

Knowledge Organiser: Forces

Key Vocabulary

Vocabulary	Definition
Force	A push or pull that can change the motion of an object.
Friction	A force that opposes the motion of objects sliding past each other.
Gravity	The force that pulls objects towards the Earth (or any other planet).
Magnetism	A force that can attract or repel certain materials, often experienced with magnets.
Air resistance	A type of friction that occurs when objects move through the air.
Newton (N)	The unit of measurement for force. One Newton is the force needed to accelerate a 1 kg mass by 1 metre per second squared.
Mass	The amount of matter in an object, usually measured in kilograms.
Weight	The force of gravity acting on an object's mass. Weight is often measured in newtons.
Balanced Forces	When two forces acting on an object are equal in size but opposite in direction, resulting in no change in motion.
Unbalanced Forces	When two forces acting on an object are not equal, causing the object to move.

Timeline of Important Events or Concepts

1. **1666 - Isaac Newton:** Formulated the laws of motion and universal gravitation, which are foundational to understanding forces.
2. **1800s - Michael Faraday:** Conducted important work on electro-magnetism, showing the relationship between electricity and magnetism.
3. **Late 1800s - Albert Einstein:** Introduced the concept of general relativity, expanding the understanding of gravity as a force.
4. **1930s - Sir William Thomson (Lord Kelvin):** Worked on the principles of thermodynamics and its relationship with forces and motion.
5. **Present Day:** Ongoing research in physics continues to explore forces at the subatomic level, opening up new realms of understanding.

Useful Websites

1. [BBC Bitesize - Forces](#) – Interactive lessons and quizzes on forces.
2. [National Geographic Kids - Forces](#) – Engaging articles and videos about forces.
3. [The Science Museum - Forces](#) – Activities and explanations of different types of forces.
4. [Khan Academy - Forces and Motion](#) – Educational videos and practice exercises on forces and motion.

Interesting Facts

- **Did you know?** The strength of gravity decreases as you move away from the Earth; that's why astronauts experience weightlessness in space!
- **Did you know?** Friction is what allows us to walk; without it, our feet would slip everywhere!
- **Did you know?** Air resistance increases with speed; that's why a skydiver falls faster than a feather!
- **Did you know?** The Earth's gravity is so strong that it pulls air towards its surface, which is why we have a breathable atmosphere.

Endpoints: What Students Should Know by the End of This Topic

By the end of the 'Forces' topic, students should be able to:

1. Describe what a force is and give examples of different types of forces (gravity, friction, etc.).
2. Explain the concept of balanced and unbalanced forces and provide examples.
3. Understand Newton's laws of motion and their implications in everyday life.
4. Distinguish between mass and weight, and understand how gravity affects them.
5. Recognise the role of friction and air resistance in motion.
6. Conduct simple experiments to observe the effects of forces on different objects.
7. Communicate their findings effectively using appropriate vocabulary and scientific reasoning.