

## Exploring Soil Lesson Plan

**The student will be able to:** describe components of soil and how soil is useful

### **Word Wall:**

- Soil-
  - The biologically active, porous medium that has developed in the uppermost layer of the Earth's crust.
  - Soil serves as a natural reservoir of water and nutrients, as a medium for the filtration and breakdown of injurious wastes, and as a participant in the cycling of carbon and other elements through the global ecosystem.
  - It has evolved through the weathering of solid materials such as consolidated rocks, sediments, glacial tills, volcanic ash, and organic matter.
  - The upper layer of earth that may be dug or plowed and in which plants grow
- Sand-
  - **Feels: Coarse, gritty, rough**
  - Mineral, rock, or soil particles that are 0.0008–0.08 in. (0.02–2 mm) in diameter.
  - A loose granular material that results from the disintegration of rocks consists of particles smaller than gravel but coarser than silt.
- Silt-
  - **Feels: Soapy, silky, smooth**
  - Loose sedimentary material with rock particles usually  $1/20$  millimeter or less in diameter
- Clay-
  - **Feels: Sticky, stiff, soapy**
  - Soil particles with diameters less than 0.005 mm; also a material composed essentially of clay particles.
  - In soils, clays provide the environment for almost all plant growth.
  - A soil that contains a high percentage of fine particles and becomes sticky when wet
- Loam-
  - A soil consisting of a brittle/flaky/crumby/ mixture of varying proportions of clay, silt, and sand
  - Used to describe a roughly equal concentration of sand, silt, and clay, and lends to the naming of even more classifications, e.g. "clay loam" or "silt loam."
- Texture triangle- Soil Texture Classification:
  - Soil textures are classified by the amount of each soil separate (sand, silt, and clay) that is in a soil.
  - Classifications are typically named for the primary constituent particle size or a combination of the most abundant particles sizes, e.g. "sandy clay" or "silty clay."
  - Determining the soil textures is often aided with the use of a soil texture triangle
- Soil Separates:
  - Soil separates are specific ranges of particle sizes.
  - Clay < Silt < Sand

**Materials:**

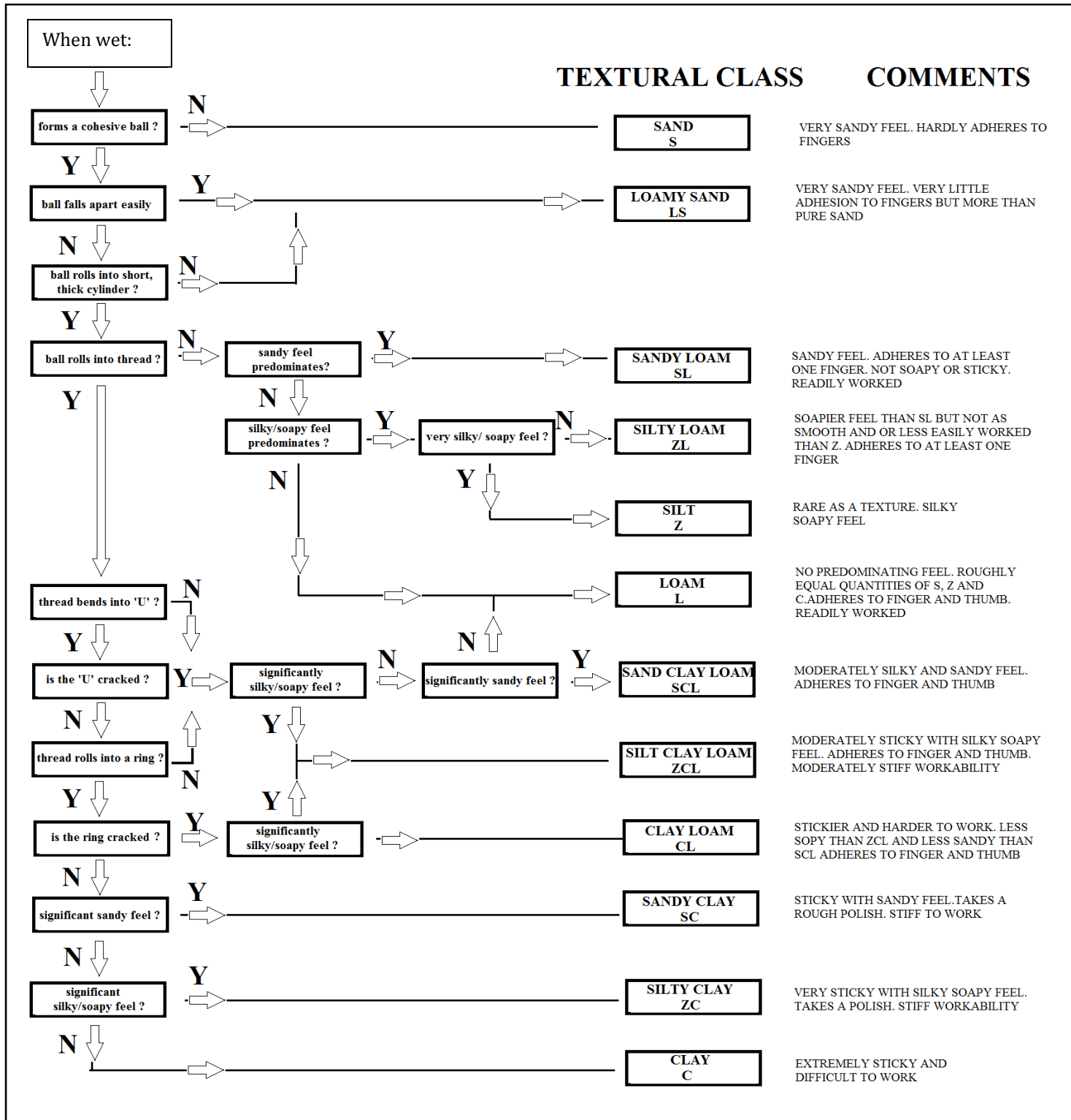
- 1 soil recording sheets per student
- 1 samples of each of the following soils:
  - 1. Silty Clay [16-41-43]
  - 2. Sandy Loam [74-12-14]
  - 3. Loam 1 [40-36-26]-Hawaii~ red because of oxidization (oxygen, rust)
  - 4. Loam 2 [42-36-22]- Local/SLO~ pond bottom, slimy
  - 5. Sandy Clay Loam [60-19-21]- SLO~ plant materials in soil, top soil
  - 6. Silty Clay [0-49-51]- Hawaii~ **NO** sand~ sand left behind when smaller particles washed or blew away
- 6 paper plates
- sharpie marker to write on paper plates
- dropper and cup of water
- butcher paper to put under the soils

