

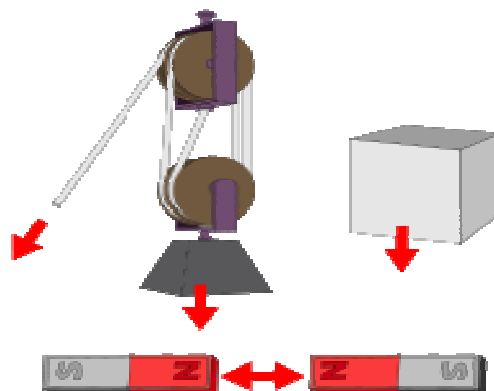
# Force

In **physics**, a force is any influence that causes an **object** to undergo a certain change, either concerning its movement, direction, or geometrical construction. It is measured with the **SI unit** of **newtons** and represented by the symbol  $F$ . In other words, a force is that which can cause an object with **mass** to change its **velocity** (which includes to begin moving from a **state of rest**), i.e., to **accelerate**, or which can cause a flexible object to **deform**. Force can also be described by intuitive concepts such as a push or pull. A force has both **magnitude** and **direction**, making it a **vector** quantity.

The original form of **Newton's second law** states that the net force acting upon an object is equal to the **rate** at which its **momentum** changes. This law is further given to mean that the **acceleration** of an object is directly proportional to the net force acting on the object, is in the direction of the net force, and is inversely proportional to the **mass** of the object. As a formula, this is expressed as:

$$\vec{F} = m\vec{a}$$

where the arrows imply a vector quantity possessing both magnitude and direction.



Forces are also described as a push or pull on an object. They can be due to phenomena such as **gravity**,

Related concepts to force include: **thrust**, which increases the velocity of an object; **drag**, which decreases the velocity of an object; and **torque** which produces **changes in rotational speed** of an object. Forces which do not act uniformly on all parts of a body will also cause **mechanical stresses**, a technical term for influences which cause **deformation** of matter. While mechanical stress can remain embedded in a solid object, gradually deforming it, mechanical stress in a **fluid** determines changes in its **pressure** and **volume**.