Topic 4.2 — What can we know from the visible sky?

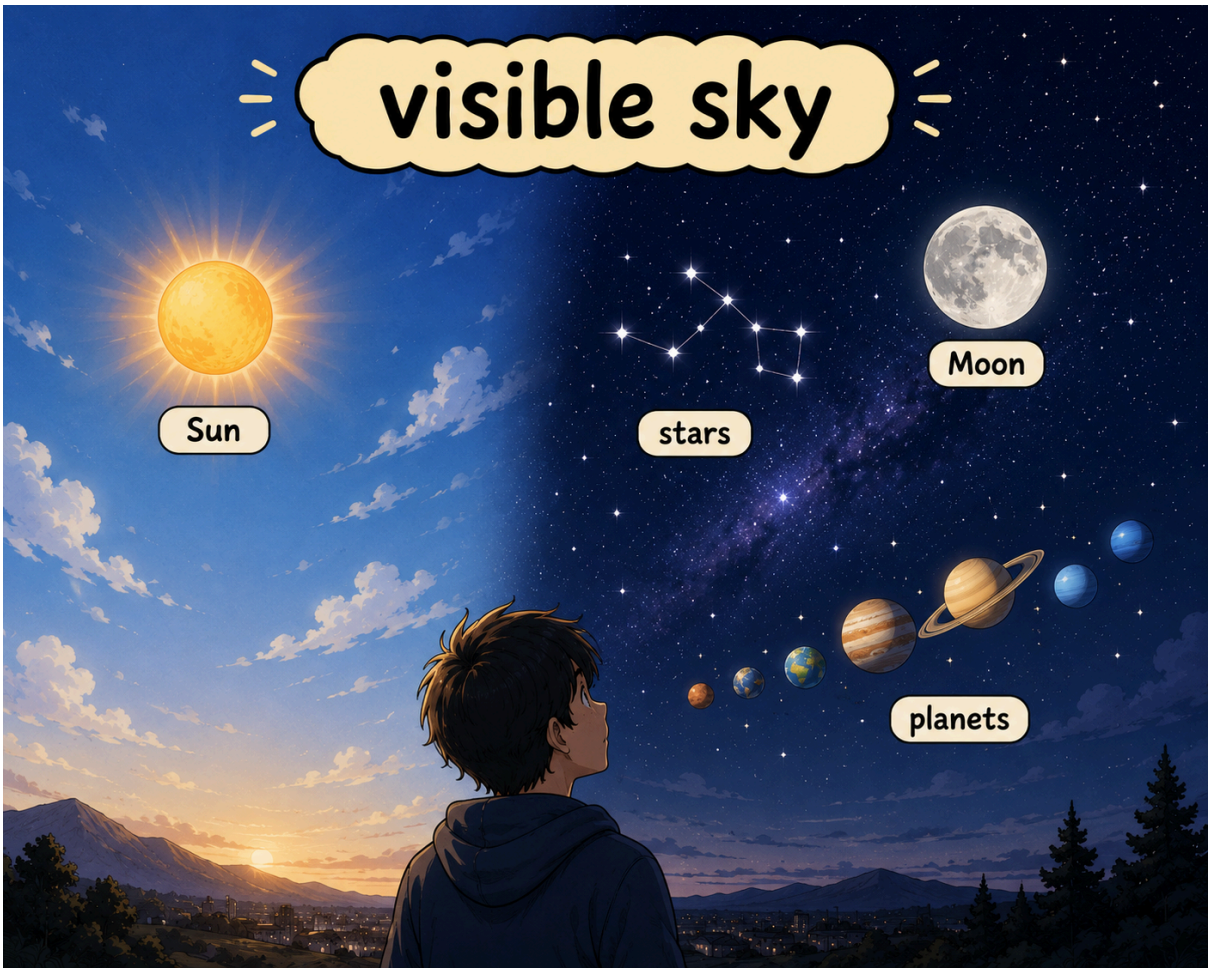
Title

The Visible Sky: Patterns, Stories, and Sky Models

Big Question

What can people learn about the universe by observing the sky with only their eyes?

What Can We See in the Sky?



Easy Explanation

People can see many objects in the sky without a telescope.

We can see the Sun during the day.

