

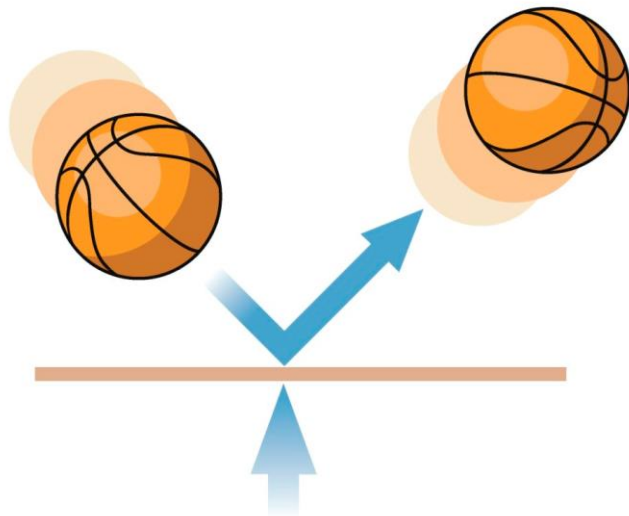


FORCES

KNOWLEDGE ORGANISER



What you should already know...

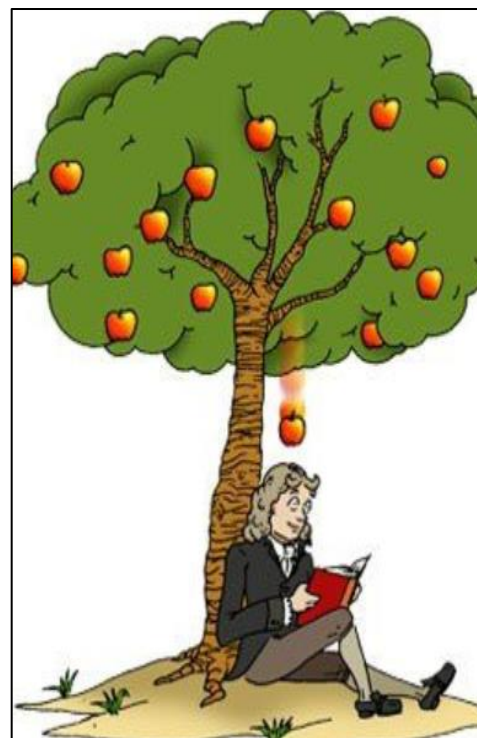


- Forces are pushes and pulls which make things move and stop moving.
- Most forces need contact between objects, but magnets can act at a distance.
- Magnets are made of materials that create a magnetic field (the area in space where the force of magnets can be detected).
- Forces are shown by arrows in diagrams. The bigger the arrow, the bigger the force.
- When forces are unbalanced, objects can speed up, slow down, or change direction.

Gravity

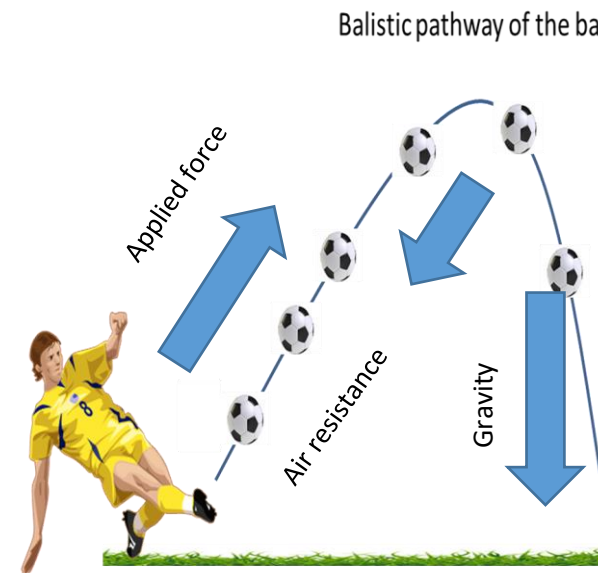
Gravity attracts all matter towards each other.

- It has been around since the beginning of the Universe, and applies to all matter in the Universe.
- The bigger an object's mass, the more gravity it will have. The smaller the mass of an object, the less gravity it will be subject to.
- Without gravity we would fly right off the planet! The moon's gravity causes our ocean tides on Earth. The Sun's gravity keeps Earth in orbit around the Sun.
- We don't actually "feel" gravity. We only feel the effects of trying to overcome it by jumping or when we fall.
- Sir Isaac Newton discovered gravity around 300 years ago. The tale is that he saw an apple fall from a tree, and wondered what force made it fall to the ground.



Definitions of Forces

There are a number of different forces that affect us in our daily lives:

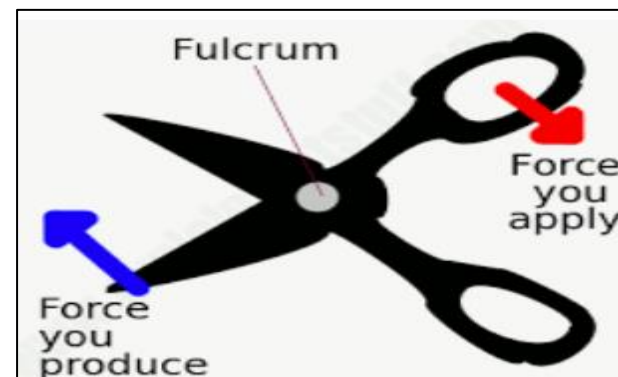


- **Applied force:** The force placed on an object by a living creature.

- (see 'Gravity' definition bottom left);
- **Friction:** the 'sticking' force that occurs when an object moves over another.
- **Air resistance** is a type of friction force that pulls against an object travelling through the air. Some objects are more 'streamlined', meaning that the air pulls on them less, and they travel faster.
- **Water resistance** is the friction force on objects floating or moving in water.
- **Surface resistance** is the friction force of objects moving across a surface.

Machines and Mechanisms

- Simple machines and mechanisms include pulleys, gears and levers. They can be used to turn a small force into larger forces. This means that we can use these machines to accomplish things more easily.



- Levers give us extra pushing or pulling force and help us lift greater weights.
- Gears are different sized cogs which work together to give a machine extra force.
- Pulleys are wheels and ropes that work together to lift heavy objects.

Key Vocabulary

Earth force gravity mass/weight Newtons air resistance water resistance upthrust friction mechanism lever/pulley force meter