Spend More Time in the Garden

Isaac Newton was the first person to explain how the universe works. He came up with his theory while lounging around in the garden of his family home...

... but Newton’s family home wasn’t your average family home. It was Woolsthorpe Manor in Lincolnshire, UK. And this is the garden:

Look at this tree. Look really hard. Do any world-changing ideas pop into your head? It inspired Isaac to make one of the greatest scientific discoveries ever.

As Isaac watched an apple fall to the ground, he started thinking about the force that made it fall. Why did it move down, and not up or sideways? He realized that a force called gravity pulls objects down towards the centre of the Earth.

In *Principia*, Isaac wrote down more than 500 pages of brilliant ideas. His laws explain why everything on Earth moves in the way it does.

Inside the science

Isaac explained that gravity acts everywhere in the universe, not just on Earth. Gravity holds planets in place as they orbit the Sun; and it holds the Moon in place as it moves around the Earth. Every object in the universe – including you – pulls other objects towards it. Isaac realized that the bigger an object is, the stronger the pull.

What changed?

Isaac published his theories more than 325 years ago, in 1687, but they are still very influential today. Whether someone builds a bridge, kicks a football or launches a space rocket, Isaac’s laws mean they can be sure of the outcome.

Scientists also learnt important lessons from Isaac’s methods. He carried out experiments to test all his ideas, collecting evidence and writing careful notes.

Standing on the shoulders of giants

Nicolaus Copernicus (1473–1543) First to suggest that the Earth is not at the centre of the universe and that the Earth moves around the Sun.

Galileo Galilei (1564–1642) Used a telescope to look at space and found things never seen before – things that supported Copernicus’s ideas.

Johannes Kepler (1571–1630) Worked out the path that planets take around the Sun.

Emilie du Châtelet (1706–1749) Translated Isaac’s famous book, *Principia*, so it could be used by herself and other French scientists.

Albert Einstein (1879–1955) Came up with a new explanation of gravity.

Links within this book

Isaac’s discoveries about optics built on the work of Alhazen (page 6).