

Speed, velocity & displacement, distance

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Scalar - the quantity with no direction

Vector - the quantity with direction

When doing the question with vector quantity, always add the direction

Distance (d)- how far travelled (scalar)

Displacement (s)- how far the object travel from starting point(vector)

Speed : $Speed = \frac{\Delta d}{\Delta t}$ $S = \frac{d}{t}$

- no direction(scalar)
- (m/s) rate of change of distance
- Always positive or zero

Velocity $velocity = \frac{\Delta s}{\Delta t}$ $V = \frac{s}{t}$

- with direction (vector)
- (m/s²) rate of change of displacement.

When the direction is changing, the speed constant but the velocity changes (eg: velocity decrease as the change of displacement decrease)

When explaining the displacement - we have to show the length and the direction eg: 53° East from north.

The **instantaneous speed** or velocity is the speed or velocity of the object at a particular moment in time

The **average speed** is calculated by dividing the total distance covered by the total time taken.

- Displacement is the distance and direction of an object from a given reference point. It is a vector quantity as it has both size and direction.
- Distance is a scalar quantity – it only has size (or magnitude) and no direction.

Displacement is the distance and direction of the object from a reference point
Displacement is the direction and distance of the object from a reference point.