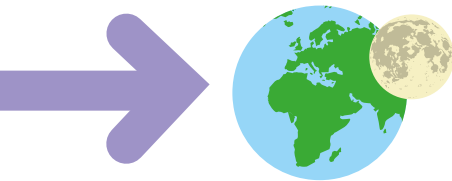


# Space –

## The relationship of the Earth and the Moon



### Key Stage 2 curriculum aims:

Use the idea of the Earth's rotation to explain day and night and the apparent movement of the Sun across the sky

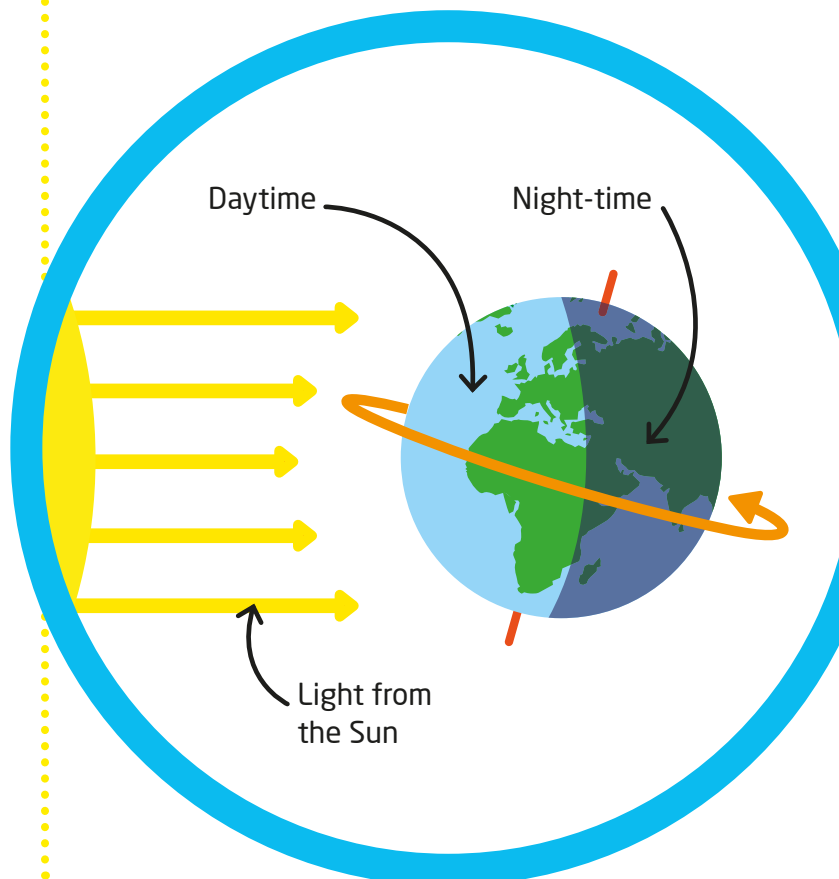
Describe the movement of the Moon relative to the Earth

