Chapter 35 - Density

$$\text{Density} = \frac{\text{mass}}{\text{volume}} = \frac{\text{mountains}}{\text{Valleys}}$$

Experiments
1. Block Wood
2. Stone
3. water / oil

1. WOOD

Density = $\frac{\text{Mass}}{\text{Volume}}$ = _____ Density = g/cm³

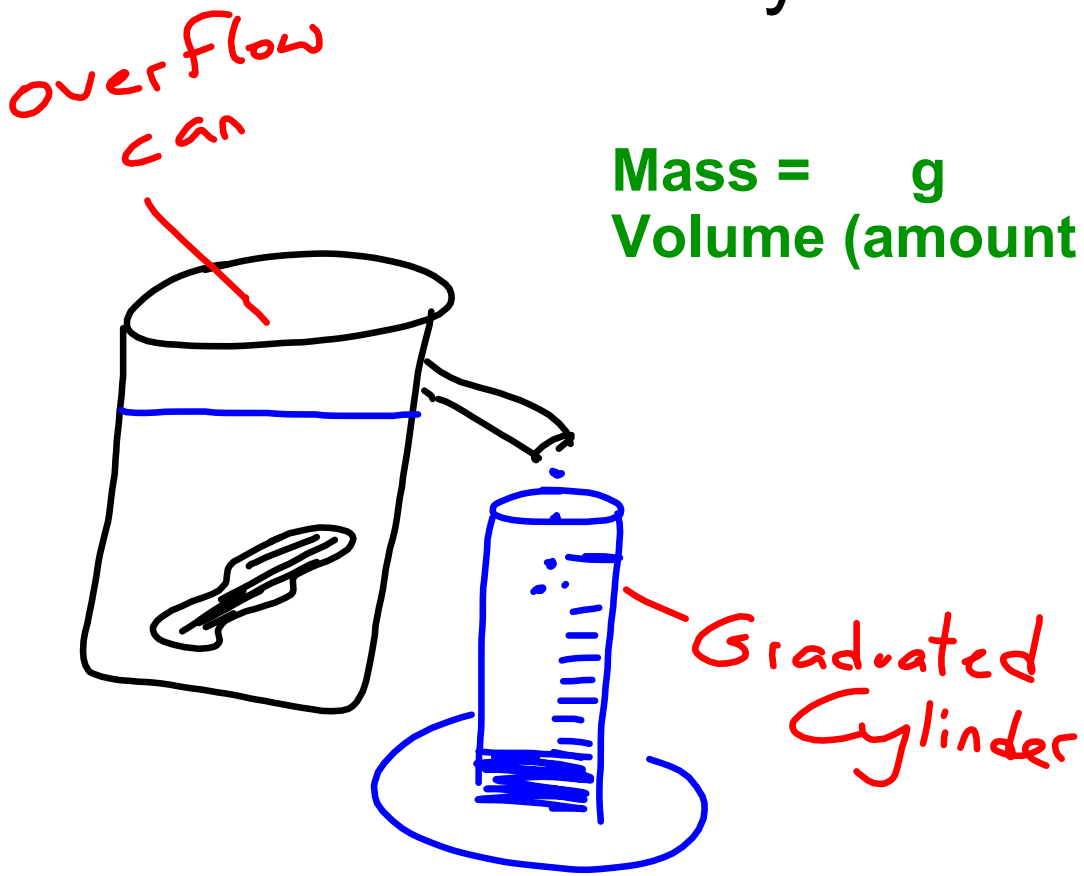
Mass = 112.2 g

Volume = 150 cm³

$= \frac{112.2}{150} = 0.75$ g/cm³

(3 Sides are multiplied)

2. Density of a Stone



Mass = g

Volume (amount of water) = cm^3

3. Tap Water, Sea-water and Oil

Procedure (Steps),

1. Measure out **10cm^3** of the liquid being tested (e.g. Tap Water)
2. Place an **empty beaker** on an electronic balance and re-zero.
3. Pour the 10 cm^3 of the liquid into the beaker and record the mass (weight) in grams.
4. Do the following calculation,

$$\textbf{Density} = \frac{\textbf{Mass}}{\textbf{Volume}} = \underline{\qquad\qquad} \quad \textbf{Density} = \quad \textbf{g/cm}^3$$

5. **Repeat** for Seawater and oil.

