Lesson Overview

This lesson will take kids outside to explore soil in their own backyard/neighborhood. They will make observations, learn about the 3 components of soil (sand, clay, and silt), and do a short activity to determine what type of soil they have.

Expected prior knowledge:

- Fractions, decimals, and percent conversions
- Measuring length with a ruler
- Basic navigation of links and videos

Notes for Parents/Teachers

Supervision:

- This lesson is designed for 5th and 6th graders, therefore it can be performed independently
- Discuss with your child before they start where they can do a small hole to collect soil
- Depending on your child's experience with measuring, they might need support measuring their soil sample.

Age Group:

- Middle School

Total Time Needed:

Total time: 60 to 80 minutes

- Day one: 10 to 20 minutes
- Day two: 50 to 60 minutes

Materials Needed

- clear container with lid (e.g. mason jar)
- Paper and pencil
- Computer or tablet to watch videos
- Trowel
- Ruler
- Tape
- Printed soil chart (in supplemental materials)

See more from MOSS Adventure Learning at moss.uidaho.edu/adventure

What is Soil?

Step 1: Video Introduction

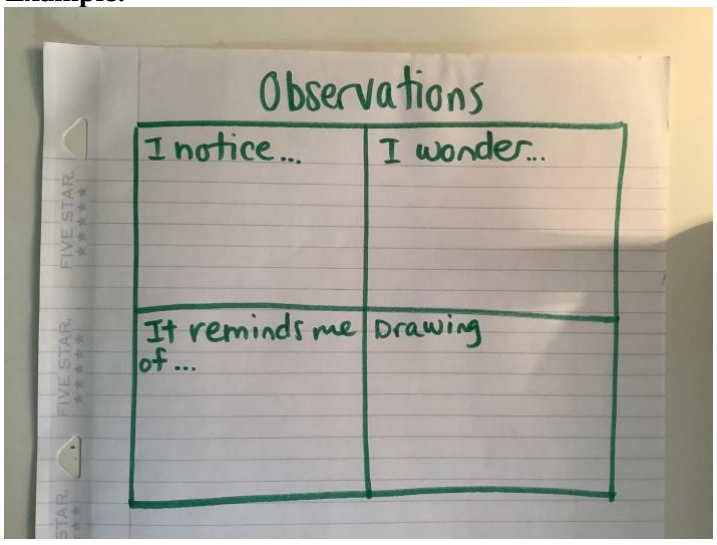
- Click on the link below to watch a short introduction video, then return to this page
- https://drive.google.com/open?id=1pag5CiJ-SXOTR6sLx6I2YUgCqqqdVYb8

Step 2: Activity Guide for Kids

- - draw a 2 by 2 chart on a piece of paper, and label it:
- - I notice…
- - I wonder…
- - It reminds me of…
- - Drawing
- - go outside for 10 minutes and make observations of **soil**, don't forget to record them on your chart

- **Note: when creating your chart, make the boxes large enough to easily write down your findings.**

Example:



Step 3: Soil Mini Lesson

- Click on the link to learn more about soil

https://www.youtube.com/watch?v=dsfJRwZXaVk

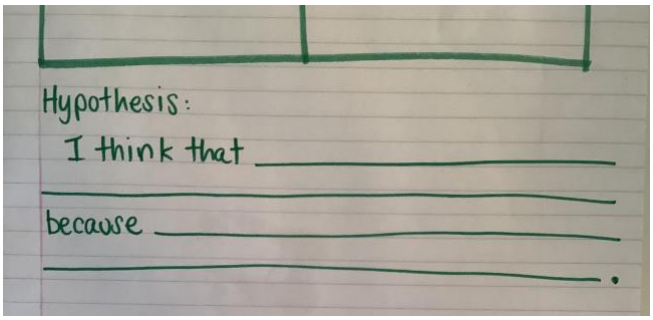
Helpful Tips:

- Use 4 or your 5 senses to make your observations (touch, smell, hearing, and looking)
- Draw anything in or on the soil that is interesting to you

What is Soil?