At night, we can see the Moon, stars, and sometimes planets.

These objects appear in patterns.

Many of these patterns are predictable.

The Sun: The Daytime Object



The Movement of Sun	
East - where the sun rises	West - where the sun sets

Easy Explanation

The Sun appears to move across the sky each day.

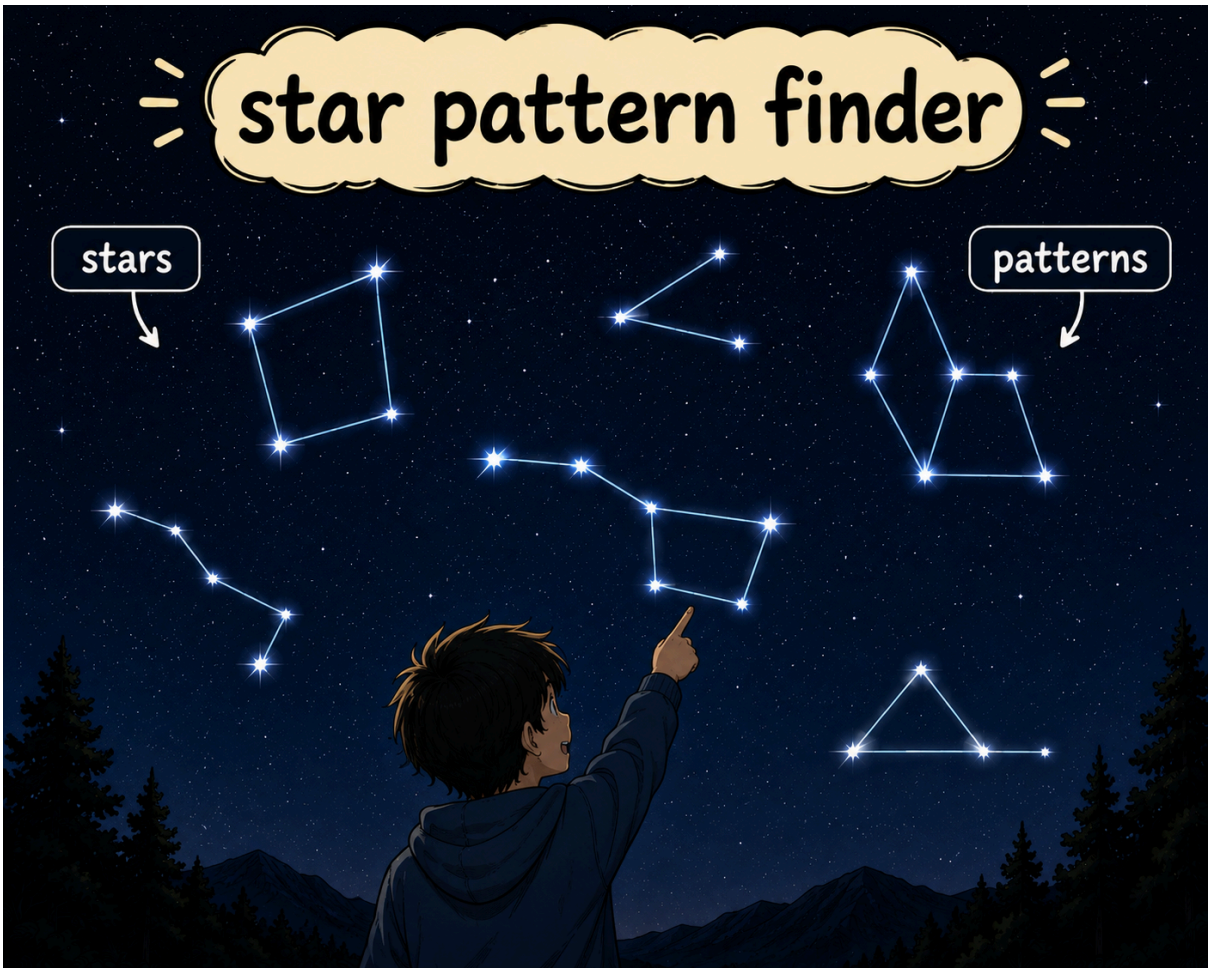
It rises in the east.

It sets in the west.

