

WATER QUALITY STATION INSTRUCTIONS

1. Air and Water Temperature

Record the air and water temperature using the thermometer in your “Green Water Test Kits.” Lower water temperatures allow the water to hold more oxygen which in turn improves living conditions for plants and animals.

2. Green Water Test Kits

Follow the instructions in your test kits to check the dissolved oxygen, PH, Nitrates, and turbidity. Record your numbers and clean the vials for the next group. Here are some important things to remember:

Dissolved Oxygen- Plants and animals that live in the water need oxygen just like those on dry land. Dissolved oxygen rates of 5 or greater support active plant and animal growth. Plants and animals in the water cannot live below a dissolved oxygen level of 1 or 2.

PH- is a numbered scale which shows how acidic or alkaline the water may be. Water that is too acidic (below 4), or too basic (above 9) will harm or destroy plants and animals. PH readings near the middle of the scale (PH 7 & 8) are better for plants and animals.

Nitrates- Again, higher levels of nitrogen is bad for plants and animals. This chemical is usually added unintentionally through the use of fertilizers and man-made products. It may cause unwanted plants to grow so much that they block sunlight that other plants need to survive.

Turbidity means how clear or cloudy the water may be. Dirty water blocks sunlight that plants need for photosynthesis and makes it hard for animals and plants to “breathe” the oxygen present in the water.

Coliform bacteria- This test should be completed once each day by the station leaders. The test tube should be labeled for date, time, and location and sent with the teachers for the 48 hour incubation period. Teachers should return the test results to the Plant-a-seed program for their records.

3. Turbidity Tube Test

This is a fun way to visually check how clear or dirty the water may be. Fill the plastic tube all the way with water from the stream. While looking through the top of the tube, allow water to leave the tube by opening the small plastic tube at the bottom. Record the level at which the black and white disc at the bottom of the tube becomes visible. Use the numbers on the white tape on the outside of the plastic tube for your results. Check to see how closely this matches your findings with the “Green Water Test Kit”. Unlike the “Green Water” results, this test measures turbidity in centimeters.

4. Stream Flow

The amount or volume of water that flows through the stream is important to the water quality of the stream. Higher stream flows have higher oxygen levels, dilute unwanted or dangerous chemicals, and will clean the stream bottom and vegetation of unwanted silt. Stream flow is measured in feet per second.

You will need a partner for this test. Measure off 100 feet in distance along the stream bank. This may already be marked for use with flags by your station leader. Have your partner stand at the downstream flag with a stopwatch. Have one student at the upstream flag toss an orange peel into the middle of the stream and shout “go!” The downstream student will start the stopwatch at this point and stop the stopwatch when the orange peel passes by their position. Record this time in seconds on your data sheet and calculate the stream flow rate.

Optional exercise- You can also calculate the amount of water in gallons that are moving through your stream. Here’s how!

Measure the depth of your stream in feet at three places. This should be measured near the middle and both ends of the stream bed. Record the measurements in feet. Add these three numbers and divide by 3 to find the average depth in feet. Your math teacher can help you with the calculations you need to find the stream flow volume in gallons.

Question?

At what season of the year would you expect the highest stream flow. Why? How are floods important to the health of a riparian buffer that you will visit at a different station.

Remember that higher stream flows generally mean better water quality for plants, animals, and people!

Don't forget to turn your group's tally sheet in the station leader before you leave!