Sir Isaac Newton

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

Childhood

Isaac was born on Christmas Day (25th December) 1642 in the village of Woolsthorpe in Lincolnshire. As a child, he was raised by his grandmother before being sent to boarding school. A few years into his education, Isaac returned to Woolsthorpe to help his mother look after the family farm and surrounding land. Nevertheless, it soon became clear that Isaac was not suited to this job so he returned to boarding school to continue his education.

Education

In 1661, Isaac began his university studies at Trinity College, Cambridge. There, he studied the works of the popular ancient Greek scientists and thinkers, Aristotle and Plato. However, Isaac soon became interested in the Scientific Revolution and this caused him to begin questioning some of these traditional ideas.

What was the Scientific Revolution?

The Scientific Revolution took place in the 16th and 17th centuries. It was a time when people began to use experimental scientific methods to understand how nature works and to think of nature as a machine. The new ideas of the Scientific Revolution questioned the popular ancient Greek ideas that saw the Earth as the centre of the universe.

Scientific Discoveries

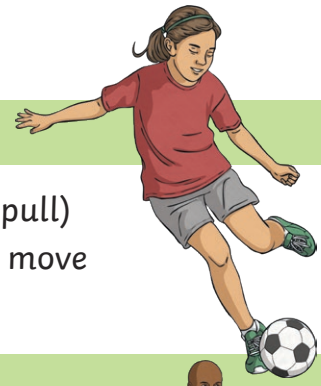
Isaac spent a lot of time at home in Lincolnshire after completing his university studies due to an outbreak of the plague in Cambridge. He carried out lots of experiments while he was there and he made some important discoveries about light. Issac found that when white light passes through a **prism**, 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 made his greatest scientific breakthrough when sitting under a tree in an orchard on his family farm. It is said that an apple fell

from a tree and landed on Isaac's head which caused him to think about why the apple fell to the ground rather than floating upwards. He then, apparently, concluded that the same force — which he called gravity — was also keeping the Moon in **orbit** around the Earth.

Isaac returned to Cambridge after the plague and began teaching as a professor at the University of Cambridge. In 1687, Isaac published his famous book which is commonly known as the 'Principia'.

His book introduced the three laws of motion:



First Law

Something that is still will stay still unless a force (a push or pull) is applied to it. For example, a football on the ground will not move unless it is kicked.

Second Law

If you apply more force to an object, it **accelerates** more quickly. Similarly, if an object has greater mass, more force will be needed to accelerate it. For example, a shopping trolley with a smaller weight will require less force to accelerate than a shopping trolley with greater weight.

Third Law

Forces work in pairs: for each force applied, another force will act in the opposite direction. 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.

Later Years

Isaac became president of a major scientific group called the Royal Society. In 1705, he was knighted by Queen Anne; this gave him the title of 'Sir'. He was also elected as a Member of Parliament (MP).

Glossary

accelerate: When an object begins to move more quickly.

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

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

Questions

1. Which family member was Isaac raised by as a child? Tick one.
   - ○ his grandfather
   - ○ his father
   - ○ his grandmother
   - ○ his aunt

2. Draw **four** lines and match each event to the correct year.

1642	Isaac began studying at Trinity College, Cambridge.
1705	Isaac published his famous book, 'Principia'.
1661	Isaac was knighted by Queen Anne.
1687	Isaac was born in Woolsthorpe, Lincolnshire.

3. Fill in the missing words.

   Issac found that when _____ light passes through a _____ it separates into a band of colours.

4. Look at the section called **Education**.
   Find and copy one word which means the same as 'long-established'.

   _____

5. Which fruit is said to have inspired Isaac to discover the force of gravity?

   _____

6. Look at the section called '**What was the Scientific Revolution?**'
   Explain why you think this has been included in the text.

   _____

   _____

   _____

7. Why did Isaac spend so much time in rural Lincolnshire?

8. Explain why you think that Isaac was awarded a knighthood by Queen Anne.