**Lesson/Activity:**

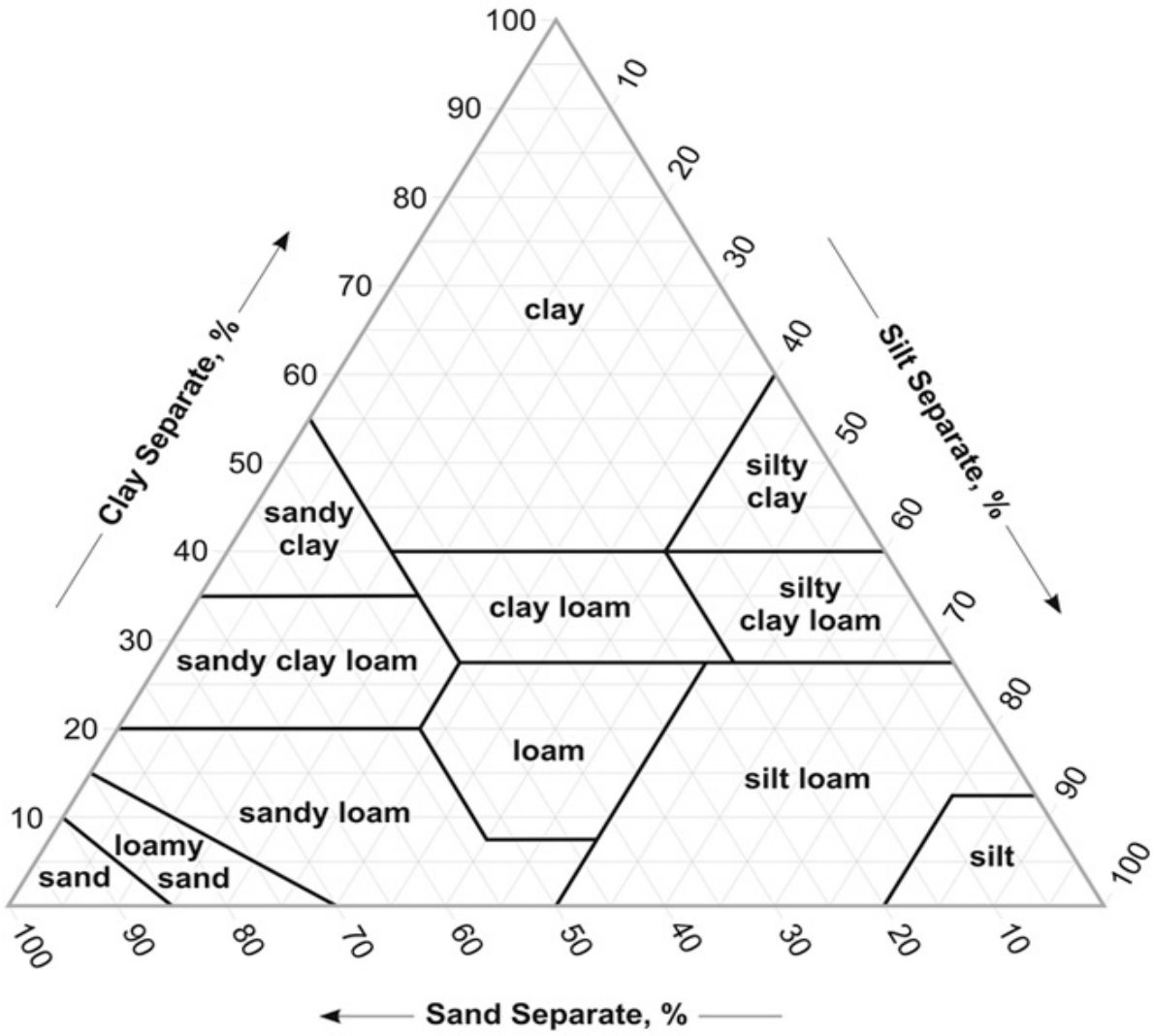
1. Prior to the beginning of class:
  - a. Prepare 1 paper plate of each of the above listed soils, writing the number of the soil around the edge of the paper plate as you do so.
  - b. Create 6 different stations with the types of soil, spacing out the paper plates around the room.
  - c. Ask students to write their name in a corner.
2. When students arrive, gather them on the floor-or some place that is away from the soils-to discuss what soil is.
3. Ask students what they already know about soil: "is it useful? How is it useful? What does soil do? What would happen if there was no soil on earth?"
4. "Today we are going to use our senses to observe different kinds of soil."
5. Explain soil triangle and Hand Texture Analysis sheet and how it can be useful
6. Explain the activity:
  - a. Divide the class into 6 groups and assign each group to a center
  - b. The students will have about 4 minutes to observe the soil and write/draw their observations on the recording sheet.
  - c. If a group is having trouble determining a type, use the water to help**
  - d. Give the signal to go to the next station
7. Complete the activity. After everyone has rotated to all centers, call the students back to their seats to discuss their observations.
8. Use the dropper to slowly add water to each of the dirt samples and allow students to observe what happens.

