NEWTON'S LAWS OF MOTION

Newton defined the three fundamental laws of motion, given below:

0.1 Newton's First Law of Motion

Definition of Inertia:
An object tends to retain its state of motion, i.e., stays in either rest or moves at constant velocity unless acted upon by an external force.
This property of the object is called inertia.

0.2 Newton's Second Law of Motion

The rate of change of momentum of a body is called the *force*, and it is directly proportion to the rate of change of its velocity, i.e., its *acceleration*.
This can be written mathematically as:

$$\overrightarrow{p} = m\overrightarrow{v}$$
$$\frac{\delta\overrightarrow{p}}{\delta t} = m\frac{\delta\overrightarrow{v}}{\delta t}$$
$$\overrightarrow{F} = m\overrightarrow{a}$$

In simpler terms (Not using vectors)

$$F = \frac{m_1.V_1 - m_0.V_0}{t_1 - t_0}$$
$$F = \frac{m(V_1 - V_0)}{t_1 - t_0}$$
$$F = \frac{\Delta V}{\Delta t}$$
$$F = ma$$

0.3 Newton's Third Law of Motion

This law states that every action has an *equal and opposite* reaction.