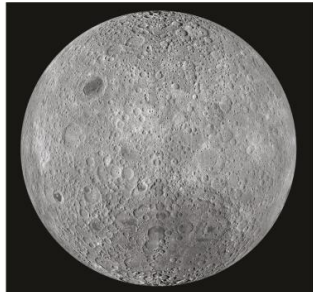


4.4 The Moon

Learning objectives

After this topic you will be able to:

- describe the phases of the Moon
- explain why you see phases of the Moon
- explain why eclipses happen.

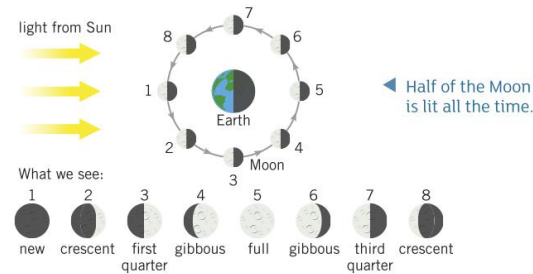


▲ There is a side of the Moon that you never see from Earth.

Many years ago, people used to have different ideas about space. The Ancient Chinese thought a solar eclipse was a demon eating the Sun. In other civilisations, people linked the changing appearance of the Moon with strange changes in behaviour.

Why does the Moon look different?

The Moon takes 27 days and 7 hours to orbit the Earth once.



A List the phases of the Moon, starting with a full moon.

Half the Moon is lit up by the Sun all the time. As the Moon moves around the Earth it looks different from the Earth. The changing shapes are called **phases of the Moon**. When the Moon is in position 1 you see a 'new' moon. You see the side of the Moon that is in shadow. The Moon moves around the Earth to position 2 and you see a crescent moon. In position 5, the Sun lights up the whole of the side that you can see from the Earth and you see a full moon.

A lunar month is the period of time from one new moon to the next new moon.

B State how much of the Moon's surface is lit up by the Sun during a new moon.

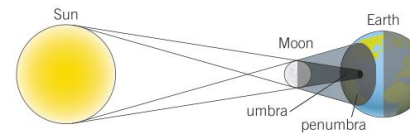
Fantastic Fact!

A 'blue' moon happens when there are two full moons in one calendar month. It happens quite often, about once every three years.

Why do we see eclipses?

Solar eclipses

When the Moon comes between the Sun and the Earth it makes a shadow on the Earth's surface. If you are standing in the **umbra**, the Moon completely blocks the light from the Sun and you see a **total solar eclipse**. If you are standing where only part of the Sun's light is blocked (the **penumbra**) you will see a **partial solar eclipse**.

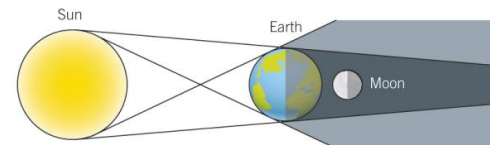


▲ A solar eclipse happens when the Moon blocks the light from the Sun.

C State the name of the deep shadow that produces a total solar eclipse.

Lunar eclipses

A **lunar eclipse** happens when the Earth comes between the Sun and the Moon.



Far side of the Moon

The Moon spins on its axis but the time it takes to spin all the way around is the same time that it takes to orbit the Earth. This means that the same side of the Moon always faces the Earth. There is a side that you never see.

This doesn't mean there is a side of the Moon that is always in the dark. When you are looking at a new moon the Sun is lighting up the side of the Moon that you can't see.



▲ You can see a total eclipse of the Sun.

Key Words

phases of the Moon, umbra, total solar eclipse, penumbra, partial solar eclipse, lunar eclipse

Summary Questions

- 1 Copy and complete the sentences below.

You see a _____ moon when the Sun lights up the whole of the side that you can see. When the side of the Moon that you can see is in shadow you see a _____ moon.

A solar eclipse happens when the _____ comes between the Sun and the _____. A lunar eclipse happens when the _____ comes between the Sun and the _____. (6 marks)
- 2 Explain why you would see an eclipse on some of the planets in the Solar System but not others. (1 mark)
- 3 Describe how you could use a torch, a beach ball, and a tennis ball to demonstrate the difference between a solar eclipse and a lunar eclipse. (6 marks)