This happens **because Earth rotates.**

The Sun helps people tell time, seasons, and directions.

Stars: Patterns in the Night Sky



Easy Explanation

Stars appear as points of light in the night sky.

Some stars look brighter than others.

People notice patterns among stars.

These patterns helped people remember the sky.

They also helped with stories, calendars, and navigation.

Constellations



Vocab	What it means
Constellation	a group of stars that forms a pattern

Easy Explanation

A **constellation** is a group of stars that forms a pattern.

Different cultures may see different shapes in the same stars.

One group may see a hunter.

Another group may see a canoe.

The stars are the same, but the story can be different.

Evidence from the Past



Easy Explanation

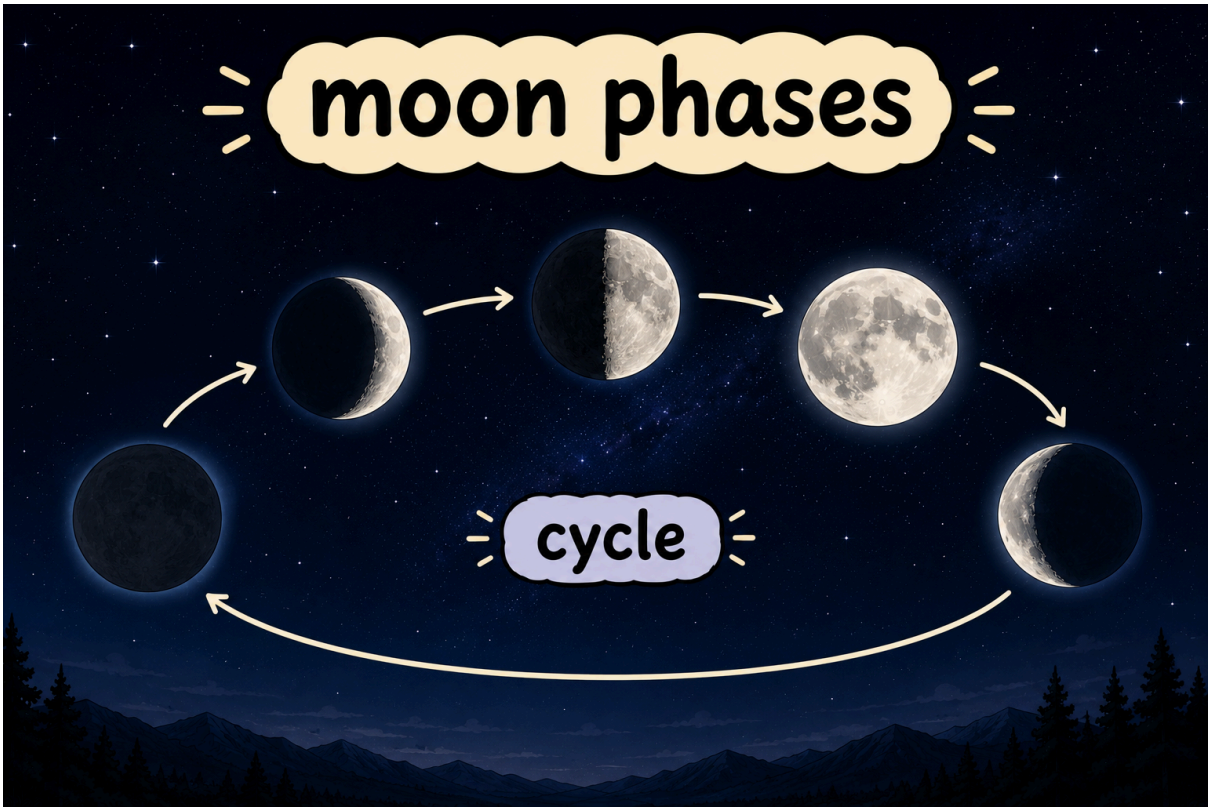
People long ago observed the sky carefully.

They recorded sky patterns in different ways.

Examples: cave paintings / stone circles / carvings / ancient books

These records show that people studied the Sun, Moon, stars, and planets.

The Moon and Its Cycle



Vocab	What it means
Moon Phase	The moon charges appearance from night to night

Easy Explanation

- One full cycle takes about **one month**.
- People used the Moon to track time and make calendars.

