3. Nitty Gritty

Visualize Your Soil Type

Are you a visual learner? If you took a big scoop of soil and hand sorted every little crumb into different categories, what would you find? Among many other things, you would probably have separate piles of sand, silt, and clay. The relative size of each pile of sand, silt, and clay would help determine the type of soil you have. The Nitty Gritty is a nifty tool that helps you determine the type of soil you have and lets you skip the hand sorting!

What is soil type?
The bulk of soil is made from particles of minerals and weathered rock. To the naked eye, these mineral particles might look indistinguishable. But under a microscope, these particles come in very different sizes. Your soil type is determined by the general sizes of your soil particles, commonly labeled as sandy soil (lots of large particles), silty soil (lots of medium particles), and clay soil (lots of extremely small particles). Loamy soils are mixtures of sand, silt, and clay. Each soil type behaves very differently from each other, and different plants tend to favor certain soil types!

How do different soil types behave?
While different soils are truly unique from one another, there are some characteristics that can be assumed based on your soil type. Sandy soils feel gritty, drain very well, are lightweight and easy to work, and warm easily in the spring. They also dry out quickly, risk leaching out nutrients quickly, and lose soil organic matter more rapidly. On the other hand, clay soils feel smooth and sticky, and have greater water holding capacity and nutrient density. They also are very heavy soils, can be difficult to work, take longer to warm in spring, and drain slowly, creating risks of erosion and flooding. Silt soils are rarer, and tend to be found near water sources like rivers and lakes. They feel smooth and slippery, are typically fertile and drain moderately well. Loams form an ideal garden soil by maintaining the benefits of each soil type while avoiding the extremes of sandy and clay soils.

What can I do about my soil type?
The truth is you cannot change your soil type and you must work with what you’re given. The good news is that all soils can be healthy soils when amended with ample organic matter. You can avoid the extreme behaviors of your soil by topdressing with compost, worm castings and mulch. Organic matter shifts all soil types to behave more similarly to a spongy loam. In sandy soil, organic matter bunches together sand particles to create structure that improves water retention and houses beneficial bacteria and fungi that recycle nutrients into the soil. In clay soil, organic matter breaks up dense clay particles and creates pore spaces that improve drainage and provide more space for plant roots, soil organisms, air and water to move deeper into the soil. No matter your soil type, compost, worm castings and mulch will benefit your soil.
Nitty Gritty

What is the objective?
By thoroughly mixing a soil sample with water in a mason jar, we can identify our soil type by estimating how much sand, silt, and clay we have in our soil.

What materials do I need?
- Digging tool such as shovel or gloved hand
- tall mason jar with lid
- water
- alum powder (optional)

Activity Guide
1. Choose a spot near the center of your garden and lightly scoot aside any mulch, revealing your soil underneath.
2. Dig out a soil sample, aiming for six to eight inches deep, and remove enough soil to fill your mason jar a bit more than half-way.
3. Fill remaining jar with water to the brim and cap tightly.
4. Strongly shake mason jar to thoroughly mix soil and water. Reopen the mason jar, top off with more water, cap tightly, and shake again.
5. (Optional) Add a pinch of alum powder, and shake thoroughly again. Alum can help particles separate and settle more quickly by neutralizing slight magnetic charges in the soil. Alum is not necessary, but can speed up the process slightly.
6. Holding the top of the mason jar, swirl the mason jar in tight circles a few times, then place mason jar on a flat surface. Let the mason jar sit for a few minutes.
7. Soil particles will settle at the bottom of the jar at different rates based on their weight – sand settles first (heaviest), followed by silt (lighter), and finally clay (lightest). Sand particles will settle immediately, whereas clay particles may take a week or longer before fully settling!
8. Observe the following:
   - A distinct layer of sand will settle immediately, and will be lighter in color with visible grit.
   - A layer of silt will form over a couple hours, and will be light in color and visibly smooth.
   - Over a week or so, a layer of clay will slowly settle on top, dark in color and visibly smooth.
   - Organic matter, including plant residues, roots, and mulches will float to the top. It may take a week or more for the clay to settle to make the organic matter visible. The more floating material, the more decaying organic matter in your soil.

An unsettled and fully settled nitty gritty in contrast.
• The color of the water also indicates dissolved organic matter. After the clay has settled, observe the color of your water. Clear water means your soil has no dissolved organic matter, whereas a peaty brown color indicates more dissolved organic matter.

9. Reflect on your findings. Which layer (sand, silt, or clay) was the tallest? The tallest layer indicates your predominant soil type. Is your soil a loam, with roughly layers of sand, silt, or clay? Consider your soil type and the behavior of your soil. Does your soil type explain why your soil behaves in certain ways? How much evidence of organic matter could you see in your Nitty Gritty?

10. Consider the fact that you cannot change your soil type, but you can influence how much organic matter is found in your soil. How often do you apply compost and mulch to your soil? How has added organic matter improved your soil?

The rough and gritty sand layer is topped by a smooth and darker clay layer. This is a sandy clay loam.