

Background

There are a number of properties of water which make it a unique liquid. Two such properties are adhesion and cohesion. The nature of water molecules causes it to be attracted to other molecules of water and also to molecules of other substances. The attraction between molecules of water is called cohesion and forces of attraction that exist between water and other molecules is called adhesion. This property is essential for the movement of water. This activity will enable students to investigate the above mentioned properties and also learn for themselves, which soils absorb more water

Methodology

- Ask students to collect different soil samples. Some of the soil types that could be collected include clayey soils, sandy soils, loamy soils, red soil, etc.
- Students should then take equal amounts of soil samples.
- Moisture from the soil samples could be removed by placing the samples under the sun for at least 6 hrs.
- Take plastic (transparent) cups of equal volume. Punch equal number of holes at the bottom of each of these cups.
- Weigh the plastic cups and record the weight (Weight A).
- Soil samples must then be compacted into the different plastic cups.
- Cups containing soil samples must then be weighed and the weight recorded (Weight B).
- Subtract the value of the weight A from weight B to get the weight of the dry soil.
- Now take a tray containing water.
- Place all the cups containing the dry soil samples in the tray for 30 minutes.
- After 30 minutes, remove the cups from the tray, wipe the water from the outer side of the cups and weigh them. Record the weight (Weight C).
- Subtract the value of the weight B from weight C to get the weight of the water which has been absorbed by the various soil samples.
- Also analyse the soil samples to understand which soil type can absorb more water.
- Students could mix different combinations of the soil to understand which of the samples absorbs more water
- In addition students could also mix some organic matter and run the same experiment? What do they see? Is there any difference in the quantity of water absorbed? Try and get explanations from students.

Objective

To demonstrate to students adhesion and cohesion - two important properties of water.

Place

Classroom

Duration

6 hours for drying soil samples; 1 hour for activity

Group size

Groups of 3-5 students

Suitable time

Anytime. However adequate sunlight is required to dry soil samples

Material

Soil samples, Weighing balance, plastic cups, Tray, water, notebooks, pen

Curricular Linkages

Subject

Science, Social Science

Concept

Properties of water, properties of soils