

Virtual River

Name: _____

Block: _____

Go to <http://vcourseware.sonoma.edu/VirtualRiver/>

Click on River discharge.

As you complete this answer on here too...it will help you go back to where you left off if you need to complete this for homework.

- Discharge is an important concept. What statement best describes stream discharge?
 - It's a measure of stream volume per distance traveled
 - It's a measure of stream velocity It's a measure of how much water is moving past a certain location along the stream each second.
- If the stream above were moving twice as fast, what would the discharge be?
 - 2.0 cubic meters/s
 - 0.5 cubic meters/s
 - 1.5 cubic meters/s

label the left side of the stream in the diagrams below

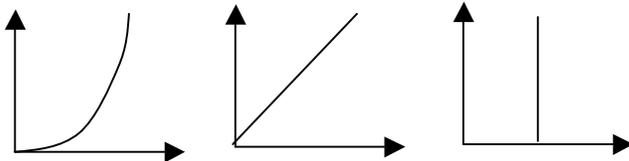


- Which part of the stream flows fastest?
 - Near the top
 - In the middle
 - At the bottom of stream.

4. Record your measurements below

Fraction of depth	Time 1	Time 2	average
0.1			
0.4			
0.6	17.2	17.2	17.2
0.8	29.8	29.6	29.7

5. Which graph below best illustrates the discharge? (velocity is on the x axis and depth is on the y axis)



6. Velocity Measurements for .2 D _____ .3D _____ .5D _____ .7D _____ .9D _____

7. At what fraction of stream depth is the velocity equal to the average stream velocity? _____

8. At what depth should a velocity sensor be placed to estimate a stream's average velocity if it's 12.5 meters deep? _____

9. Same questions as above, but for a stream that's 2.0 meters deep. _____

A simple stream

- What is the velocity value at a sensor depth of 0.30 m at 6.2 m on the tape measure? _____ m/s
- How does the velocity at 9.1 m on the tape (also at a sensor depth of 0.3) compare with that at 6.2 m and 0.30 sensor depth?
 - greater
 - less than
 - the same

1. What is the maximum depth of water in this hypothetical stream? ____ meters
2. At what actual depth should the velocity sensor be set to record the average velocity? (Remember that the average velocity is best measured at 6/10th's of the total depth.)____ m
3. What is the average velocity of this stream, as measured by the virtual stadia rod and velocity sensor? ____ m/sec
4. What is the distance on the tape of the left edge of stream? (Note that the edge of the stream is NOT at "0.0" on the tape.) ____ m
5. What is the distance on the tape of the right edge of the stream? _____ m
6. Compute the width of the stream. (This is the difference between the right and left sides.) _____ m
7. Discharge is computed as the volume of water in the stream passing by in one second.
DISCHARGE = DEPTH times WIDTH times AVERAGE VELOCITY.
 (Keep in mind that for this very simplistic stream the velocity at a fixed depth is constant from side to side. Water velocity in a real stream varies not only with depth, but from side to side.)
 What is the discharge of this stream? (Calculate to TWO decimal places in cubic meters per second)
 _____ cu m / sec

Stream features

Write the letter (A-G) next to the feature it matched

- | | |
|------------------------------|--------------------------------|
| 1. ____riffle | 5. ____cutbank on left bank |
| 2. ____upstream pool | 6. ____point bar on right bank |
| 3. ____downstream pool | 7. ____point bar on left bank |
| 4. ____cutbank on right bank | |

Measuring velocity and discharge of a complicated river

1. Once you finish ALL measurements and calculations: the total discharge of the river is _____ m³/s
2. After converting, the discharge is _____ cubic feet per second