

The Adventures of Mighty Mole (and of Mighty Kids)

(Arts & Crafts, Indoor & Outdoor Activity, 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 focus on the mole and dramatize, draw, and write about her experience.

Materials Needed

- ◆ The book *Mighty Mole and Super Soil*
- ◆ Writing and/or drawing paper, 1 sheet per student
- ◆ Colored markers or crayons, enough for all students

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
- ◆ Writing
 - Text Types and Purposes K.3, 1.3, 2.3, 3.3

Procedure

1. Read aloud the book. Ask children to find the mole in every picture in the book. What is she doing? How does she move? What body parts allow her to move this way? What does she eat?
2. What are her "mighty" traits? What do they help her to do?
3. If you could have one of these traits, as a human, what would you choose?
4. Invite children to write and illustrate a story about themselves with their one mighty trait. What would they do? How would their lives be different?
5. Have children share some of the stories and then ask them: even with this mighty trait, how are their lives (and adventures) different from Mighty Mole's?

Next Generation Science Standards (DCI K-3)

- ◆ Life Science
 - LS1 From Molecules to Organisms: Structure and Function
 - LS2 Ecosystems: Interactions, Energy, and Dynamics
 - LS4 Biological Evolution: Unity and Diversity

Nature Extensions

Mighty Mole is an eastern or common mole. There are six kinds of moles in North America. One type, the Star-nosed Mole, lives both in the water and the ground and has 22 tentacles around its snout. Show a photo from a book or the Internet of the Star-nosed Mole. How did it get its name? How do those nose tentacles help it to survive?

Some people don't like the bumps that mole tunnels make in their yards and gardens. They think that moles eat their plants. They trap or kill moles. Be a mole and list all the ways that you help the environment. Write a letter to an angry person and describe the benefits of moles and persuade him or her not to harm you.

Additional Resources

- ◆ Mole Movement

Moles dig with a swimming movement and gobble earthworms, as shown in this science video: <http://news.sciencemag.org/sifter/2014/02/video-moles-swim-through-the-earth>

Mighty Mole and Super Soil

The Underground Community

Answers to matching clues with underground critters

Garter Snake

I'm a reptile that can grow up to four feet long.
Some of my favorite foods are moles, mice, and bird eggs.
I kill my prey by wrapping my body around it and squeezing it to death.

Earthworm

I breathe through my wet skin. But if the ground gets too wet, I might drown.
When I wiggle through the soil, I keep the soil loose and rich.
Moles like to eat me. So do some birds, snakes, and box turtles.

Wolf Spider

I have a hairy body and eight legs.
My large eyes can see in four directions at one time.
Some birds, snakes, and lizards like to eat me.

Eastern Mole

I spend almost all of my time underground.
My tunnels help the soil by mixing and loosening it.
I eat grubs and insects that damage plants. My favorite food is earthworms.

Box Turtle

I'm a reptile that lives as long as 100 years.
My shell is soft when I'm young and gets harder as I get older.
I'm eaten by some birds and snakes.

Meadow Mouse

I sometimes use mole tunnels to travel underground.
Moles get blamed for the damage I do to lawns and gardens.
I'm food for birds, snakes, and foxes.

Ground Beetle

I'm an insect and lay my eggs underground.
I'm a good digger and a fast runner.
My mouthparts are adapted for eating insects, worms, and snails.

Soil Microbes

There are lots of us in the soil.
Some of us are so tiny that we're only as big as one cell.
We eat dead plants and animals.

Ant

I live in a colony. Each member has a special job to do.
The queen's job is to lay eggs.
Workers build tunnels using their mouthparts.

Woodchuck

I'm a large rodent also called a groundhog.
I make deeper tunnels and burrows than moles do.
My tunnel system has many exits so I can escape from predators.

Thank You, Soil!

(Indoor Activity, 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 explore the many things in our lives that depend on soil.

Materials Needed

- ◆ The book *Mighty Mole and Super Soil*
- ◆ Index cards, 2 per child
- ◆ Pencils, 1 per child
- ◆ Scotch tape for each index card

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 and ask children what creatures live in soil and how they help make it healthy.
2. List on the board the important jobs of soil (from the back pages of the book: to grow the plants we eat; to grow plants/trees for our clothes, houses, and paper; to grow plants that supply oxygen for us to breathe; to be the home for many creatures, etc.).
3. Give each child two index cards. Have students look for things in the classroom that came from or rely on the soil (wooden toys, lunch, individual books, pencils, class plants or pets, etc.).
4. On each card, have them write "Thank you, Soil," the name of the thing they found, and their name. Discuss all the things that rely on soil. Teachers might tape an index card on themselves, to highlight that humans, too, rely on soil.

At Home: Give children three more index cards and ask them to find things that are different from the things on their two classroom cards. One of these things should be a snack or dinner item. What did they find?

Next Generation Science Standards (DCI K-3)

- ◆ Life Science
 - LS1.A Structure and Function
 - LS2.A Interdependent Relationships in Ecosystems

Nature Extensions

Explain how plants depend on the nutrients in soil to grow. Identify the different parts of plants and what parts might be eaten. Bring in examples (first ensuring no one has allergies) and show photos of the whole plant. Tomatoes and apples (fruit), lettuce (leaves), celery (stems), corn and sunflower seeds (seeds), carrots and potatoes (roots). Let children taste them all. Thank you, Soil!

Have children name their favorite foods. Ask them to find out how this food can be traced back to a plant that relies on soil. For example: chocolate comes from the cacao beans of a cacao tree; ice cream from cows' milk, which the cow makes after eating grass; sugar comes from the sugar cane plant. Popcorn is the cooked seeds of a special kind of corn. (Six American states grow most of the popcorn in the world: Indiana, Illinois, Iowa, Missouri, Nebraska, Kansas. January 19 is National Popcorn Day.)

Additional Resources

◆ **Soil:** The Foundation of Culture
YouTube Video by Clay Robinson, aka Dr. Dirt,
www.doctordirt.org

Growing Plants:

Jo MacDonald Had a Garden by Mary Quattlebaum, illustrated by Jen Bryant

Garden Treats:

<http://www.kidsgardening.org/activity/cooking-classroom>

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

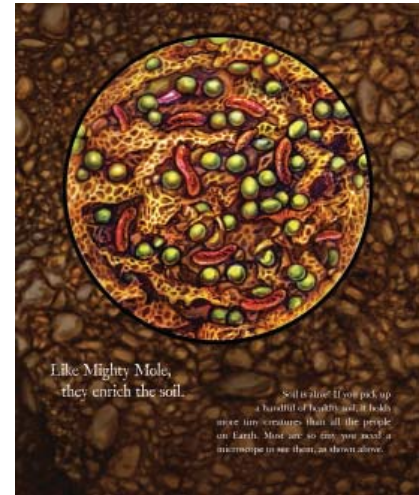
(Indoor Activity, Observation, Experiment, Discovery)



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

- Microscopic Soil Bacteria

http://www.youtube.com/watch?v=7sB_cTCyEAO

A Handful of Dirt by Raymond Bial.