**Evaluation/Assessment:** students will observe various types of soil cooperatively with their team. Students will also write and draw their observations on the recording sheet.

# Hand Identification Chart for Soil Texture Analysis

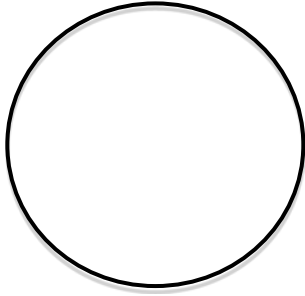


# CLAY



**SAND**

**SILT**



**SOIL 1:**

Look:

Smell:

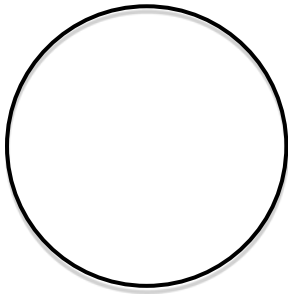
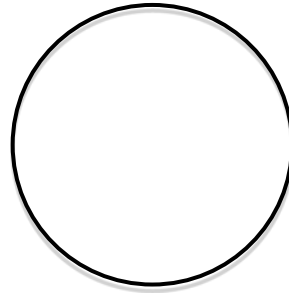
Feel:

**SOIL 2:**

Look:

Smell:

Feel:



**SOIL 3:**

Look:

Smell:

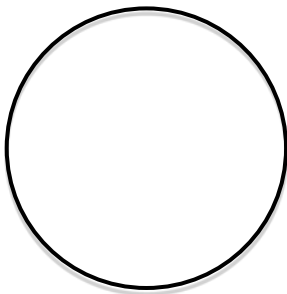
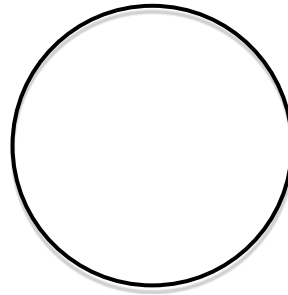
Feel:

**SOIL 4:**

Look:

Smell:

Feel:



**SOIL 5:**

Look:

Smell:

Feel:

**SOIL 6:**

Look:

Smell:

Feel:

