

Determination float
from upstream
direction. get a stop



**ASSIGN
BUSTER**

Determination the velocity & discharge using floats APPARATUS: 1)

Tape Measure 2) Stop-Watch cell phone having a timer 3) Meter stick TO Measure Depth (Tape Measures are not possible to use) 4) Buoyant objects such as orange THEORY: If a Flow Meter is not Available or Rough Estimate is enough so we can use the float to measure the flow.

The float can be any light object such as pine cone or an orange or partially filled plastic water bottle. The basic idea is to Measure the time that it takes a floating object to travel a specified distance downstream. We measure the flow of stream.

Flow is important because define the shape, size and direction of the stream. Measure the distance up to 50 feet along the bank string the rope at the both ends. 1.

Using the total stream calculate the cross sectional area of the stream at the both end. To find the total stream width and the average depth. Total Width (feet) * Average depth (feet) = area in feet. 2. Throw The Float From Upstream Direction.

Get a stop watch to record the time it takes to reach the downstream. If the float moves too fast so record the data 75 or 100 instead of 50 feet. Repeat this process two more times for a total of three measurements. 3. Now in this step we will calculate the velocity the distance covered by float divided by the average amount of time it took to cover the distance. If the distance is 50 feet and the time taken by orange 100 seconds so get the velocity is 0.5 feet/sec.

50 feet/100sec = 0.5 sec. 4. Calculate the mid-depth velocity by multiplying the surface velocity by 0.

$$85. \quad 0.5 \times 0.85 = 0.43 \text{ ft/sec.}$$

5. Now calculate the discharge in cubic feet per second (cfs) & multiplying the Velocity (ft/sec) by the cross-sectional area (ft.) of the stream.

$$0.43 \text{ ft/sec} \times 10.73 \text{ ft} = 4.62 \text{ cfs.}$$

USING A STAFF GAUGE The staff gage is a long ruler placed half-permanently in a stream or lake used to measure the water depth. Staff gauges are the most common & useful for measurement. Place the staff gauges in a lake. Place the three staff gauges because in mid-portion the lake water velocity is different as compared to the side of lake. There is some resistance at the side of lake that's why we place the multiple staff gauge. If a staff gauge is placed on a non-vertical place so knowing that the staff gauge reading is correct or not.

WHY USE A STAFF GAUGE We can use a staff gauge to get the information in an indirect way to calculate the stream flow. If we place the staff gauge near a section of stream for which you are collecting flow data, you can identify the relationship between stream depth & stream flow. Once you get this relationship so we can calculate flow from the stream depth without having to take a time to make a detailed flow measurement. A staff gauge having numerically labeled divisions in lines to take the measurement of water easily the depth & stream flow.