

Vectors & Scalars

Vectors: are values/measurements that have **both Direction and Magnitude (size)**. Examples are position, displacement, velocity.

Examples:

Vector quantities can be represented in diagrams as **arrows** whose lengths are scaled to match the magnitude of the quantity and the direction is measured as an angle.

Scalars: are values/measurements that have **only magnitude (size)**. There is no reference to direction. Examples are distance and speed.

Examples:

Vectors

Position: refers to how far an object is from the origin (reference point) and the direction.

Displacement: describes the magnitude and direction of the change in position

$$\Delta \vec{d} = \vec{d}_2 - \vec{d}_1$$

Average Velocity: is calculated as the total displacement over the total time.

$$\vec{v}_{av} = \frac{\Delta \vec{d}}{\Delta t}$$

Scalars

Distance: involves only a measure of the length between two objects or places (does not depend on a reference point), Δd

Average Speed: is calculated as the total distance over the total time.

$$v_{av} = \frac{\Delta d}{\Delta t}$$