The Celestial Sphere



Vocab	What it means
Celestial sphere	• An imaginary model of the sky • It helps us describe where objects appear

Easy Explanation

From Earth, the sky looks like a dome around us.

The stars seem to move across this dome.

This is a model.

It helps us understand what we observe.

Stars Appear to Move



Vocab	What it means
Polaris (North Star)	a bright yellow supergiant star It sits very close to the north pole It is a key tool for navigation since it sits there

Easy Explanation

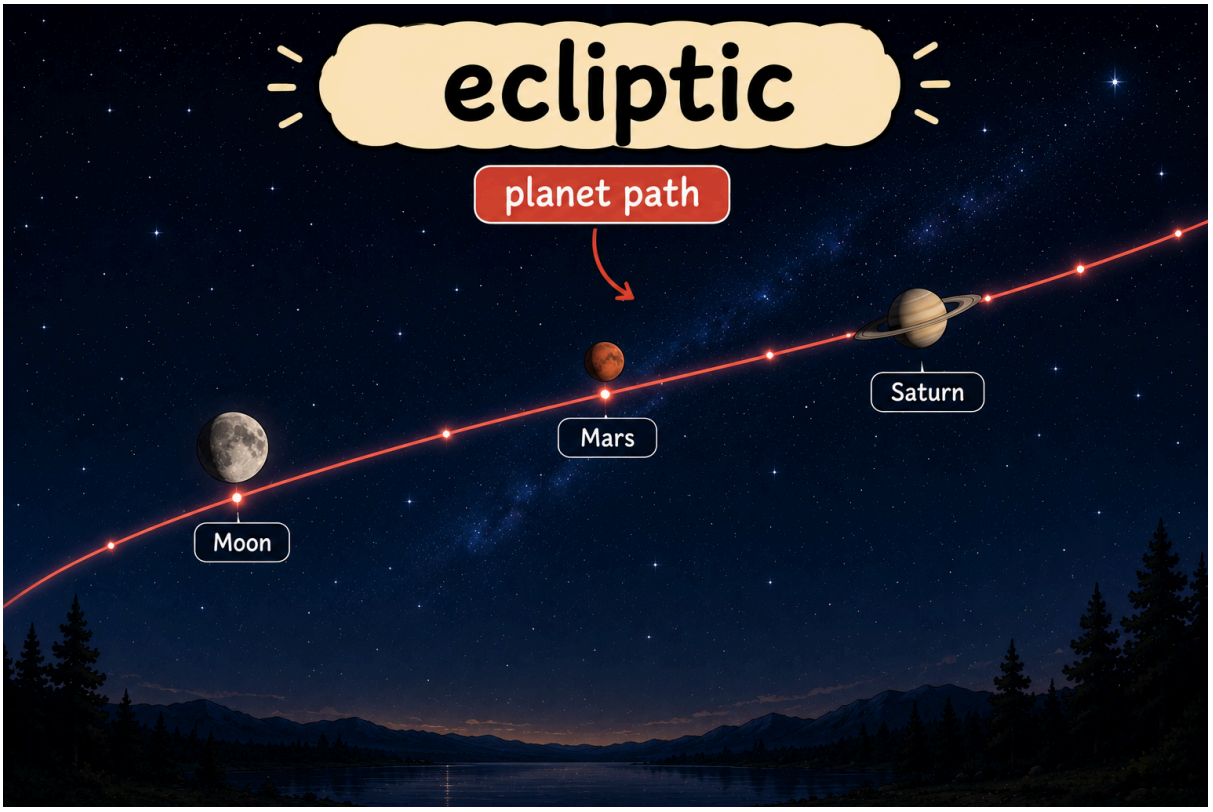
Stars appear to move across the night sky.

In the northern hemisphere, many stars appear to circle around Polaris.

Polaris is called the North Star.

This happens because Earth rotates.

