Galileo Galilei – the father of modern science

Group:	Key Stage 2
Key message:	Science is all around you
Props:	Assembly board
	Heavy ball and a light ball of a similar size
	Feather
	YouTube clip *Galileo's Famous Gravity Experiment*
	https://www.youtube.com/watch?v=QyeF-_QPSbk

Engage

Sometimes the best scientific discoveries happen when curious people see things that they can't explain.

For example, Galileo Galilei made some of his best discoveries by looking at everyday objects and events in the world around him. He was in church one day when he noticed a chandelier above his head, swinging from side to side. He wondered why the chandelier, which was acting as a pendulum, kept swinging at the same speed, even when it was swinging less far. He carried out some investigations to try to discover what was happening.

Nobody had investigated pendulums before, but Galileo's curiosity, based on a simple observation in church, helped us understand an important scientific principle and led to many inventions such as pendulum clocks and guidance systems on aircraft and ships.

Develop

Galileo Galilei was born in Italy in 1554. When he was young, he wanted to become a monk, then decided to become a doctor, but then changed his mind and studied mathematics. Galileo was always very curious, quick to notice things around him and to ask questions.

As well as his work on pendulums, he made several other important scientific discoveries and invented a new type of thermometer, a telescope, an automatic tomato picker, a compass used by the army to aim cannonballs and a type of comb that was also an eating utensil. After his studies, Galileo developed a keen interest in astronomy.

Ask: What is astronomy?

Galileo used the powerful telescope he invented to look at objects in the sky that nobody had seen before. He saw mountains and valleys on the surface of the Moon, sunspots on the Sun and moons revolving around Jupiter. He became very famous for these discoveries. But, it was Galileo's telescope and interest in astronomy that eventually led him into trouble.

In those days, the Church was very powerful and told people what they should believe about the Earth and space. The Church believed that the Earth was the centre of the universe with the Sun and all the planets orbiting around the Earth.

Ask: Is that right?

Galileo did not agree with them and publicised that the Earth and all other planets in our Solar System moved around the Sun (which is correct) and unlike others, could prove it. The Church banned him from spreading this message but it didn't stop Galileo from telling people what he knew to be true, even writing a book about it. This was too much for the Church, and in 1633, Galileo was sentenced to life imprisonment under house arrest. Galileo continued to study and write until the end of his life, even though he was going blind.

After nearly 400 years, the Church admitted that Galileo had been right about the Earth and the Sun. His discoveries changed the way people looked at the world and taught them that there was so much more to find out. Many other scientists were inspired by his work because he was willing to stick to what he knew was true even though some people didn't agree. This is why he is known as 'the father of modern science'.

Innovate

Show the children the two balls.

Ask: If I drop these balls from the same height, at the same time, which will hit the ground first?

Encourage children to predict what will happen, explaining their thinking. Drop the balls and ask children to describe what happened. The balls should have hit the floor at roughly the same time proving that objects of different masses, but with similar air resistance, will fall at the same speed, as predicted by Galileo.

Now show the children one of the balls alongside the feather and again ask what will happen if both are dropped from the same height. Drop the ball and feather and discuss the results. Explain that the feather falls more slowly due to air resistance, however, if air resistance wasn't a factor, both the ball and feather would fall at exactly the same speed. To prove this, play the YouTube clip *Galileo's Famous Gravity Experiment*.

Express

Ask: What do you think has been the most important scientific discovery ever?