



**INSPIRE NURTURE BELIEVE ACHIEVE**

*Working together to be the best that we can be.*

**Happiness**

**Perserverance**

**Resilience**

**Kindness**

**Friendship**

**Respect**

# **Science: Earth and Space Progression of Skills and Milestones Document**

## Year 5 Earth and Space

- Describe the movement of the Earth, and other planets, relative to the Sun in the solar system.
- 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.

### Notes

*The Sun is a star. It is at the centre of our solar system. There are 8 planets (can choose to name them, but not essential). These travel around the Sun in fixed orbits. Earth takes 365¼ days to complete its orbit around the Sun. The Earth rotates (spins) on its axis every 24 hours. As Earth rotates half faces the Sun (day) and half is facing away from the Sun (night). As the Earth rotates, the Sun appears to move across the sky. The Moon orbits the Earth. It takes about 28 days to complete its orbit. The Sun, Earth and Moon are approximately spherical.*

### Key Vocabulary

Earth, Sun, Moon, (Mercury, Jupiter, Saturn, Venus, Mars, Uranus, Neptune), spherical, solar system, rotates, star, orbit, planets

### Common Misconceptions

Some children may think:

- the Earth is flat
- the Sun is a planet
- the Sun rotates around the Earth
- the Sun moves across the sky during the day
- the Sun rises in the morning and sets in the evening
- the Moon appears only at night
- night is caused by the Moon getting in the way of the Sun or the Sun moving further away from the Earth.

### Activities

- Use secondary sources to help create a model e.g. role play or using balls to show the movement of the Earth around the Sun and the Moon around the Earth.
- Use secondary sources to help make a model to show why day and night occur.
- Make first-hand observations of how shadows caused by the Sun change through the day.
- Make a sundial.
- Research time zones.
- Consider the views of scientists in the past and evidence used to deduce shapes and movements of the Earth, Moon and planets before space travel

*TAPS practical assessments to be used at the end of each unit.*

### Possible Evidence

- Can create a voice over for a video clip or animation
- Can show, using diagrams, the movement of the Earth and Moon
- Can explain the movement of the Earth and Moon
- Can show using diagrams the rotation of the Earth and how this causes day and night
- Can explain what causes day and night
- Can use the model to explain how the Earth moves in relation to the Sun and the Moon moves in relation to the Earth
- Can demonstrate and explain verbally how day and night occur
- Can explain evidence gathered about the position of shadows in term of the movement of the Earth and show this using a model • Can explain how a sundial works
- Can explain verbally, using a model, why we have time zones
- Can describe the arguments and evidence used by scientists in the past

*Concept Cartoons' and 'Exit Cards' to be used at the end of lessons to assess understanding.*

# Y5 Proof of Progress - Working Towards (Basic), Age Related (Advancing) and Greater Depth Expectations (Deep)

Describe the movement of the Earth relative to the Sun in the solar system.

Note: part of this standard appears in Milestone 2 and the activities here have been replicated. Tasks that refer to other planets, which do not appear in Milestone 2, have been added.

## Basic

Describe the movement of the Earth relative to the Sun.

Label and describe our solar system.

Answer questions about the scientists who first observed the Earth's movement around the Sun.

Describe how the movement of the Earth gives rise to seasonal changes.

## Advancing

Explain why the Earth's movement gives rise to the seasons.

Explain why the effect of the Earth's movement on seasons is more acute further away from the equator.

## Deep

**True or false?** A year is always 365 days, no matter where you are in our solar system.

**Relate** your knowledge of the Earth's movement relative to the Sun to time zones. Assess the **significance** of this to our daily lives.

At any time of day it is always 5 o' clock somewhere on Earth. **Do you agree?**

Describe the movement of the Moon relative to the Earth.

Note: this standard appears in Milestone 2 and the activities here are replicated.

## Basic

Identify the Moon and Earth and label them on a diagram.

Describe the Moon's movement relative to the Earth.

Answer questions about the Moon's movement relative to the Earth.

Observe, name and record the phases of the Moon.

## Advancing

Explain why the Moon's movement affects the tides of oceans and seas on Earth.

Explain how we can predict the times of high and low tides.



