

Curriculum Organiser – Year 5, Earth and Space Science

Vocabulary and Concepts	
Learning Intention – We are learning that the Earth is part of a system of planets orbiting around a star (the sun)	
Astronomy	<b>Astronomy</b> is the branch of science that studies outer space focusing on celestial bodies such as stars, comets, planets, and galaxies.
Sun	The star at the centre of our solar system around which Earth and the planets orbit.
Star	A star is type of astronomical object consisting of a bright sphere held together by its own gravity. The nearest star to Earth is the Sun.
Earth	The third planet in order from the Sun
Moon	Earth's only natural satellite.
Planet	<b>Planets</b> are large natural objects that orbit, or travel around, stars.
Satellite	A <b>satellite</b> is a small object that orbits, or revolves around, a larger object in space.
Axis	An imaginary straight line around which an object such as Earth rotates.
Orbit	The path that an object such as a planet, moon, or satellite follows around a larger astronomical object such as the Sun.
Rotate	To turn like a wheel around an axis or a fixed point, or make something turn around an axis or a fixed point.
Mercury	The closest planet to the sun. It has many large pits and is made of iron.
Venus	The 2 <sup>nd</sup> planet from the sun. Brightest and hottest planet in the solar system.
Mars	The 4 <sup>th</sup> planet from the sun. Called the red planet because it is covered in iron oxide (like rust)
Jupiter	The 5 <sup>th</sup> planet from the sun. The largest planet in the solar system. Covered in storms. A gas giant.
Saturn	The 6 <sup>th</sup> planet from the sun. Surrounded by rings of ice. A gas giant.
Uranus	The 7 <sup>th</sup> planet from the sun. A gas giant that is the coldest in the solar system.
Neptune	The 8 <sup>th</sup> , further planet from the sun. A gas giant with many storms.
Pluto	The closest dwarf planet to the sun.
Milky Way	A spiral galaxy. Our solar system is part of the Milky Way.
Key Facts	
1	The eight planets orbit the sun. We orbit the sun which takes 1 year/ 365 days.
2	The planets are spherical and are made of different materials.
3	Planets reflect light from the sun
4	The four inner planets are made of rock and are relatively small.
5	The four outer planets are gas planets. They are much larger
6	The inner and outer planets are separated by an asteroid belt (between Mars and Jupiter)
7	The Sun has a massive mass which produces a huge force of gravity keeping our solar system together and in orbit around it.
8	The Sun is our nearest star. It is one of billions making up the Milky Way galaxy.
9	The planets orbit the Sun in a circular motion. Each planet orbits at a different speed and this is related to the distance from the Sun.

Science as Human Endeavour
Science involves testing predictions by gathering data and using evidence to develop explanations of events and phenomena and reflects historical and cultural contributions
<ul style="list-style-type: none"> <li>- The position of Venus was, and still is, used as a navigation aid by sailors before compasses were commonly available.</li> </ul>
<ul style="list-style-type: none"> <li>- Describing how technologies developed to aid space exploration have changed the way people live, work and communicate</li> </ul>
<ul style="list-style-type: none"> <li>- Explore the development of the telescope</li> </ul>
Science Enquiry Skills
Represent and communicate observations, ideas and findings using formal and informal representations
Aboriginal Perspectives
<a href="https://www.atnf.csiro.au/research/AboriginalAstronomy/Examples/SunMoon.htm">https://www.atnf.csiro.au/research/AboriginalAstronomy/Examples/SunMoon.htm</a>

## **Australian Curriculum Achievement Standard**

### **Year 5 Achievement Standard**

By the end of Year 5, students classify substances according to their observable properties and behaviours. They explain everyday phenomena associated with the transfer of light. They describe the key features of our solar system. They analyse how the form of living things enables them to function in their environments. Students discuss how scientific developments have affected people's lives, help us solve problems and how science knowledge develops from many people's contributions. Students follow instructions to pose questions for investigation and predict the effect of changing variables when planning an investigation. They use equipment in ways that are safe and improve the accuracy of their observations. Students construct tables and graphs to organise data and identify patterns in the data. They compare patterns in their data with predictions when suggesting explanations. They describe ways to improve the fairness of their investigations, and communicate their ideas and findings using multimodal texts.

