

Haileybury Turnford A-Level Physics Summer Work

****For Students Entering Year 12 in September 2025****

Topics Covered: Electricity (GCSE review), Astrophysics research

Part 1: Multiple Choice Questions — Electricity (GCSE Recap)

1. What is the unit of resistance?
 - A) Ampere
 - B) Ohm
 - C) Volt
 - D) Watt
2. Which equation correctly links voltage (V), current (I), and resistance (R)?
 - A) $V = I \times R$
 - B) $R = I \times V$
 - C) $I = V \times R$
 - D) $V = R \div I$
3. A 2.0 A current flows through a 6.0 Ω resistor. What is the potential difference across the resistor?
 - A) 3.0 V
 - B) 8.0 V
 - C) 12.0 V
 - D) 0.33 V
4. In a series circuit, the total resistance is:
 - A) The same as the largest resistor
 - B) Less than the smallest resistor
 - C) The sum of all the resistors
 - D) Calculated using the reciprocal rule
5. What happens to the current in a parallel circuit when more branches are added?
 - A) It increases
 - B) It decreases

- C) It stays the same
 - D) It becomes zero
6. The current through a component is 0.50 A for 10 seconds. How much charge flows?
- A) 0.05 C
 - B) 5.0 C
 - C) 20 C
 - D) 0.2 C
7. Which of the following appliances has the highest power rating?
- A) 60 W lamp
 - B) 3 kW kettle
 - C) 500 W microwave
 - D) 1.2 kW hairdryer
8. The frequency of the UK mains electricity supply is:
- A) 60 Hz
 - B) 100 Hz
 - C) 230 V
 - D) 50 Hz
9. What is the function of the earth wire in a plug?
- A) Provides energy to the appliance
 - B) Carries current during normal operation
 - C) Prevents overheating
 - D) Carries current to the ground if a fault occurs
10. Which statement about Ohmic conductors is correct?
- A) They obey Ohm's Law at all temperatures
 - B) Their resistance increases with current
 - C) The current through them is not proportional to the potential difference
 - D) They have a constant resistance at constant temperature

Part 2: Research Essay — The Life Cycle of a Star

Task:

Write an essay of approximately 500–700 words explaining the life cycle of a star, including how a star's mass affects its evolution and final fate.

Your essay must include:

- - The formation of a star from a nebula
- - How nuclear fusion begins
- - The stages of a main sequence star
- - The difference between the life cycles of low-mass and high-mass stars
- - End stages such as white dwarfs, neutron stars, and black holes
- - The role of supernovae and the creation of heavier elements

You should:

- Include diagrams or labelled sketches if helpful
- Use scientific vocabulary accurately
- Reference at least one reliable source, e.g. a science textbook, NASA website, or BBC Bitesize

Submission Instructions

- Please bring your completed MCQs and printed essay to your first Year 12 Physics lesson in September.
- If typed, make sure your name is on the essay.
- Your work will be discussed in the first week to support a smooth start to A-Level Physics.