

PLANET SPOTTING: FIND THE ECLIPTIC

LEARNING OBJECTIVES

- Use a compass
- Practise patience and stickability
- Practise finding the ecliptic
- Locate planets in the night sky

🕒 1-2 HOURS

MINIMAL ADULT INVOLVEMENT

DIFFICULTY: ★★★★★

YOUR MISSION

Find the ecliptic! The **ecliptic** is the imaginary line that appears to mark the Sun's annual path across our skies. It's the line that **lunar and solar eclipses** happen on – that's why it is called the ecliptic. When it is dark, the planets also appear to travel along (or very close to) this path. The ecliptic will seem to be in different places in the sky depending on where you are in the world and what time of year it is. Which planets you can see, and how bright they are, will also vary depending on the time of year and your position on Earth. Everyone, no matter where they are, should get the chance to observe all five of our nearest and brightest planets, Mercury, Venus, Mars, Jupiter and Saturn, with the naked eye, for at least one period each year.

Watching the skies and observing and identifying planets makes you an astronomer!

GET STARTED

PHASE 1:

Find a space outdoors with a good view. It will help if you're away from tall buildings, trees and any bright lights. If you're in your garden, turn the lights off in your house.

PHASE 2:

Allow at least 15 minutes for your eyes to adjust to the darkness, until you are able to see dimmer objects in the night sky.

PHASE 3:

Use your compass to find south. Mark the direction on the ground with some chalk or some sticks in daylight if it's easier. Face that way. East is now to your left and west is to your right.

PHASE 4:

Using your sky map, look for the names of the planets in our solar system. Look for the planets nearest to Earth. Mercury, Venus, Mars, Jupiter and Saturn can all be seen with the naked eye. However, they won't necessarily all be visible at the same time (see page 2). The sky map will help you locate the planets' positions on the ecliptic – for example you might need to look towards the south-east, high in the south, or low in the western sky.

YOU WILL NEED

- Your eyes
- An open space
- A sky map – try *Stellarium* on a laptop or mobile device
- Compass
- Chalk (optional)
- Sticks (optional)
- Binoculars (optional)
- Telescope and tripod (optional)

CONTINUES ON PAGE 2

PHASE 5 :

Once you've located the ecliptic and a planet to observe, compare it with the stars you see in the sky. The planet will probably be brighter and more obvious. It might even look bigger than some stars. This is because the planets are much closer to Earth than any of the stars you see. Of course, the stars are all, in reality, far bigger and brighter than any of our planets. They look smaller and dimmer because they are so far away.

PHASE 6 :

Make a mental note of where the planet appeared and go out again the following evening. Is it still in the same part of the sky? What happens over several days? Do the planets steadily move further east or west each night? Do they 'rise' earlier, or later?

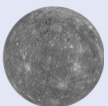
PHASE 7 :

If you have binoculars or a telescope, train them on the planet you have found. Can you see an even bigger difference in brightness and size now that the planet is magnified? If you are spotting Jupiter, you will almost certainly see it as more of a disc than a point of light. A more powerful telescope might even let you make out its stripes! Why not look for its four largest moons in a diagonal line either side of the planet (it has over 60 altogether!). These are called Ganymede, Calisto, Io and Europa. Ganymede is the largest moon in our solar system. It's bigger than the planet Mercury!

THINGS TO THINK ABOUT

- * Unlike stars, planets don't emit their own light, so why are they so bright? What do you think?
- * While you're staring up at the night sky you can take a moment or two to notice some other things. What can you hear? What can you smell? What do you feel?
- * Can you think of three different ways to record what you have observed?

For the rest of 2020, these are the times you will be most likely to see the following planets in the northern hemisphere:



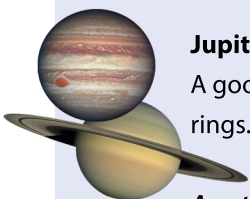
Mercury: **late May to early June**, and **mid September to early October**, low in the western sky after sunset.



Venus: **mid to late April**, very bright in the west after sunset and then setting below the horizon. It then won't be visible again until **mid July to mid August**, in the early morning sky before sunrise, so you'd need to get up very early!



Mars: **mid October to late December**, rising in the east after sunset and travelling westwards along the ecliptic. It will be brightest early in this period and appears shining like a star with a yellowy-orange colouring. Mars will also be visible from **late May to early June**, very early in the morning before sunrise, low in the south eastern sky.



Jupiter and Saturn: **mid July to mid September**, brightly visible, travelling across the sky all night from sunset. A good pair of binoculars or a telescope should permit observation of some of their brightest moons and Saturn's rings. Later in their period, Jupiter and Saturn will appear higher in the sky, earlier in the evening.

A note about planet spotting from the southern hemisphere and near the equator:

*From the southern hemisphere, the ecliptic appears in the **northern sky**, with the planets appearing to travel from right to left. From the equator, the ecliptic is more or less directly overhead.*