

Measuring and Calculating Stream Flow

Materials

2 flags to mark the start and end of the stream monitoring section
Measuring Tape
Orange or other float device

Appropriate footwear (boots, waders, or water shoes)
Personal Flotation Device (when requested by teacher)
Stopwatch
Calculator

Safety

DO NOT ENTER A STREAM THAT IS MOVING FAST OR IF THE WATER LEVEL IS ABOVE YOUR THIGH. IF AT ANY TIME YOU FEEL YOU MAY LOSE YOUR BALANCE, EXIT THE STREAM. IF REQUESTED BY YOUR TEACHER, WEAR A PERSONAL FLOTATION DEVICE. WEAR APPROPRIATE FOOTWEAR IN AND OUT OF THE STREAM.

Procedure

Set-up

1. Locate a straight section of stream at least 20 feet long. Mark the start and end of the length of stream with flags.
2. Measure the width of the stream and record data in Table 1.1
3. Measure the depth (in tenths of an inch) of the stream at 1 foot intervals. Record data in Table 1.2
4. Observe the bottom of the stream. Circle below the best description of the stream bottom.
 1. Rough, loose rocks, coarse gravel, weeds
 2. Smooth mud, sand, bedrock

Measuring Velocity

5. Release your float 3-4 feet upstream of the “Start” flag.
6. Measure the time it takes for the float to travel the distance between flags. *With the students in small groups, have one student in the water ready to release the float object, one on shore watching the starting line, another watching the finish line, one using the stop watch, and all others in the water behind the finish line to catch the object.* Only time the distance between flags. Record in data Table 1.1
7. Repeat step 4 and 5 at three additional locations across the stream. Record data in Table 1.1

Data and Calculations

Table 1.1

	Width of Stream	Float Distance Measured	Time to travel distance
Location 1			
Location 2			
Location 3			
Location 4			
		Average Travel Time	

Table 1.2

Depth 1	Depth 2	Depth 3	Depth 4	Depth 5	Depth 6	Depth 7	Depth 8	Depth 9	Depth 10	Average Depth

Multiply the average depth of the stream by the width of the stream to find the **area** in ft^2 .

Divide the distance traveled by the average travel time to find the **velocity of the stream** in ft/sec .

Multiply the velocity of the stream by a correction factor. This is the **corrected velocity** of the stream.
Choose a correction factor of 0.8 for stream bottoms with rocks, loose gravel, coarse gravel, or weeds.
Choose a correction factor of 0.9 for stream bottoms with smooth mud, sand, or bedrock.

Multiply the corrected velocity of the stream by the area of the stream to obtain ft^3/sec . This is the measure of stream flow in cubic feet per second!

Conclusion

Based on your data analysis, write a conclusion for this activity.