

Year 5 Physical Science: Earth and Space

Unit 3

<p>Scientific Model (KS2): Force Arrow Model</p> <ul style="list-style-type: none"> - Use the force arrow model when discussing gravity as part of this unit. 	<p>Scientific Skills Taught:</p> <p>ASK</p> <ul style="list-style-type: none"> - To ask different kinds of questions - To identify appropriate secondary sources to research ideas and ask questions <p>BREAKDOWN</p> <ul style="list-style-type: none"> - To recognise and control variables in tests - To plan different enquiries to answer questions <p>CAPTURE</p> <ul style="list-style-type: none"> - To choose and use a range of equipment precisely - To decide what observations and measurements to make <p>DESCRIBE</p> <ul style="list-style-type: none"> - To use evidence from enquiry to support or refute ideas being tested - To explain how scientific ideas develop over time - To identify and comment, using appropriate language, on patterns they notice - To use relevant scientific language and illustrations in reports and when drawing conclusions
<p>Scientific Investigations:</p> <ul style="list-style-type: none"> - Observing Changes over Time - Looking for Naturally- Occurring Patterns and Relationships - Identifying and Classifying Things - Researching Using Secondary Sources 	
<p>Scientists:</p> <ul style="list-style-type: none"> - Margaret Hamilton - worked for NASA and was responsible for programming the onboard flight software on the Apollo spacecraft computers. She wrote the code that the computer used to navigate from Earth to the Moon and made sure that the computer would land the spacecraft safely on the Moon. 	

<p>Prior Learning:</p> <ul style="list-style-type: none"> - Observe changes across the four seasons. (Y1 - Seasonal changes) - Observe and describe weather associated with the seasons and how day length varies. (Y1 - Seasonal changes) - Forces and understanding the pulling force of gravity (Y5 - Autumn term)

Curriculum	Learning Intention	Knowledge and Key Vocabulary
<p><u>Making links to learning and discuss the model (if needed)</u></p> <p>Use the force arrow model when discussing gravity as part of this unit.</p>	<p>What do we know about our planet?</p> <ul style="list-style-type: none"> • Describe prior knowledge of the Earth and Space • Explain that gravity is a pull force from the Earth's core • Draw an arrow model to show the force of gravity acting on the Earth 	<p><u>Knowledge:</u></p> <ul style="list-style-type: none"> - The Earth takes 24 hours to fully rotate - There are four seasons: Spring, Summer, Autumn, Winter - There are 24 hours in a day - There are 365 days in a year - Gravity is a pull force <p><u>Vocabulary:</u></p> <ul style="list-style-type: none"> - Gravity, seasons, force, rotate, rotation,
<p>Knowledge and skills through investigations Pupils should be taught to:</p> <ul style="list-style-type: none"> - describe the movement of the Earth, and other planets, relative to the Sun in the solar system 	<p>How do we know that the Earth is spherical?</p> <ul style="list-style-type: none"> • Observe evidence about the Earth being spherical 	<p><u>Knowledge:</u></p> <ul style="list-style-type: none"> - Know the Sun, Moon and Earth are spherical bodies

<ul style="list-style-type: none"> - describe the movement of the Moon relative to the Earth - describe the Sun, Earth, and Moon as approximately spherical bodies - use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky. <p>Notes and guidance (non-statutory):</p> <ul style="list-style-type: none"> - Pupils should be introduced to a model of the Sun and Earth that enables them to explain day and night. - Pupils should learn that the Sun is a star at the centre of our solar system and that it has eight planets: Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, and Neptune (Pluto was reclassified as a 'dwarf planet' in 2006). - They should understand that a moon is a celestial body that orbits a planet (Earth has one moon; Jupiter has four large moons and numerous smaller ones). - Note: Pupils should be warned that it is not safe to look directly at the Sun, even when wearing dark glasses. - Pupils should find out about the way that ideas about the solar system have developed, understanding how the geocentric model of the solar system gave way to the heliocentric model by considering the work of scientists such as Ptolemy, Alhazen, and Copernicus. <p>Pupils might work scientifically by:</p> <ul style="list-style-type: none"> - comparing the time of day at different places on the Earth through internet links and direct communication. - creating simple models of the solar system; constructing simple shadow clocks and sundials, calibrated to show midday and the start and end of the school day. - finding out why some people think that structures such as Stonehenge might have been used as astronomical clocks. 	<ul style="list-style-type: none"> • Compare the evidence for the arguments for the Flat Earth Theory and the Earth being spherical. <p>How do we know that the Earth is spinning?</p> <ul style="list-style-type: none"> • (link to Centre for Life workshop) • Children to complete the Pendulum experiment, looking into Leon Foucault's Pendulum Theory. <p>Why do we get day and night?</p> <ul style="list-style-type: none"> • Explain why we get day and night <p>Do the sun and stars really move across the sky?</p> <ul style="list-style-type: none"> • Make observations using sundials <p>Explain why the moon looks different each night.</p> <ul style="list-style-type: none"> • Complete a diagram about the phases of the moon <p>Compare the size and movement of Earth with the other planets in our solar system.</p> <ul style="list-style-type: none"> • Research the planets in the solar system • Describe and compare the size and movement of the planets in the solar system • Present knowledge about Earth and Space to others 	<ul style="list-style-type: none"> - Explain why Earth is spherical - Know why the planets stay in orbit - Know how long it takes the Earth to rotate. - Explain how day and night occur. - Know the moon takes approximately a month to orbit the Earth - Name and order the bodies in the solar system. - Know Earth is the only planet with known life and the only planet with liquid water - Name the type of planet Pluto is. <p>Vocabulary:</p> <ul style="list-style-type: none"> - Sun; Moon; Earth; orbit; planets; moon; celestial body; Mercury; Venus; Mars; Jupiter; Saturn; Uranus; Neptune; Pluto (as a dwarf planet); day; night; phases; gravity; gravitational pull; Solar System; Universe; comet; colonise; explore; astronaut; rocket; space station; lunar; lunar cycle; rotate; axis; revolve; sphere; spherical; geocentric; heliocentric; constellation; full moon; gibbous moon; half-moon; crescent moon; new moon; waxing moon; waning moon
--	--	--

Application and Assessment Activity

18. Select the correct answer for each question.

19. Light waves travel in straight lines. Which of the following is not a straight line?

It is a light wave.

It takes 20 hours to get to the moon.

It takes 20 days.

20. A person uses a telescope to observe the Sun. The picture shows a person using a telescope to observe the Sun.

21. Complete the table below to show what items it would be at each place on the globe.

Place	Item
A	weight
B	weight
C	weight
D	weight

Thinking Deeper:

Do you think there is, or ever has been, other life within space?

What do you think this life could realistically look like?

What do you think the future of humans in space might look like?

Links to other subjects:

- Subject Specific links – Maths
- Personal Development – working cooperatively within a team
- SMSC – be able to discuss ideas and respect those of others
- Cultural Capital – to understand that countries are united in creating the space station and our country's participation sending astronauts
- Careers – job roles within NASA watching STEM career videos
- British Values – law – Can anyone travel to space? What laws are there to protect people?
- Equality – different people in space – e.g. men and women and different nationalities