WHAT CAN I FIND ON THE EARTH'S SURFACE?

BIG IDEA 6: EARTH STRUCTURES

BENCHMARKS AND TASK ANALYSES

SC.1.E.6.1 Recognize that water, rocks, soil, and living organisms are found on Earth's surface.
SC.1.E.6.3 Recognize that some things in the world around us happen fast and some happen slowly.
The student:

- records long term observations of various places during different times of the year to see fast and slow changes (soil, plants, weather).
- discusses current events to recognize that things can happen quickly or slowly in our world.

SC.1.N.1.1 Raise questions about the natural world, investigate them in teams through free exploration, and generate appropriate explanations based on those explorations.
The student:

- raises questions about the natural world.
- explores questions about the natural world with a team of students through free exploration and generates appropriate explanations for what was observed.

SC.1.N.1.2 Using the five senses as tools, make careful observations, describe objects in terms of number, shape, texture, size, weight, color, and motion, and compare their observations with others.
The student:

- uses the five senses as tools to:
    - make careful observations.
    - describe objects in terms of number, shape, texture, size, weight, color, and motion.
    - compare own observations with observations of others.

SC.1.N.1.3 Keep records as appropriate - such as pictorial and written records - of investigations conducted.
The student:

- keeps records, such as student-drawn illustrations, science notebooks, or digital media, of investigations conducted.

SC.1.N.1.4 Ask "how do you know?" in appropriate situations.

KEY QUESTION

What types of things can be found on the Earth's surface?

MATERIALS

Teacher

clean jar filled with soil
chart paper
marker

Per student

magnifier
craft stick
newspaper
2 paper plates or containers for soil samples
spoon for digging
science journal
pencil

TEACHER BACKGROUND INFORMATION

Soil is a mixture of rock, mineral particles, and organic matter. Weathering forms the rock and mineral particles of soil. These particles are inorganic parts of soil. Other inorganic parts are water and air. Most organic material in soil comes from decaying plants and animals. This material is called humus. Bacteria and fungi break down plant and animal remains and form humus.

Soil is made up of layers called horizons. The first layer is mostly decaying leaves, twigs, and animal remains. The second layer is topsoil, the third is subsoil, and the bottom is weathered rock. It takes thousands of years for a soil to mature.

SAFETY

Student goggles are recommended in activities using rocks or soil.

TEACHING TIPS

- Identify ahead of time a location around the school which may have different kinds of soil, rocks, and living organisms.
- Provide the opportunity for students to explore their natural world many times over the year. Students can participate in this exact lab many times and still find new objects and get a new experience each time.

ENGAGE

1. Show students a jar of soil.
2. Ask: *What is in the jar?*
3. Record their responses on a Circle Map.
4. Ask: Where can I find soil? (outside, on the Earth's surface)
5. Give each student a spoon and paper plate. Take the students outside and have them gather soil samples from the area you have previously identified as having a variety of soil, rocks, and living organisms. Be certain that students get their samples from different places in that area.

EXPLORE

1. Have students cover their desks with newspaper. Distribute materials to each group.
2. Tell students to make as many observations about the soil as possible. Encourage them to look, smell, and touch the soil. Remind them that they have magnifiers to use. They can use the craft stick to sort through the soil and look for different parts.
3. Direct students to record their observations in their science journals.

EXPLAIN

1. Ask: *What kinds of things can be found on the Earth's surface?* (Make a list of the different things groups saw.)
2. Ask: *Did all of the soil samples look the same? Did they have the same color? Did they have the same smell? Did they have the same texture?*
3. Ask: *How would you describe soil? How does it look? How does it feel? How does it smell? What is soil?*
4. Ask: *Why do you think we need soil?*
3. Return to the Circle Map to add/delete from their brainstorming. Conclude that soil is made up of living things and once living things, such as worms, bugs, leaves, and roots. Soil is also made up of things that have never lived, such as rocks and sand. The pieces are all different sizes. Rocks around the world are constantly, slowly changing into dirt.

EXTEND AND APPLY

1. Discuss how important soil is for life on earth. (Plants need soil to grow, and we need plants to survive.)
2. Have students bring in samples of soil from their yards in small baggies. Give each student a paper plate and a plastic spoon. Let students choose spoonfuls of three soil samples to examine and compare. Discuss the properties of the different soils.

3. Complete this lesson multiple times through the year so students have the opportunity to notice and discuss changes in their environment as different times throughout the year.
4. Have students ask their parents about current events that cause a change in the Earth. Allow students time to share their information.

ASSESSMENT

Teacher observation of student use of materials, participation in group and class discussions.

TREE OBSERVATIONS

BIG IDEA 6: EARTH STRUCTURES

BENCHMARKS AND TASK ANALYSES

SC.1.E.6.1 Recognize that water, rocks, soil, and living organisms are found on Earth's surface.
SC.1.E.6.2 Describe the need for water and how to be safe around water.
The student:

- describes the need for water.

SC.1.E.6.3 Recognize that some things in the world around us happen fast and some happen slowly.
The student:

- records long term observations of various places during different times of the year to see fast and slow changes (soil, plants, weather).
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SC.1.N.1.4 Ask "how do you know?" in appropriate situations.

KEY QUESTION

How do populations of living things change over long periods of time?

TEACHER BACKGROUND INFORMATION

Plants need air, water, light and space in order for them to be healthy and grow properly. If a plant is deprived of one of its essential needs its growth may be stunted or it will die. Some, not all, plants need soil. Living things interact with each other and populations of living things are dependent upon changes in the environment.

