

Into Our Skies: Space in Schools

Classroom Activity: Why does the Moon look different?

National Curriculum Learning Outcome: To describe the movement of the Moon relative to the Earth.

Focus of this activity: Pupils will use the classroom demonstration to understand that the Moon is a satellite of Earth, rotates once every 28 days and appears differently in our sky at different times of the month.

Resources required: A ball to represent the Moon with half of it painted black or covered in black paper (a painted ping pong ball and black marker pen works well), a pen and paper. Some kind of light source e.g. projector/torch/lamp.

Starter: Recall the dance session explaining that the Sun, Earth, and Moon are all spherical. Do they remember that we called the Moon a satellite of Earth?

Teaching Questions:

- What does the Moon look like? Can they see craters on the Moon, light and dark patches?
- Both the Earth and the Moon don't emit light, they reflect the light from the Sun. Does the Moon always look like a circle/disk?
- As the Sun lights up the Moon, how does what we see change over the 28 days it takes for the Moon to rotate around us?

Student Activity:

This can be done in groups or as a class demonstration.

- Use the whiteboard/screen/torch to represent the Sun and the pupil is the Earth.
- Remind pupils that the ping pong ball orbits (circles) the Earth once in 28 days, but the white half of the Moon (ball) is always facing the Sun.
- Place the Moon between the student (Earth) and the screen (Sun). Ask the student to place the ping pong ball with the black half facing them and the white half facing the Sun. This is a **new Moon** – no Moon can be seen.
- Place the student (Earth) between the screen (Sun) and the Moon. Ask the student to place the ping pong ball with the black half facing away from them and the white half facing towards the Sun (and them). This is a **full Moon** – we see one full side of the Moon.
- What about when the Moon is not directly in line with Sun and Earth? Get the student to face the side, 90 degrees (anticlockwise) from the screen (Sun) and place the ping pong ball (Moon) correctly with the white half facing the screen. What do they see?

- Repeat facing the opposite side. Pupils should see a **half-moon**.
- Now what about the positions in between the 4 points? Move anti-clockwise from the screen to about 45 degrees, keeping the white side of the ping pong ball facing the screen. This will require a small rotation as the student moves. The student should see a small bit of white on the ping pong ball. This is a **waxing crescent** Moon.
- Get the student to repeat this for the other 3 positions around the orbit and draw what they see on the ping pong ball. They should see a **waxing gibbous, waning gibbous and waning crescent** moon as they orbit anti-clockwise.
- Go through the different phases of the Moon once they have drawn them all. There are 2 videos to help with this.

Extension:

1. What do we know about gravity on the Moon?

There is less gravity on the Moon so we can float and jump higher. You could use this to link to your Forces topic about gravity. You could find some clips of Neil Armstrong bouncing on the Moon.

2. Get the pupils to do a piece of creative writing about journeying to and exploring the Moon.

Some good texts are:

- "Space Maps" by Lara Albanese and Tommaso Vidus Rosin
- "Here we are" by Oliver Jeffers
- "Cosmix" by Frank Cottrell Boyce available from the Power of Reading scheme

3. What does the phases of the moons of Mars look like?

Mars has two moons called Phobos and Deimos but they aren't spheres. If we assume they orbit Mars the same way our Moon orbits Earth, what would their phases look like? Maybe try this out with some playdoh?

These moons of Mars orbit Mars three times a day! They are thought to be captured asteroids!



Additional Links:

Detailed European Space Agency video (~ 5 minutes long) all about the Moon's motion and phases and includes information about other moons in our Solar System. Also goes on to talk about eclipses.

[https://www.esa.int/ESA_Multimedia/Videos/2018/10/Paxi_and_Our_Moon_Phases_and_Eclipses/\(lang\)/en](https://www.esa.int/ESA_Multimedia/Videos/2018/10/Paxi_and_Our_Moon_Phases_and_Eclipses/(lang)/en)

Detailed look at the Moon including formation, composition, rotation and phases (~3 minutes long.) <https://www.nationalgeographic.com/science/article/why-does-earth-have-moon-how-does-it-affect-our-planet0>