

Year 5, Topic 1 , Switched on Science



SWITCHED ON **Science**

Second Edition

Out of this world

In this topic you will:

- Learn how the planets in our Solar System are organised.
- Use mathematics to make a model of our Solar System.
- Describe the motion of the Earth and Moon around the Sun.
- See how evidence can support a theory.
- Describe how the Moon orbits the Earth.
- Use a scientific model to explain an idea.

Key vocabulary

- Axis
- Centric
- Day
- Geocentric
- Heliocentric
- Month
- Moon
- Night
- Orbit
- Phases
- Planet
- Solar System
- Space
- Star
- Sun
- Timeline
- Time zone
- Year



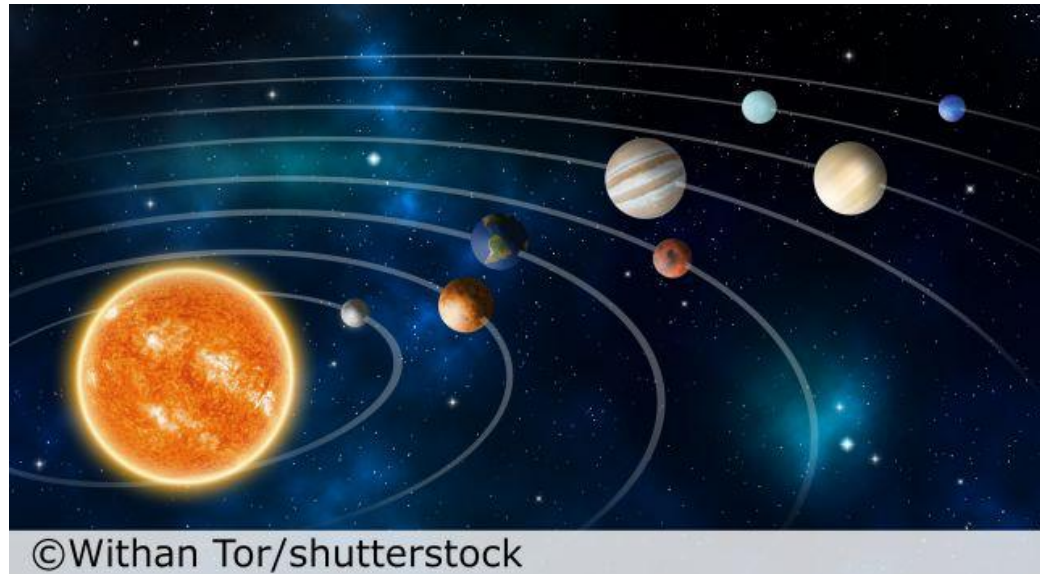
Did you know?

- You are travelling on Earth through space at the speed of 107,218 kph.
- It is impossible to land on Saturn's ring because it consists of millions of pieces of ice, dust and rocks scattered around the planet.
- Some people today still believe that the Earth is flat, the Sun moves around the Earth and we are at the centre of the universe, despite all the evidence that says this is false.
- Galileo believed that the Sun was not just the fixed centre of our Solar System but the fixed centre of the whole universe. We now know that the Sun is not the centre of the universe and that it does move.
- You don't feel the Earth spin because you, the atmosphere, skyscrapers, and everything else are spinning along with the Earth at the same constant speed.

The Sun and the planets

The eight planets in the solar system are:

- Mercury
- Venus
- Earth
- Mars
- Jupiter
- Saturn
- Uranus
- Neptune



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Remembering the names of the planets

A **mnemonic** is a made-up sentence that helps you remember a list of words. The first letter of each word gives you the clue to what the first letter of the word you need to remember is.

My **V**iolent **E**vil **M**onster **J**ust **S**cared **U**s **N**uts

Mercury **V**enus **E**arth **M**ars **J**upiter **S**aturn **U**ranus
Neptune

Can you make up a mnemonic of your own to help you remember the names of the eight planets?

Stepped pages



Fold over
cover.

