



Vocabulary

Vocabulary: Forces & Motion

motion:

The movement of an object—the distance covered by the object, and the time it took to move. The elements of motion are displacement, time, velocity, and acceleration.

displacement:

The amount of change in an objects position (distance and direction).

speed & velocity:

Speed describes how fast an object moves, or distance divided by time. Velocity is the rate at which an object changes its position in a specific direction (an objects speed and direction).

$$v = d/t \quad (\text{average velocity} = \text{displacement divided by time})$$

acceleration:

The rate at which an object changes its velocity (speed, direction, or both).

$$a = v/t \quad (\text{acceleration} = \text{change in velocity divided by the time interval of change})$$

force:

A push or a pull on an object, resulting from its interaction with another object.

- Forces have a magnitude and a direction (vector), which both have to be considered when combining forces. The **net force** is the sum of the forces acting on an object:

$$\begin{array}{c} \xrightarrow{5} + \xrightarrow{5} = \xrightarrow{10} \\ \xrightarrow{10} + \xleftarrow{-5} = \xrightarrow{5} \end{array}$$

contact force:

A force where two interacting objects are in physical contact with each other. Examples of contact forces:

- **frictional force:** The force exerted by a surface as an object moves across it or makes an effort to move across it. The frictional force opposes the motion of the object.
- **normal force:** The support force exerted upon an object in contact with another stable object.
- **applied force:** A force applied to an object by a person or another object.

Action-at-a-distance force:

A force where even though the two interacting objects are not in physical contact with each other, they are still able to exert a push or pull.

Examples of action-at-a distance forces are **gravitational force, electrical force, and magnetic force.**

inertia:

The tendency for objects to resist changes in movement.