## Deep

**True or false?** The shape of the Moon's phases is a natural calendar.

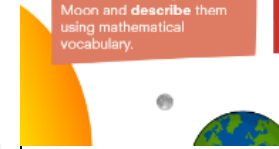
**Is it possible** to calculate how long until a particular moon shape will appear again? (**prove or disprove**)

Explain the concept of a leap year.

Describe the Sun, Earth and Moon as approximately spherical bodies.

## Basic

Observe pictures and videos of the Sun, Earth and Moon and **describe** them using mathematical vocabulary.



## Advancing

**Explain**, using your knowledge of gravity, why the Sun, Earth and Moon are almost spherical.

## Deep

**Investigate** reasons why planets and moons are not completely spherical. Explore terms such as 'equatorial bulge' and suggest an experiment that would **prove** this phenomenon.

See an example on page 276

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

## Basic

Draw, label and describe how the Earth's rotation gives rise to day and night.



## Advancing

Explain and **demonstrate** how and why a sundial, used to tell the time, works.

## Deep

At night, sundials do not work. **Suggest** or **investigate** other ways you could tell the approximate time using views of the night sky.

See an example on page 276

## End of Upper Key Stage 2 Age Related Expectations

Milestone indicator	Basic	Advancing	Deep
<p><b>Describe the movement of the Earth, and other planets, relative to the Sun in the solar system.</b> Note: part of this indicator appears in Milestone 2 and the activities here have been replicated. Added are tasks that refer to other planets, which does not appear in Milestone 2.</p>	<p><b>Describe</b> the movement of the Earth relative to the Sun.</p> <p><b>Label</b> and <b>describe</b> our solar system.</p> <p><b>Answer questions</b> about the scientists who first observed the Earth's movement around the Sun.</p> <p><b>Describe</b> how the movement of the Earth gives rise to seasonal changes.</p>	<p><b>Explain why</b> the Earth's movement gives rise to the seasons.</p> <p><b>Explain why</b> the effect of the Earth's movement on seasons is more acute further away from the equator.</p>	<p><b>True or false:</b> A year is always 365 days, no matter where one is in our solar system?</p> <p><b>Relate</b> your knowledge of the Earth's movement relative to the Sun to time zones. Assess the <b>significance</b> of this to our daily lives.</p> <p><b>Do you agree:</b> At any time of day it is always 5 O' Clock somewhere on Earth.</p>
<p><b>Describe the movement of the Moon relative to the Earth.</b> Note: this indicator appears in Milestone 2 and the activities here are replicated.</p>	<p><b>Identify</b> and <b>label</b> the Moon and Earth.</p> <p><b>Describe</b> the Moon's movement relative to the Earth.</p> <p><b>Answer questions</b> about the Moon's movement relative to the earth.</p> <p><b>Observe, name</b> and <b>record</b> the phases of the Moon.</p>	<p><b>Explain</b> why the moon's movement affects the tides of oceans and seas on Earth.</p> <p><b>Explain</b> how we can predict the times of high and low tides.</p>	<p><b>Could this be true:</b> the shape of the moon's phases is a natural calendar?</p> <p><b>Is it possible (prove or disprove)</b> to calculate how long until a particular moon shape will appear again?</p> <p><b>Explain the concept</b> of a leap year.</p>
<p><b>Describe the Sun, Earth and Moon as approximately spherical bodies.</b></p>	<p><b>Observe</b> pictures and videos of the Sun, Earth and Moon and <b>describe</b> them using mathematical vocabulary.</p>	<p><b>Explain</b> , using your knowledge of gravity, why the Sun, Earth and Moon are almost spherical.</p>	<p><b>Investigate</b> reasons why planets and moons are not completely spherical. Explore terms such as 'equatorial buldge' and suggest an experiment the would <b>prove</b> this phenomenon.</p>
<p><b>Use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky.</b></p>	<p><b>Draw, label</b> and <b>describe</b> how the Earth's rotation gives rise to day and night.</p>	<p><b>Explain</b> and <b>demonstrate</b> how and why a sun dial, used to tell the time, works.</p>	<p>At night, sun dials do not work. <b>Suggest</b> or <b>investigate</b> other ways one could tell the approximate time using views of the night sky.</p>