

Teachers' Notes: KS3 Observing the Universe

Content outline

This interactive session gives students an opportunity to explore ideas about the Universe and solar system from Ptolemy to Galileo.

We look at how scientists work, exploring how the evidence gathered by astronomers like Ptolemy and Galileo led to two contrasting models of the Universe.

We will also explore the scientific revolution brought about by Galileo in the early 17th-century using the newly invented telescope which created new opportunities for empirical observation and evidence-based argument.

Students will get involved in breakout activities and explore objects from the Museum's collection such as the armillary sphere and Galileo's telescope.



Armillary sphere, Rome 1588, Inv.

Learning

Students will:

- explore the role of observation in astronomy from a historical perspective
- discover how Ptolemy and Galileo used observations as a basis for two contrasting models of the Universe – the geocentric and heliocentric models
- learn about the invention of the telescope and how it revolutionised observational astronomy
- encounter amazing instruments from the Museum's collection of early scientific instruments

Curriculum

The session links to the following areas of the curriculum:

Science:

- how science works
- astronomy and the solar system
- measuring and observing
- models of the Universe
- arguments for and against geocentric vs heliocentric model

Pre-session activities

Explore online resources:

- **Galileo and astronomy**
- <https://www.rmg.co.uk/stories/topics/what-did-galileo-discover>
- **Renaissance in Astronomy: Books, globes and instruments of the 16th-century**
<https://www.mhs.ox.ac.uk/exhibits/the-renaissance-in-astronomy/>
- **Meet Galileo**
<https://www.museogalileo.it/en/museum/explore/meet-galileo.html>

Watch a film:

- **The armillary sphere**
<https://www.hsm.ox.ac.uk/armillary-sphere>

Post-session activities

- Use the PDF resource **Exploring Mars** as a starting point for exploring the NASA website and identify new knowledge about Mars based upon empirical observations.
- Make a poster on Mars including what we know about it and what it could mean to us in the future.

IT set-up requirements and resources

This session would normally be delivered to a whole class using a VDU positioned at the front of the classroom and a link supported by an approved platform such as **Microsoft Teams** or **Google Meet** which can be set up by either the school or the Museum.

The workshop facilitator would normally expect to have a camera view of the classroom and microphone to pick-up sound in order to facilitate Q&A interaction which may need to be supported by the classroom teacher.

The workshop facilitator would normally expect to text the link with the class teacher at an agreed time at least 2 days before the workshop takes place in order to allow time to remedy any IT issues.

Activity resources needing printing would be emailed to the class teacher in advance of the workshop and printed copies should be handed out to the students before the session starts.