# Soil water holding capacity

## Authorship

Nick Youngblut (2015)

# Notes

* Measurments are usually done in triplicate.

# Equipment and Reagents

1. completely dried soil (25 g per measurement)
   * Measurements usually done in triplicate.
   * Soils should be dried over night (or more) in the drying oven.
2. 125 ml flasks
   * 1 for weighing
   * 1 for each funnel
3. filter paper
   * Whatman 110mm diam; Cat No: 1001 110
4. funnels
   * big enough for the filter paper
5. DI water
6. gram scale

# Procedure concept

You are measuring soil that's completely dry, then remeasuring it after saturating it with DI water. The difference between saturated soil weight and dry soil weight is the soil water holding capacity.

# Procedure

1. Designate 1 flask (or beaker) as the 'weighing flask'.
   1. The 'weighing flask' is just used to hold the funnel on the scale.
   2. Place this weighing flask on the scale and tare (zero the scale).
2. Give the other funnels disctinct labels so you can keep track of soil samples.
3. For each funnel: place the funnel in a flask (not the weighing flask), and place a filter in the funnel.
4. Pre-moisten the filter paper with DI water.
   1. Water can drip into the flask.
5. For each funnel + wetted filter paper
   1. Add 25 g of dried soil to the funnel.
   2. Place it on the weighing flask (on the tared scale) and record the weight.
      1. Weight = weight of dry soil + filter paper + funnel
   3. Saturate the soil with DI water.
   4. Let the soil free drain into the flask until it stops dripping.
      1. The time needed for this depends on the soil, but usually no more than a few minutes.
      * **MAKE SURE:** that there is no water remaining in the neck of the funnel (it should be all drained).
        + A paper towel can be used to pull out water from the funnel neck.
   5. Move the funnel with soil to the weighing flask on the scale and record the weight.
   6. Water carrying capacity =
      1. Weight = **weight of water held** + weight of dry soil + filter paper + funnel
   7. Water holding capacity = (wet soil weight - dry soil weight) / dry soil weight
6. To increase accuracy, use the mean water holding capacity value for 3 replicates.