Measuring Turbidity

Activity

Background

When water is murky or muddy it is said to be turbid. Turbidity affects water quality and can impede the passage of sunlight through water. Lack of sunlight, caused by too much turbidity can have a detrimental/ harmful impact on aquatic life. Suspended particles could clog gills of fish, reduce their growth rate and decrease their resistance to diseases. Turbidity could be caused due to soil erosion, waste discharge, urban runoff, dredging operations or due to algal growth. Turbidity is a relative measure of clarity of water. Murkier the water, greater is the turbidity. It is usually expressed as nephelometric turbidity units (NTU) or as meters.

Objective

To make a Secchi (pronounces sek-kee) disk and measure the turbidity of water.

Place
Outdoors

Group size
Individual/ group

Duration
2-3 hours for making Secchi disc. 40 - 45 min for the activity

Suitable time
Anytime

Materials
A thick stiff plastic sheet; nylon rope; cutter; black, white and red water proof paint; brush; heavy object

Curricular Linkages

Subject
Science, Social Science

Concept
Water pollution, Eutrophication

Methodology

- Ask students to take a thick plastic sheet and cut out a circle of 10 cm radius. Ask students to draw and divide the circle into four quadrants.
- Students must paint the alternate quadrants with black and white water proof paint
- After the paint has dried ask students to bore a hole in the centre of the disk (this could be done with the help of a hot nail).
- Now attach a rope through the centre of the disk. A heavy object (about 1-3 kg) must be tied to the end of the rope to provide stability to the disk.
- Mark the string with red water proof paint at intervals of 1m (this mark could also be indicated by making a knot at intervals of 1m).
- Every tenth of a meter could also be indicated on the rope by marking with black water proof paint.
- After the disk is ready, students could visit a water body and test its turbidity.
- Prior to lowering the disk into the water, students must ensure that the disk hangs horizontally when suspended. Students now require to record two readings
  - ⋆ The depth where the disk disappers - students must lower the disk into the water and measure the depth where the disk just disappears (Reading A). The length of the rope, submerged to the nearest one-tenth meter could be recorded (the length should be noted where the rope and waterline meet).
  - ⋆ Students must then raise the disk until it just appears (Reading B) and record the length of the rope submerged to the nearest one-tenth meter where the rope and waterline meet.
- An average of the two readings gives a limit of visibility in the water body being studied.

Note: If the disk hits the bottom before dropping out of sight, note this observation and record the bottom depth of the water body.

Source: *Joy of Learning – Handbook of Science and Environmental Activities Vol. 3* (2005); Centre for Environment Education, Ahmedabad