1.1 Describing Motion

Motion is movement in any direction and, therefore is a *vector quantity.*

Speed is the distance that has traveled a body In unit time speed only has magnitude (size) Making it a *scalar quantity*. The unit of speed is m/s or km/hr.

Speed = $\frac{DISTANCE}{TIME}$

S=$\frac{d}{t}$

Velocity is the distance traveled in unit time in a given direction. Velocity has both magnitude (size) and direction. It is a *vector quantity*.

The unit of velocity is m/s direction. For example 4m/s east.

Displacement is the length from one point to another at a given direction.

Velocity=$\frac{DISPLACEMENT}{TIME}$
S is displacement.
V is velocity
T is time

V=$\frac{s}{t}$

Note: Distance is a scalar quantity, and Displacement is a vector quantity.

Example:

Jennie travels 550 metres to the East in 10 seconds. Find the speed and velocity Jennies used to travel.

ANS:
Speed = $\frac{DISTANCE}{TIME}$=$\frac{550m}{10s}$=55m/s
Velocity=$\frac{DISPLACEMENT}{TIME}$=$\frac{550m\ East}{10s}$= 55m/s East

Factors that influence the speed of an object:

1. **Force applied**: Applying force to an object can result in a change of Speed in an object.

2. **Mass of the object**: According to or a given force Newton's second law, for a given force, a more massive object will experience less acceleration compared to a less massive object.

3. **Direction of force**: The object's speed can increase if a force is applied in the direction of motion. If the force is applied in the opposite direction - of motion, it can slow down or decelerate the object.

4. **The medium in which the motion is taking place**: The state of matter that the object is traveling through can affect the speed of motion, for example, an object may experience drag forces that can influence the speed.

5. **The Gradient**: If a motion is taking place along an inclined plane/surface, the object's speed can be affected. The Steeper the gradient, the greater the acceleration or deceleration depending on the direction of motion.