Stapled to
hold the
folded
edge.



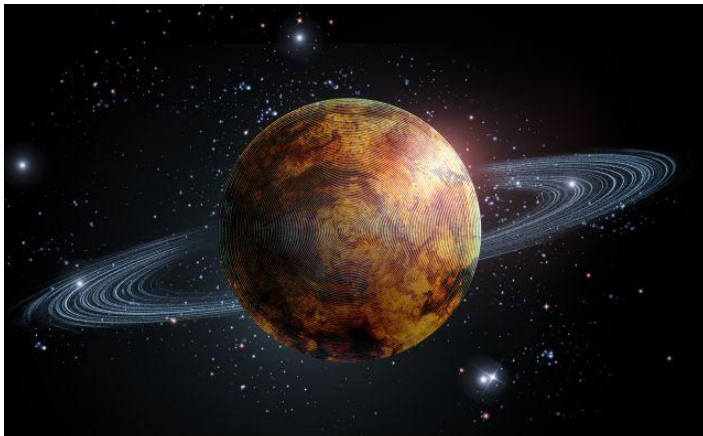


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Which is the odd one out?
What are your reasons?



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A fruity model of the solar system

40 cm Peppercorn – Mercury

70 cm Cherry tomatoes – Venus

1 m Cherry tomatoes – Earth

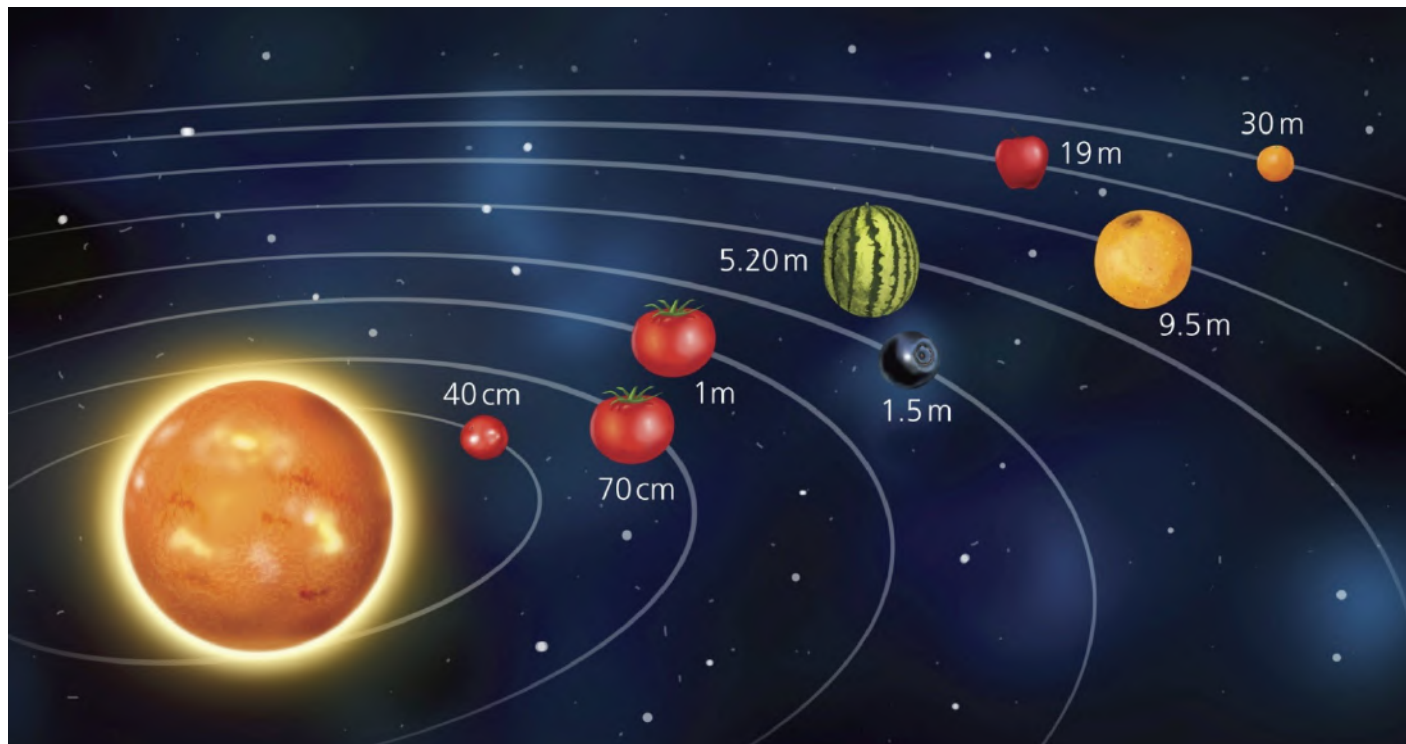
1.5 m Blueberry – Mars

5.20 m Watermelon – Jupiter

9.5 m Grapefruit – Saturn

19 m Apple – Uranus

30 m Orange – Neptune



The spherical earth

