

# Edexcel IGCSE Physics

## 8 - Stellar Evolution and Cosmology (Physics Only)

### Flashcards

This work by [PMT Education](https://www.pmt.education) is licensed under [CC BY-NC-ND 4.0](https://creativecommons.org/licenses/by-nc-nd/4.0/)



What is the name of the scale that measures brightness of a star for a fixed distance so it becomes independent of distance?



What is the name of the scale that measures brightness of a star for a fixed distance so it becomes independent of distance?

Absolute Magnitude



Stars can be classified in HR diagram. What do the axes of the HR diagrams represent?



Stars can be classified in HR diagram. What do the axes of the HR diagrams represent?

X axis : decreasing temperature

Y axis : Absolute magnitude / Luminosity



Star A has absolute magnitude of  $-3$ , star B has  $1$ .  
Which star has the highest luminosity?



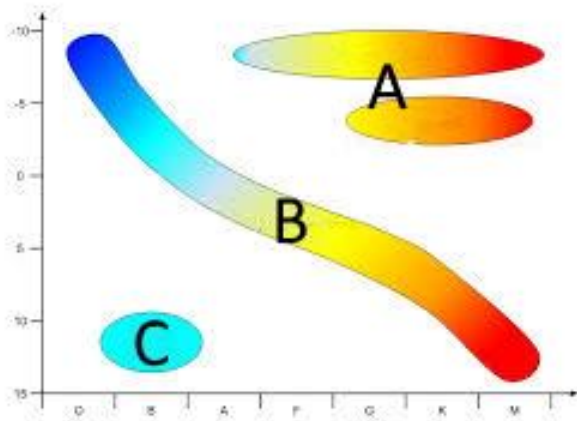
Star A has absolute magnitude of  $-3$ , star B has  $1$ .  
Which star has the highest luminosity?

Star A.

Absolute Magnitude has an inverted scale.

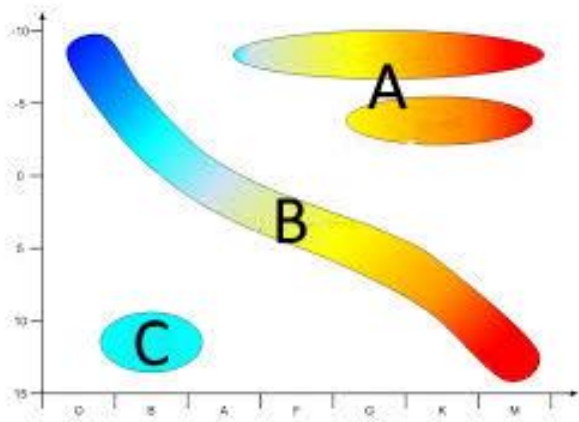


For the HR diagram given below, state which type of stars each letter represent.





For the HR diagram given below, state which type of stars each letter represent.



- A: Red Giant/Supergiant
- B: Main Sequence
- C: White Dwarf



# Summarise the Big Bang Theory.



# Summarise the Big Bang Theory

According to the Big Bang Theory, the universe expanded from a very small dense point about 14 billion years ago



Give two pieces of evidence that support the  
Big Bang Theory



# Give two pieces of evidence that support the Big Bang Theory

- Cosmic Microwave Background Radiation(CMB)
- Redshift of distant galaxies.



# Explain how the evidence supporting the Big Bang Theory works



# Explain how the evidence supporting the Big Bang Theory works

## **CMBR**

- Cosmic microwave background radiation that comes from all directions in space. It is the leftover thermal energy from the Big Bang.

## **Red Shift**

- The further away a galaxy is, the greater its red shift, hence the faster it's moving away. This shows that the universe and space itself is expanding.



Explain what is meant by redshift.





Explain what is meant by redshift.

When a galaxy (or a star) is travelling away from the Earth, wavelength of the light emitted by the object increases therefore it shifts towards the red end of the visible light spectrum.



Explain what is meant by blueshift.



## Explain what is meant by blueshift

When an object is travelling towards the Earth, wavelength of the light emitted by the object decreases therefore it shifts towards the blue end of the visible light spectrum.



How is observed frequency and observed wavelength affected by

- Redshift?
- Blueshift?



How is observed frequency and observed wavelength affected by A. Redshift? B. Blueshift?

- In redshift, observed wavelength increases and observed frequency increases.
- In blueshift, observed wavelength decreases and observed frequency decreases.
- This is due to wave speed being constant for the same medium and  $v = \lambda \times f$



State an equation linking “change in wavelength”, reference wavelength, recessional speed of galaxy and speed of light



State an equation linking “change in wavelength”, reference wavelength, recessional speed of galaxy and speed of light

$$\frac{\textit{change in wavelength}}{\textit{reference wavelength}} = \frac{\textit{velocity of galaxy}}{\textit{speed of light}}$$

$$\frac{\Delta\lambda}{\lambda_0} = \frac{v}{c}$$



Explain how redshift observations from distant galaxies supports the Big Bang Theory.





## Explain how redshift observations from distant galaxies supports Big Bang Theory

Observations show distant galaxies show greater redshift. This means that distant galaxies are moving away faster. So all galaxies are moving away from each other therefore the Universe and space is expanding.