Step 4: Hypothesis

- Write a hypothesis about what you think you will find when you perform the Jar Test for your soil
- Use your observations, and info you learn from videos to support your hypothesis statement

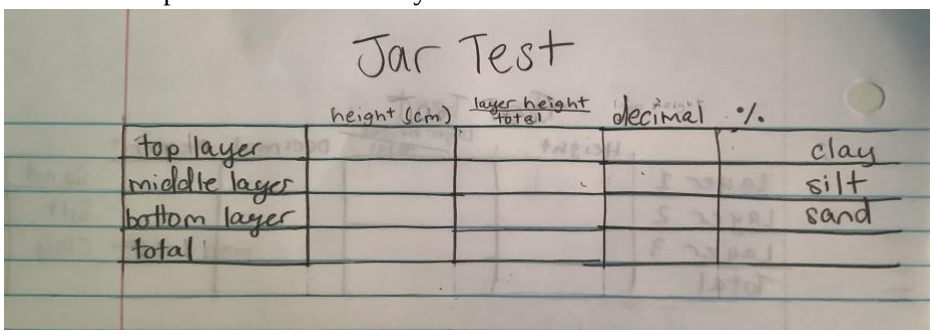


Step 5: Jar Test

- Fill ½ of your container with soil
- Fill the rest of the container *almost* to the top with water, and close with a lid
- Shake your container for 3 minutes to mix the soil (do this outside so you don't make a mess)
- Set your jar down, and leave it alone for 24 hours

After 24 hours:

- Set up this chart to record your results:



- Closely examine your jar without moving it, and identify the layers
- Mark the layers with a sharpie or dry erase marker (this can be tricky, so just try your best to notice where colors change)

Think about....

- Finding two areas of your yard to test that are different based on your observations (maybe one is under a tree and another is in direct sun light all day??
- Getting a friend in your neighborhood to a Jar Test too, you can compare your results (remember social distancing rules!)
- Sharing what you did and your results with your science teacher, they would love it!

What is Soil?

Yay Math Time!

- Measure the height of each layer (I recommend centimeters) and record
- Add the each layer height to get the total height
- Write the layer height over the total as a fraction
- Divide layer height by total to get the decimal (round to hundredths place)
- Convert decimal to percent

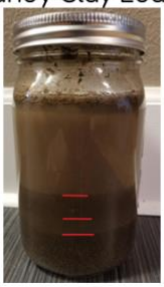
Step 6: Determining Soil Type

- Print out the soil texture triangle
- Watch this video to learn how to find your soil texture: https://drive.google.com/file/d/1QbpZiHhuImxCrKxAP2rUJ3-oagMb6YxM

Step 7: Reflection

Below is a list of questions to think about to reflect on what you have learned about soil. I invite you to do this part with a parent so you can share everything you learned!

- State your hypothesis and explain if your results matched your hypothesis
- How does your soil compare to Amanda's and Daniel's?

Amanda's	Daniel's
Sandy loam 	Sandy Clay Loam 

- Who do you think performs soil tests? Why?
- How does soil interact with the living and nonliving things around it?

Extra Resource:

If you don't have access to a printer here is an online soil calculator: https://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/survey/?cid=nrcs142p2_05416

What is Soil?

Did you love this lesson?

- Ask a friend who lives in a different place to do this activity, then get on zoom and talk about your results
- Check out this website: (https://www.idahogeology.org/map-based-search) that has soil textures for around Idaho. Find the map for where you live. Does your soil match what the map says?
- Research your soil type to learn more about how it reacts to water

Connection to Standards: Common Core and Next Gen Science

6.RP.A.3.C: Find a percent of a quantity as a rate per 100 (e.g. 30% of a quantity means 30/100); solve problems involving finding the whole, given a part and the percent
3.MD.B.3: Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch

Crosscutting Concepts:
-a system can be described in terms of its components and their intersections
- systems may interact with other systems; they may have sub-systems and be a part of larger complex systems

Disciplinary Core Ideas:

- *5.LS2.B: Matter cycles between air and soil and among plants. Animals, and microbes as these organisms live and die. Organisms obtain gases, and water from the environment, and release waste matter (gas, liquid, or solid) back into the environment*
- *MS.LS2.C: Ecosystems are dynamic in nature; their characteristics can vary over time. Distributions to any physical or biological component of an ecosystem can lead to shifts in all its populations*