Year 9 Science: Stars, planets and moons: our place in the universe

Name: _____ Date: _____

Try these without your notes first, then check the answer key.

Practice

1. Venus is often the brightest point in the evening sky after sunset. Is it a star or a planet, and how do you know it does not make its own light?

2. Titan orbits Saturn and is bigger than the planet Mercury. Which group does Titan belong to, and why does its size not matter?

3. A friend says the Moon only comes out at night. Give two pieces of evidence that this is wrong.

4. Mars is on average about 228 million km from the Sun. How long does sunlight take to reach Mars, in minutes?

5. Matariki rises together and keeps the same shape every year. Explain why it cannot be a group of planets.

Fix the mistake

6. Correct this statement: "The Moon glows at night because it makes its own light."

7. Correct this statement: "The phases happen because Earth's shadow covers part of the Moon."

8. Correct this statement: "The Sun cannot be a star because it is far bigger and brighter than the stars at night."

9. Correct this statement: "Titan is bigger than Mercury, so Titan must be a planet."

Answer key (for parents and tutors)

1. Venus is often the brightest point in the evening sky after sunset. Is it a star or a planet, and how do you know it does not make its own light?
   A planet. It shines steadily, it drifts against the stars over weeks, and it only shines because sunlight reflects off its clouds.
2. Titan orbits Saturn and is bigger than the planet Mercury. Which group does Titan belong to, and why does its size not matter?
   A moon. The group depends on what it orbits, and Titan orbits a planet, not the Sun directly.
3. A friend says the Moon only comes out at night. Give two pieces of evidence that this is wrong.
   The Moon is often seen in a blue afternoon sky near first quarter and in the morning sky near last quarter, and it can be up at night or in the day depending on its phase.
4. Mars is on average about 228 million km from the Sun. How long does sunlight take to reach Mars, in minutes?
   228,000,000 ÷ 300,000 = 760 s, and 760 ÷ 60 = about 12.7 minutes.
5. Matariki rises together and keeps the same shape every year. Explain why it cannot be a group of planets.
   Matariki is a cluster of stars. Planets each wander across the sky at their own pace, so a group of them would not keep a fixed shape year after year.
6. Correct this statement: "The Moon glows at night because it makes its own light."
   The Moon is grey rock that only reflects sunlight, which is why we see just the part of it facing the Sun.
7. Correct this statement: "The phases happen because Earth's shadow covers part of the Moon."
   Phases come from how much of the Moon's sunlit half faces us as it orbits; Earth's shadow only falls on the Moon in a lunar eclipse.
8. Correct this statement: "The Sun cannot be a star because it is far bigger and brighter than the stars at night."
   The Sun is a star that looks bigger and brighter only because it is about 8 light-minutes away, while the next star is over 4 light-years away.
9. Correct this statement: "Titan is bigger than Mercury, so Titan must be a planet."
   The group depends on what an object orbits, not its size, and Titan orbits Saturn, so it is a moon.