We now know the Earth is spherical because:

- Astronauts have flown around it and taken photographs.
- At sea, you can see high mountains before low ground because the Earth curves.
- The Earth appears as a sphere from space, no matter where you are you are looking from.



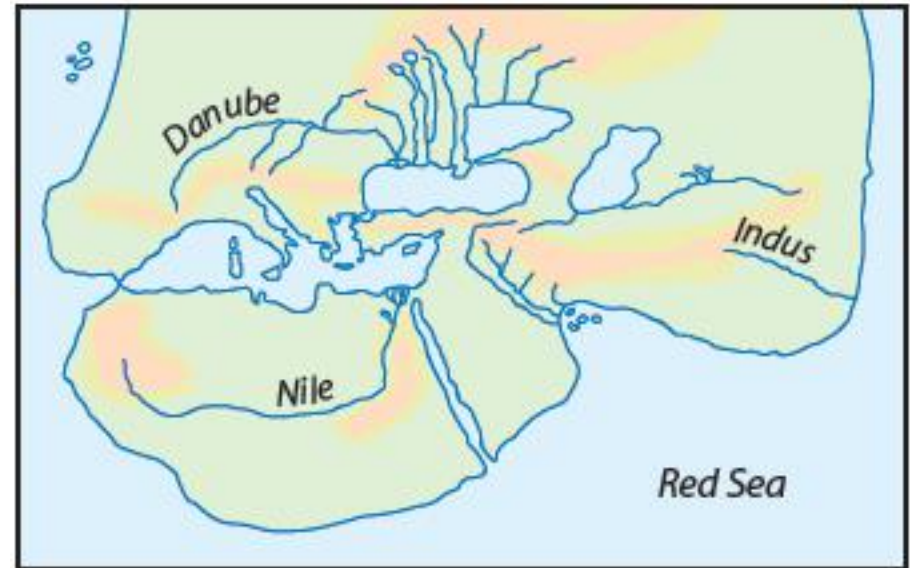
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The flat earth

Around 400 BC, the Greek Herodotus drew his view of the Earth. It was flat and surrounded by water.

To him it represented all the known Earth.

Why would anyone think that the Earth was flat?