Describe the Sun, Earth and Moon as approximately spherical bodies

## Introduction: Sunlight

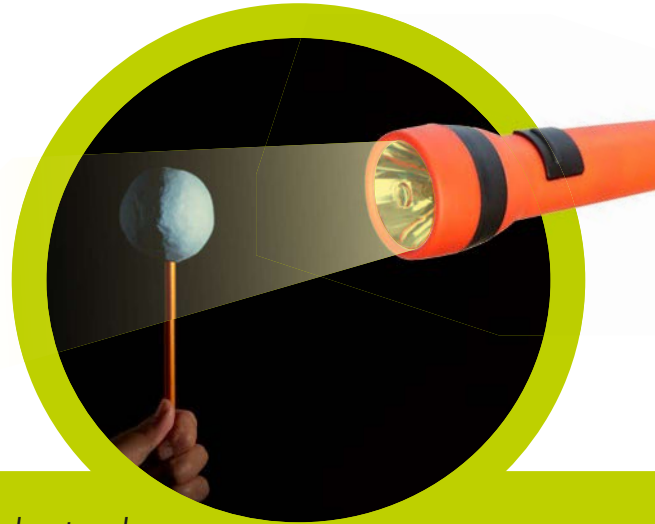
- Show the class a picture of a **solar eclipse**, explaining that it is called a **solar eclipse**. Explain that a **solar eclipse** is when the **Moon** (an **opaque** object) passes in-between the **Earth** and the **Sun**. Explain that during a **solar eclipse**, some countries are in complete darkness, even in the middle of the **day**. Mention never to look directly at the **Sun**, even during a **solar eclipse**, as it can damage your eyes.
- Explain that the reason we have daylight is because the **Sun** gives us light, and during a **solar eclipse**, the **Moon** moves in front of the **Sun** and blocks it out. This is similar to when someone closes **opaque** curtains over a window, and the room becomes dark because they block the light from outside.
- Explain that darkness at **night** is different. It is not caused by the **Moon** blocking out the **Sun**. Ask the class if they can think of reasons other than the **Moon** moving in front of the **Sun** for why we have darkness at night.

- Explain that the reason we have darkness at **night** is because the **Earth** is slowly spinning, doing one complete turn in one day. At **night**, our country, and the countries on the same side of the earth as us, face away from the **Sun**, and are in **shadow**.



## Activity: Day and night

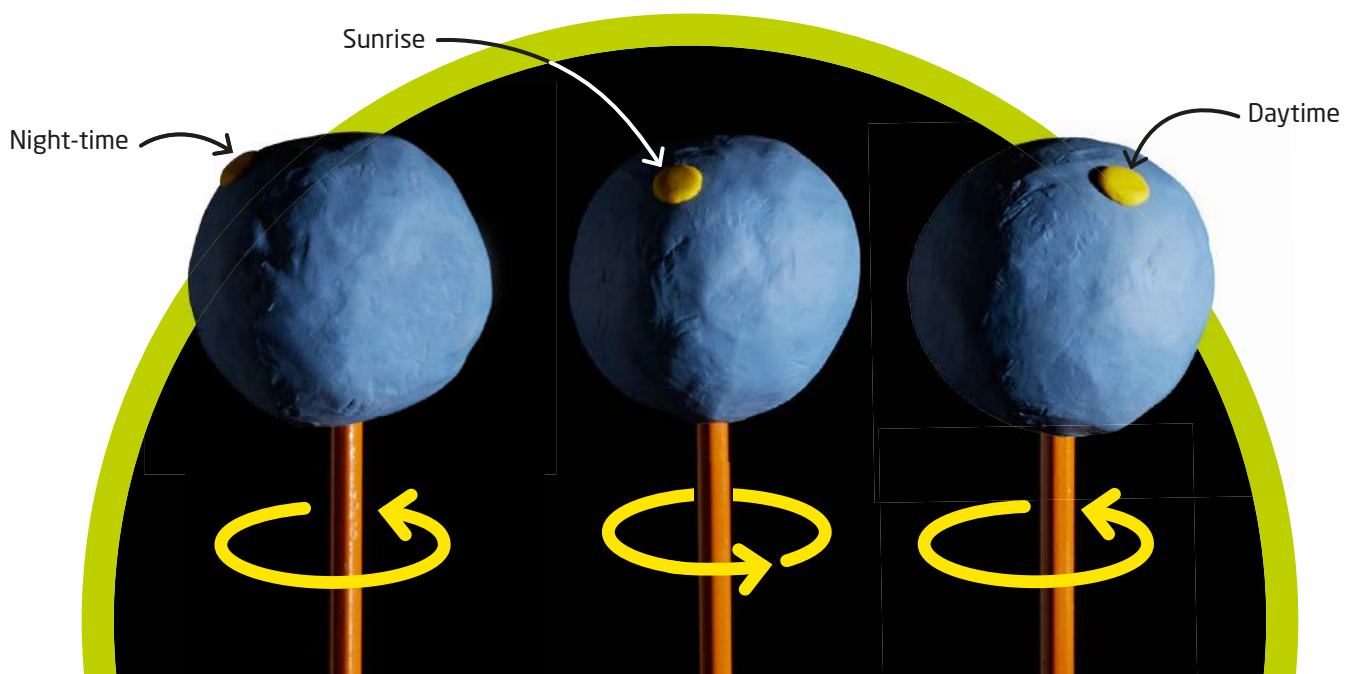
Explain to the children that the **Earth** is spherical like a ball, and spins round an invisible line through the middle, called the **axis**. This means that only one side at a time faces the **Sun**, so while it is light in countries on our side of the world, it is dark in countries on the other side of the world.



