

All About Sir Isaac Newton



Exciting Discoveries

History has been full of exciting discoveries and inventions.

- The invention of the wheel – we aren't sure who made this discovery but can you imagine life without wheels?
- The Gutenberg Press – before this invention, books were handwritten. This printing press, invented in 1440, meant books could be made quickly and easily. Books were available to lots of people for the first time.
- Penicillin – A Scottish scientist named Alexander Fleming discovered this antibiotic that can help us fight off illnesses, in 1921.
- Electricity – In 1821, Michael Faraday discovered that a wire carrying an electric current will rotate when put next to a magnetic pole. This would eventually lead to the invention of electricity generators. And without that, you wouldn't be looking at this screen now!

Exciting Discoveries

- The causes of diseases – Before a chemist called Louis Pasteur did experiments with bacteria in the 1860s, it wasn't known what caused diseases. Pasteur's experiments showed that diseases came from bacteria and also that bacteria could be killed by heat and disinfectant. After this discovery, doctors started to wash their hands and sterilise their equipment. This has saved millions of lives.
- Chocolate chip cookies – In 1930, a café owner named Ruth Graves Wakefield was baking chocolate cookies to sell to her customers. She had run out of cooking chocolate so broke up chunks of a normal chocolate bar and added it to her mixture. When the cookies came out of the oven, instead of the chocolate having melted into the mixture (which cooking chocolate would do), the chunks of chocolate were still in pieces. Ruth's customers loved it and the chocolate chip cookie was born!

Sir Isaac Newton

Sir Isaac Newton made some of the world's most important scientific discoveries. Here are some facts about his early life.

- Sir Isaac Newton was born on 4th January 1643... or was he? The calendar we use to set dates has changed since Newton's birth. We use a dating system called the Gregorian calendar, but when Newton was born, the Julien calendar was used. In the Julien calendar, Sir Isaac Newton's date of birth was Christmas Day, 1642!
- He was born prematurely (too early) and wasn't expected to survive.
- While at school, Newton loved studying chemistry. However, when he was 12 years old, his mother made him leave school to help run the family farm. Newton was miserable and hated farming. Eventually, his uncle convinced Newton's mother to allow him to attend university.
- Newton studied at Trinity College, Cambridge.

The Apple Tree

Legend has it that Sir Isaac Newton made one of his most important discoveries when an apple fell from the tree he was sitting under and hit him on the head. This story isn't quite true, but a falling apple did lead to one of Newton's discoveries. Newton observed an apple falling from a tree and it got him thinking.

Newton discovered that Earth must have a force which pulls things down instead of letting things float upwards. We call this force gravity. Newton discovered that gravity attracts all objects towards each other. The bigger an object, the more gravity it would have. He developed this theory to work out that gravity kept the moon in orbit around Earth.



Newton's First Law of Motion

Sir Isaac Newton also discovered something known as the three laws of motion.

The first law is something that is still, will remain still unless a force is applied to it.

For example, a football that is on the ground won't move unless you kick it.

The first law also states that an object that is in motion (moving) will continue to move in the same direction and at the same speed unless a different force is applied to it.

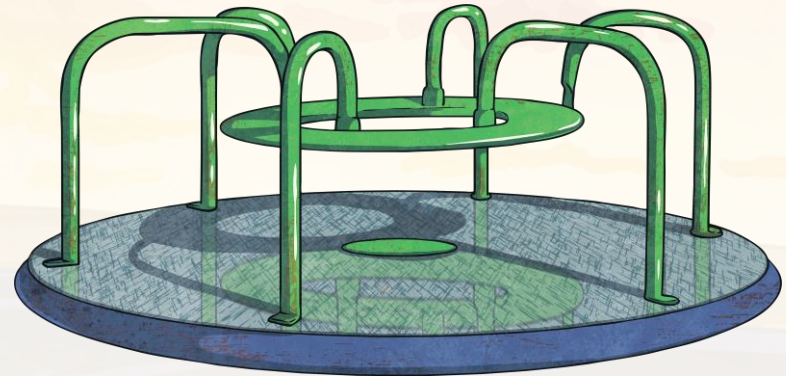
So when you kick the football, it won't change direction or speed unless it is kicked again, headed, hits something or air slows it down.



Newton's Second Law of Motion

Acceleration (speeding up) happens when a force is applied to an object. The heavier the object, the more force will be needed to accelerate the object.

Imagine you were in a park pushing a roundabout. If one person was on the roundabout, you wouldn't have to push very hard to make the roundabout speed up. However, if five people were on the roundabout, it would be much heavier and you would have to push much harder to make the roundabout speed up.



Newton's Third Law of Motion

Newton's third law of motion states:

For every action, there is an equal and opposite reaction.

