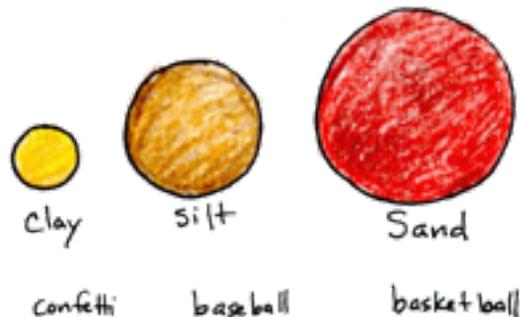


## Components of Soil

### Lesson Summary:

In this lesson students will learn about the three primary components of soil: sand, silt, and clay. Students will discover the properties of each component and what percentage of sand, silt, and clay makes the best gardening medium before analyzing their garden soil.



### Grade Level: 3-5

### Lesson Objectives:

Students will be able to:

1. Identify sand, silt, and clay in a soil sample.
2. Explain the physical properties of the three soil components.
3. Describe the make-up of healthy garden soil.
4. Analyze a soil sample and determine the percentage of sand, silt, and clay by using a soil composition chart.

### Time Frame: 30-45 minutes

### Materials:

- Quart mason jars (2 per sample location)
- Soil composition chart
- Proportional sand, silt, and clay paper cut-outs (sand should be approximately the size of a basketball, silt the size of a baseball, and clay the size of a confetti dot)

### Procedures:

*This activity can be done two different ways: Either collect a soil sample the day before to refer to for this lesson OR wait 24 hours for soil sample to settle in order to analyze results.*

1. Ask students if they know what soil is made of. Narrow down the answers to the three most basic components: sand, silt, and clay.
2. Show students three circular cut-outs of varying sizes, representing particle sizes of sand (largest), silt (medium), and clay (smallest).
3. Discuss with students how each type of particle fits together with others, and the range of space in between the different sized particles (lots of air and water can get in between large sand particles, not as much air and water can get through silt particles, almost no air and water can get through clay particles).

4. Ask students to decide how these three types of particles will settle in a jar when a soil sample is taken, and why.
5. Collect soil samples from different parts of the garden, and have students shake them for two minutes.
6. Pass out soil component chart and look at it with students. Tell them that their soil sample needs to settle for 24 hours, and will be ready to analyze the next day. At that point they can compare it to the soil chart to determine what type of soil is in the garden.
7. Discuss what type of soil is ideal for growing plants and why (a loamy soil is best- if soil is too sandy it won't hold any water, if it is too high in clay the water won't be able to penetrate the soil, therefore a mix is best). Talk about how to change the composition of soil to make it healthier (adding compost or soil amendments over time).

### **Assessment:**

Students will:

- Name the three main components of soil.
- Describe the properties of each component.
- Use samples of soil to identify the amount of sand, silt, and clay in each, using simple methods.

### **Resources:**

Shelburne Farms *Project Seasons Handbook* by Deborah Parrella

### **NH State Science Standards:**

S:SPS4:2:6.1 Plan and carry out simple activities with a group.

S:SPS2:4:1.4 Explain that scientific investigations may take many different forms, including observing what things are like or what is happening somewhere, collecting specimens for analysis, and doing experiments; and that investigations can focus on physical, biological, and social questions.

S:ESS1:4:2.4 Given certain Earth materials (soils, rocks, or minerals) use physical properties to sort, classify, and/or describe them. [ESS1 (K-4)INQ-1]

### **Common Core Standards:**

CCSS.ELA-Literacy.SL.3.1 Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on *grade 3 topics and texts*, building on others' ideas and expressing their own clearly.

CCSS.ELA-Literacy.SL.3.1c Ask questions to check understanding of information presented, stay on topic, and link their comments to the remarks of others.

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