### Class activity

*Scientists build models to understand the workings of the universe... so let's give it a go!*

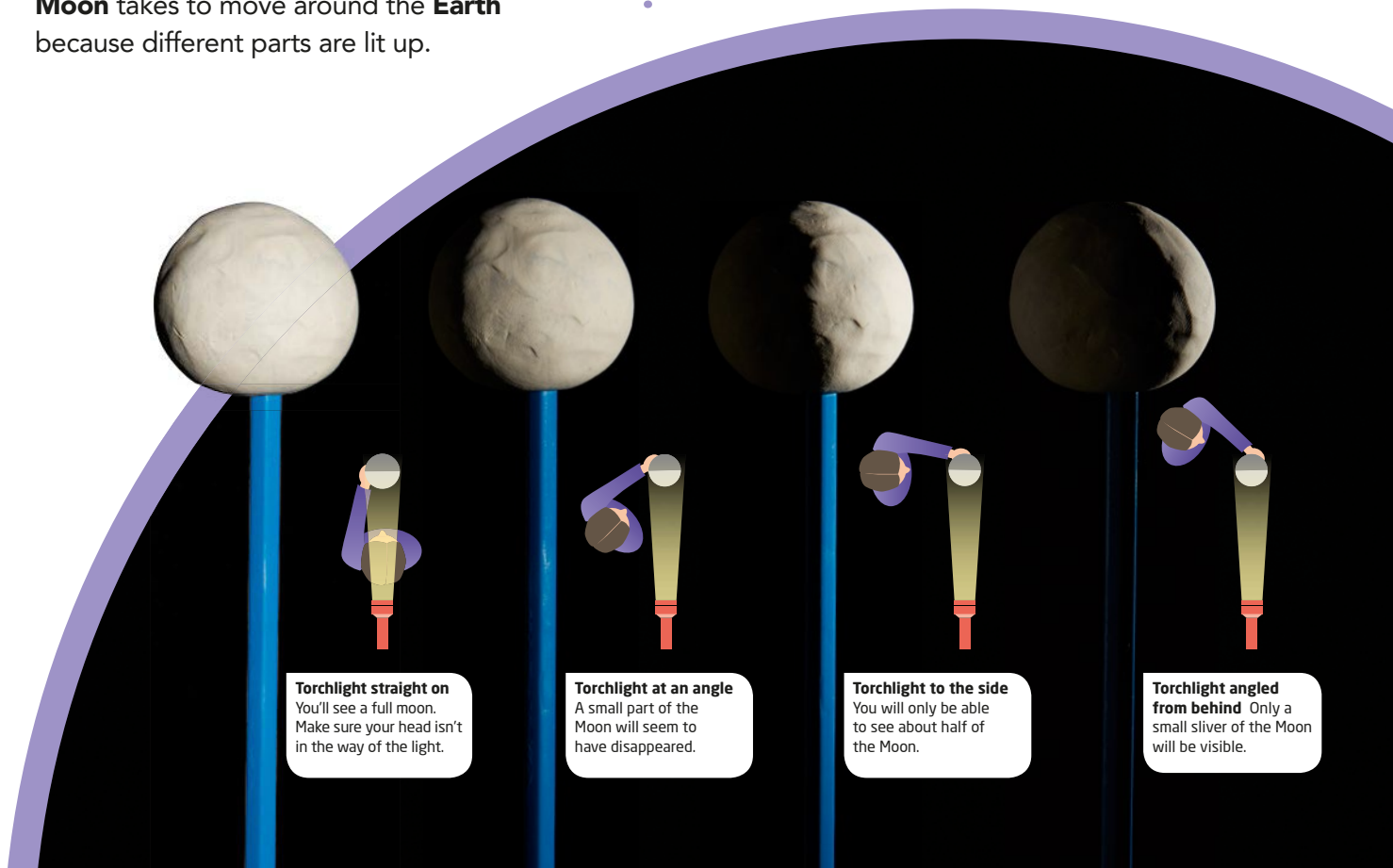
- Divide the class into groups and give each one a large piece of modelling clay (about 6cm diameter) in one colour, and a smaller piece (0.5 cm) in another, as well as a pencil and a torch. Tell the groups to create a ball out of the bigger lump of clay, which represents the **Earth**. They should then place a dot of the other colour where their country is, and put the "**Earth**" on the end of the pencil. Keep a picture of the globe, with your country marked on it, in sight, so they know where to put the dot.
- Make the room slightly darker by part-closing the curtains, so that the torch beams can be seen. Ask each group to shine the torch onto the side of the ball with the dot on it, keeping it still. Explain that the torch is like the **Sun**, and the ball is like the **Earth**. The light shines on one side, lighting it up. This means that our country, represented by the dot, has daylight. Explain that countries on the other side of the **Earth** are now in darkness, so while it is **day** in our country, it is **night** there. Ask the children to spin their **Earth** around, keeping the torch in the same place. Tell them to stop once the country is facing away from the torch beam. Point out that the beam of light is now shining on the opposite side of the **Earth** to our country. Explain that our country is now in darkness, and it is **night**.
- Explain that a **sunrise** happens as we spin towards the **Sun**, after we have been facing away. Tell the children to slowly spin the pencil, and watch the line where the dark becomes light move around the ball. This is the **sunrise** in different parts of the world.



