

Gravimetric Soil Moisture Protocol

Lab Guide

Task

Weigh soil moisture samples, dry them completely, and weigh them again.

What You Need

- Heating lamp(s) or soil drying oven
- Thermometer capable of measuring to 110° C (if using a soil drying oven)
- Balance or scale with 0.1 g sensitivity and at least 400 g capacity (600 g recommended)
- Soil samples in containers, sealable bags or cans, depending on drying method
- Appropriate soil moisture data sheet ([Star](#), [Transect](#), [Depth Profile](#))
- Science Log
- Pen or pencil

In the Lab

1. Calibrate the balance according to the manufacturer's directions. In your science log, record the standard mass used to calibrate the balance. If using an electronic balance, check that the balance is measuring in grams and is zeroed properly.
2. Shake the sample bag to move soil to one end of the bag. Fold the bag so the soil can occupy as little space as possible and it can be placed entirely on the scale to measure the wet mass of the soil sample and bag (figure 1).
3. Record the mass to the nearest 0.1 g as the Wet Mass next to the appropriate sample container number on the *Soil Moisture Data Sheet*. (Be sure to select the data sheet that corresponds to your collection method: Star Pattern, Transect Pattern, or Depth Profile.)
4. Open bag(s) and dry beneath a 250 watt heating lamp (figure 2). If using a drying oven place the sample can in the oven without the lid (Do not place bags in oven).
5. Determine when the sample is dry by weighing the bag or can and sample, reheating for a few more hours and then weighing the sample again. When the mass of the sample does not change it can be considered dry.
[**Note:** drying times vary based on drying method and soil water content; heating lamps may take 2-3 days to dry soil in a zip lock bag. Drying ovens should dry soil in a can overnight.]
6. Carefully remove the bag and soil sample from beneath the heating lamp (or can from the oven) when the samples are dry.
7. Determine the mass of the dry soil sample (figure 3) and record it next to the appropriate container number on the *Data Sheet*.
8. Repeat steps for each soil sample.

Note: Dried soil should be returned to the site to fill in holes so site may be used in future years.



Figure 1, determine wet mass of soil sample and bag



Figure 2, drying soil under heating lamp



Figure 3, determine dry mass of soil sample and bag