

GP 1 Overall grade of Excellence

Q1.a Achieved (correct term)

Q1. b, Not Achieved (not attempted, perhaps thinking of Pluto but knew was no longer planet)

Q1.c, d Achieved for both answers (recall)

Q1. e Merit (discussed different planets orbiting at different speeds and **linked** this with Earth overtaking a planet giving the appearance of the planet reversing direction)

Q2. a Merit (correctly identified Moon as having Earth's shadow cast on it reinforced with quality diagram showing convergence of light rays to cast shadow on Moon).

Q2.b Excellence (recognised that the Moon orbits the Earth and is illuminated by the Sun and specific information relating to New Moon phase).

Q2.c Not Achieved (recognised that the Moon rotates but had the period of rotation wrong and did not mention orbit of earth by Moon).

Q2.d Not Achieved (1 planet incorrect)

Q2.e Excellence (due to diagram showing the Earth orbiting the Sun, the Earth's tilt and comment of tilt of Earth's axis being 90 degrees to the Sun).

Q3.a Excellence (contrasted specific types of information from both types of devices).

Q3.b Achieved (specific valid example given ie radio telescope)

Summary: Excellence standard met

You are advised to spend 20 minutes answering the

A.P.I. (E)

QUESTION ONE: THE SOLAR SYSTEM

- (a) What name is given to the curved path that a planet takes :

orbit

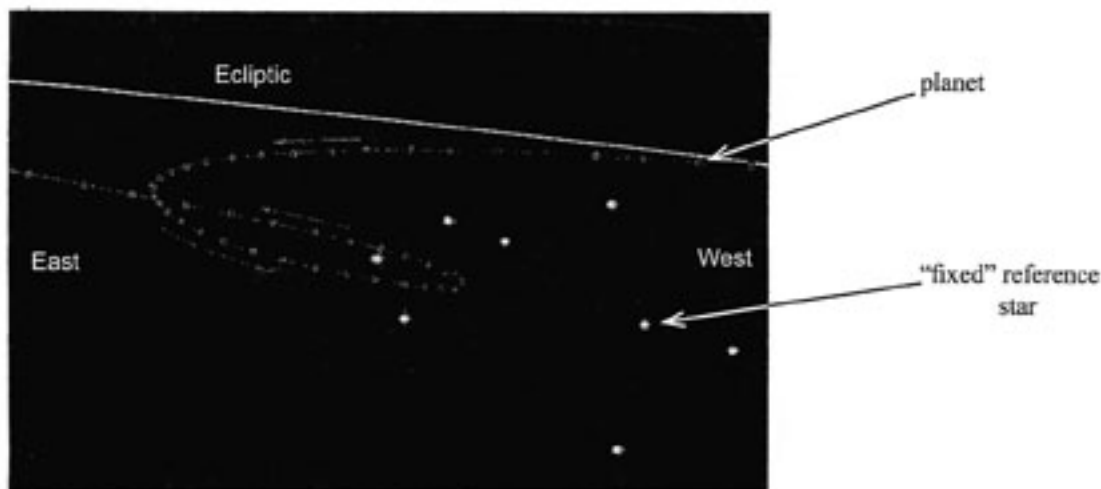
- (b) Name the planet whose path around the Sun is **not** in the same plane as all the other planets.

~~##~~

- (c) Name the largest planet in our solar system.

Jupiter

All planets travel around the Sun in the same direction. Sometimes, a planet viewed from Earth appears to have reversed its direction of motion, as shown in the diagram below.



- (d) Name the term used to describe the motion of a planet as shown in the above diagram.

retrograde motion

- (e) Explain why a planet when viewed from Earth appears to have reversed its direction of motion.