# Activity: Phases of the Moon

- Now tell the class to take the dot away, and pretend that the ball of clay is the **Moon** instead. Explain that the **Moon** moves slowly around the **Earth**, taking 27 days to make it all the way around. Show the class images of the **phases of the Moon**, with the different names, and say that they might have noticed that the **Moon** changes shape on different nights. We can only see the sections of the **Moon** that are lit up by the **Sun**. The shape seems to change during the 27 days that the **Moon** takes to move around the **Earth** because different parts are lit up.

- Tell the groups to light their **Moons** from the front, and explain how when the **Sun** shines directly onto the **Moon**, all of it is lit up, so we can see it all. Then ask them to shine the light from the side. Depending on where you are sitting, you can only see part of the **Moon** lit up. This is because the moon has moved around the earth, so the light from the **Sun** hits it in a different way. This is a different **phase of the Moon**.



Show the class the eight **phases of the Moon**, with each corresponding name, for a few minutes, and then quiz them on these names.



## End of lesson: Word test and time quiz

### Word test

Flash these words and phrases up on the screen and see if pupils can shout out what they mean.

1. Solar eclipse
2. Sun
3. Earth
4. Moon
5. Opaque
6. Day
7. Night
8. Earth's axis
9. Sunrise
10. Phases of the Moon

### Guess the time

- Explain that because different parts of the world have day and night at different times, the **clock times are different**. When it is 3pm in England, it is 10am in New York, America.
- Use a computer to find out the times in different countries, and a globe to point to different countries. Ask the class to guess if it is day or night right now in each country you point to, and to guess the time.