Year 5 Rubric

A	B	C	D	E
Use of accurate diagrams, other representations and relevant science terminology to coherently communicate ideas	Use of diagrams, other representations and relevant science terminology to communicate ideas	Use of diagrams and other representations to communicate ideas	Communication of ideas using everyday language	Fragmented communication of ideas
Thorough description of the key features of our solar	System informed description of the key features of our solar system	Description of the key features of our solar system	Identification of the key features of our solar system	Statements about the solar system

NB – the following terminology will be helpful in making grading choices.

- Knowledge/information refers to facts, concepts, principles, laws, theories and models that have been established by scientists over time;
- Understanding - the concepts underpinning and connecting knowledge in a learning area, *related to a student's ability to appropriately select and apply knowledge* to solve problems in that learning area
- Fragmented - disjointed, incomplete or isolated
- Informed - Having relevant knowledge; being conversant with the topic; in the context of Science, informed means referring to scientific background knowledge and/or empirical observations
- Reasoned - logical and sound; presented with justification; in the context of Science, reasoned also means that the evidence is provided through reference to scientific background knowledge and/or empirical observations as part of the justification

Further information is available at [https://www.gcaa.qld.edu.au/downloads/p\\_10/ac\\_sci\\_yr5\\_se.pdf](https://www.gcaa.qld.edu.au/downloads/p_10/ac_sci_yr5_se.pdf)

## Possible Assessment Task 1

### Data analysis: Patterns in the solar system

	Distance from sun	Length of day	Length of year	Diameter
Mercury	58 million km	176 Earth days	88 days	4,879 km.
Venus	108 million km	213 Earth days	225 days	12,100 km.
Earth	150 million km	1 Earth day	365 days 366 in leap year	12,756 km.
Mars	228 million km	25 hours	686 days	6,780 km.
Jupiter	778 million km	10 hours	12 Earth years	142,984 km.
Saturn	1,427 million km	10 hours	30 Earth years	120,540 km.
Uranus	2,870 million km	17 hours	84 Earth years	51,118 km.
Neptune	4,497 million km	18 hours	165 Earth years	49,528 km.

#### Annotations

Constructs a table to record and organise data collected.

Identifies the planets in the solar system, and that they have varying properties (distance from the sun, day length, year length, diameter).

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### Data analysis: Patterns in the solar system

- ① What did you notice about the length of the year of the planets in relation to the distance from the sun? That the furthest planets from the sun had the longest orbit and the ones closest to the sun had a short orbit.
- ② How were the planets spaced? The first four planets were very close together and the other four were away from the first four but not close to each other.
- ③ Which planet has the smallest orbit? Why? The planet with the smallest orbit, or year is mercury. This occurs because it is the smallest planet and the closest planet to the sun.
- ④ What do you notice about the size (diameter of the planets)? I've noticed that no two planets have the same diameter and that the gas planets are larger than the rock ones.
- ⑤ What other patterns do you notice about the planets in the solar system? I have noticed that Venus and Earth are very similar throughout the diagrams and that Neptune is actually smaller than Uranus.

#### Annotations

Identifies patterns in data by relating two variables, and recognises that year length is related to time taken to orbit the sun.