World map of Herodotus

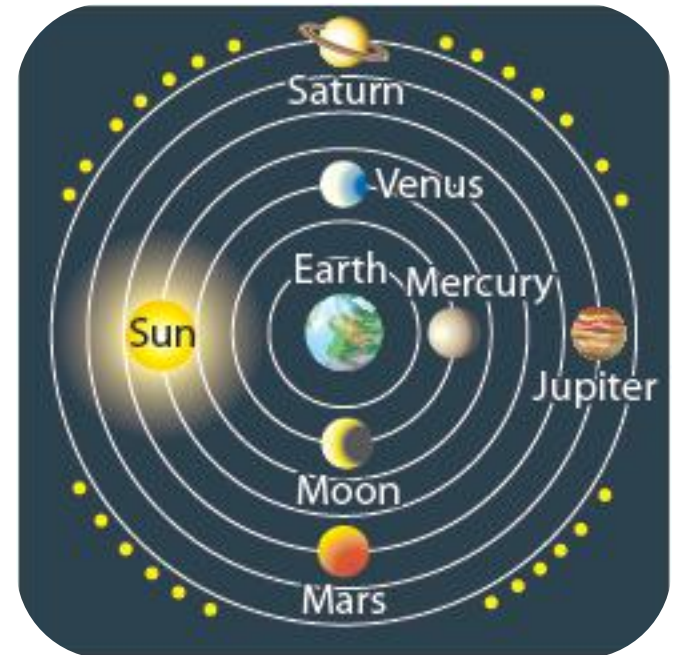
The geocentric model

In this model:

- the Earth is at the centre of the Universe
- the Earth is stationary and does not move
- eight spheres surround the Earth
- these spheres contain the Moon, Mercury, Venus, the Sun, Mars, Jupiter, Saturn and the stars.

People thought this model to be true because, as you look towards the sky, it appears that everything moves around the Earth.

The Earth is solid, and you cannot feel it moving. Since it is still, they believed that everything else must move round it.



Famous astronomers: Nicolaus Copernicus

- This astronomer (1473–1543) made accurate observations of the Moon and planets.
- He used mathematics to show that their movements could be much better explained if you put the Sun at the centre of the Solar System.
- How do you think his observations could be used to prove that the Earth was not flat?



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The heliocentric model

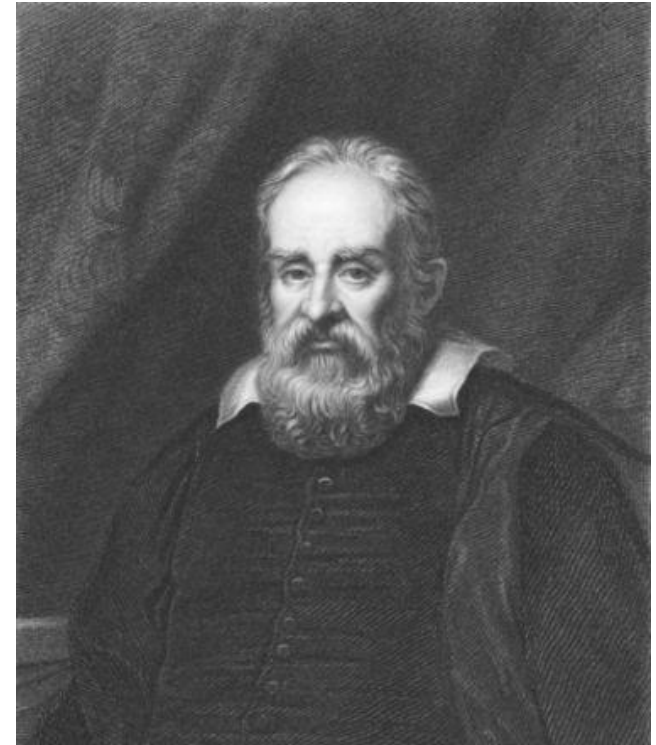
In this model:

- the Earth is one of seven planets that are circling a stationary Sun.
- the Earth moves in two main ways: it rotates every day causing day and night and it moves around the Sun once a year.
- How is this different from the geocentric model of the Solar System?