Conclusions

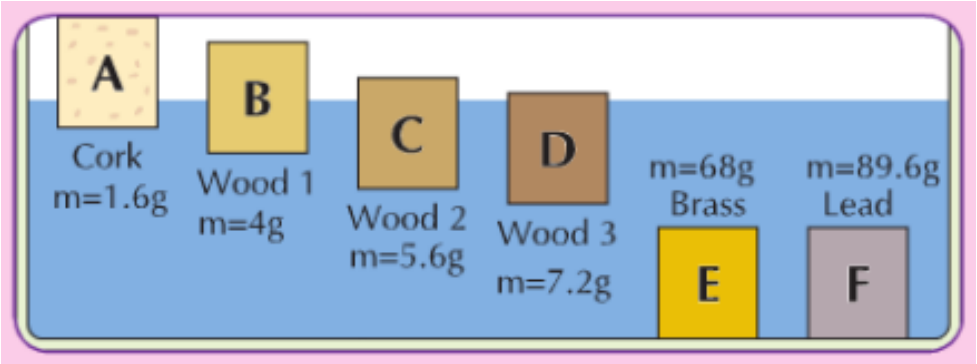
1. The volume of the regularly shaped **wood** was easy to measure with a ruler. The density was **less** than 1, which means it is less dense than water and will **float.**

2. The volume of the irregularly shaped **stone** was hard to measure with a ruler. We used an **overflow can** to measure its volume instead. The density was **greater** than 1, which means it is more dense than water and will **sink**.

3. The volume of the **liquids** was easy to measure with a **graduated cylinder**. The density was **less** than 1 for **oil**, **greater** than 1 for **saltwater** and exactly 1 for tapwater.

Flotation

The less dense objects float higher than the more dense objects.

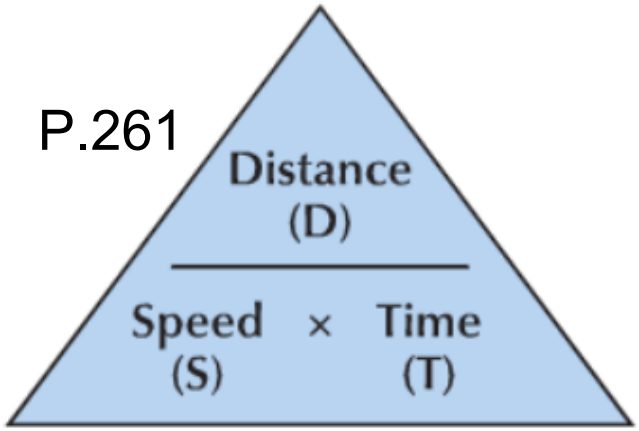


e.g. Block A is less dense than Block F

Speed

$$\text{Speed} = \frac{\text{Distance (m)}}{\text{Time (s)}} = \frac{10\text{m}}{2\text{s}} = 5\text{m/s}$$

P.261



A girl runs 200m in 1 minute.
Calculate her speed...

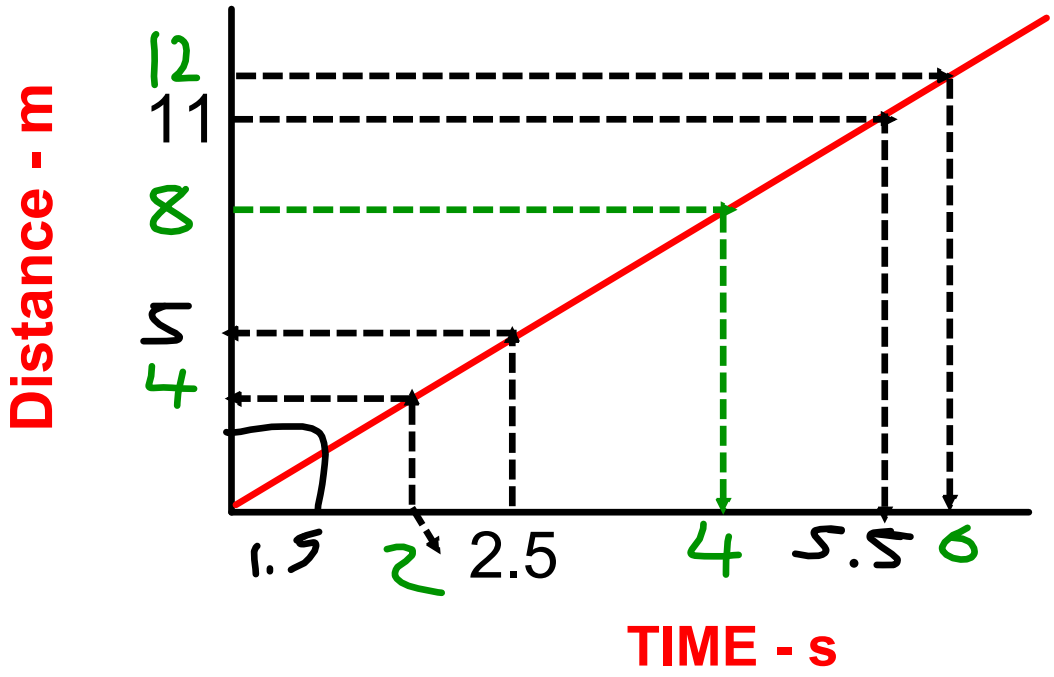
Speed = $\frac{\text{Distance}}{\text{Time}}$

