

Laboratory Analysis

Measuring Bulk Density and Preparing Samples for Other Lab Analyses

(Skip this part if you are not measuring bulk density.)

1. Weigh each dry bulk density sample in its container and record this dry weight on the Bulk Density Data Work Sheet.



2. Place a sieve (#10, 2 mm mesh) on a large piece of paper (such as newspaper) and pour one sample into the sieve. Put on rubber gloves to avoid contaminating your sample with acids from your skin.



3. Carefully push the dried soil material through the mesh onto the paper. **Be careful not to bend the wire mesh by forcing the soil through.** Rocks will stay on top of the sieve. (If no sieve is available, carefully remove the rocks by hand.) Save the sieved soil from each sample for the other lab analyses.



If rocks are present, use the following procedure to determine the volume of the rocks.

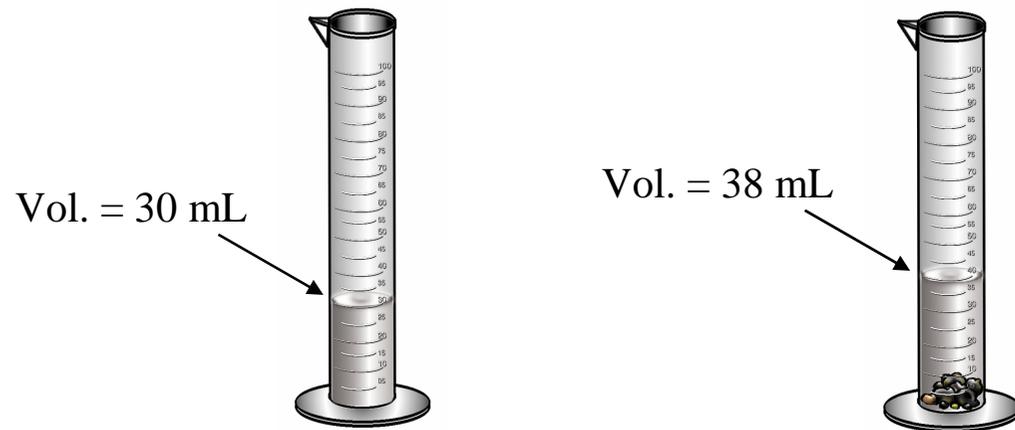
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Determining the Volume of Any Rocks That Are in a Sample:

1. Weigh the rocks that are left on top of the sieve and record this weight on the Bulk Density Data Work Sheet.



2. Place 30 mL of water in a 100 mL graduated cylinder, and without spilling, add the rocks to the water. Read the level of the water after all the rocks have been added and record this value and the original volume of water on the Bulk Density Data Work Sheet.



Note: As you add the rocks, if the volume of the water comes close to 100 mL, record the increase in volume, empty the cylinder and repeat the procedure for the remaining rocks. In this case, you must record the sum of the water volumes with the rocks and the sum of the water volumes without the rocks.

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Preparing Samples for Other Lab Analyses (If You Are Not Measuring Bulk Density)

1. Put the #10 sieve (2 mm openings) on a large piece of paper and pour one sample into the sieve. Put on rubber gloves so the acids in your skin don't contaminate the soil pH measurement.



2. Carefully push the dried soil material through the mesh onto the paper. **Be careful not to bend the wire mesh by forcing the soil through.** Remove the rocks (and other pieces of debris) that stay on top of the sieve and discard. Save the sieved soil from each sample for the other lab analyses.



Note: If no sieve is available, carefully remove the rocks by hand.)

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Preparing Samples for Other Lab Analyses (If You Are Not Measuring Bulk Density)

3. Transfer the rock-free, dry soil from the paper under the sieve into new, clean, dry plastic bags or containers. Seal the containers, and label them the same way that they were labeled in the field (horizon number, top and bottom depth, date, site name, site location, etc.). This is the soil that will be used for the other lab analyses.

On the label, include:

