# KINEMATICS

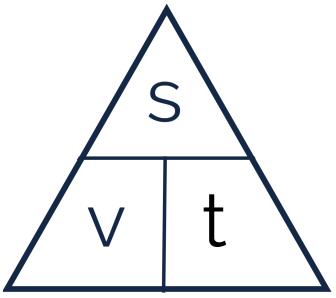
> Speed, Time, Distance

**symbols:**

- speed = v
- time = t
- distance = s

**formula**:

- speed (v) = distance (s) / time (t)
- average speed = total distance / total time




> Scalar & Vector and Distance & Displacement

**Scalar**:
- distance
- doesn't have directions (length, area, volume, speed, density, etc)

**Vector**:
- displacement
- has direction (displacement, velocity, acceleration, etc)

**Distance**:
- total distance traveled
- doesn't need NEWS (North, East, West, South)

**Displacement**:
- distance from start to end (a shortcut)
- needs NEWS (North, East, West, South)


> Acceleration & Deceleration

**Deceleration**:
Speed becomes slower.

**Acceleration**:
Speed becomes faster.

**units:**

- speed -> m/s
- acceleration -> m/s/s -> $m/s^2$

**symbols**:

- acceleration = a
- Vf = final speed
- Vi = initial speed

**formula**:

$Vf = t \times a \times Vi$

**Example**:

A person gains 5 m/s every second.