

G481

Module 2: Forces in Action

1.2.1 Force



Objectives

- List different types of forces.
- Describe the forces acting on objects
- Compare the forces acting on a moving and a stationary objects.
- Assess the forces acting on objects on slopes.



Types of Force

Gravitational

Weight

Electromagnetic

Thrust

Friction

Upthrust

Reaction / Normal / Contact Force

Drag / Water or Air Resistance

Electrostatic

Magnetic

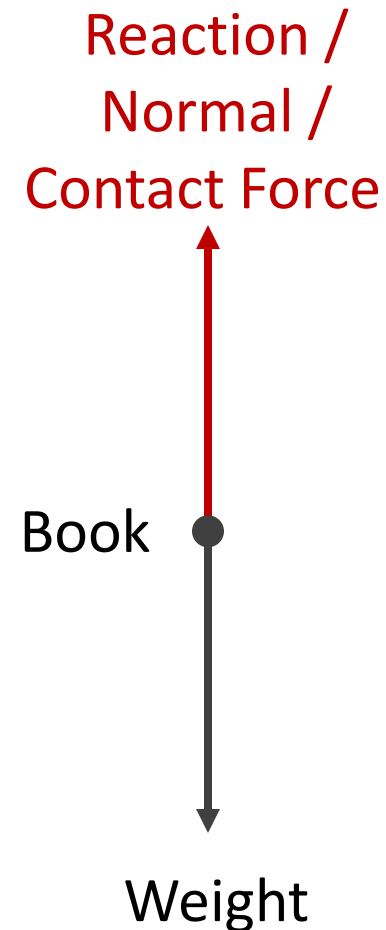
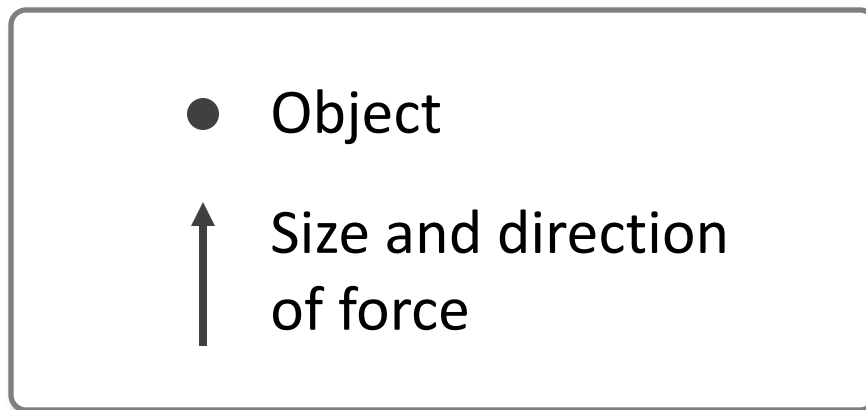
Strong Nuclear Force

Weak Nuclear Force



Types of Force

Forces on an object can be shown with labelled arrows. For example, an object like a text book at rest on the desk would experience the following forces.



Acceleration of an Object

If you apply the same force to two objects the lighter object will accelerate quicker.

If you apply a large force to the same object it will accelerate quicker than if a small force is applied.

- We can therefore write: $a \propto 1/m$ and $a \propto F$
- Combining these we get: $a \propto F/m$ and rearranging $F \propto ma$
- Provided the correct constant is chosen we can say:

$$F = m a$$



The Newton

$$F = m a$$

This leads onto the definition on the **newton**, the unit of force.

Newton: The force that will give a mass of 1kg an acceleration of 1ms^{-2} in the **direction of the force applied**