Famous astronomers: Galileo

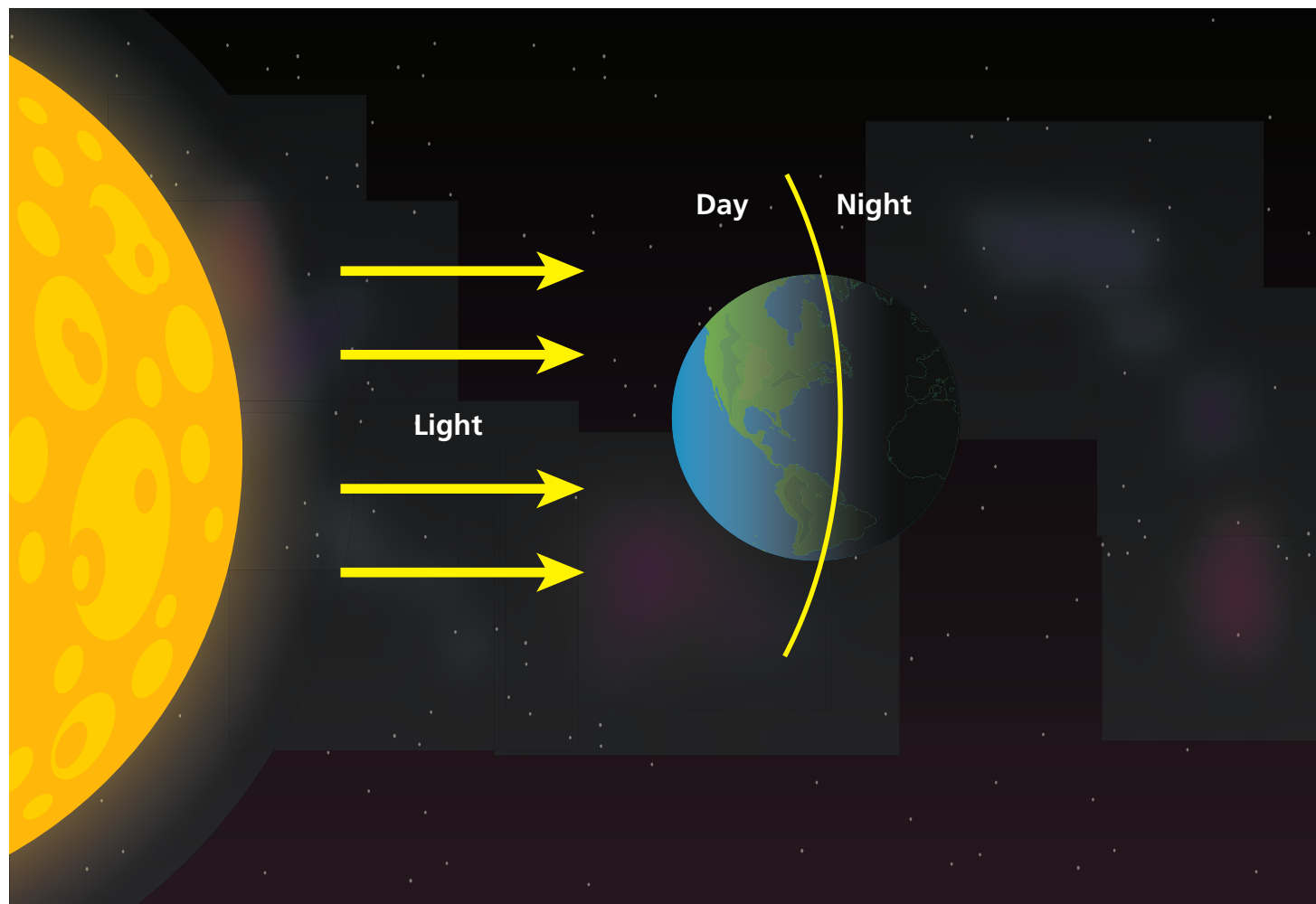
- Galileo (1564–1642) used telescopes to show that Jupiter had its own moons.
- He championed the idea that the Sun was at the centre of the Solar System.
- Why was the Catholic Church so angry with Galileo?



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Evidence for a month



This diagram shows what the Moon looks like to us from the Earth over 28 days.

Use this diagram to explain why this is good evidence for the Moon taking a month to orbit the Earth.



Moon craters



How will you carry out a fair test?

What will you change?

What will you keep the same?

What will you measure

How will you record your measurements?

Do you think you need to repeat readings? Why?