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## 19. CORALS NEED CRYSTAL CLEAR WATER TO LIVE

### Turbidity

Turbid water might be described as “murky” in appearance; the clearer the appearance of the water, the lower its turbidity. When turbidity is high, water loses its ability to support a diversity of aquatic organisms. Solid particles—such as sediment—suspended in the water can block out light that aquatic plants and organisms need. Suspended solids can also absorb heat from sunlight, raising the temperature of the water. As the water becomes warmer, it loses its ability to hold oxygen. This causes dissolved oxygen levels to drop, further reducing the number of plants and animals that can live in the water.

You will use a Secchi disk to measure turbidity. A Secchi disk is a scientific tool for measuring the relative clarity of deep water. The clearer the water, the lower the turbidity. The murkier the water, the higher the turbidity.

### Materials

- Plastic lid, white or light-colored, 20 cm (about 8 in) in diameter
- One black waterproof marker
- Several meters of fishing line
- Flagging tape or strips of colored ribbon
- Meter stick
- Eyebolt with 2 nuts and washers
- Several sharpened pencils

### Methods

1. Use a sharpened pencil to punch a hole in the center of the plastic lid.
2. Use your waterproof marker to divide the top (outside) of the lid into four pie-shaped pieces of equal size (see illustration). Color the upper left and lower right sections black.
3. Thread a nut and washer (in that order) onto the eyebolt.
4. With the nut and washer on the eyebolt, insert the eyebolt through the hole in the center of the lid. Then add the other washer and nut (in that order) to the eyebolt on the underside of the lid (see illustration).
5. Tie one end of the fishing line to the eye of the eyebolt.
6. Using the meter stick, measure out from the eyebolt 250 centimeters (about 10 in) along the line, and tightly tie ribbon around the line. Continue tying ribbons to the line every 250 centimeters. In the field, you will lower the Secchi disk into the water. As soon as you can no longer see it, you will stop and count the number of ribbons to determine the turbidity level.

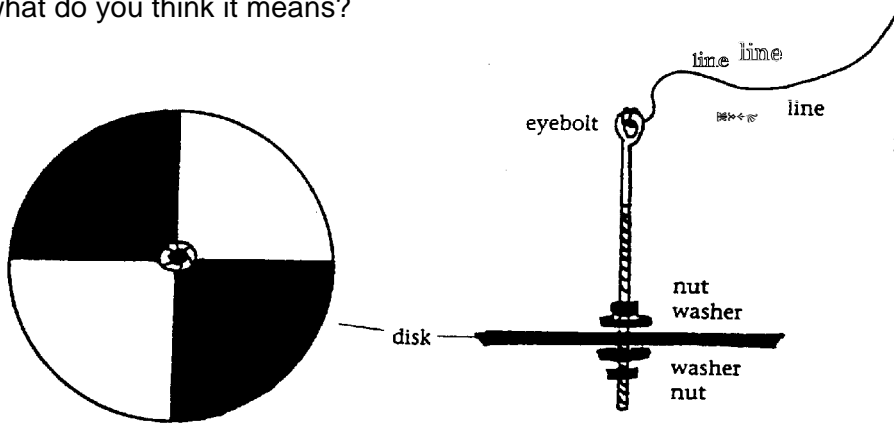
### Field Experiment

1. If possible, stand on a bridge over the water at your aquatic site. If there is no bridge, simply conduct this experiment from the bank. Lower the Secchi disk into the water just to the point where you can no longer see it.

2. When you can no longer see the Secchi disk, count the number of ribbons remaining above the surface of the water. Subtract this number from the total number of ribbons on the line to calculate the number of ribbons submerged with the disk. This is your turbidity reading.

Example: Suppose you count 10 ribbons above the water at the time you can no longer see your Secchi disk. If your fishing line has a total of 15 ribbons, you would subtract 10 from 15, and your turbidity reading would be 5.

If your Secchi disk reaches the bottom and you can still see it, you should still record the number of ribbons submerged with the disk. If you are still able to see the disk after it has reached the bottom, what do you think it means?



3. Repeat the experiment one or two times. Record the turbidity each time. To get an average of your Readings, add the turbidity readings and then divide by the number of times you did the experiment.

**Correlation to National Standards from McREL ( <http://www.mcrel.org> ) :**

Life Sciences

6. Understands relationships among organisms and their physical environment

Earth and Space Sciences

1. Understands atmospheric processes and the water cycle

Geography

7. Knows the physical processes that shape patterns on Earth's surface