

STARDOME OBSERVATORY & PLANETARIUM FACTS, RESOURCES AND ACTIVITIES ON...

SCIENCE CONTENT/
CURRICULUM LINK
STARS, CONSTELLATIONS
AND TIME. SHARING IDEAS
AND OBSERVATIONS
ABOUT TIME AND
THE STARS.

CHANGING CONSTELLATIONS

This resource is to explain why we see different constellations during the year.

Finding and identifying stars and constellations in the night sky can be difficult and confusing. You might learn to recognise the bright star Regulus and the upside down constellation of Leo the lion after sunset during Easter. But looking for them the next morning before sunrise will be fruitless, and they won't appear at all in August.

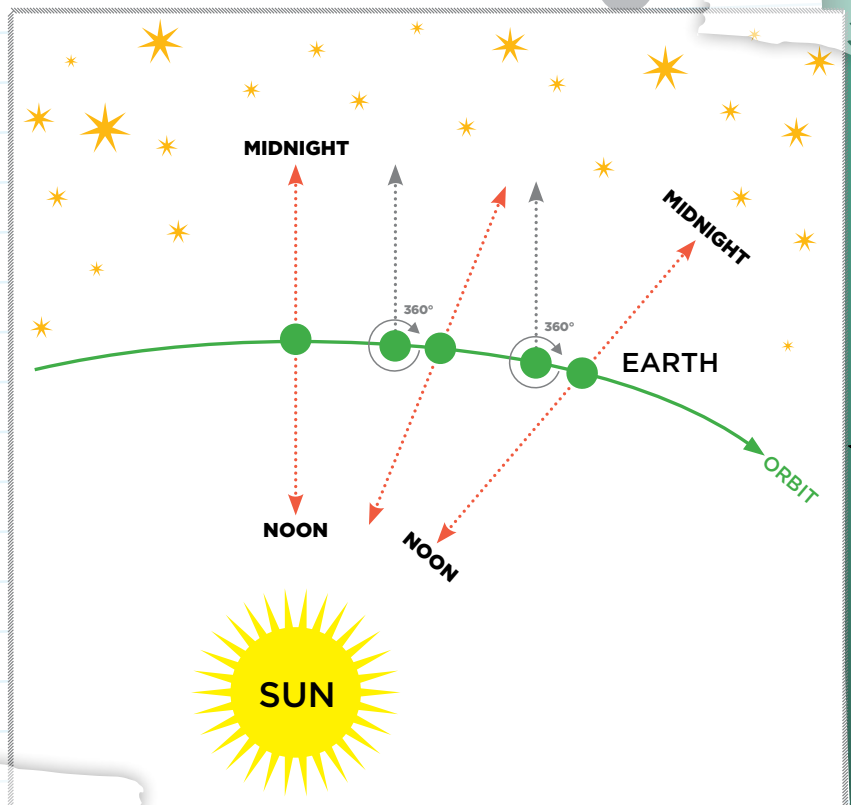
Looking out at the night sky after sunset in winter the constellation of Scorpius dominates the eastern sky, but three months later it is high overhead towards the west. The sky in summer is dominated by the large constellation of Orion in the northeast, which is found low in the west three months later.

Looking south after sunset, the Southern Cross stands proud, high in the sky in winter, but is upside down near the horizon during summer.

So, what is going on? The positions change during the year because each day the Earth moves more than 2.5 million kilometres as it orbits around the Sun (or about 1/365th of a full orbit). The stars above our heads at midnight gradually change each night, making a full cycle in one year.

The Earth therefore makes an extra rotation each year in relation to the stars compared with the Sun. This is called sidereal ('star') time, where a sidereal day is just under 4 minutes shorter than our 24-hour solar day.

The [Discovering Constellations](#) activity reveals the yearly cycle of constellations seen at night.



A solar day (midnight to midnight) is about 4 minutes longer than a sidereal (star) day (Earth turns 360° circle).

Check out this other resource...

➔ Stellarium: <http://stellarium.org/>

DISCUSSION POINTS

Do the planets move the same way as the stars?

Do astronomers use solar time or sidereal time?



ACTIVITY

STARDOME OBSERVATORY & PLANETARIUM

DISCOVERING CONSTELLATIONS

This activity aims to document the yearly cycle of the stars moving across the sky. The observations should be made looking in the same direction each time, i.e. north, east or west.

