

Galileo Galilei



Galileo was a brilliant physicist, mathematician and astronomer. His scientific observations and inventions changed the way people thought about the world and his ideas and discoveries are still hugely relevant today. However, because of his scientific findings, Galileo led a life full of opposition and constraints.

Galileo Galilei was born on 15th February 1564 in Pisa, Italy where he grew up with his brothers and sisters during the Italian Renaissance (the rebirth and development of education, science, art, music and literature). His father, who was not a particularly wealthy man, was a famous musician and music teacher. Around the age of 10, Galileo and his family moved to Florence where Galileo attended Camaldolese monastery to receive his education. He was a talented musician and a very able student. Learning in a monastery, at first Galileo believed that he would become a priest, but his father did not want him to pursue a religious life and eventually removed him from the school. In 1581, urged on by his father, he began studying medicine at the University of Pisa, training to become a doctor.

Galileo was always curious about the world around him and he shifted the focus of his university studies to mathematics. In 1585, he left university without earning a degree and began working as a professor. At this time, he continued to study mathematics on his own and started to perform scientific experiments.

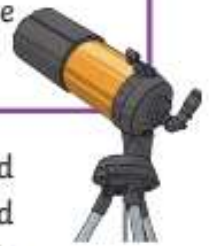
In the 1500s, 'scientists' did not really exist. People did not run experiments or test out ideas like they do today. Instead, they studied the works of classical philosophers such as Aristotle and simply believed them to be true. Galileo on the other hand began using scientific methods to test out principles and ideas in order to prove if they were correct or not.

One famous experiment that he conducted was from the Tower of Pisa. At that time, a commonly held belief was that if two objects were dropped from the same height, the heavier one would land first. To test this theory, Galileo went to the top of the tower and dropped two balls of different weights. They both landed at the same time and Galileo had thereby refuted the original theory.



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In 1609, Galileo heard about an invention by the Dutch inventor Hans Lippershey that could make things far away appear to be much closer. This optical instrument was the telescope. Galileo was fascinated and began to build his own telescope. His improvements were so significant that he was able to use it to study the Sun and other planets in space. This led to three major discoveries; that Jupiter was orbited by four moons and not stars as had previously been believed; that the moon was covered in craters as opposed to being smooth; and that Venus went through a complete set of phases indicating that it orbited the Sun and not vice versa.



Another belief that Galileo did not just accept was that the Sun orbited the Earth. In the 1500s, a Polish mathematician and astronomer called Nicolaus Copernicus pioneered the idea that the Sun was actually at the centre of the universe, rather than the Earth as people had previously believed. Galileo studied Copernicus' work and felt that his own scientific observations supported this idea. In 1632, Galileo published his findings in a book called 'Dialogue of the Two Principal Systems of the World' in which he clearly supports and advocates the Copernican model of the universe rather than previously held beliefs about the Sun and Earth.

Galileo's ideas and findings were not popular at the time as they opposed and challenged people's traditional beliefs about the world. Galileo was forbidden by the Catholic church to write or teach about his work and was sentenced to life in prison for his heretic ideas. However, his sentence was later changed, and he was permitted to live under house arrest. Galileo continued to study and a year before he died he came up with a pendulum design that could be used for keeping time.

Galileo became totally blind in his later years and he died in Florence on 8th January, 1642 aged 77.

Did You Know...?

In 1979, Pope John Paul II led an investigation into how Galileo had been condemned by the Catholic Church. 13 years later, in 1992, the Pope closed the investigation, made a formal apology and finally admitted that the Copernicus heliocentric theory was true.

Questions

1. Which of the following was Galileo **not**? Tick **one**.

- an astronomer
- a mathematician
- a philosopher
- a physicist

2. Explain in your own words what a **renaissance** is.

3. What career did Galileo's father want him to pursue?

4. Explain why Galileo is considered one of the fathers of the scientific method.

5. What does the word **refuted** mean?

6. Explain how Galileo's discovery that Venus orbited the Sun led to further discoveries.

7. What nationality was Copernicus?

Galileo Galilei Questions

8. Explain what Galileo's book, 'Dialogue of the Two Principal Systems of the World', was about.

9. What do you think was Galileo's greatest discovery or achievement? Explain your answer fully.

10. When did the Catholic Church apologise for the way that Galileo was treated? Tick **one**.

- 1642
- 1992
- 1979
- 1790