Introduction

This part of the program is to welcome students to Common Ground and to find out what they already know about soils. Some points to make through discussion:

- Soils are made up living and non-living parts- both are important for plant growth
- The size of the particles in soils determines the amount of drainage and aeration of a soil (perc through the pores demo can be used here if appropriate)
- Healthy soils are necessary to grow plants and support life
- Parts of soils: clay, sand, silt, hummus, organic material, rocks
- Soils in nature are never made up of just one thing—they are a mixture. Different mixtures are good for different things.

Discussion: Have you been studying soil in your classroom? Tell me about what you have done? As kids mention vocabulary words such as sand, silt, clay, hummus etc ask them to elaborate. Try to hear from as many different students as possible. Use the samples of each type of soil to illustrate particle size and to encourage students to use their magnifying glasses and “be soil scientists.”

If appropriate and there is time, the perc through the pores game can be done in the intro as a demo (not including everyone in the class.) Otherwise, it can be done at the end with the group of 12 or eliminated. READ THE GROUP! The most important part of this trip is the data collection, and that kids can answer their own questions through collecting and recording information.

Part 1: Divide to collect samples

Each group of 12 students will be divided into 3 or 4 groups. Each group will have:
- Data sheet, clipboard and pencil
- Trowel
- Each student will have a magnifying glass
- The group of 12 will need 3 large plastic bags to collect one sample from each location

First, ask the question: do you think that soil from all places is the same of different? Don’t answer the question, just ask what everyone thinks.

Then, introduce the mystery sample. Explain that our job is to figure out where that sample was taken: the forest, the garden or on the field. We are going to find out by collecting a lot of information from each place. This is what scientists do!

Move from station to station. The forest sample can be taken in any forested area, the garden sample should be taken from an unplanted -yet prepped- garden bed (the dig beds work when everything else is full or if you are unsure.) The field sample should be taken from the field.

Each station should take 20-30 minutes; however the first stop will take longer so that you can teach the students how to use the data sheet. Take time to do this! It is not obvious to students how to fill out a data sheet. Teach them how to collect data for each station and encourage them to write in as much information as they can about each sample. Model how to collect the sample with a trowel.

As kids work in their groups, circulate to ask them questions about what they have found and help them with the data sheet. If there are not enough adults, make sure to position yourself so that you
can see all the kids.

After each station, circle back up and ask follow up questions (for each station!):
  • What did you notice about your sample?
  • How many groups found living things in their sample?
  • What were the results of the squish test?
  • What did you notice about the color?
  • How did this sample compare to __________?

While in the forest, take some time to look for decomposers. While in the garden, taste some plants.

When the groups come back to homebase, they will try to use their data sheets to figure out the mystery sample. Encourage students to use evidence to support their answer. If they are not sure, provide them with the samples collected to make comparisons. Give them time to explain themselves.

Part 2: Wrap-up

This activity exposed students to the different properties of soils. The wrap-up should synthesize this information and allow kids a chance to further process the relationship between the properties of soil and the function of soils. Some guiding questions are below:

  • Do you think soils are different?
  • What did you find in the forest soils? The garden? The field?
  • Which soil had the most living things? What kinds of living things?
  • Which soil was the darkest in color? Which was the lightest?
  • What do you think the difference in color means? (nutrients, moisture)
  • How about the difference in particle size? (water drainage, aeration)
  • Which soils are best for plants? What do plants need from soils?
  • Why can’t plants grow on the field?
  • Did any of this surprise you?
  • Will you think differently about soils?
  • What did you learn about soils today?

Take home study: take home samples of different soils and try to grow beans in each one. Monitor for 3-6 weeks. Which one grew better? Why do you think?
<table>
<thead>
<tr>
<th>soil sample # 1</th>
<th>soil sample # 2</th>
<th>soil sample # 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>location (circle one):</td>
<td>location (circle one):</td>
<td>location (circle one):</td>
</tr>
<tr>
<td>field garden forest</td>
<td>field garden forest</td>
<td>field garden forest</td>
</tr>
<tr>
<td>what do you see? (plants or animals)</td>
<td>what do you see? (plants or animals)</td>
<td>what do you see? (plants or animals)</td>
</tr>
<tr>
<td>no</td>
<td>yes</td>
<td>no</td>
</tr>
<tr>
<td>do they big or small? (circle one)</td>
<td>do they big or small? (circle one)</td>
<td>do they big or small? (circle one)</td>
</tr>
<tr>
<td>no</td>
<td>yes</td>
<td>no</td>
</tr>
<tr>
<td>is the test squishy? yes</td>
<td>no</td>
<td>yes</td>
</tr>
<tr>
<td>can you see or feel rocks? yes</td>
<td>no</td>
<td>yes</td>
</tr>
<tr>
<td>can you see any living things? yes</td>
<td>no</td>
<td>yes</td>
</tr>
<tr>
<td>does it feel gritty wet dry soft smooth sticky</td>
<td>gritty wet dry soft smooth sticky</td>
<td>gritty wet dry soft smooth sticky</td>
</tr>
<tr>
<td>(circle your choices or write in the space below)</td>
<td>(circle your choices or write in the space below)</td>
<td>(circle your choices or write in the space below)</td>
</tr>
<tr>
<td>describe the color:</td>
<td>describe the color:</td>
<td>describe the color:</td>
</tr>
<tr>
<td>black, red, light, dark, examples: brown, gray,</td>
<td>black, red, light, dark, examples: brown, gray,</td>
<td>black, red, light, dark, examples: brown, gray,</td>
</tr>
<tr>
<td>yes</td>
<td>no</td>
<td>yes</td>
</tr>
</tbody>
</table>

**Names of all team members**
1. Where did your mystery soil come from?

2. What clues helped you to figure it out?

3. Do you think your mystery soil would be good for growing plants?

   Yes  No

4. Why or why not?

   Yes  No

5. What is one thing you learned about soils today?

   Yes  No

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**Mystery Soil Sample**

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**Soil Test:**

- **Does it stick?**
  - Yes
  - No

- **Squish Test:**
  - Rock(s)
  - Can you see or feel:
    - Pieces of rock or gravel
    - Plants or animals

- **Living Things:**
  - Can you see any:
    - Ectoparasites
    - Oviparous
    - Hollower

- **How does it feel?**
  - Gritty
  - Wet
  - Dry
  - Sticky
  - Soft

- **Describe the color:**
  - Black
  - Red
  - Light
  - Dark
  - Brown
  - Gray
  - Other: