

Jennifer LaPoma

## Soil Properties Investigation

1, 45 min class period

### Goals:

- Understand the difference in soil composition
- Understand which types of soil support which vegetation

### Objectives:

- Be able to determine soil type based on their knowledge
- Be able to use soil equipment (soil Munsell chart, pH meter)

### Materials:

Soil samples (sand, clay, organic material, SOC soil sample) (per lab group)  
Hand Lens  
Cup of water (per lab group)  
Oakton pH meter  
pH buffer solution 7 and 4 and 2 centrifuge tubes  
centrifuge tube for each SOC sample  
10 mL graduated cylinders  
Munsell Soil Color Book  
Newspapers to lay down on desk  
Attached worksheet

### Prior Knowledge/ Pre-Activity

- Geology/ rock cycle/ minerals
- Soil forming factors (Cl, o, r, p, t) model
- The pH scale
- Importance of soil

**NJCCCS Standards:** 5.7.1.B.1, 5.7.1.B.3, 5.7.1.C.1, 5.7.1.C.2, 5.7.3.A.1, 5.7.8.A, 5.7.8.C.1, 5.7.8.D.2

### Procedure:

1. Instructor should begin with a small discussion on soil particle properties
  - texture, color, cohesiveness
  - Encourage students to discuss any other properties they notice about soil
  - Also, ask students to approximate what weighs 10 grams
2. Students in groups of 3 will collect a sample from bin 1, 2, and 3
3. Students investigate their different samples and describe properties of sample according to the attached worksheet
4. Pass SOC soil sample to each group
5. Each group will also measure the pH of the soil sample
6. If short on time select volunteers to discuss their soil sample findings

**Name:**

**Team:**

### **Mystery Earth Materials Investigation Worksheet**

Observe each sample with hand lens...

1. Describe the texture of the mixture, (soft, coarse, smooth, spongy, powdery)

Sample 1:

Sample 2:

Sample 3:

2. Describe the color of the sample....

Sample 1:

Sample 2:

Sample 3:

3. Put approximately 10 grams of the sample and 5 mL of water in the palm of your hand. Attempt to roll into a ball and describe what happens. Repeat this step for each sample.

Sample 1:

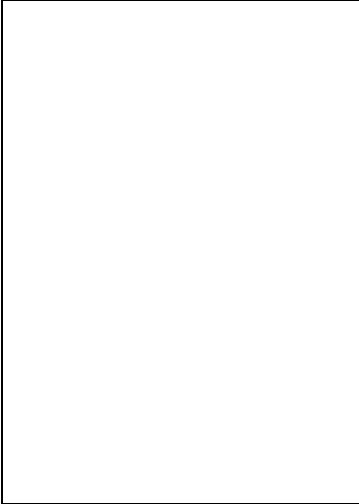
Sample 2:

Sample 3:

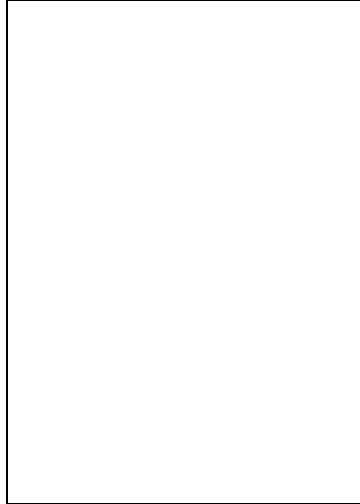
4. Make a smear of your sample (using water) in the box provided below.

Be careful to contain the smear in the appropriate sample box!

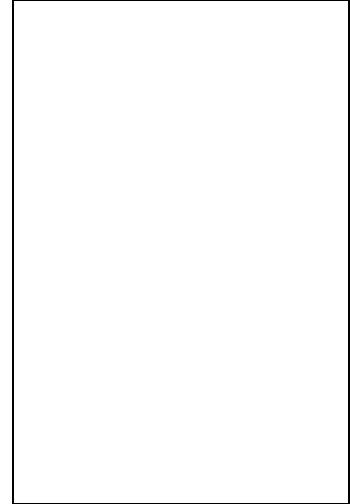
Sample 1:



Sample 2:



Sample 3:



Discuss what you see and what this tells you about each of your samples:

Sample 1:

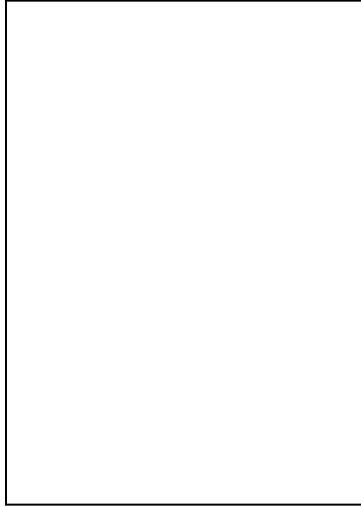
Sample 2:

Sample 3:

### 5. SOC Soil Sample

- Where was this sample collected? Describe the environment.
  
- Color (using Munsell Color Book):
  
- Texture:

- Smear:



- Soil pH measurement:
- Would you consider your soil to be acidic? If so, why?
- What type of vegetation do you expect this soil to support? Why?