# River Hydrology

Good hydrology is important for the health of our rivers and quality of our water. This includes aspects such as depth, width, velocity and volume of water (discharge). There should be different varieties of all these in a river to maintain its natural flow.

Velocity

The velocity of a river is the speed at which water flows along it (distance/time). The velocity will change along the course of any river, and is determined by factors such as the gradient (how steeply the river is losing height), the volume of water, the shape of the river channel and the amount of friction created by the bed, rocks and plants.

Equipment

Orange or a ping pong ball, stopwatch, measuring tape and 3 people.

Person A — DISTANCE 10m — Person B

Person C
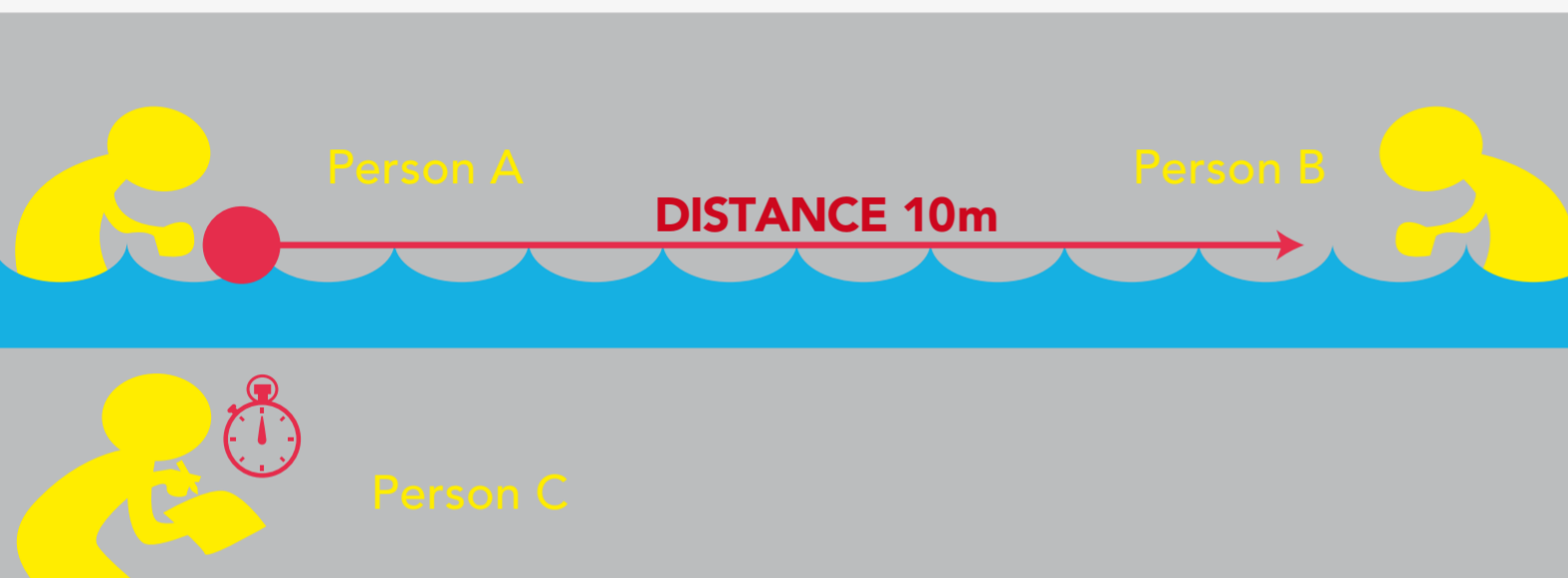
EXAMPLE: Measure timing four times over a distance of 10m.

