

Soil Texture Analysis

Courtesy of Ted Sammis at New Mexico State University

A simple method to estimate the percent sand silt and clay in a soil and determine its texture.



1. Get a quart jar from the supermarket with a lid or use any jar with a large mouth.
2. Fill the jar half full of soil
3. Wet the soil to a mud consistency and tap the jar to settle the soil.
4. Mark the level of soil on the jar with a marking pen or whiteout
5. If you have some calgon put a teaspoon full in the jar
6. Add water to the top of the jar and shake the soil water mix till the soil is all mixed up in the water
7. Put the jar on a table and let the soil settle out for 40 seconds, mark the level of soil on the jar. This is sand portion in the soil.

8. Wait 6 hours and mark the level of the soil in the jar. The difference between the bottom mark, which is the sand, and the second mark up is the silt portion of the soil. The total sand plus silt is the distance from the bottom of the jar to the second mark.

9. Calculate the percent sand, silt and clay by measuring the depth of the soil by measuring the distance from the bottom to the first mark up in inches which is the sand fraction, the distance from the first mark up to the second mark up which is the silt fraction and the distance from the bottom to the third mark up from the bottom which is the sand plus silt plus clay fraction. . Sometimes, when all the sand silt and clay has settled, the height of the soil is higher than when you marked the jar after making a mud solution. This can only be determined by letting the jar sit for several days. If you have the time to do this , then a more accurate calculation of % sand silt and clay can be determined based on this new measured total height. Also, the percent sand, silt, and clay is a volume percentage. The soil triangle and table below for soil classification is in percent by weight. You need to correct this problem by converting from percent volume to percent weight by multiplying the percentage of sand by 1.19, the percentage of silt by 0.87 and the percentage of clay by 0.94. These numbers are the weight ratio's of bulk density compared to average bulk density of the material.



10. The percent sand is the depth of the sand divided by the depth of the total soil
11. The percent silt is the depth of the silt divided by the depth of the total soil
12. The percent clay is 100 minus the percent sand plus silt.
- 13 To determine the soil texture knowing percent sand silt and clay using the table below

Soil classification	Clay Soil	Loam soil	Sandy soil
percent clay	40-100%	7-27%	1-10%
percent silt	0-40%	28-50%	1-15%
percent sand	0-45%	23-52%	85-100%

14. A more precise determine of soil texture can be determine from percent sand silt and clay using the [soil triangle](#).

This simple approach to determining texture will not work if the soil contains a lot of gypsum. Soils that contain a lot of gypsum are normally are pinkish white in color.