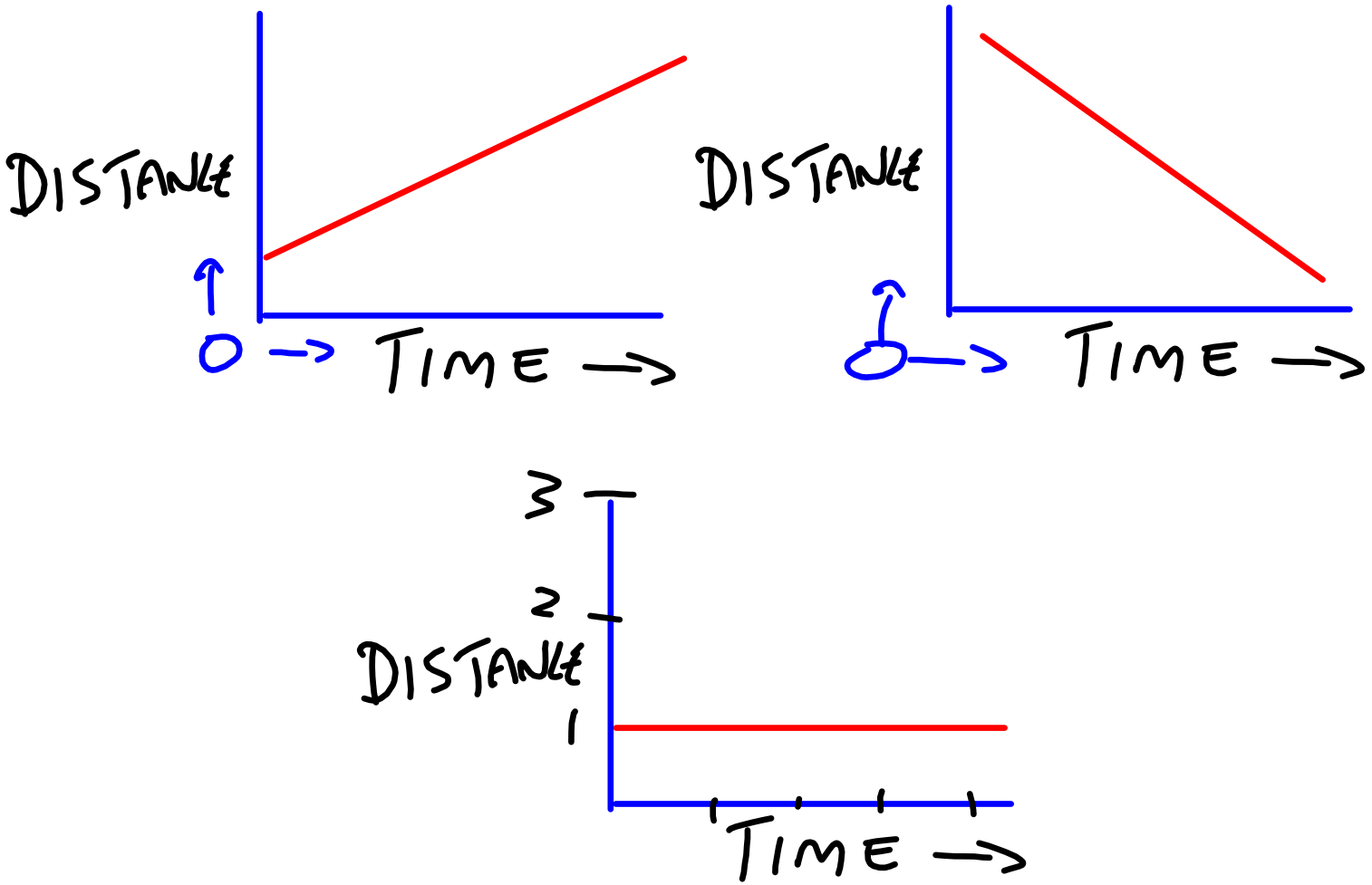
Speed = $\frac{200}{60}$

Speed = 3.3 m/s (ms^{-1})

