

Life Science: Exploring Soil

Activity Overview

Children carefully **investigate** and **describe** a sample of garden or backyard soil. They **observe** the color, texture, and odor of the soil and use magnifying lenses to **examine** things in the soil such as roots, leaves, pebbles, and possibly tiny living creatures.

*Science process skills are in bold.



Underlying Science Concepts:

- Soil is made of non-living things (rocks, sand, pebbles), organic matter (remains of plants and animals), and living organisms (parts of living plants).
- Soil is important as a home for living things - plants and small animals such as worms, ants, and pill bugs.

Materials:

- Clean soil from a yard or garden (store bought soil will not contain the variety and richness of materials as soil collected from outside)
- Magnifying lenses
- Trays or paper plates
- Spoons or scoops
- Craft sticks
- Bug boxes or small cups

If children are new to using magnifying lenses, allow them time to practice with them before using them for a focused activity.

Getting Ready:

- Collect some garden soil from a clean and safe area of your yard or the schoolyard.
- If your soil sample is dry, you can lightly mist it to reduce dust.

→ Engage

- Show the children a pile of soil on a tray, and encourage them to share their prior knowledge and experiences by asking them questions such as:
 - *What do you see on the tray?*
 - *Where have you seen soil before?*
 - *Why is soil important?*
- Children will likely call it "dirt." Introduce "soil" as the word that scientists use.
- Tell the children that they will be investigating the soil. Ask them to make predictions about what they think they will find in the soil.
- Record their predictions on chart paper.
- Demonstrate how to place a scoop of soil onto a tray. Use your craft stick to slowly explore and look through the soil. Emphasize how to observe using all of your senses (except taste). Model how to use the magnifying lens to get a closer look.
- Ask, "What should we do if we find any little creatures in the soil?" Show the bug boxes or small cups that can be used to collect any worms or other tiny creatures. Emphasize the need to be careful not to harm them.

Making predictions is part of the scientific process. It allows children to make connections to earlier experiences, to imagine possibilities, and develop the habit of "testing" and "checking" instead of being right.

→ Explore

- Provide each child with a tray and soil to investigate.
 - As children are exploring their soil, encourage them to describe their observations. *What does it look like? How does it feel? What are you finding? How does it smell?*
 - If they are interested, children can sort what they find in the soil into groups such as rocks, leaves, sticks, roots, etc.
- If children find living creatures, place them in a bug box or small cup where they can be safely observed and then released outside.
- Suggest that children record their observations and findings through drawing.

The soil exploration activity can be done outside. If there is a clean, safe area for children to dig, let them collect the soil themselves.

You can provide children with sifters (sand box sifters and/or colanders) to sift the soil to separate smaller and bigger pieces.

→ Reflect

- Share and discuss the children's findings. Ask, "What was something interesting you noticed?"
- Revisit their list of predictions and compare their predictions to their findings.
- By asking them questions and drawing on their responses, point out that soil contains living and non-living things. Refer back to the list to



identify examples from both groups (Non-living: rocks, pebbles, sand; Living: roots, leaves, seeds, little animals).

- Have children think about why soil is important. Soil is valuable for many reasons: it helps to grow food, holds the roots of plants in the ground, and is a home for many animals.

Ideas for Further Explorations

- Provide soil samples collected from different places. Do all soils look the same? Compare and contrast their colors, textures, contents, etc.
- Fill the sensory table or bins with soil purchased from a store. Provide small plastic shovels, rakes, small plastic pots and fake flowers for pretend gardening. Toy insects could also be placed in the sensory tub with other natural objects such as pebbles, pinecones, leaves and twigs.
- Build a terrarium! A terrarium is a mini-forest habitat in a plastic container using soil, plants, and a variety of natural items like leaves, bark, and seeds. Small creatures that live in soil like earthworms, pill bugs, and snails can be kept in the terrarium for observation.
- Provide bowls or other containers, soil, water, and mixing utensils for making mud.
- Use this activity as an introduction to gardening.
- Talk with the children about our role in keeping the earth clean by not littering.

Safety: Collect soil from a clean source. Always wash hands after touching the soil. Because young students may inadvertently inhale or eat soil, collect the soil from a garden area that has not been sprayed with chemicals or used by pets.

Key Vocabulary

During the activities integrate the words below into your conversations. Children's vocabulary will build with practice.

- Soil
- Predict
- Observe
- Investigate
- Living
- Non-living

Teacher Tips

Keep in mind that in our society, many people have negative attitudes toward soil as dirty or "yucky." Help children appreciate soil's relationship to other living things and its important role in our lives.

Finding small animals in the soil is exciting but requires adult supervision. Remind children that it is their responsibility to be respectful to living things and to be careful not to hurt them. Centipedes and spiders are not safe for children to handle.

After giving the children time to observe, be sure that any creatures you collect get returned to their natural habitat.

The Soil Song
(Sung to the tune of "When the Saints Go Marching In")

Oh when you dig
In the deep dark ground
Oh when you dig in the deep dark ground
You'll find rocks and bugs and plants parts
When you did in the deep dark ground.

Oh soil is home
For lots of worms
Oh soil is home for lots of worms
Squishy, squirmy, soft, and slimy
Soil is home for lots of worms.

Oh we need soil to grow our food
Oh we need soil to grow our food
Soil is life, we can't live without it
We need soil to grow our food.

Background Information for Teachers

Soil is made up of many organic and inorganic substances including: rocks, minerals, air, water, and living and dead organisms. Soil provides an underground home for many small organisms including earthworms, ants, isopods, bacteria, and fungi. Small organisms that live in the soil help by mixing the soil, creating tunnels for air, and decomposing plant and animal matter. Soil contains water and nutrients that are necessary for plants to grow, and also acts as an anchor for plant roots.

Soil varies in texture, color, and odor. When soil gets wet, it changes in consistency and is referred to as mud. Mud can be slippery and sticky. Soil is different from sand (although sand may be an element of soil), which is only made of rocks that have been broken down into tiny pieces.

Soil is also used by people to create natural building materials such as brick and adobe. Bricks can be made out of soil heavy in clay, sand, and lime (a material made from limestone rock). Adobe ("mud brick") is made from mud mixed with grass and straw and then baked.

