

**Stars and planets**

In space there are many stars and many planets.

**To do**

Fill in the boxes to answer the questions:

* What do stars and planets have in common?
* How are they different?

Is the Sun a star or a planet?

*Explain your answer*

*Physics > Big idea PES: Earth in space> Topic PES1: Solar System and beyond > Key concept PES1.3: Night sky, stars and galaxies*

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| **Response activity** |
| **Stars and planets** |

**Overview**

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| Learning focus: | The Sun is one of billions of stars in our galaxy and our galaxy is one of many billions of galaxies in the universe. |
| Observable learning outcome: | * Identify the Sun as a star |
| Activity type: | Response, application and practice - problem |
| Key words: | Planet, star |

This activity can help develop students’ understanding by addressing the sticking-points revealed by the following diagnostic question:

* Diagnostic question: The Sun

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| **P** | **PRIOR UNDERSTANDING**  This activity explores ideas that are usually taught at age 5-11, to aid transition from earlier stages of learning. |

**What does the research say?**

In a study only about half of 10- and 11-year-olds (n=42) realised that the Sun is a star and three-quarters described the Sun as a huge ball of fire (Sharp, 1996). Around three-quarters also thought of stars as round or ‘star-shaped’ (with five points), but they were not aware of the stars position in space or their movement. The misunderstanding, that the Sun is different to the stars, is persistent and just 55% of adults identify the Sun as a star (Lightman, Miller and Leadbetter, 1989).

This activity challenges students’ ideas about what the Sun is. By identifying the characteristics of both stars and planets, students compare the Sun to the descriptions of each in order to form a more general understanding of stars that includes the Sun.

**Ways to use this activity**

This activity gives students the opportunity to practise applying their understanding and to clarify their thinking through discussion. To support this, students should answer the question in pairs or small groups.

Listening to individual groups as they work often highlights any difficulties they might have. These can often be overcome, through a whole class clarification or redirection part way through the activity.

Asking students to share their answer is a useful check. After a group has fed back, it might be helpful to model an even better answer. You could do this, for example, by asking another group to add to, or clarify, the first observation. Then ask another group to sum up the important part of the observation, and so on.

*Differentiation*

If some students are working with a teaching assistant, then a list of prompt questions for the TA could help to make this activity more purposeful.

**Expected answers**

Similarities might include: spherical, visible in the night sky, found in space

Differences of stars might include: give out heat and light, usually much bigger than planets, form patterns (constellations) in the night sky

Differences of planets might include: orbit stars (including but not exclusively the Sun), do not give out light, reflect light, much smaller than stars, may support life

**Acknowledgments**

Developed by Peter Fairhurst (UYSEG).

Images: Stars: NASA/European Space Agency/Space Telescope Science Institute/Association of Universities for Research in Astronomy. Planets: NASA's Goddard Space Flight Center. Jupiter image courtesy of NASA. Venus image courtesy of Mattias Malmer.

**References**

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Lightman, A. P., Miller, J. D. and Leadbetter, J. B. (1989). Contemporary cosmological beliefs. *Second International Seminar: Misconceptions and Educational Strategies in Science and Mathematics.* Cornell University, Ithaca, N.Y.

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