

# In a Speck of Soil

(Indoor Activity, Observation, Experiment, Discovery)



## Introduction

In the book *Mighty Mole and Super Soil*, author Mary Quattlebaum introduces children to an underground ecosystem. What creatures live in the ground and how do they help make the soil healthy? These underground happenings are largely invisible to humans but vital to the health of the planet. In this activity, children use observation and several scientific tools to examine healthy soil.

## Materials Needed

- ◆ Small bucket of healthy soil, enough for each child to have a sample
- ◆ Scientific notebook (3 pieces of paper stapled), one per child
- ◆ Pencils, one per child
- ◆ Magnifying glass, enough for children to share
- ◆ Microscope, one per class
- ◆ Slide and slide cover, one per class

## Common Core Standards (ELA K-3)

### ◆ Reading: Literature

- ◆ Key Ideas and Details K.1, 1.1, 2.1
- ◆ Craft and Structure K.7, 1.7, 2.7

## Procedure

1. Read aloud the book paying particular attention to the how Mighty Mole and the soil he lives and moves in.
2. Tell children that they are scientists and will be making careful observations of soil using three types of scientific tools (eye, magnifying glass, and microscope).
3. Ask them to draw one big circle on each page of scientific notebook.
4. Give each child small handful of soil. Explain that healthy soil is made largely of small rocks, water, air, and decomposing plants and animals. Explain that there are three types of soil according to the size of bits of worn-down rock: sand (big bits), silt (smaller bits), clay (smallest bits; feels sticky).
5. **Observation 1:** Have children examine soil with hands and eyes. The eye is usually the scientist's first tool. Ask what they feel/see or "observe" (any tiny rocks or bits of old leaves, for example). Identify the type of soil. Have them list and then draw their observations inside the first circle in notebook.
6. **Observation 2:** Have children observe a bit of their soil with a magnifying glass and draw what they see inside the second circle in notebook.
7. **Observation 3:** Place a bit of soil on slide with cover slip. Have children observe with microscope and draw what they see inside the third circle of notebook.
8. Have children compare their different observations. What are similarities and differences between the three drawings?
9. Explain that the underground world has some creatures that you can see with your naked eye but many are so tiny that you can see them only with a microscope. Some of these tiny bacteria act to decompose or break down dead plants and animals; others help plants to use the nutrients in the soil.

# In a Speck of Soil

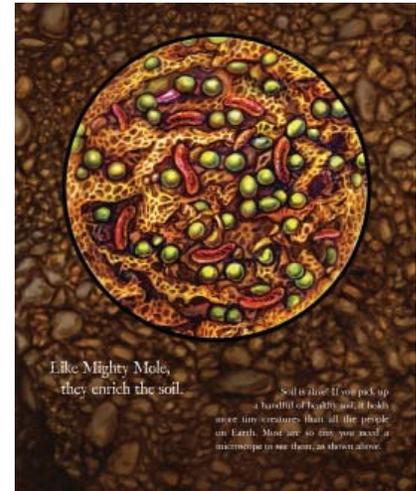
(Indoor Activity, Observation, Experiment, Discovery)



## Nature Extensions

Invite children to examine dirt collected from a spot where nothing is growing by repeating steps 2-6 in procedures above. Have them compare their observations/drawings of soil and dirt. What are similarities? Differences?

Have children examine a bit of soil to which a drop of bleach or other chemical has been added. As teacher, repeat step 6 in procedures above and do not let children handle/feel the polluted soil. Have them compare their observations/drawings of soil and soil with bleach. Discuss with children: How might pollutants and chemicals affect the microorganisms that enrich the soil? What might be the effect upon food grown in polluted soil? The effect upon creatures that then eat that food?



## Next Generation Science Standards (DCI K-3)

### Life Science

- LS1 From Molecules to Organisms: Structures and Processes
- LS2 Ecosystems: Interactions, Energy, and Dynamics
- LS4 Biological Evolution: Unity and Diversity

### Earth Science

- ESS2 Earth's Systems

### Physical Science

- PS1 matter and Its Interactions

## Additional Resources

- Soil Composition

[http://www.soil-net.com/cms\\_test/ks2/topic5/topic5\\_factsheet.pdf](http://www.soil-net.com/cms_test/ks2/topic5/topic5_factsheet.pdf)

- Microscopic Soil Bacteria

[http://www.youtube.com/watch?v=7sB\\_cTCyEAO](http://www.youtube.com/watch?v=7sB_cTCyEAO)

*A Handful of Dirt* by Raymond Bial.