

**GCSE Physics B (Twenty First Century Science)**  
**J259/02** Depth in physics (Foundation Tier)

**Question Set 31**

1 James is an astronomer and he observes light from distant galaxies on Earth.

The diagram shows the spectral lines of hydrogen in the visible part of the electromagnetic spectrum, as seen on Earth, and for two galaxies at different distances away from Earth.

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(a) James makes a conclusion from this data.

Complete the sentences to finish James's conclusion.

Use words from the list.

You can use each word once, more than once, or not at all.

further nearer more less red blue

wavelength frequency faster slower

The further away the galaxies are from Earth, the more the spectral lines are shifted towards the red end of the spectrum.

This suggests that the wavelength of the light coming from galaxies further away is stretched. I can conclude that more distant galaxies must be moving away from the Earth faster, than galaxies that are closer to Earth, which suggests that the universe is expanding. [4]

(b) James discovers a new galaxy and writes an article about it in a scientific journal.

Before it is published it must be peer reviewed.

Explain why and how the article is peer reviewed.

The work is checked by other scientists to see if it is correct. [2]

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