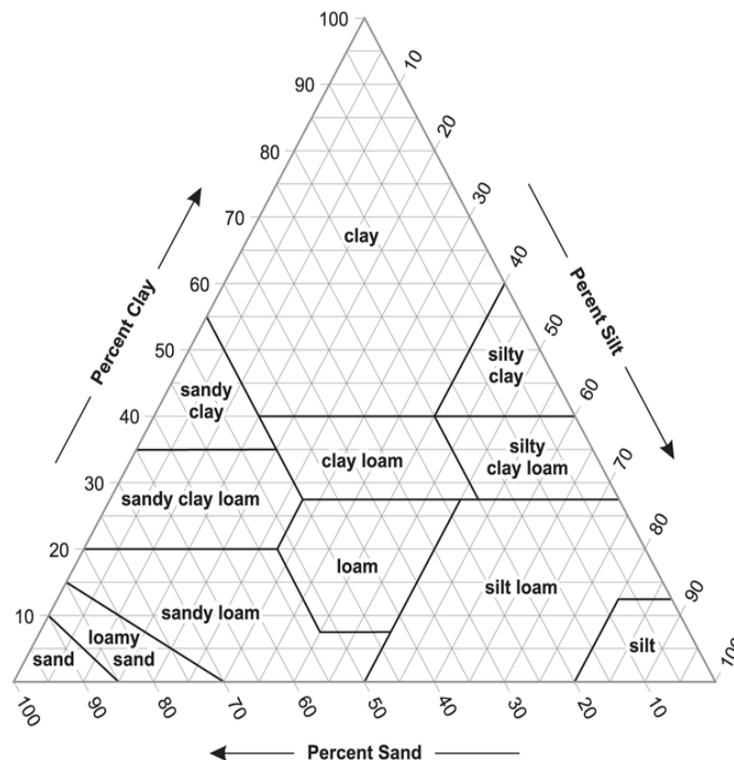


# Mudshakes

What is soil? Soil is a natural medium for the growth of plants and furnishes the plant with an anchor for its roots, as well as nutrients (including water) and oxygen for growth and reproduction. Soils consist of four components: mineral material, organic matter, water and air. Depending on the specific garden, there will be different percentages of these components. There are a few key characteristics to soil: texture, structure and reactions.

Soil texture is sometimes called the “feel” of the soil. It determines the physical behavior of the soil such as drainage, moisture content, plant-nutrient supply and workability. Soil texture depends upon the amounts of different sizes of mineral and rock particles; from largest to smallest, they are sand, silt, and clay. What we call the soil is determined by the relative amounts of sand, silt and clay that are present.

The following soil pyramid is the Soil Textural Triangle from the U.S.D.A Natural Resources Conservation Service and it shows how you can determine the specific soil texture from measurements of the three types of particles.



Soil structure is a measure of how well the soil particles are joined together into crumbs with spaces, or pore networks, of different sizes connecting them. So, soil structure refers to the physical arrangement of the mineral and organic particles in the soil. The soil structure affects movement of air and water through the soil and influences the supply of water, air and nutrients to the plant roots.

## Materials:

- ☼ Clear jars with straight sides, one for each soil sample
- ☼ Soil from different areas (however many that you wish to analyze)
- ☼ The Soil Triangle
- ☼ Ruler
- ☼ Laundry Detergent

## Directions:

1. Fill a clear container with straight sides about two-thirds full of water. Add enough soil to nearly fill the jar. Add a pinch of laundry detergent to help the soil components separate well. Shake the jar vigorously and then put it in a safe place.
2. Over the next 2-3 days, observe how the particles settle into layers. The sand particles are largest and heaviest, so will settle at the bottom. The next layer up will be the medium silt. The clay particles are smallest so will be on top. The clay may stay suspended and cloud the water for several days, which is why the sample needs to sit undisturbed. Organic matter will float on or just below the surface of the water.
3. Measure the height of each layer, as well as the overall height of the soil (including all layers). Then translate these measurements into percentages for each component. To do this, divide the height of each component by the total height of the sample.
4. Use the Soil Textural Triangle (from the explanation above) to determine the soil type by drawing lines to represent the percentages of the three components. The point where they converge is the soil texture.

**Example:** Measured 20% clay, 10% silt and 70% sand. Soil Textural Triangle below. The soil would be between a sandy loam and a sandy clay loam.