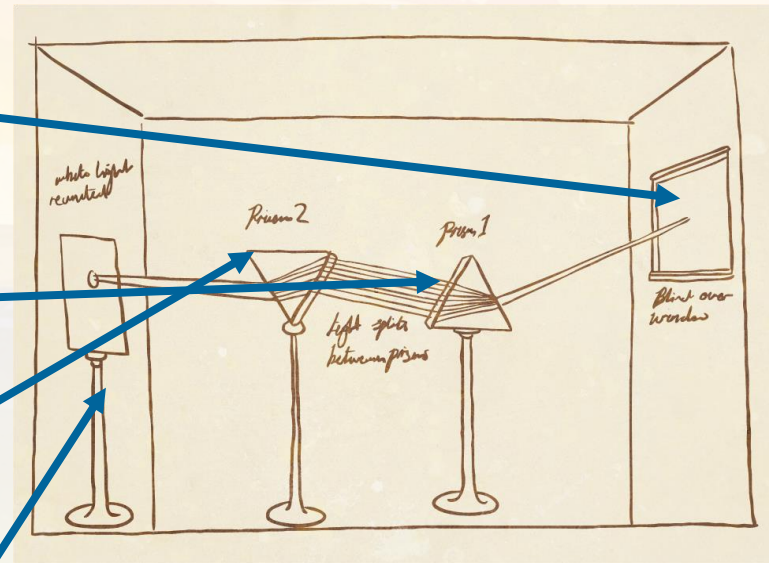
This means forces work in pairs. For each force applied, another force will act in the opposite direction. If you let go of an untied balloon, the air will come out in one direction and the balloon will fly off in the opposite direction.



Light

Newton also carried out experiments about light. Using a dark room and a prism, Newton was the first to discover that light is made up of different colours. Here is Newton's sketch of his experiment:

1. A blind was placed over the window with a small hole to allow a beam of light through.
2. When the beam of light hit the first prism, it was refracted (bent) causing it to disperse (split) into lots of colours.
3. When the refracted light hit the second prism, it was refracted again back in to one beam of light.
4. The single white beam of light appeared.



Newton's Other Achievements

Newton made many other scientific discoveries. As well as his scientific career, Newton also held several important positions.

He was a Member of Parliament (MP) for Cambridge University. In the year he was an MP, Newton only spoke once in the House of Commons; he asked for a window to be closed as he was feeling cold!

Newton was the Master of the Mint. The Royal Mint is where coins are made and Master of the Mint was one of the most important positions there.

From 1703–1727, Newton was President of the Royal Society. The Royal Society is the oldest scientific institution in the world and many key discoveries have been made there.

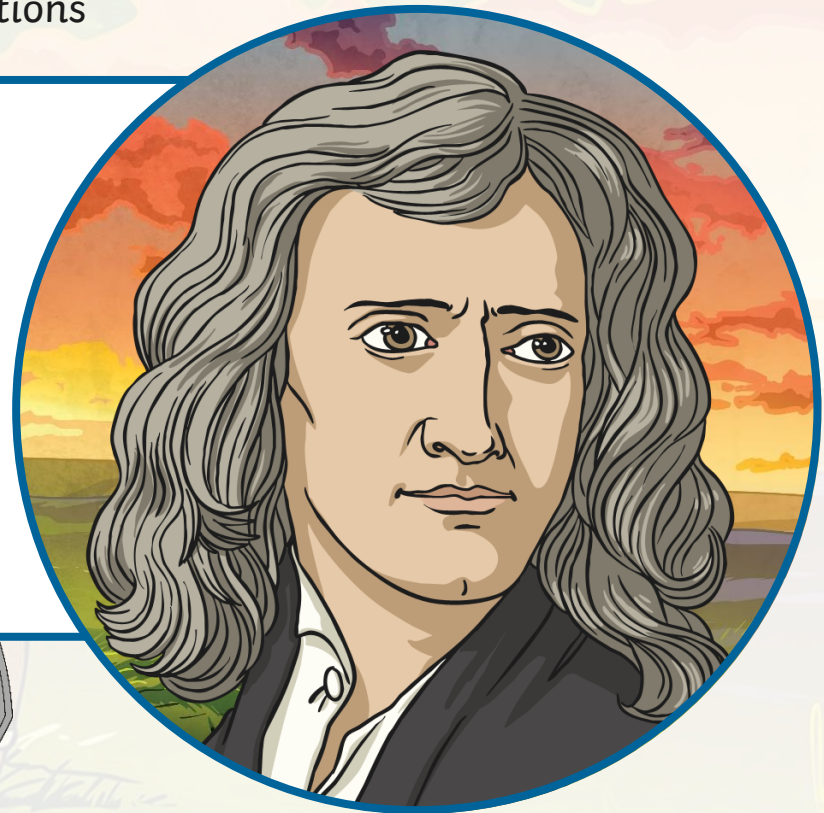


Honours for Newton

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When he died in 1727, Newton was buried in Westminster Abbey. Other people buried in the Abbey include Henry VII, Elizabeth I, Charles Dickens and Charles Darwin.

In 2017, the Royal Mint released a special 50 pence coin in honour of Sir Isaac Newton.



The Shoulders of Giants

Of his scientific discoveries, Sir Isaac Newton said:

“If I have seen further, it is by standing on the shoulders of giants.”

What do you think he meant by this?

