

What should I already know?

- Know what a **force** is and be able to explain that a push and pull are types of **forces**.
- That when **forces** are applied to an object they allow them to move or stop moving.
- The strength of the **force** determines how far and fast an object moves.
- **Friction** is the **resistance** of **motion** when there is contact between two **surfaces**
- The **force** that causes objects to move downwards towards the ground is **gravity**.
- That **magnets** have poles, and that opposite poles **attract**, while similar poles **repel**.

Vocabulary

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|-------------|---|
| attract | If one object attracts another object, it causes the second object to move towards it |
| friction | the resistance of motion when one object rubs against another |
| force | the pulling or pushing effect that something has on something else |
| gear | a part of a machine that causes another part to move because of teeth which connect the two moving parts |
| gravity | the force which causes things to drop to the ground |
| lever | a basic tool used to lift or pry things open |
| motion | the activity of changing position or moving from one place to another |
| opposite | Opposite is used to describe things of the same kind which are completely different in a particular way. For example, north and south are opposite directions |
| pulley | a simple machine that makes lifting something easier. A pulley has a wheel or set of wheels with grooves that a rope or chain can be pulled over |
| repel | When a magnetic pole repels another magnetic pole, it gives out a force that pushes the other pole away |
| resistance | a force which slows down a moving object or vehicle |
| spring | a spiral of wire which returns to its original shape after it is pressed or pulled |
| streamlined | A streamlined vehicle, animal, or object has a shape that allows it to move quickly or efficiently through air or water |
| surface | the flat top part of something or the outside of it |

Famous scientists and inventors



Isaac Newton is considered one of the most important scientists in history. He developed the theory of **gravity**, the laws of motion (which became the basis for **physics**) and a new type of mathematics called calculus.

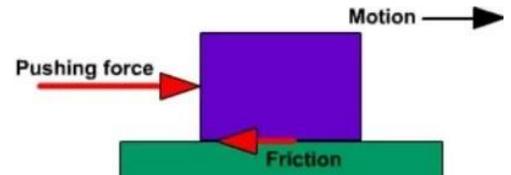


Archimedes was, arguably, the world's greatest scientist. He was a mathematician, physicist, astronomer, engineer, inventor, and weapons-designer. He discovered the laws of levers and pulleys, which allow us to move heavy objects using small forces.

What will I know by the end of the unit?

What are **forces**?

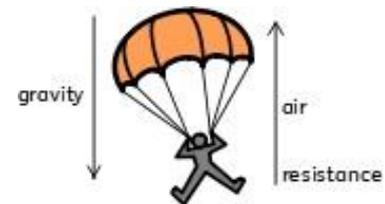
- **Forces** are pushes and pulls.
- These **forces** change the **motion** of an object.
- They will make it start to move or speed up, slow it down or even make it stop.
- For example, when a cyclist pushes down on the pedals of a bike, it begins to move. The harder the cyclist pedals, the faster the bike moves.
- When the cyclist pulls the brakes, the bike slows down and eventually stops.
- **Friction** is a **force** - it is the **resistance** of **motion** when one object rubs against another.



- Other **forces** that create **resistance** of **motion** include **water resistance** and **air resistance**.

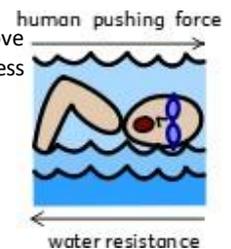
What is **gravity** and **air resistance**?

- **Gravity** is the **force** that pulls objects to the centre of the Earth.
- **Air resistance** pushes up on the parachute, **opposing** the force of **gravity**. This makes the parachute land more slowly.



What is **water resistance**?

- **Water resistance** is the **friction** that is created between water and an object that is moving through it.
- Some objects can move through water with less **resistance** if they are **streamlined**.



What are examples of **mechanisms**?



- **Levers** allow us to do heavy work with less effort. For example, trying to pick up a large heavy box is difficult, however if a **lever** is used it becomes much easier to move it.
- **Pulleys** also allow us to do heavy work - objects are attached to ropes and **pulley** wheels, and so instead of lifting heavy object upwards, we can pull on the **pulley** rope downwards.
- **Gears** are toothed wheels. Their 'teeth' can fit into each other so that when the first wheel turns, so does the next one. This allows **forces** to move across a **surface**.
- **Springs** can be stretched by pulling them or squashed by pushing them. The greater the **force** pulling or pushing the **spring**, the greater the force the **spring** uses to move back to its normal shape.

Lakeside Primary Academy - Science

Forces

Year: 5

Strand: Physics

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Lakeside Primary Academy - Science

Forces

Year: 5

Strand: Physics

| You are planning an investigation to understand more about air resistance using parachutes that you have made. You decide to ask the question, "Does the surface area of the parachute affect the time it takes for a parachute to fall?" | Start of unit: | End of unit: |
|--|----------------|--------------|
| Question 7: Name three things that must stay the same during the experiment. | | |
| Question 8: Name one variable that will change during the experiment. | | |
| Question 9: Give a prediction and explain your reasons for this prediction (if pupils have done the experiment, the question could be changed to give a <i>conclusion</i> for the end of unit question). | | |
| Question 10: Explain the importance of repeating the test a few times. | | |