Class name

Date

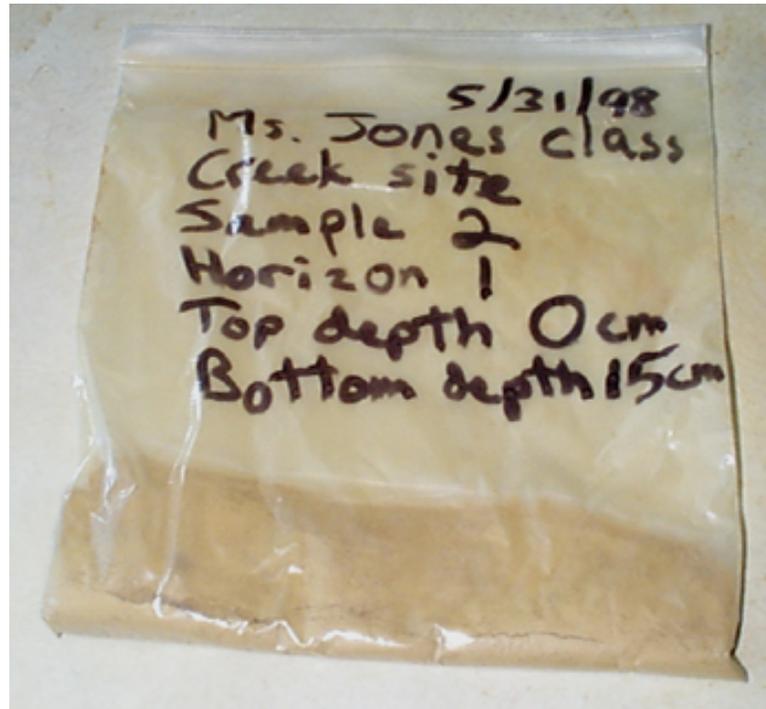
Site name

Sample number

Horizon number

Top depth

Bottom depth

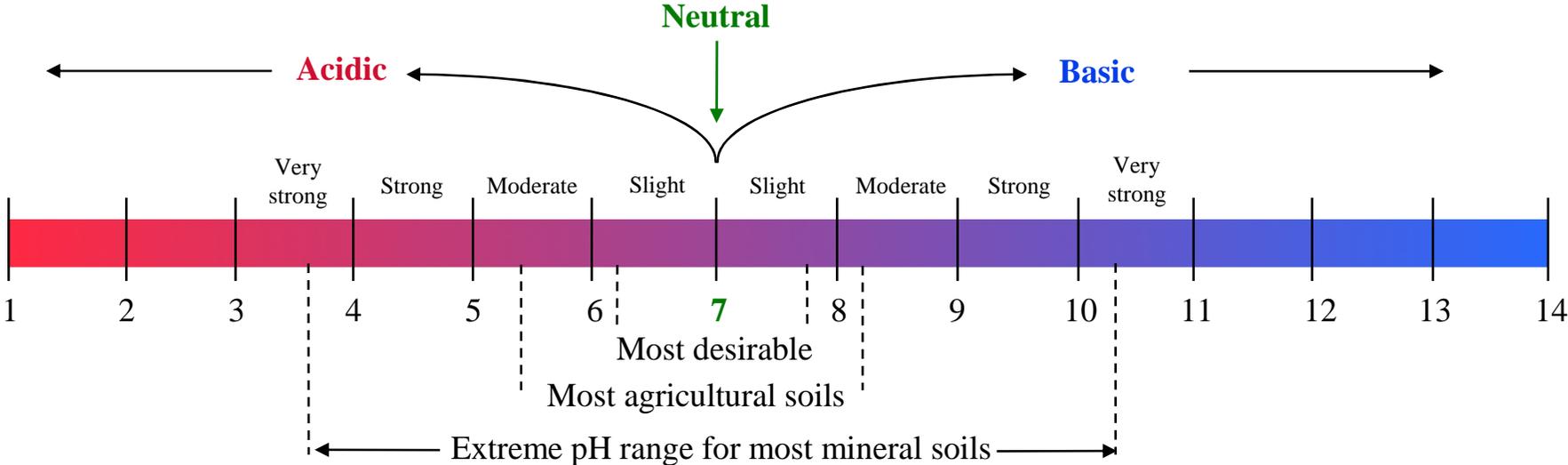


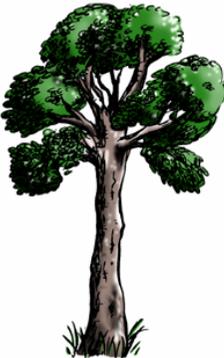
4. Store these samples in a safe, dry place until they are used.

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pH Measurements

Possible pH Ranges Under Natural Soil Conditions



	apple: 5.0-6.5
	spinach: 6.0-7.5
	tomato: 5.5-7.5
	cranberry: 4.2-5.0
	wheat: 5.5-7.5
	cucumber: 5.5-7.0
	carrot: 5.5-7.0
	white pine: 4.5-6.0
	black walnut: 6.0-8.0

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pH Measurements

40 g Soil

40 mL Distilled H₂O

Take pH of Distilled H₂O

Mix Soil and H₂O for 30 seconds every three minutes for a total of 15 minutes.

Allow the mixture to settle and wait for a supernatant to develop.

Mix	Wait	Mix	Wait								
30 sec	3 min	30 sec	*								

* Wait for a supernatant to develop and then take the pH by putting the probe into the supernatant and not into the soil.

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pH Measurements

1. In a cup or beaker, measure the pH of the distilled water you will be using. Dip the pH paper or calibrated pen or meter, into the water and obtain a reading.



2. In another cup or beaker, mix 40 g of dried and sieved soil with 40 mL of distilled water (or other amount in a 1:1 soil to water ratio) using a spoon or other utensil to transfer the soil. Stir with a spoon or other stirrer until the soil and water are thoroughly mixed.



3. Stir the soil-water mixture every 3 minutes for 15 minutes. Then, allow the mixture to settle until a supernatant (clearer liquid above the settled soil) forms (about 5 minutes).

4. Measure the pH of the supernatant using the pH paper, pen, or meter.

Place the bottom of the pH pen in the Supernatant (clearer liquid above the settled soil).



The pH of this soil is 6.5.

5. Repeat steps 1-4 for each sample from each soil horizon, and record your results on the Soil pH Data Worksheet.