

Bay Area Scientists in Schools Presentation Plan

Lesson Name Soils Are Diverse!

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Grade Level 2 Standards Connection(s) Earth Sciences: Soils

Next Generation Science Standards:

2-PS1-1. Plan and conduct an investigation to describe and classify different kinds of materials by their observable properties.

2-PS1-2. Analyze data obtained from testing different materials to determine which materials have the properties that are best suited for an intended purpose.

2-PS1-3. Make observations to construct an evidence-based account of how an object made of a small set of pieces can be disassembled and made into a new object.

2-LS4-1. Make observations of plants and animals to compare the diversity of life in different habitats.

| Science & Engineering Practices | Disciplinary Core Ideas | Crosscutting Concepts |
|---|--|--|
| <p>Planning and Carrying Out Investigations</p> <p>Planning and carrying out investigations to answer questions or test solutions to problems in K–2 builds on prior experiences and progresses to simple investigations, based on fair tests, which provide data to support explanations or design solutions.</p> <p>Plan and conduct an investigation collaboratively to produce data to serve as the basis for evidence to answer a question. (2-PS1-1)</p> | <p>PS1.A: Structure and Properties of Matter</p> <p>Different kinds of matter exist and many of them can be either solid or liquid, depending on temperature. Matter can be described and classified by its observable properties. (2-PS1-1) Different properties are suited to different purposes. (2-PS1-2),(2-PS1-3)</p> | <p>Patterns</p> <p>Patterns in the natural and human designed world can be observed. (2-PS1-1)</p> <p>Energy and Matter</p> <p>Objects may break into smaller pieces and be put together into larger pieces, or change shapes. (2-PS1-3)</p> |

Common Core Standards:

ELA/Literacy:

W.2.8 Recall information from experiences or gather information from provided sources to answer a question.

W.2.7 Participate in shared research and writing projects (e.g., read a number of books on a single topic to produce a report; record science observations).

SL.2.5 Create audio recordings of stories or poems; add drawings or other visual displays to stories or recounts of experiences when appropriate to clarify ideas, thoughts, and feelings.

Mathematics:

MP.2 Reason abstractly and quantitatively.

MP.5 Use appropriate tools strategically.

FOSS Connections:

Grade 2 Module: Pebbles, Sand, and Silt

Investigation 4: Soil Explorations

Teaser:

We will introduce what a soil is and the main components of soils. Students will learn that soils are not the same everywhere and can be very different from one another. They will use their senses to examine four soils from different environments (wetland, desert, tropical forest, and grassland) and make inferences about the type of life each supports.

Objectives:

Students will learn what a soil is, some of the main physical properties of soils, and how different soils support different life forms.

Vocabulary:

1. Soil: Soils cover the upper most layer of the Earth's land surface and are composed of four main things: inorganic material, organic material, air, and water. The amount of each of these four pieces determines the properties of the soil and the type of life that it can support.
2. Organic material: Living things like earthworms, insects, and microbes; and things that used to be living like sticks, dead bugs, and leaves. Just because something is no longer living doesn't mean it's not organic.
3. Inorganic material: Things that are not alive right now, and were never alive. In the soil, this is the solid portion that isn't organic stuff, like rocks and sand.

Materials:

- 4 different soil types
- Pictures of the field sites (x10)
- Ziploc snack bags
- Worksheets for each student
- Boxes to put used soil in

Classroom Set-up:

Students should be in small groups of 3-5 and have pencils to fill out a worksheet.

Classroom Visit

1. Personal Introduction:

___5___ Minutes

- *Hi our names are Kari and Gavin and we're both graduate student (in 18th grade) at UC Berkeley. Most of our research is focused on soils which is really awesome! We get to travel to cool places to collect soil samples. In the lab we look at the samples we collected to determine what makes the soil different from other soils. You are going to get a chance to see what our jobs are like!*

2. Topic Introduction:

___10___ Minutes

- *Does anyone know what a soil is? Where do we find soils? Why do we need soils? What are they made of? Are all soils the same?*
- *Go over new vocabulary*

- Today we are going to examine 4 different soils that we have collected from the field. Using our senses we will describe how they are different from each other and try to determine which environment they are from! Our choices are a desert, a tropical forest, a grassland, and a wetland -- pass around pictures.