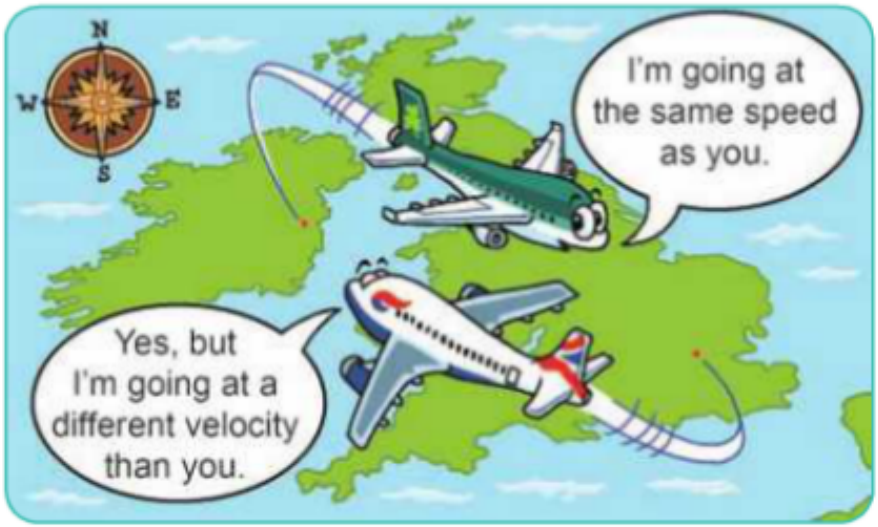
Graphs

Speed = $\frac{\text{Distance}}{\text{Time}}$




DISTANCE
0
TIME
DISTANCE
TIME
3
2
DISTANCE
1
TIME

Velocity = Speed and Direction

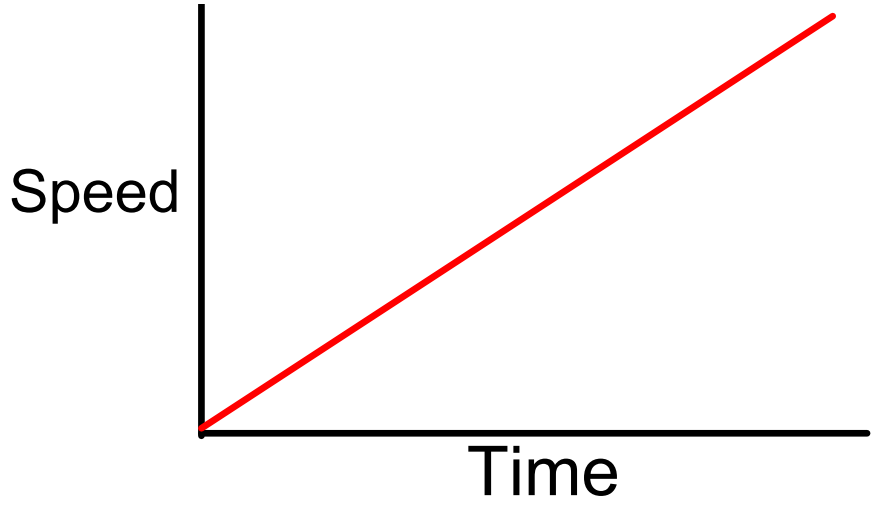


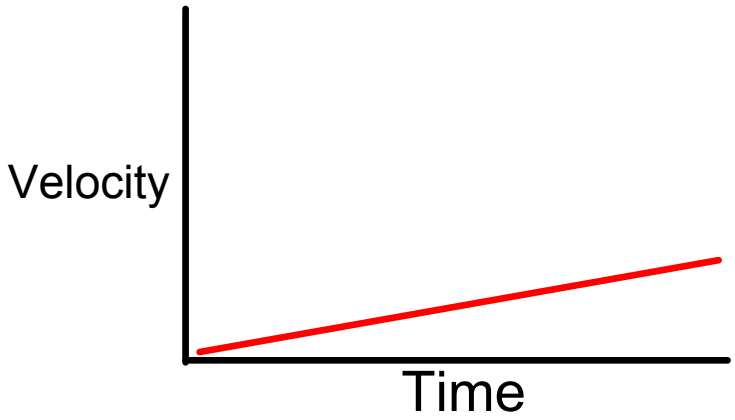
The velocity of an object is its speed in a certain direction.