The Ecliptic

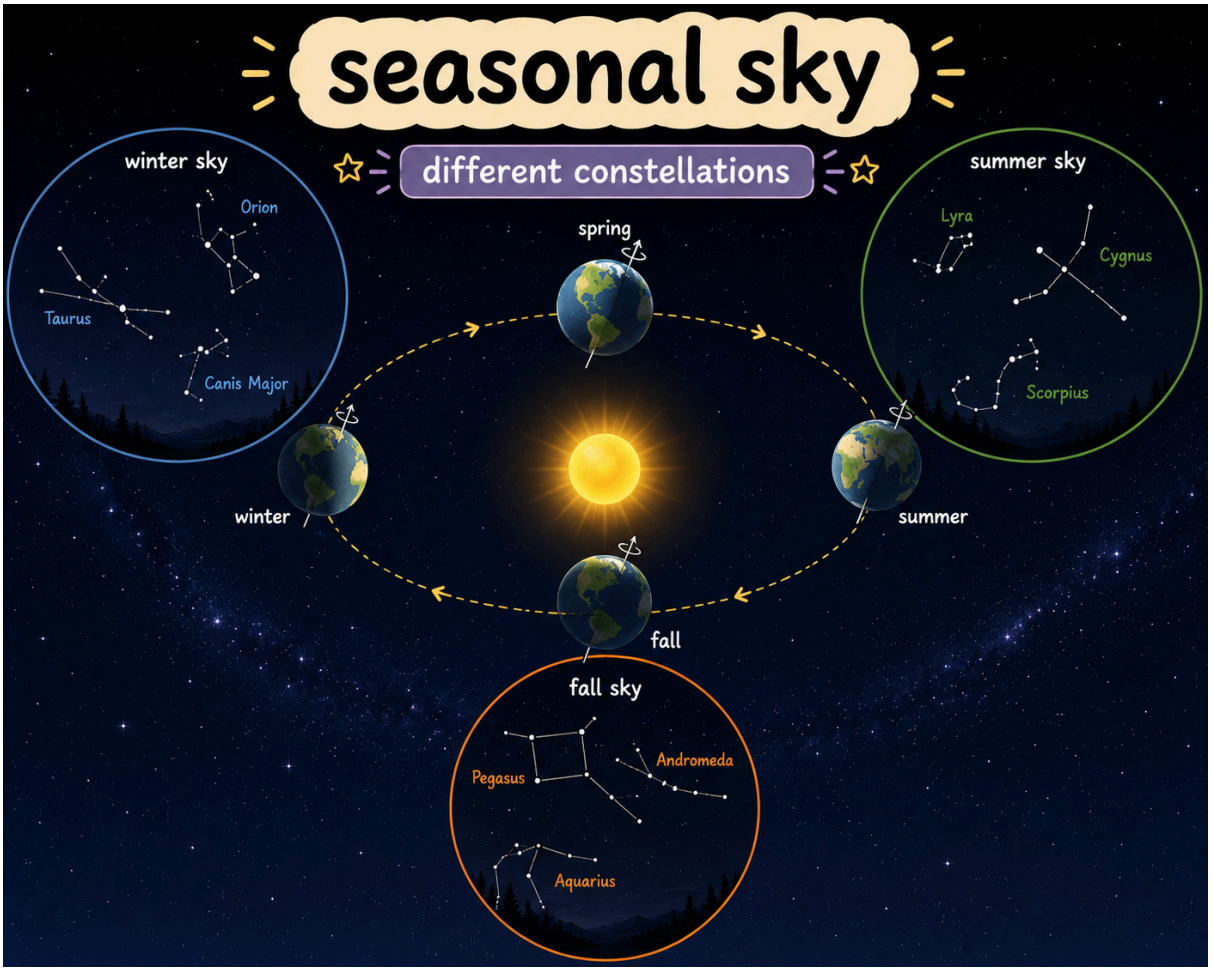


Vocab	What it means
Ecliptic	• The path the Sun appears to follow across the sky over a year • The Moon and planets often appear near this path (Ecliptic)

Easy Explanation

This helps people locate planets in the sky.