3. Learning Experience(s): _____ **25** _____ **Minutes**

- Now we are going to give each person a little bit of each soil to examine. We want you to look at the soil, feel the soil, smell the soil, and listen to it. Fill out the worksheet as you do these things then try to decide which environment the soil came from. We'll walk around and help you.
- Pass out Ziploc bags with a small quantity of soil and a packet of worksheets to each student.
- The students will have 5 minutes to examine each soil and fill out the corresponding worksheet.

4. Wrap-up: Sharing Experiences _____ **5-10** _____ **Minutes**

- Who can tell me where they think the first soil is from? What about the second, third, fourth?
- Look at the pictures from each place. Which one do you think has the most rain? The least rain? The types of plants that are growing there are very different! In the desert there are only a few bushes and shrubs, but in the rainforest there are lots of tall trees and a wide variety of other plants. The wetland has standing water, so only plants that can survive in water are able to live there.
- The soil is where plants get their water and nutrients. They absorb all the things they need to survive through their roots. But if the soil doesn't have water or nutrients to give them, they aren't able to grow. This is what happens in deserts. Grasslands and tropical forest are able to give plants all the water and nutrients that they need, so a variety of things grow there.

5. Connections & Close: _____ **5** _____ **Minutes**

- Next time you're outside playing games or hiking with your family, look at the soil and think about what it's made of and how it is able to support the plants and trees that grow in it.

Follow-up – After Presentation

- Students can write a letter to their friend explaining how they learned about what soils are made of and how they can be different from each other. Remember to mention how soils are able to support different plants and trees
- Create a soil Map: <http://urbanext.illinois.edu/gpe/case2/c2a.html>
- Reading Connections:
 - Soil (True Books: Natural Resources) by Christin Ditchfield
<http://www.amazon.com/Soil-True-Books-Natural-Resources/dp/0516293680>
 - A Handful of Dirt by Raymond Bial
[http://www.amazon.com/A-Handful-Dirt-Raymond Bial/dp/0802786987/ref=pd_sim_b_4](http://www.amazon.com/A-Handful-Dirt-Raymond-Bial/dp/0802786987/ref=pd_sim_b_4)
 - Dirt: The Scoop on Soil by Natalie M. Rosinsky
http://www.amazon.com/Dirt-Amazing-Science-Picture-Window/dp/1404803319/ref=pd_sim_b_1
- Soil Science Society of America
 - Resources for kids:
<http://www.soils4kids.org/home>
 - Resources for teachers:
<http://www.soils4teachers.org/>

Name _____

Soil Worksheet

(1) WHAT COLORS DO YOU SEE? (You may circle more than one!)

black dark brown medium brown light brown grey
red orange yellow pink white

(2) WHAT ORGANIC MATERIAL DO YOU SEE? (You may circle more than one!)

leaves roots sticks worms insects

(3) WHAT INORGANIC MATERIAL DO YOU SEE? (You may circle more than one!)

rocks pebbles

(4) HOW DOES THE SOIL LOOK AND FEEL? (You may circle more than one!)

wet dry sticky

(6) WHICH ENVIRONMENT DO YOU THINK IT CAME FROM? (Put a check in the box.)

- Desert: light and dark colors, dry, does not have organic material
- Grassland: light and dark colors, dry, has organic material
- Wetland: very dark color, wet, has organic material
- Tropical forest: red, brown, and yellow colors, sticky, wet

(7) DRAW THE PLANTS AND ANIMALS THAT MIGHT LIVE THERE

