

Term 2 and 3

Year 9 Science Curriculum Overview – Terms 2 and 3

Welcome to the Year 9 Science curriculum overview for Terms 2 and 3. As students transition into their GCSE studies, they will begin following the AQA GCSE Science curriculum. This term, students will focus on foundational units in Biology, Chemistry, and Physics to build essential knowledge and skills for their exams. Below is an outline of the topics your child will study.

Biology: Unit 1 – Cell Biology

In this unit, students will explore the fundamental building blocks of life, developing a deeper understanding of cells and their functions.

1. Cell Structure and Function

- Students will learn about the structure of prokaryotic and eukaryotic cells, comparing plant, animal, and bacterial cells.
- Key cell structures, such as the nucleus, mitochondria, chloroplasts, and cell membranes, will be studied in detail.

2. Microscopy

- Students will explore how microscopes are used to study cells, including the differences between light and electron microscopes.
- They will calculate magnification and practice preparing and observing specimens under a microscope.

3. Cell Division

- This section introduces mitosis and the cell cycle, focusing on their importance in growth, repair, and reproduction.
- Students will also learn about the role of stem cells in medicine and their potential applications.

4. Transport in Cells

- Students will study diffusion, osmosis, and active transport as processes by which substances move in and out of cells.
 - Practical activities will reinforce these concepts, such as investigating osmosis in plant tissue.
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Physics: Unit 1 – Energy

In this unit, students will explore different energy stores, how energy is transferred, and the importance of sustainable energy resources.

1. Energy Stores and Transfers

- Students will learn about the main energy stores (e.g., kinetic, thermal, chemical) and how energy is transferred between them.

- They will study systems and pathways, including mechanical, electrical, heating, and radiation transfers.
 - 2. Thermal Conductivity**
 - Students will explore the concept of thermal conductivity and how it influences the rate of heat transfer in different materials.
 - Practical activities will include investigating insulation and understanding how thermal conductivity is important in energy conservation in buildings and appliances.
 - 3. Energy Resources**
 - Students will explore renewable and non-renewable energy resources, including fossil fuels, solar, wind, and nuclear energy.
 - They will discuss the environmental impacts of energy use and evaluate the importance of transitioning to sustainable energy sources.
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Chemistry: Unit 9 – Chemistry of the Atmosphere

This unit focuses on the composition and evolution of Earth's atmosphere, as well as the impact of human activities on the environment.

- 1. Evolution of the Atmosphere**
 - Students will learn about the changes in Earth's atmosphere over time, from its early volcanic state to its current composition.
 - They will explore the roles of photosynthesis and geological processes in shaping the modern atmosphere.
 - 2. Composition of the Atmosphere**
 - Students will study the main gases in the atmosphere, including nitrogen, oxygen, carbon dioxide, and trace gases, and their relative proportions.
 - 3. Human Impacts on the Atmosphere**
 - This section covers human activities that contribute to air pollution and global warming, such as burning fossil fuels and deforestation.
 - Students will learn about pollutants like carbon monoxide, sulfur dioxide, and particulates, and their effects on health and the environment.
 - 4. The Greenhouse Effect and Climate Change**
 - Students will study the enhanced greenhouse effect, focusing on the science behind global warming and its consequences.
 - They will evaluate strategies for mitigating climate change, such as reducing carbon footprints and adopting renewable energy.
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Assessment and Skills Development

Throughout Terms 2 and 3, students will develop critical scientific skills, including data analysis, practical investigations, and application of mathematical concepts to science. They will conduct hands-on activities, such as observing cells under a microscope, investigating

heat transfer, and modeling atmospheric changes. Assessments will include regular quizzes, practical evaluations, and end-of-term tests to track progress and understanding.

We are excited to support your child as they begin their GCSE journey!