SPACE AND THE SOLAR SYSTEM

Activity Pack -- FREE Resource

Ages 8-11 | No Prior Reading Required
Classroom, Library and Home Use

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Planet Parade

Our solar system has one star -- the Sun -- and eight planets. Between Mars and Jupiter lies the Asteroid Belt, and beyond Neptune is the Kuiper Belt, home of the dwarf planet Pluto.

Activity 1: In Order From the Sun

Number the planets from 1 (closest to the Sun) to 8 (furthest away).

Planet	Order	Planet	Order
Earth	____	Neptune	____
Jupiter	____	Mercury	____
Mars	____	Saturn	____
Venus	____	Uranus	____

Activity 2: Match the Planet

Write the planet's name next to each fact.

Fact	Planet
The hottest planet, wrapped in thick clouds	
Red because its soil has rusted	
A gas giant with the Great Red Spot storm	
Tilted on its side, rolling along its path	
Its rings are mostly less than a kilometre thick	
The only planet known to support life	

Think About It

* Why is Venus hotter than Mercury, even though it is further from the Sun?

* Which planet would you most like to visit? Why?

Space Numbers

Space is full of extreme numbers. Mercury's day reaches 430 degrees Celsius but its night plunges to minus 180. Uranus's poles get about 42 years of sunlight, then 42 years of darkness.

Activity 1: Hot and Cold

Place	Temperature (degrees Celsius)
Mercury in the day	**430**
Venus	**465**
Mercury at night	**-180**
A warm day in Australia	**30**

1. Which is hottest? _____ Which is coldest? _____

2. How much hotter is Venus than Mercury in the day? 465 - 430 = _____

3. From -180 up to 0 is 180 degrees. From 0 up to 430 is 430. Total change: _____

Activity 2: Space Puzzles

1. 42 years of light + 42 years of dark = _____ years for one trip around the Sun.

2. Galileo found four of Jupiter's moons in 1610. How many years ago was that? _____

3. The Sun is about 150 million kilometres away. Write 150 million in numbers: _____

Think About It

* Why do you think Mercury's nights are so cold when its days are so hot?

* Which space number surprised you the most?

Design a Space Probe

Real space probes visit planets for us, sending back photos and data. Every probe is designed for its planet -- a probe for Venus needs to survive 465 degrees, while a probe for Neptune must work 4.5 billion kilometres from the Sun.

Activity 1: What Does a Probe Need?

Tick what a space probe needs. Cross what it does not need.

Probe Part	Needs it	Doesn't need it
A camera to take photos	[ ]	[ ]
An antenna to send messages home	[ ]	[ ]
A power source, like solar panels	[ ]	[ ]
Seats and seatbelts for passengers	[ ]	[ ]
A shield to protect it from heat or cold	[ ]	[ ]

Activity 2: My Probe

My probe is going to: _____ It needs to survive: _____

DRAW AND LABEL YOUR PROBE:

Think About It

* Why don't most space probes carry people?

* What is the first thing you would want your probe to find out?

Under a Sky Full of Stars

Note to students:
This worksheet explores personal feelings. There are no right or wrong answers -- your thoughts are your own. Sharing is always optional. If any question brings up big feelings, please talk with a trusted adult.

Lying under a sky full of stars can make us feel tiny, amazed, or full of questions. Some questions have no easy answer -- which is exactly why they are worth asking.

Activity 1: Feeling Check-In

Circle the words that show how you feel.

When I look up at the night sky, I feel:
Amazed Small Calm Curious Other: _____

When I don't know the answer to a question, I feel:
Curious Stuck Frustrated Excited Other: _____

When I learn something amazing, I feel:
Excited Proud Wowed Happy Other: _____

Activity 2: My Night Sky

DRAW THE NIGHT SKY FROM YOUR BACKYARD OR WINDOW:

Something I wonder about: _____

Think About It

* Why is it okay to have questions that nobody can answer yet?

* What helps you feel calm when something feels too big to understand?

Curious Minds

Curiosity -- asking, noticing and recording -- is how every scientist begins. Scientists keep notebooks and sketchbooks, and they never stop asking questions. The universe always has more.

Activity 1: Curious Habits

Tick the habits that help a curious mind grow.

Habit	Helps	Doesn't help
Asking questions	[ ]	[ ]
Writing notes about what you learn	[ ]	[ ]
Sketching what you see	[ ]	[ ]
Pretending you already know everything	[ ]	[ ]
Giving up when something is hard to understand	[ ]	[ ]

Activity 2: My Space Questions

Write three questions you still have about space -- and how you could find out.

1. _____ Find out by: _____
2. _____ Find out by: _____
3. _____ Find out by: _____

Think About It

* Why is a question 'the beginning of something'?

* We are made of the same material as the stars. What do you think about that?

My Space Explorer Goals

Here is a challenge: be a space explorer. Look up at the sky, ask questions, and keep a notebook of everything you notice and wonder about.

Activity 1: My Explorer Goals

Write or draw one goal for each time.

Goal Tier	My Goal	How I Will Do It	When I Will Start
THIS WEEK			
THIS TERM			
THIS YEAR			

Activity 2: Space Explorer Tracker

Colour a star each day you do it.

I did it!	Mon	Tue	Wed	Thu	Fri
I looked at the sky and noticed something	*	*	*	*	*
I asked a space question	*	*	*	*	*
I wrote or drew in my notebook	*	*	*	*	*
I found out a new space fact	*	*	*	*	*
I shared a space fact with someone	*	*	*	*	*

Think About It

* What is one question about space you would love to answer one day?