RESULTS: 1st: 36 seconds, 2nd: 28 seconds, 3rd: 34 seconds, 4th: 30 seconds

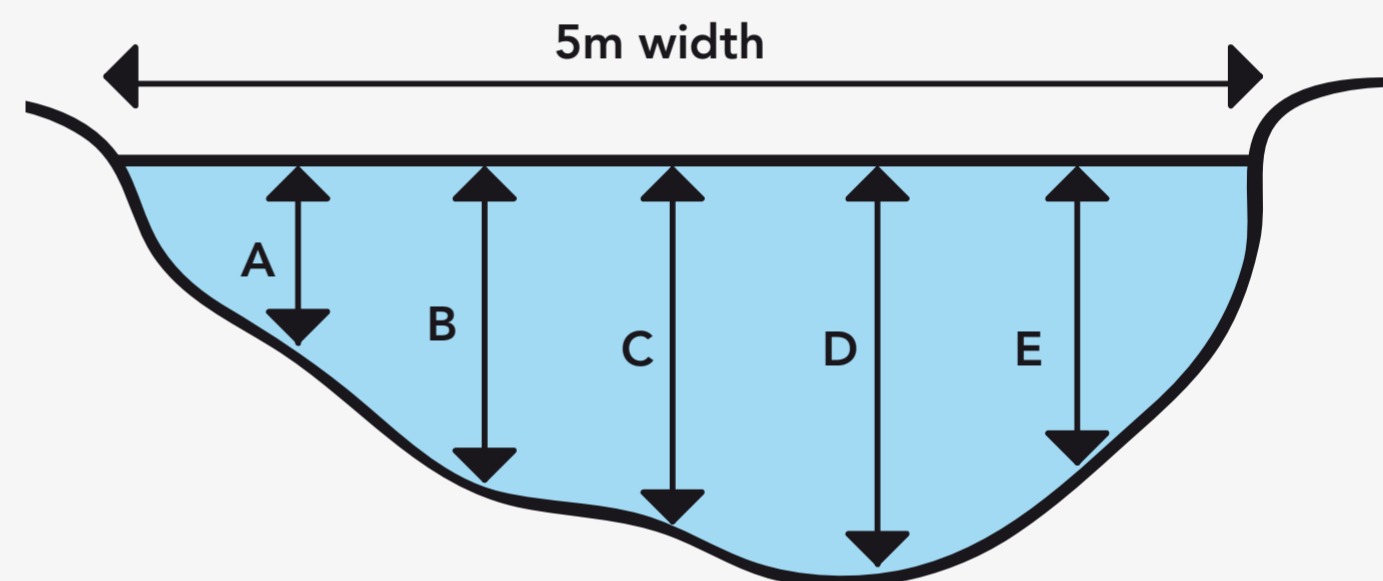Calculate average time
$$\frac{36 + 28 + 34 + 30}{4} = 32_{sec}$$

Calculating velocity

$$\frac{DISTANCE}{AVERAGE\ TIME} = AVERAGE\ VELOCITY$$
$$\frac{10}{32} = 0.3125m/sec$$

The surface velocity is found to be **0.3125 metre per second.**

Discharge

The river's discharge at that location depends on the rainfall on the catchment or drainage area and the inflow or outflow of groundwater to or from the area, stream modifications such as dams and irrigation diversions, as well as evaporation and evapotranspiration from the area's land and plant surfaces. The discharge of a river is useful to find out if there is enough water for a business or industry. It can also help you to predict flood extent downstream using data on flood waters upstream from you.

5m width

A B C D E

EXAMPLE:
A = 0.2m; B = 0.5m; C = 0.7m; D = 1m; E = 0.6m

Calculate average depth

$$\frac{A+B+C+D+E}{5}$$
$$= \frac{0.2+0.5+0.7+1+0.6}{5} = 0.6m$$

Calculating discharge rate

by the amount of water flowing past a point in a given unit of time to what you want to measure) and take note of the time it takes for the orange to flow over the 10m.

DISCHARGE RATE

= (*RIVER WIDTH* x *AVERAGE DEPTH*) x AVERAGE VELOCITY

= (5 x 0.6) x (0.3125)

= 0.9375m³/sec

The river's discharge rate is found to be **0.9375 cubic metre per second.**

Please note

Discharge rate may increase or decrease over time as a result of changes in the river's velocity.

Global Environment Centre

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