



The Earth, Sun and Moon! Year 7 Science at Home

You can help! Your child is learning about the movements of the Earth, sun and moon and how these cause seasons, tides and eclipses. The sky above you tells this story every night!

Why are we learning this? The sky and Country

Looking at the night sky has always been important in this part of Australia. First Nations peoples have incredibly detailed astronomical knowledge — using the positions of stars, the moon phases, and the seasons to track time, predict weather, plan food gathering and navigate across Country. Yolngu and other First Nations groups have oral traditions that record solar and lunar eclipses going back thousands of years. When your child studies the Earth-sun-moon system, they are engaging with one of the oldest sciences — and one that has deep roots in the knowledge systems of this land.

My child will learn to:

✓ Explain seasons

Describe how Earth's tilt as it orbits the sun causes the seasons (including why we have wet and dry instead of the 4 European seasons).

✓ Explain moon phases

Know that the moon's changing appearance is caused by its position relative to the Earth and sun.

✓ Explain tides

Understand that tides are caused by the gravitational pull of the moon (and sun) on Earth's oceans.

✓ Explain eclipses

Describe how solar and lunar eclipses occur and predict when they might happen.

Big ideas to know:

Earth's tilt causes seasons

Earth is tilted at 23.5 degrees as it orbits the sun. When the southern hemisphere is tilted towards the sun (December), we get summer — longer days and more intense sunlight. When tilted away (June), we get winter. Up here in the tropics, the effect is different — we get wet and dry seasons rather than the classic four seasons.

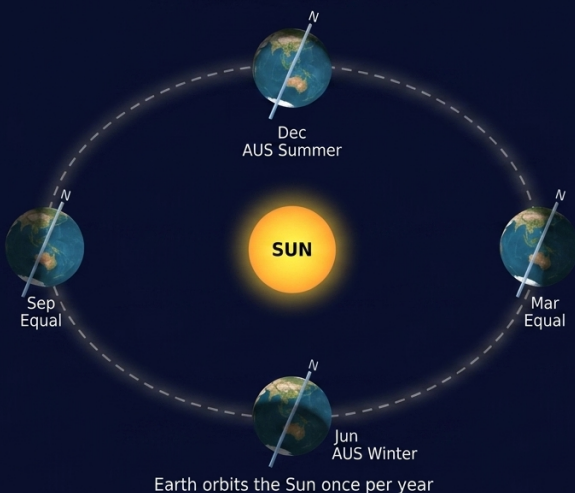
Moon phases

The moon does not produce its own light — it reflects sunlight. As the moon orbits Earth over 28 days, we see different amounts of its lit surface — this gives us the phases (new moon, crescent, half, gibbous, full). First Nations peoples used moon phases as a calendar for many activities.

Tides and eclipses

The moon's gravity pulls Earth's oceans towards it, creating high tides. When the moon and sun line up, tides are highest (spring tides). A solar eclipse happens when the moon passes between Earth and the sun. A lunar eclipse happens when Earth's shadow falls on the moon.

Seasons from Earth's Tilt



Moon Phases & Tides





How Earth, Sun and Moon interact

Phenomenon	What causes it	Visible evidence
Seasons	Earth orbiting sun while tilted at 23.5 degrees	Wet vs dry season, longer/shorter days, sun angle in sky
Day and night	Earth rotating on its axis every 24 hours	Sun rises in east, sets in west, stars visible at night
Moon phases	Moon orbiting Earth over 28 days — we see different lit amounts	Full moon, half moon, crescent — changing each night
Tides	Gravitational pull of moon (and sun) on ocean water	High and low tide each day — stronger at full and new moon
Solar eclipse	Moon passes directly between Earth and sun	Sun blocked during the day — sky goes dark briefly
Lunar eclipse	Earth passes between sun and moon — shadow on moon	Full moon turns orange-red — visible from half of Earth

Think Like a Scientist — Moon Tracker

Each night for one month, look at the moon and draw its shape. Note whether it is getting bigger (waxing) or smaller (waning). After 4 weeks you will have mapped a complete lunar cycle — the same cycle First Nations peoples have tracked for thousands of years.

Ask: "Is the moon getting bigger or smaller tonight? When do you think it will be full? Can you predict which nights will have the most light for being outside at night?"

What to observe:

1. Moon shape each night — draw it in a simple diagram or photo
2. What time does the moon rise? Is it early or late?
3. How bright is the moonlight — can you see shadows?
4. Can you see any stars near the moon? Do they move?
5. Check a tide app — is there a pattern between moon phase and tide height?

Questions to ask your child

1. Why does the moon look different each night even though it has not changed?
 2. If the southern hemisphere has summer in December, why does Europe have winter at the same time?
 3. Why are the tides at their highest on full moon and new moon nights?
 4. Have you ever seen a lunar eclipse? What colour did the moon turn and why?
 5. How did First Nations peoples in this area use the moon phases?
 6. If Earth had no tilt, would we still have seasons? Why or why not?
 7. How long does it take the moon to orbit Earth once? How do you know?
- There are free apps that show you the current moon phase and predict upcoming eclipses — try searching "moon phase app". Viewing the moon together each night and drawing its shape is a simple and powerful astronomy activity!*

Key words to know:

Orbit	The path a planet or moon follows as it travels around another object
Rotation	Earth spinning on its axis — one rotation takes 24 hours and creates day and night
Tilt	Earth's axis is angled at 23.5 degrees — this causes the seasons
Lunar cycle	The 28-day cycle of moon phases as the moon orbits Earth
Eclipse	When one celestial body casts a shadow on another (solar = moon blocks sun; lunar = Earth's shadow on moon)
Tides	Regular rise and fall of ocean levels caused by the gravitational pull of the moon and sun
Gravity	The attractive force between any two objects with mass — keeps planets in orbit and causes tides

Key words to look up

Orbit · Rotation · Tilt · Lunar cycle · Eclipse · Tides · Gravity

What school will check

By the end of Year 7, your child needs to model cyclic changes in the relative positions of the Earth, sun and moon and explain how these cycles cause eclipses, seasons and tides.

Try it at home!

Check the tides for your nearest coastal area over the next two weeks. Look for the pattern — when are the biggest (spring) tides? Now check the moon phase calendar. Is there a connection?