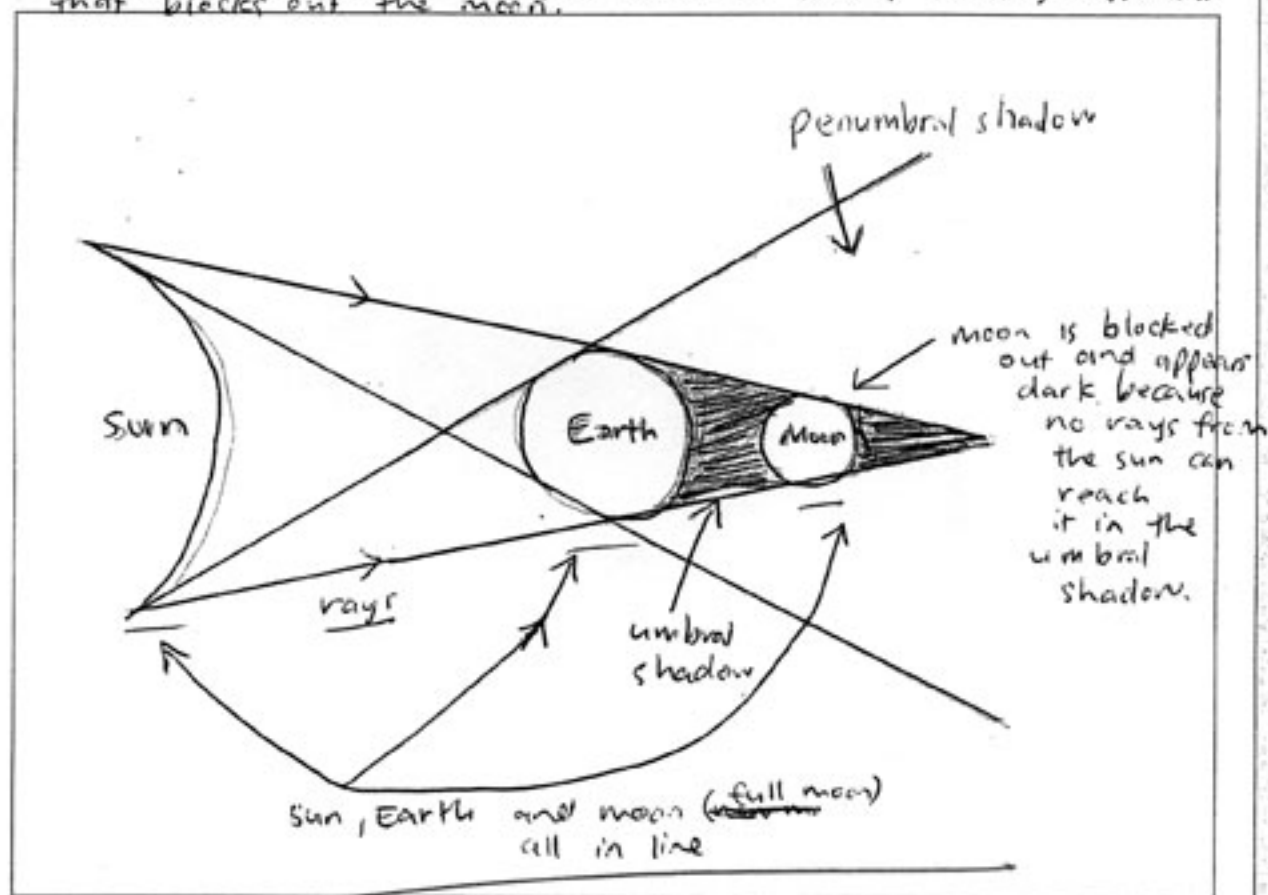
Planets further out than Earth have a slower and longer orbit speed than Earth because Earth is closer to the sun. Planets appear to travel in an easterly direction around the sun but for a few weeks when the planet is closest to the sun it appears to move in ~~reverse~~ reverse because Earth is catching up and overtaking the planet. ~~Retrograde motion~~ This is called retrograde motion and is caused by the difference in orbit speeds.