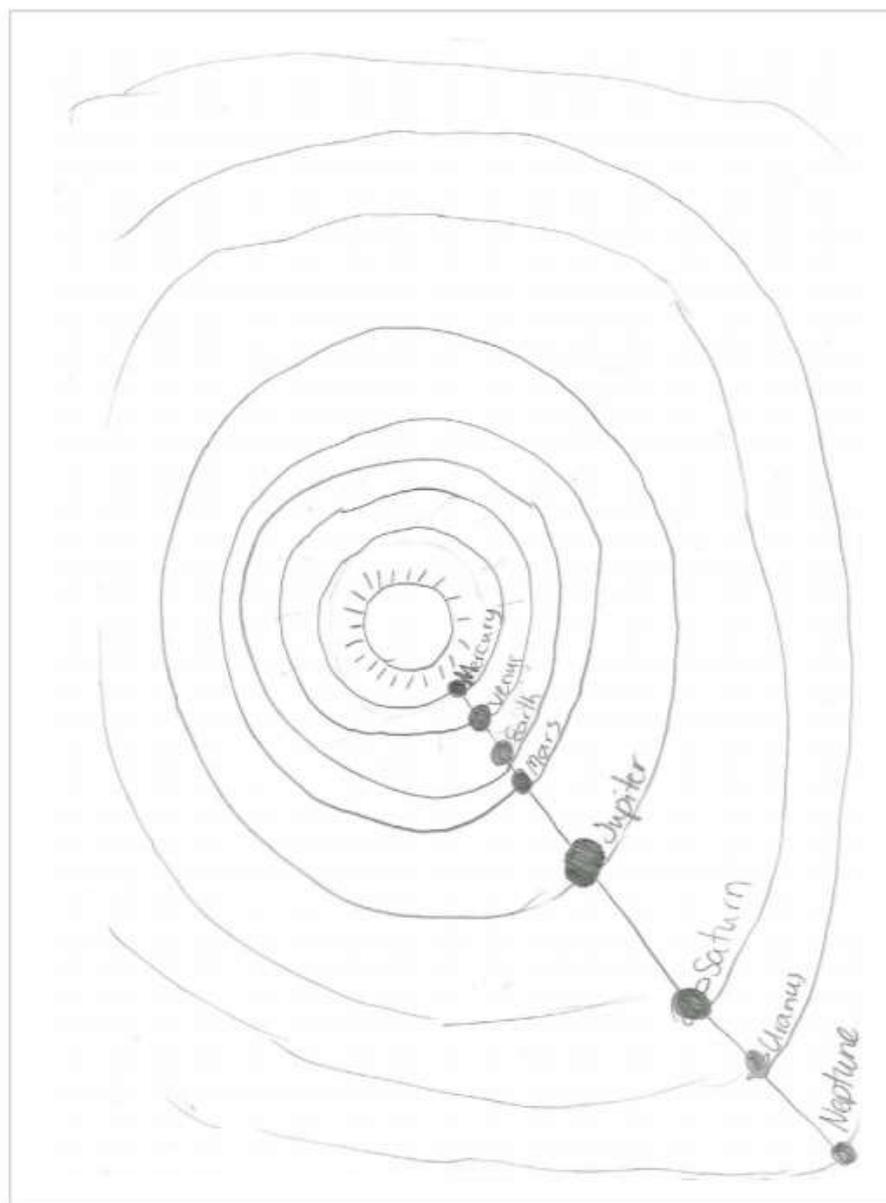
Observes and describes patterns in the data.

Uses data to answer a research question and provides an explanation with reference to features of the solar system.

Draws on qualitative data to identify additional patterns.

Identifies similarities between planets based on a range of properties.

## Data analysis: Patterns in the solar system



### Annotations

*Constructs a labelled diagram of the solar system.*

### Annotations (Overview)

*The student communicates ideas and findings using tables, written text and labelled diagrams.*

Possible Assessment Task 2

Science

Year 5

Unit 2

Assessment task — Template: Exploration of the solar system

# Exploration of the solar system

Planets	Average distance from the sun (km)	Average temperature (°Celsius)	Time to orbit the sun (Earth days)
Mercury	58 000 000	-167	88
Venus	108 000 000	-462	224.7
Earth	150 000 000	15	365.26
Mars	228 000 000	-65	687
Jupiter	778 000 000	-148	4332
Saturn	1 424 000 000	-178	10756
Uranus	2 867 000 000	-216	30687
Neptune	4 448 000 000	-214	60190

How does the temperature of the planet vary with the distance from the sun?

What effect does the sun have on Earth?

List other objects in the solar system.

Describe the similarities and differences between two of the objects listed above.

## Scientific advancements

Scientific developments including new understandings about the solar system, discoveries and inventions can directly affect our lives.

List two discoveries or inventions which have been a result of space exploration.

Choose one discovery or invention.



How has this discovery or invention affected people's lives or solved a problem?