

2. Skills Challenge: Soil Texturing

Time: 30-35 minutes

Supplies:

- Samples of sand, silt, and clay soils
- Water (a spray bottle works best as you don't need a lot of water to test soil texture, but a regular water bottle also works).
- Paper towels between samples to clean hands
- Hand Texturing of Soils Flowchart (students can share flowchart)

Transition to Soil Texture:

In the clear tube/vase with the tennis balls, add the marbles, then the sand. Teach students that a mix of sand, silt, and clay is optimal for rangeland productivity (*you may want to ask students “why?” at this point, the answers are provided under the “Reflect” section below*). By hand texturing the soil, we can start to understand the proportions of each of the soil particles and better understand how to manage the rangeland.

Do:

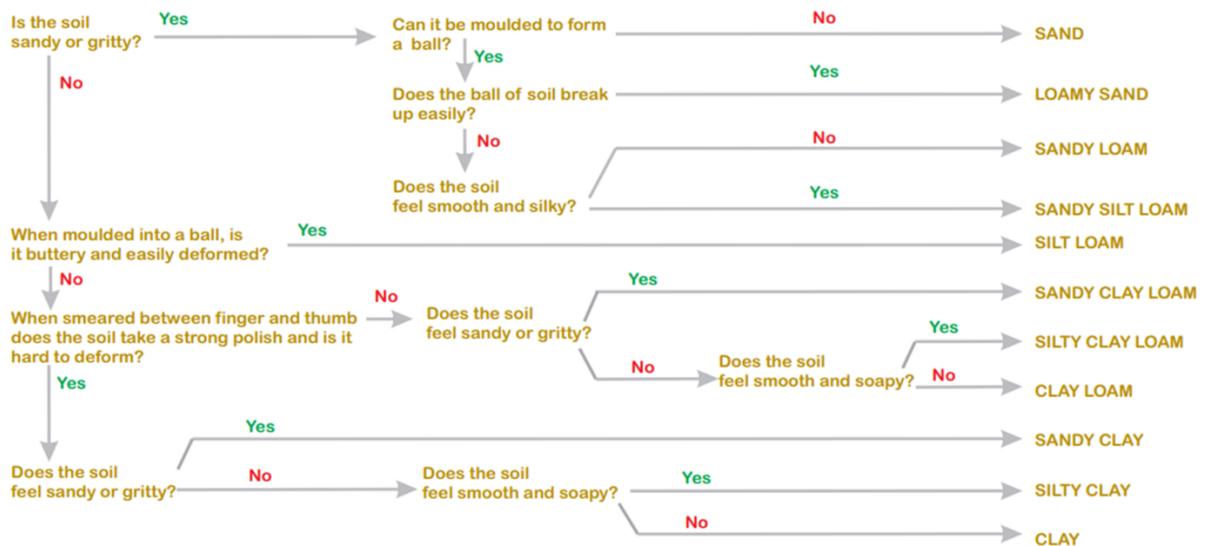
For each of the soils, do the following steps:

- Place about 25 g (~ 1 Tablespoon) soil in your palm
- Add a few drops of water (or slowly mist soil) and knead to break down all clumps (or aggregates). Knead the soil until it feels like moist putty.
- *If the soil is too wet, add more dry soil*
- *If the soil is too dry, add more water*

If you have a soil that has a lot of sand, you likely will not get to the “moist putty” consistency. However, it should be noted that kneading the soil does take time! Don't give up too soon.

Now that you have soil that feels like moist putty, proceed to “Hand Texturing of Soil Flowchart¹”. The flowchart gives the step-by-step instructions on how to texture an unknown soil type.

Take a small clump of moistened soil and knead between fingers and thumb



Reflect:

- According to the “Hand Texturing of Soil Flowchart”, what type of soil do you have?
- Does your soil name include loam?

Loam soil is a mixture of clay, silt, and sand which gives you the best characteristics of all three! Clay and silt help hold water in the soil, while sand keeps it from compacting too much. Sand helps with drainage so roots don’t get waterlogged, and the clay and silt provide stability so the soil doesn’t just crumble.

- What does it mean when you name includes a particle size and loam?

All this means is that the soil mixture contains more of that particle size than the other two. For example, if you have a “clay loam” soil, your soil contains more clay than sand and silt.

Repeat the steps to Soil Texture the other two soil types.

Particle Size	Soil Texturing Hints
SAND	<ul style="list-style-type: none">• Gritty feel• Particles can be seen with the naked eye• Hand sampling: little to no residue should be left on hand
SILT	<ul style="list-style-type: none">• Dry: Powdery smooth/velvety feel• Wet: Creamy slick, slippery feel• No sticky or plastic feel• Particles can be seen with a hand lens or microscope• Hand sampling: coats hand, able to brush off
CLAY	<ul style="list-style-type: none">• Dry: hard feel• Wet: sticky, plastic feel• Can not be seen with the naked eye or with a hand lens• Hand Sampling: thick film residue.

Words to Explore*:

- **Erosion:** (v.) Detachment and movement of soil or rock fragments by water, wind, ice, or gravity.
- **Infiltration:** The flow of fluid into a substance through pores of small openings. It connotes flow into a substance in contradistinction to the word percolation.

*Definitions from the Society for Range Management Glossary of Terms

Additional Resources:

Visit the <https://idrange.org/education-2/iroam/> to see videos and other additional educational links and materials.

References:

¹**Hand Texturing of Soil**, http://www.soil-net.com/sm3objects/activities/Activity_HandTexturing1.pdf