QUESTION TWO: MOONS

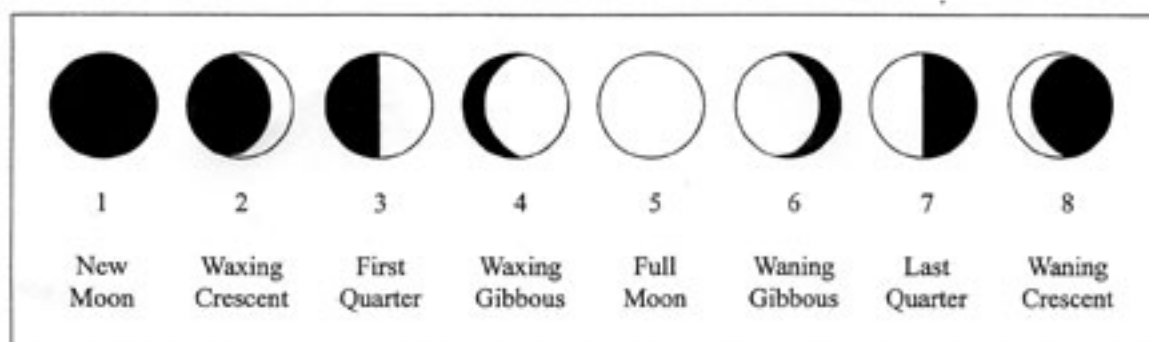
Assessor's
use only

- (a) Explain what causes an eclipse of the Moon. A diagram should be included in the space provided below.

An eclipse of the moon occurs when ~~a full~~ the Earth passes between the sun and the moon, this occurs at ~~first~~ a full moon. The Earth casts ~~a shadow~~ two kinds of shadows onto the moon, the umbra where no rays from the sun can reach the moon ~~and it is very dark and~~ completely blocks out the moon and the penumbra where only some rays can reach this shadow is lighter and less dense than the umbra. A lunar eclipse is caused when the sun, earth, and moon all line up creating a shadow that blocks out the moon.



- (b) The following diagram illustrates the phases of the Moon.



Discuss the cause of the Moon's phases.

The moon has phases because it travels in an orbit around Earth and spins on its axis. The different phases occur because in their different positions during the orbit the sun lights up different sides of them.

For example when there is a new moon, the moon is between the sun and Earth and therefore the sun lights up the side closest to it and the other side is dark (this is how it appears from earth).

~~the moon is~~ Whereas at a full moon the ~~sun lights~~ Earth is between the sun and moon so the side seen by Earth is lit up and the other side is dark.

- (c) Explain why the same side of the Moon always faces the Earth.

Because the moon spins on its axis every 24 hours and the so does the Earth ~~so~~ but the moon is seen at night and therefore we only see half of the moon's revolutions ^(12 hrs). We see the same part of the revolution each day. // no mention of orbit

- (d) Name THREE planets, other than the Earth, that have moons.

