.

Having completed their *Soil Observations* handout, students will work on developing an inquiry question about soil that they can research to further their knowledge. Use the *Soil Inquiry Project* handout to guide students in the development of their inquiry question. Once students have decided on an inquiry question, they'll be required to complete the steps in the *Soil Inquiry Project* handout to be able to plan their experiment. Once students have completed their plan, provide them with time to conduct and interpret their experiment.

### Possible Inquiry Questions:

- Why might very moist soils not be optimal for the growth of a radish? What might be an optimal amount of moisture?
  - How will different soils affect the growth of a radish? Why might that be?
  - How would the introduction of a worm or another insect affect the growth of a radish? Why might this have an impact?
  - How could we create an optimal soil environment to grow a radish? What is needed?
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## Consolidation/Extension

Students can complete their experiment alone or in small groups. When they are complete, they will be required to present their project. This can be done as a presentation or as a gallery walk. A *Peer Project Learning Opportunity* handout is provided for students to use during the gallery walk.

A rubric is provided to allow for assessment of all stages of the inquiry project.

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## Resources

The following website can be used to provide students with an introduction to soils: **Soil School** - <http://www.soil-net.com/primary/>.