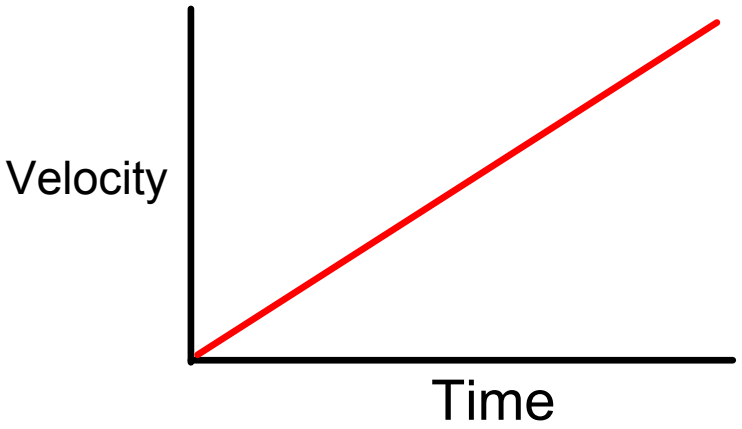
Acceleration

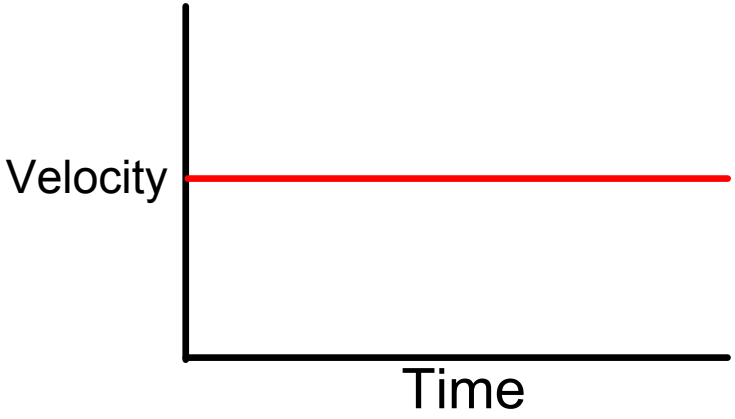
Acceleration is the rate of change of velocity (or speed).

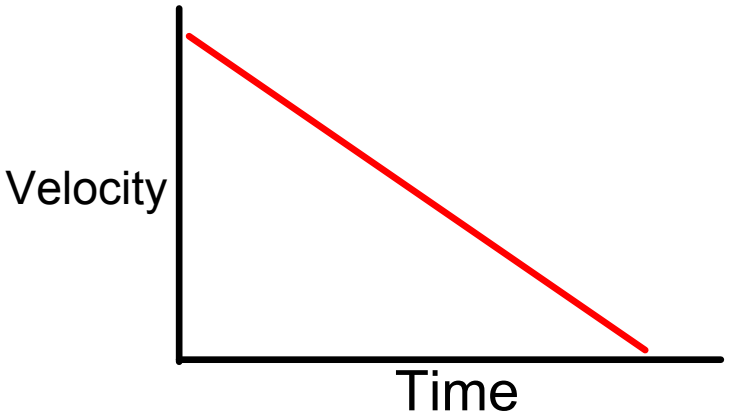
$$\textit{or} \quad \text{acceleration} = \frac{\text{change in velocity}}{\text{time}}$$




Velocity
Time


Velocity
Time


Velocity
Time


Velocity
Time