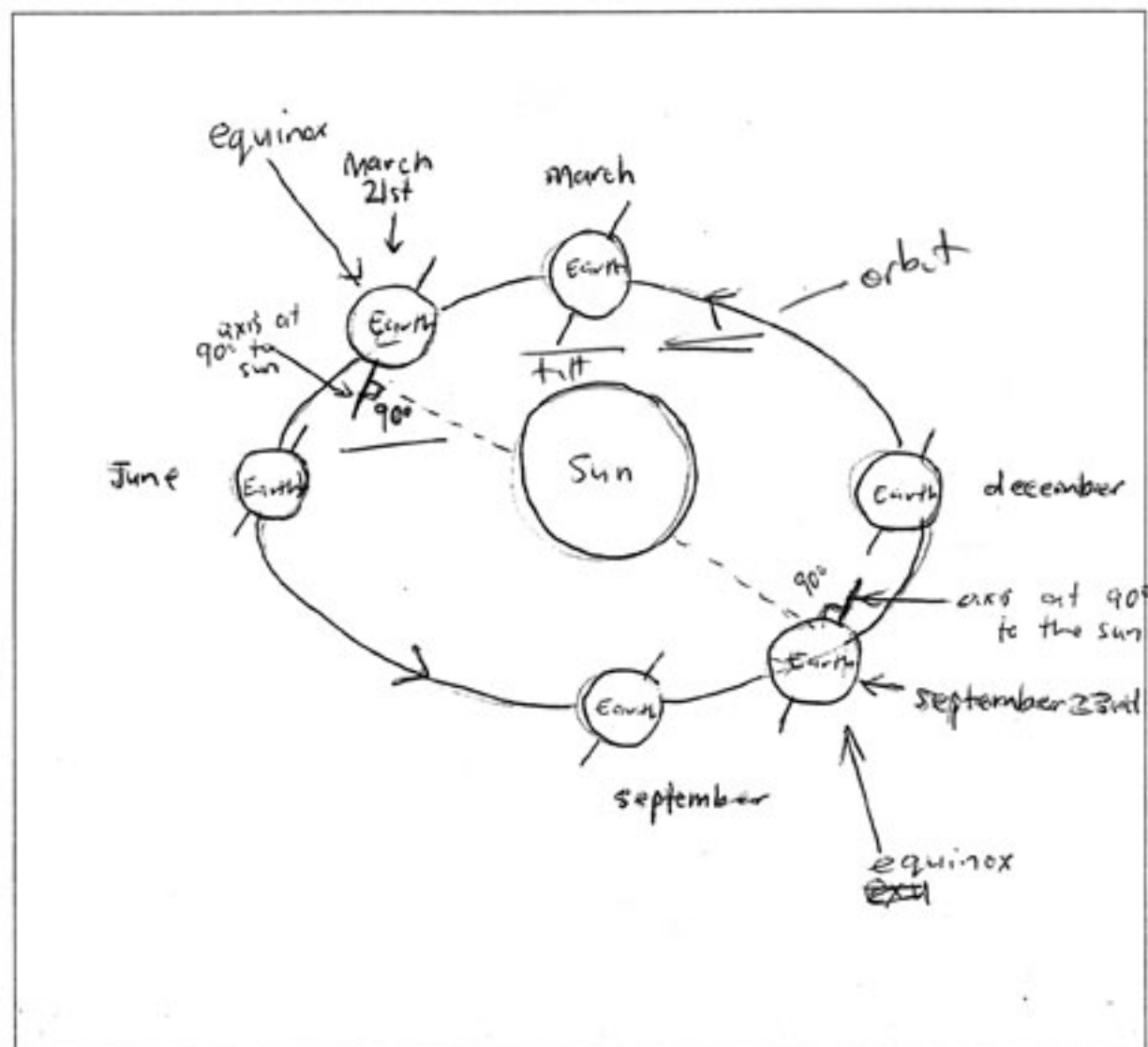
(i) Mars

(ii) Venus incorrect

(iii) Saturn

An equinox is when day and night are of equal length. There are two equinoxes in a year. One equinox occurs in spring, and the other in autumn.

- (c) Use the position and movement of the Earth to discuss **how** and **why** the two equinoxes occur. On the 21st of March and the 23rd of September the equinoxes occur this is when ~~the~~ day and night is exactly 12 hrs each (equal length). The equinoxes occur because at this point of the year the tilt of the Earth's axis is ~~exactly~~ at 90° to the sun therefore one rotation of the Earth on its axis will be exactly the same length because both sides of the Earth ~~are~~ get the same amount of sun. This occurs twice a year. This happens in autumn and spring because both sides of the earth are ~~at~~ tilted towards the sun at this time



QUESTION THREE: SPACE EXPLORATION

Scientists use a variety of methods to gather information about the solar system.

- (a) Compare and contrast the type of information gathered by **space orbiters**, such as the Mars Reconnaissance Orbiter, and Earth-based **light telescopes**.

The ~~isq~~ information gathered by space orbiters ~~is~~ is more specific than ~~light~~ Earth-based light telescopes because they are actually up in space. They allow detailed descriptions of what ~~is~~ space is like for example the Mars Reconnaissance orbiter collects information about ~~the~~ what Mars looks like, its atmosphere, its surface etc. whereas an Earth-based telescope such as ~~lense or ref~~ refracting telescope or a reflecting telescope gather information about constellations of stars and positions of planets. They do this by collecting the light from space and focusing it. Space orbiters gather ~~info~~ specific information about the make up of planets, Earth-based telescopes gather information about ~~se~~ star and planet positions.

- (b) State ONE **other** method used to gather information about the solar system.

~~reflecting~~ radio telescope