* Write your own explorer motto in 10 words or fewer.

Teacher's Companion

No Prior Reading Required
This pack is fully standalone. No book or characters are referenced. Any student can complete these worksheets without prior reading. Suitable for classroom, library, and home learning programmes. This pack is an excerpt of a full book-specific learning pack available with purchase at **learningsmart.au**

Australian Curriculum Alignment

Learning Area	Strand	Year Level	Content Description (summary)
Science	Earth and Space Sciences	Yr 3-6	The Earth is part of a system of planets orbiting the Sun (WS1)
Science	Science as a Human Endeavour	Yr 3-6	Scientists such as Galileo built knowledge over time; space probes (WS3, WS5)
Mathematics	Number	Yr 3-6	Negative numbers in context; large numbers; subtraction (WS2)
Design and Technologies	Design Processes	Yr 3-6	Design a probe to meet the needs of an environment (WS3)
Health and PE	Personal, Social and Community Health	Yr 3-6	Recognise feelings of wonder, curiosity and frustration (WS4)
Gen. Capabilities	Critical and Creative Thinking	Yr 3-6	Pose questions and plan how to investigate (WS5)
Gen. Capabilities	Personal and Social Capability	Yr 3-6	Develop curiosity and persistence (WS5, WS6)

16 Key Space and the Solar System Lessons

#	Lesson
1	The solar system has one star, the Sun, and eight planets.
2	The Sun is a huge ball of hydrogen gas about 150 million kilometres away.
3	Mercury is the smallest planet and the closest to the Sun.
4	Venus is the hottest planet because of a runaway greenhouse effect.
5	Earth is the only planet known to support life.
6	The Moon helps steady Earth's tilt and drives the tides.
7	Mars is red because its soil contains rust (iron oxide).
8	The Asteroid Belt is mostly empty space with millions of rocky pieces.
9	Jupiter is a gas giant; its Great Red Spot is a giant storm.
10	Saturn's huge rings are made of ice, rock and dust.
11	Uranus is tilted on its side and rolls along its path.
12	Neptune has the fastest winds in the solar system.
13	Pluto is a dwarf planet in the icy Kuiper Belt.
14	A comet's tail is ice and dust turning to gas near the Sun.
15	Every planet is unique, but all formed from the same cloud of gas and dust.
16	Big idea: The universe always has more to discover.

Answer Keys and Discussion Guidance

WS1 -- Planet Parade (Answers)
Order: Mercury 1, Venus 2, Earth 3, Mars 4, Jupiter 5, Saturn 6, Uranus 7, Neptune 8. Facts: Venus; Mars; Jupiter; Uranus; Saturn; Earth.

WS2 -- Space Numbers (Answers)
1. Hottest: Venus; coldest: Mercury at night. 2. 35 degrees. 3. 610 degrees. Puzzles: 1. 84 years; 2. depends on the current year (e.g. 2026 - 1610 = 416); 3. 150,000,000.

WS3 -- Probe Parts (Answers)
Needs: camera; antenna; power source; shield. Doesn't need: seats for passengers (probes are uncrewed).

WS4 -- Sensitivity Note for Educators
Big questions about space can bring up feelings of smallness or worry for some students. Keep the tone curious and safe. Do NOT require sharing. If a student discloses a concern, follow your school's wellbeing and child safety protocol.

WS5 -- Curious Habits (Answers)
Helps: asking questions; writing notes; sketching. Doesn't help: pretending to know everything; giving up.

WS6 -- Challenge Tracker
There are no correct scores. Celebrate every attempt; any day left blank is a chance for a gentle reminder, not correction.

Upsell Note for Educators
This generic pack is based on the Learning Smart book series. The full book-specific learning pack -- which references the characters, story moments, and adventure narrative -- is available with book purchase or subscription at **learningsmart.au**. Book-specific packs significantly increase student engagement and reading motivation.

Differentiation Strategies

Level	Strategy	Example Application
Below Level (support)	Reduce written output; use sentence starters; allow verbal responses; pair with peer.	WS1: use a planet mnemonic and picture cards. WS4: use feeling faces instead of writing.
On Level (standard)	Complete all activities as written. Use discussion partner for Think About It sections.	Standard completion with class debrief of Think About It questions.
Extension (enrichment)	Make a scale model of planet distances along the school corridor using toilet paper squares.	WS2: research and compare the length of a day and a year on each planet.

7 Discussion Questions

1. Why are big questions with no easy answers worth asking?
2. Why is Venus hotter than Mercury, even though it is further away from the Sun?
3. What makes Earth special compared with the other planets?
4. Why do you think scientists believe Mars may once have had life?
5. What would it be like to live through a 42-year winter on Uranus?
6. We are made of the same material as the stars. What does that mean to you?
7. What is one question you still have about space?

Classroom Display Ideas

Planet Parade: A hanging model of the eight planets in order from the Sun.

Hot and Cold Thermometer: A giant thermometer showing temperatures from WS2.

Probe Gallery: Display the WS3 space probe designs with their target planets.

Question Galaxy: Students' space questions on paper stars across the ceiling.

Scale Distance Walk: A corridor line showing the planets' distances to scale.

Space Notebook Wall: Pages from students' space explorer notebooks.

Want the Full Adventure?

This free activity pack is inspired by the **Learning Smart book series** -- everyday adventures about character, confidence and growing into a kind, capable leader.

The Full Book-Specific Learning Pack Includes:

* Worksheets tied directly to the book's characters and story moments
* Story-based Think About It questions that deepen reading comprehension
* A Teacher's Companion with book-specific discussion questions
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