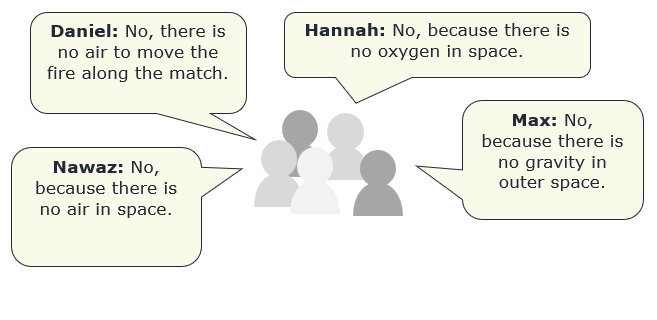
**Matches in space**

1. Some students answer the question, “Can a match burn in space?”

Who do you agree with, and why?



*Chemistry > Big idea CCR: Chemical reactions > Topic CCR2: Understanding reactions > Key concept CCR2.2: Combustion*

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| --- |
| **Diagnostic question** |
| **Matches in space** |

**Overview**

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| Learning focus: | During combustion new products are formed from the combination of oxygen with the fuel, resulting in an increase in measured mass. |
| Observable learning outcome: | Recognise that burning requires oxygen. |
| Question type: | talking heads |
| Key words: | air, oxygen |

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

**What does the research say?**

Research described in Children’s Ideas in Science found that, when asked whether a match would burn in outer space, about 20% of children made links with a perceived lack of gravity. This was thought to have been due to these children associating air and gravity.

Most children appreciated that air was a mixture of gases and that oxygen was one of these gases.

When asked why, if gently blown, a bunch of glowing splints would burn more brightly, about a third of children did recognise that air or oxygen was needed for burning but their suggested functions for the air were varied.

**Ways to use this question**

This task is intended for discussion in pairs or small groups. It can be done as a pencil and paper exercise or projected onto a screen.

Students should read the statements and follow the instructions on either the worksheet or the PowerPoint. Listening in to the conversations of each group will often give you insights into how your students are thinking. Each member of a group should be able to report back to the class.

Feedback from each group can be used, with careful teacher questioning, to bring out a clear description or explanation of the science.

*Differentiation*

The quality of the discussions may be improved with a careful selection of groups; or by allocating specific roles to students in each group. For example, you may choose to select a student with strong prior knowledge as the scribe. They may question the others and only write down what they have been told. This strategy encourages contributions from more members of each group.

**Expected answers**

Hannah and Nawaz are both correct.

**How to respond - what next?**

A student agreeing with Max may have correctly recalled information about gravity but may not understood that it is oxygen is necessary for burning.

A student agreeing with Daniel may have correctly recalled that air is needed for burning but may have misunderstood why.

If students have misunderstandings about the requirement for oxygen for burning then these should be considered in further planning for teaching the topic. Diagnostic question “Oxygen need” may be used to explore these misunderstandings further.

**Acknowledgments**

Developed by Helen Harden (UYSEG), from an idea described in Children’s Ideas in Science (Driver, Guesne and Tiberghien, 1985)

Images: None

**References**

Driver, R., Guesne, E. and Tiberghien, A. (1985). *Children's Ideas in Science,* Milton Keynes, UK: Open University Press.