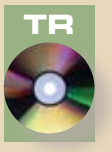
FROM IDEAS TO IMPLEMENTATION: REVIEW QUESTIONS



Verb scaffolds
Working with verbs
Sample answers and marking criteria

Working with the HSC verbs

1. Define the 'photoelectric effect'.
2. Identify two physical properties of a superconductor.
3. Describe two major differences between classical physics and quantum physics.
4. Outline the experimental procedure that can be used to demonstrate that cathode rays carry momentum.
5. Identify two advantages of solid state devices over thermionic devices.
6. German physicist Heinrich Hertz was the first person to produce and investigate the properties of radiowaves. Outline the experimental procedure used by Hertz to determine the speed of the radiowaves produced.
7. Superconductors are able to exclude external magnetic fields, a phenomenon known as the Meissner effect. Account for this.
8. Justify the decrease in resistance when silicon is doped with phosphorus or when it is heated.
9. Cathode rays demonstrate wave-particle duality.
   (a) State two properties that characterise cathode rays as waves.
   (b) State two properties that characterise cathode rays as particles.
10. Compare the conduction of electricity in a P-type semiconductor to that in a N-type semiconductor.
11. Discuss Einstein and Planck's views on the relationship and link between science and political forces.
12. With the aid of a diagram, describe how the BCS theory is used to explain superconductivity.
13. Discuss the importance of scientific experiments on validating physic theories and scientific thinking.
14. Analyse how the ability to produce and manipulate cathode rays has led to the development of cathode ray oscilloscopes.
15. The results of a well set up scientific experiment are the most effective way of settling a debate in the scientific community regarding a particular physics phenomenon. Discuss this statement using Thomson's experiment as an example.
16. The Physics Nobel Prize-winning discovery, the photoelectric effect, has had profound impacts on the development of modern technologies. Analyse the application of the photoelectric effect in photo cells and solar cells.
17. Assess the impact of the uses of superconductors on society and the environment.
18. Assess the impact of gaining understanding of black body radiation and the discovery of photoelectric effect on scientific thinking in the 20th century.
19. Evaluate the impact advances in the ability to manipulate semiconductors have had on society.
20. Even the most complicated technology starts with a simple idea. Analyse how colour TV, computers, solar cells and maglev trains are all based on a simple idea.