Changing Night Sky by Season



Easy Explanation

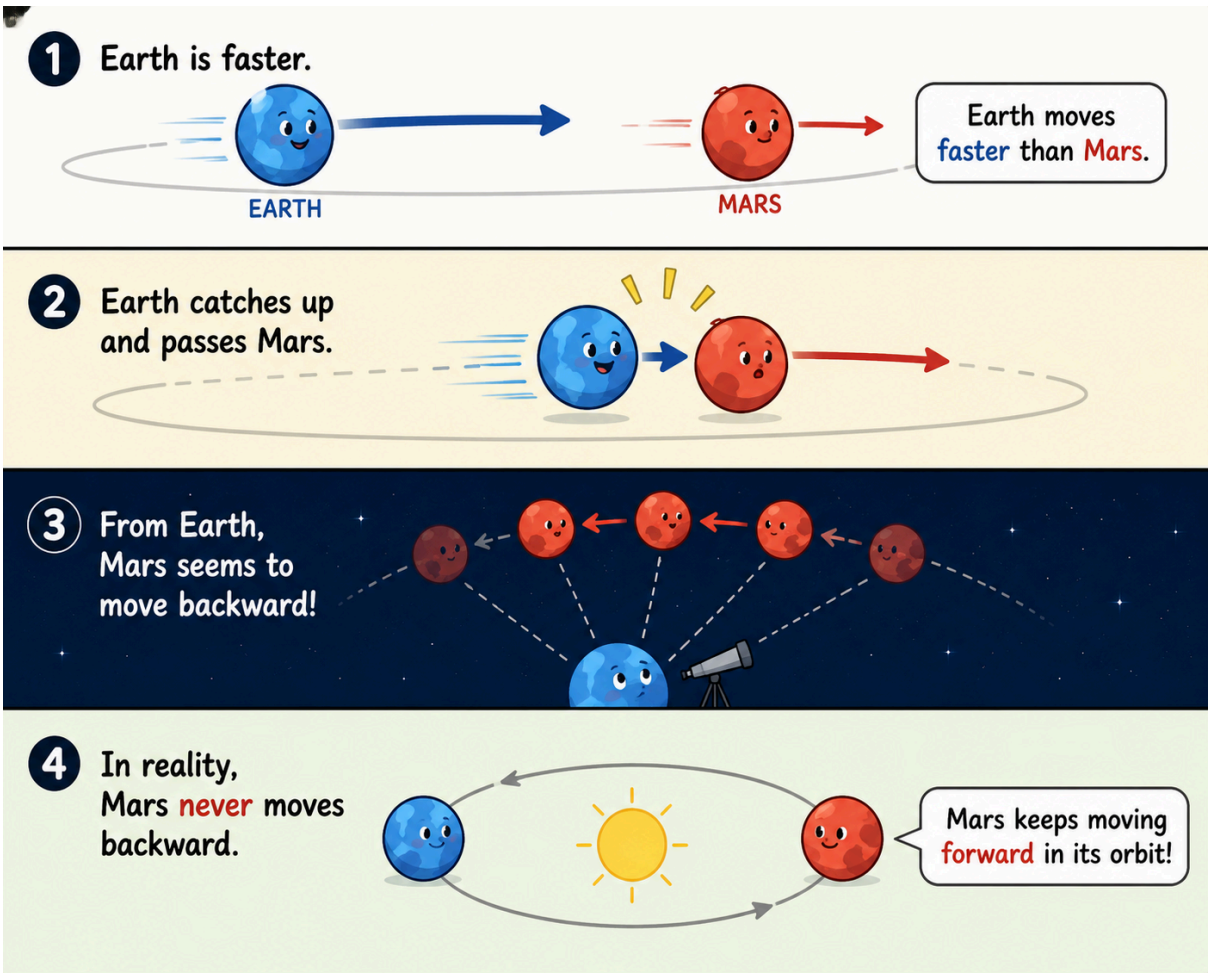
We do not see the same stars all year.

As Earth moves around the Sun, our nighttime view changes.

Some constellations are visible in winter.

Others are visible in summer.

