

# Sir Isaac Newton



Sir Isaac Newton was an important scientist and mathematician who is famous for his work on **gravity** and the three laws of motion.



## Early Life and Education

Isaac was born on Christmas Day (25<sup>th</sup> December) 1642 in the village of Woolsthorpe, Lincolnshire. He spent most of his childhood living with his grandmother before being sent to **boarding school**.

Isaac began studying at the University of Cambridge in 1661 where he learnt about the famous Greek thinkers, Aristotle and Plato. However, Isaac soon became interested in the new ideas about science which were becoming popular at the time. Many people were starting to question the old belief that the Earth was the centre of the universe and Isaac was keen to explore new ways of understanding how nature worked.

## Did You Know...?

Isaac returned to Lincolnshire for a short while to help his mother to run the family farm. However, he soon found that he was not suited to farm life so he went back to boarding school to continue his education.

## Scientific Discoveries

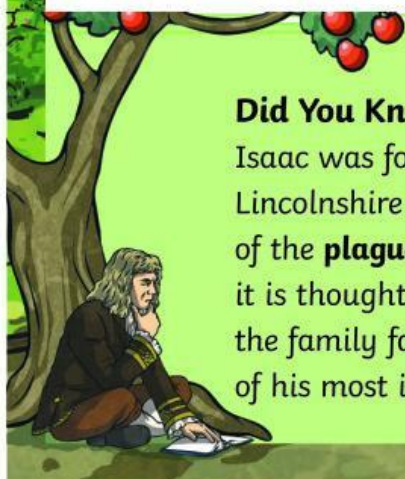
After completing his university studies, Isaac carried out lots of experiments and made some important discoveries. He found that when white light passes through a **prism** it separates into a band of colours. This led him to discover that white light is made up of a mixture of colours.



Many people believe that Isaac discovered gravity while sitting under a tree on his family's farm. It is said that an apple fell from a tree and landed on Isaac's head. He then started to wonder why the apple fell to the ground rather than floating upwards. Isaac also realised that it was gravity that kept the Moon in **orbit** around the Earth.

## Did You Know...?

Isaac was forced to move back to Lincolnshire because of an outbreak of the **plague** in Cambridge. However, it is thought that it was at home on the family farm where he made some of his most important discoveries.



## Sir Isaac Newton

After the plague, Isaac began working as a teacher at the University of Cambridge. In 1687, Isaac published his famous book which is known as the 'Principia'.

His book introduced the three laws of motion:

### The First Law of Motion

Something that is still will stay still unless it is pushed or pulled.

For example, a football on the ground will not move unless it is kicked.



### The Second Law of Motion

If you use more force when pushing or pulling an object, it speeds up more quickly. Objects with a greater mass will need more force when pushing or pulling to make them speed up more quickly.



### Third Law of Motion

For every action, there is an opposite reaction because forces work in pairs.

For example, when rowing a boat, we move the water backwards with the paddle and the water reacts by pushing the boat in the opposite direction.



### Glossary

**boarding school:** A school (away from home) where children live during term time.

**gravity:** A force that pulls objects towards the Earth.

**orbit:** To repeatedly travel around a star, a planet or a moon.

**plague:** A dangerous disease which spreads rapidly.

**prism:** A glass or transparent object which separates white light into a spectrum of colours.

# Questions

1. On which famous holiday was Isaac born? Tick one.

- ☐ Easter Sunday
- ☐ New Year's Day
- ☐ Christmas Day
- ☐ Boxing Day

2. Draw **three** lines and complete each sentence.

The first law of motion  
states that...

The third law of motion  
states that...

The second law of motion  
states that...

for every action, there is an opposite  
reaction because forces work in pairs.

if you use more force when pushing  
or pulling an object then it speeds up  
more quickly.

something that is still will stay still  
unless it is pushed or pulled.

3. What was the name of Isaac's book published in 1687?

\_\_\_\_\_

4. Find and copy one word which means the same as 'movement'.

\_\_\_\_\_

5. Fill in the missing words.

Many people were starting to question the old belief that the \_\_\_\_\_  
was the centre of the \_\_\_\_\_.

6. Where was Isaac believed to have been when he discovered gravity?

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

7. Why do you think that Isaac was not suited to running the family farm?

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

8. Summarise what you have learnt about Isaac Newton.

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