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STUDENT WORKSHEET FOR FLOAT STUDY

Student/Team Name:__________________

Stream Name:

Date:

Water Temperature:

In this part of your study we want to describe a few of the physical features of the stream. Those features include the average width, the average depth, and the average speed of the water. Using those values, we can calculate how much water is flowing past any point.

Your teacher will help you choose the portion of the stream you are going to study. Be sure that you have a representative sample containing riffles, pools, and other features. Next, look for three "average" cross sections of your study area. Working in teams, place a measuring tape across the width of the stream. Anchor the loose end of the tape on the left bank as you look upstream.

Average Width

In the spaces below, write the widths of the different cross sections that you included in your stream study.

Cross section #1 ___________ inches

Cross Section #2 ___________ inches

Cross Section #3 ___________ inches

Now, add the measurements and divide by 3 to get the average width of the stream

#1 ___ + #2 ___ + #3 ___ = ___ ÷ 3 = _____
Average Width

Average Depth

We are next going to determine the average depth of each section. Note the total width, and divide that by 5. Place a marker on the tape at the length of each of the 5 intervals. Using a yardstick, measure the depth at each of the markers you put on the measuring tape. In the spaces below, record the depth in inches.

Increment #1 ____________ inches

Increment #2 ____________ inches

Increment #3 ____________ inches

Increment #4 ____________ inches

Increment #5 ____________ inches

Now, add up the increments and divide by 5 to get the average depth of the stream

#1 ___ + #2 ___ + #3 ___ + #4 ___ + #5 ___ =_____ ÷ 5 = _____
Average Depth

Finally, gather the average depth data from the other cross sections and calculate the average depth of the stream.

#1 ___ + #2 ___ + #3 ___ = ___ ÷ 3 = _____
Average Width

Average Water Speed
Finally, we need to determine the speed of the water. You can measure the time it takes for a floating object to travel a known distance then divide by the time by the distance to calculate the speed. You can use any object that will float near the surface. Oranges, bags ¾ filled with water, ice cubes, ping-pong balls, and water-logged sticks are all objects that will float close to the surface.

Measure a distance on the bank with the measuring tape: Distance = _________(ft)

Now measure the time it takes for the object to float down the length you marked on the bank. Stand slightly up stream of the starting point so that the object will reach the water's speed as it passes by the first marker. Be sure that someone will catch the float after it passes the downstream mark.

Trial #1 ________ seconds

Trial #2 ________ seconds

Trial #3 ________ seconds

Add the times for the three trials and divide by 3 to calculate the average time

#1 ___ + #2 ___ + #3 ___ =_____ ÷ 3 = _____
Average Time

Finally, divide the distance by time to get the speed in feet per second:

_______ feet ÷ ______ sec = ________ feet/sec

Discharge Volume

Now that we have measured the stream's average depth, width, and speed we can calculate the discharge of the stream. We measure the discharge in cubic feet per second (cfs) or cubic feet per hour. If you have not done so, be sure to convert all measurements to feet by dividing the number of inches by 12.

Width (ft)____× Depth (ft) ____× Speed (feet/sec)_____ = ________
Discharge (cfs)

You may also wish to draw a graph illustrating the contours of the stream bed. All you need to do is to graph distance on the "X" axis and depth of the "Y" axis. The graph will show more detail if you include more observation points then the five you previously took.