MATERIALS

Per class
camera (recommended)

Per student
science notebook

Per teacher
The Giving Tree by Shel Silverstein

SAFETY
Always follow OCPS science safety guidelines.

TEACHING TIPS
- A camera for students to take pictures of the tree is recommended. However, students may draw pictures if necessary.
- A deciduous tree would be best to use for this observation such as maple, oak, or persimmon. The tree should be easily accessible. Sign should be posted identifying the class adopting the tree so that others will not select the same tree.
- Remember that this is an ongoing project that requires students to observe and collect data throughout the entire school year.
- This activity should be repeated approximately once a month, with modeled entries in the class notebook and student entries in individual student science notebooks.

ENGAGE
1. Read the book *The Giving Tree* by Shel Silverstein.
2. Ask: *What happened to the tree?*
3. Ask: *What do real trees need to survive?* (sunlight and food)
4. Take students on a walk of the school grounds. Ask them to observe what types of things are on the school grounds – rocks, plants, trees, man-made structures.
5. Stop and discuss what types of things are found on the Earth's surface.
6. Now tell students that they are going to select a tree to adopt. This project continues throughout the entire year. It provides multiple opportunities for data collection and prediction.

EXPLORE
1. On the first day of the project start a class tree notebook, describing the location and the characteristics of the tree.
2. Take a picture of the adopted tree.
3. Students should draw a picture of the tree in their science notebook and date their observation. Tree should be measured in girth (with string or other non-standard measure).
4. Leaves should be described and collected.
5. The outside temperature and environmental characteristics should be recorded.
6. The area immediately surrounding the tree should be observed and described.
7. Have students keep the area around the tree free from litter and weeds to help keep it healthy.
8. This activity should be repeated approximately once a month, with modeled entries in the class notebook and student entries in individual student science notebooks.

EXPLAIN
1. Each time the class journal should be read prior to observing the tree, so that students can recall the way the tree looked at the last observation.
2. After reading the previous entry, the students should observe the tree and document changes in the characteristics of the tree.
3. Each time, remind students of the importance of water to plants and that without it they would die.
4. Ask: *Where does our tree get its water?*
5. At the end of the project, the notebook should be added to library collection.

EXTEND AND APPLY

1. Complete this lesson multiple times throughout the year so students have the opportunity to notice and discuss changes in their environment as different times throughout the year.
2. Groups of 3-4 students should combine the digital pictures from the year's study into a Power-Point presentation for parent night or for presentation to other classes. This presentation should be organized with a student created script. Each group member may take part in the verbal presentation or may be assigned a job more in keeping with their interests such as creating the Power-Point, presenting the visual aids, etc. Research about the class tree should be done through computer and media resources and shared with the entire class prior to creating the Power-Point.
3. Have students ask their parents about current events that cause a change on the Earth. Allow students time to share their information.

ASSESSMENT

notebook entries, student questioning

Rubric:
The following three-point rubric may be adapted to your county's grading scale to evaluate students' work during these lessons.

• **3 points:** Students were highly engaged in class discussions; were able to demonstrate a clear understanding of the vocabulary and give correct examples appropriate to the lesson
• **2 points:** Students participated in class discussions; were able to demonstrate a basic understanding of the vocabulary and give mostly correct examples; drew pictures that were somewhat appropriate to the lesson.
• **1 point:** Students participated minimally in class discussions; were unable to demonstrate a basic understanding of the vocabulary and could not give examples of lesson. Pictures were incomplete and/or did not clearly identify lesson objectives.

HOW DO HUMANS USE WATER?

BIG IDEA 6: EARTH STRUCTURES

BENCHMARKS AND TASK ANALYSES

SC.1.E.6.2 Describe the need for water and how to be safe around water.
The student:

- describes the need for water.
- recognizes how to be safe around water.

KEY QUESTION

How do humans use water?

TEACHER BACKGROUND INFORMATION

Water is the single most important substance that the body needs to keep operating. We can live up to five weeks without food, but we can only live for a few days without water. Our body is made of 75% water. Water is involved in every function of our body. It is very important for us to drink water every day. Water is just as important to plants and animals as it is to people. We also use water to travel and move objects. Water can move against gravity, sticks together, absorbs and mixes with most things and has a mass that allows heavy objects to float.

MATERIALS

Teacher/Class

Water, Water Everywhere: A Book about the Water Cycle by Berger

Per student

paper
pencil
crayons

SAFETY

Always follow OCPS science safety guidelines.

TEACHING TIPS

- This activity may require more than one day.
- Make sure that you have all materials out and ready and clear a space for the students to work in groups.

ENGAGE

1. *Share the book Water, Water Everywhere: A Book about the Water Cycle* by Melvin and Gilda Berger.
2. Ask: *Why is water important to us?*
3. Ask: *How have you used water in the past few days?*

EXPLORE

1. Have students make charts and pictures of water and how it is used in their everyday lives
2. Allow students time to report and share their drawings.

EXPLAIN

1. Ask: *Could we live without water?* (no)
2. Ask: *What other things need water?*
3. Ask: *How does water give us enjoyment*? (going to the beach, swimming in a pool, etc.)
4. Ask: *When we play with water, do we have to think about safety?* (yes)

5. Ask: *What are some things we do to be safe around water?* (keep it out of our mouth when we swim, wear flotation devices, etc.)

EXTEND AND APPLY

The teacher can extend the lesson with a center that uses water in a variety of different ways.

ASSESSMENT

- science notebook
- class discussion