Observe the night sky at least an hour after sunset. Draw a diagram of the star patterns you can see. You might find it useful to use graph paper or a maths exercise book.

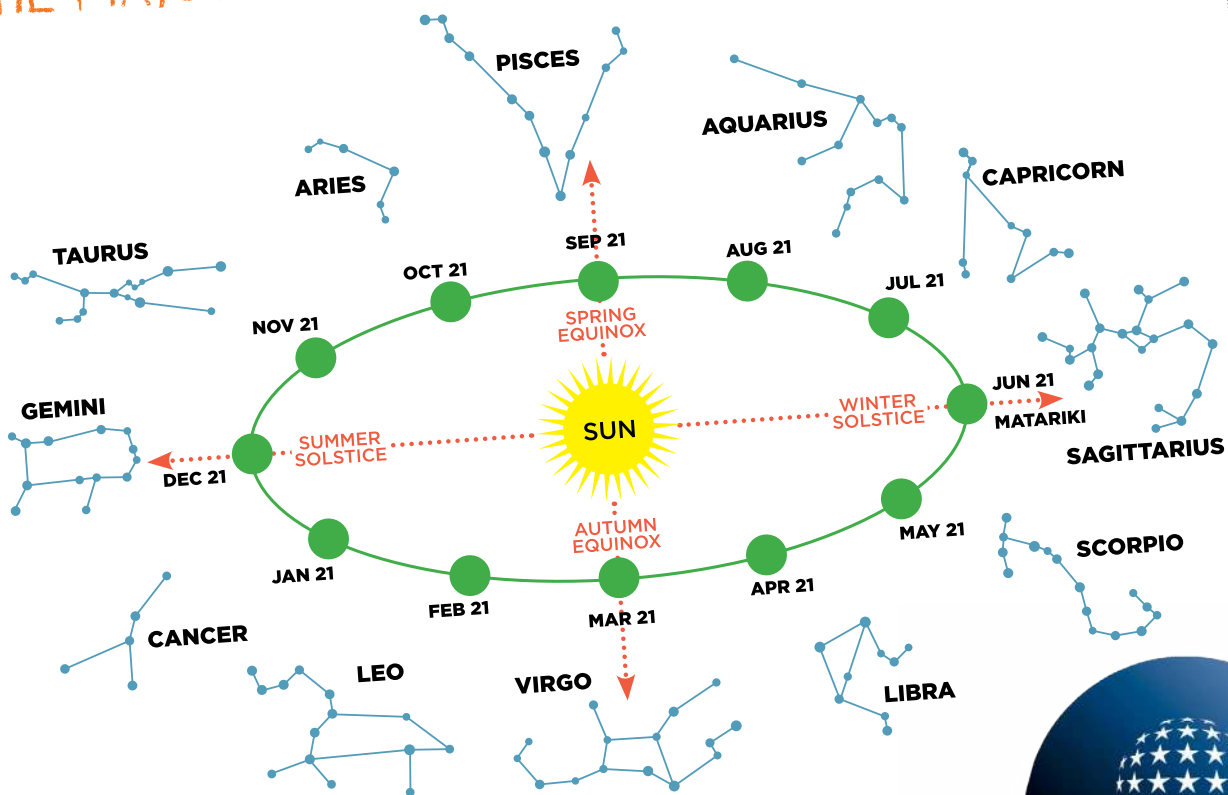
Repeat the activity once a week or every two weeks at the same time of night. To keep consistency try to perform the observations from the same location, but this isn't essential. However, it is important to face the same direction at the same time of night for each diagram.

The gradual progression of constellations from east to west across the sky during the year will become apparent with successive observations. Looking south the stars will make a circle around the south celestial pole (see our "Finding North at Night" resource).

Use a printed or online star chart (you can find monthly star charts at <http://stardome.org.nz/astronomy/resources/star-charts/>) or a smart phone night sky app to identify the constellations in your diagrams.

Ideally, it will take a full year to complete this activity. If you continue this activity for a second year, the same constellations will appear in the same places in the sky as the new year progresses.

THE MAJOR CONSTELLATIONS FOR EACH MONTH



Have any questions? Drop us an email at education@stardome.org.nz



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