Retrograde Motion



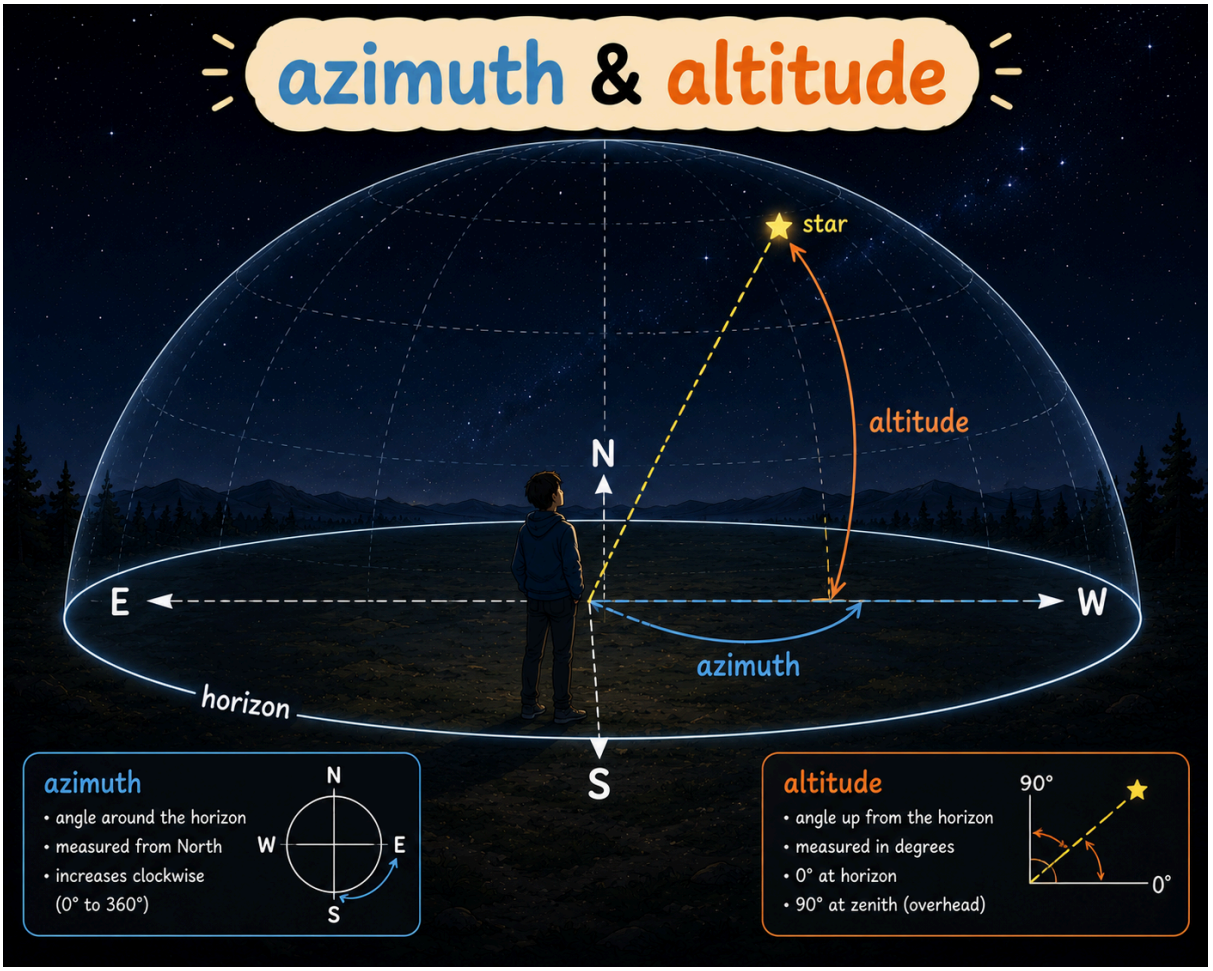
Vocab	What it means
Retrograde Motion	• Planets usually appear to move one away across the sky • Sometimes a planet appears to slow down, move backward, and loop • This is called retrograde motion

Easy Explanation

It is an apparent motion.

It happens because Earth and the planet move at different speeds around the Sun.

Azimuth and Altitude



Vocab	What it means
Azimuth	direction along the horizon
Altitude	height above the horizon

Easy Explanation

We can describe where an object is in the sky.

Azimuth tells direction along the horizon.

Altitude tells height above the horizon.

Together, they help locate a sky object.

Final Summary

Final Explanation

People can learn a lot from the sky without telescopes.

They can observe objects.

They can notice patterns.

They can create stories and calendars.

They can use models like the celestial sphere.

They can use tools like azimuth and altitude to describe positions.
