



Course Outline

Biology Year 10

Inspiring excellence, empowering global minds

Overview

The Edexcel IGCSE Biology Syllabus at GEMS Wesgreen International Secondary School provides students with a solid foundation in the biological sciences, equipping them with essential knowledge and skills to understand the intricate workings of living organisms and their environments. This internationally recognized qualification covers a diverse range of topics, including cell biology, genetics, ecology, and human physiology, while fostering scientific inquiry through practical laboratory work. Students gain a deep appreciation for the natural world, its complexities, and the ethical considerations surrounding modern biological advancements. Edexcel Biology IGCSE prepares learners for further academic pursuits and encourages a lifelong fascination with the wonders of the living world.

Learning Outcomes

- Learn about unifying patterns and themes in biology and use them in new and changing situations
- Acquire knowledge and understanding of biological facts, terminology, concepts, principles, and practical techniques
- Apply the principles and concepts of biology, including those related to the applications of biology, to different contexts
- Evaluate biological information, making judgments on the basis of this information
- Appreciate the practical nature of biology, developing experimental and investigative skills based on correct and safe laboratory techniques
 - Analyze, interpret, and evaluate data and experimental methods, drawing conclusions that are consistent with evidence from experimental activities and suggesting possible improvements and further investigations
 - Recognize the importance of accurate experimental work and reporting scientific methods in biology
 - Select, organize, and present relevant information clearly and logically using appropriate vocabulary, definitions, and conventions
 - Develop a logical approach to problem-solving in a wider context
 - Select and apply appropriate areas of mathematics relevant to biology as set out under each topic
 - Prepare for more advanced courses in biology and for other courses that require knowledge of biology.

Topic Overviews

Term 1

Organisms and Life Processes

Approximate length: 14 hours

In this topic, students will explore an enormous variety of living organisms. Biologists put them into groups according to their structure and function. The members of each group have certain features in common. The students will also explore the cell structure of plants and animals. They will explore the variety of biological molecules present in the living world. The students will then study how different substances get transported across the cells.

Specific objectives with the Edexcel syllabus covered:

- Unit 1a. Life Process
- Unit 1b. Variety of living organisms
- Unit 2a. Level of organization
- Unit 2b. Cell structure
- Unit 2c. Biological molecules
- Unit 2d. Movement of substances in and out of the cells

Term 2**Plant Physiology****Approximate length: 6 hours**

In this topic, students will describe how plants make food by photosynthesis. Photosynthesis requires water from the roots to be transported to the leaves, and sugars and other products of photosynthesis to be transported away from the leaves to the rest of the plant. This chapter explains how these materials are moved through the plant and gas exchange through stomata. They also explore the process of respiration.

Specific objectives with the Edexcel syllabus covered:

- Unit 2e. Nutrition in plants (Plant and Food)
- Unit 2f. Respiration
- Unit 2g. Plant and food: Gas exchange in Flowering Plants
- Unit 2h. Transport in Flowering Plants

Animal Physiology**Approximate length: 16 hours**

In this topic, students will learn that Food is essential for life. The nutrients obtained from food are used many different ways by the body. This chapter looks at the different kinds of food, and how the food is broken down by the digestive system and absorbed by the blood so that it can be used by all the tissues of the body. They will also study how we breathe in, how air is moved in and out of the lungs so that gas exchange can take place between the air and the blood. This chapter looks at these processes, and also deals with some ways that smoking can damage the lungs and stop these vital organs from working properly. They also explore how blood gets circulated around the body.

Specific objectives with the Edexcel syllabus covered:

- Unit 2e. Nutrition in animals (Food and digestion)
- Unit 2g. Gas exchange in animals
- Unit 2h. Transport in animals

Term 3**Plant Physiology****Approximate length: 8 hours**

In this topic, students will focus on the excretory products of plants. They will also explore the process of excretion in plants. The students will then learn about the ways plants can detect changes in their environment and respond to them, but the responses are much slower than those of animals. This is because movements in a plant are brought about by changes in the plant's growth. This chapter is about these growth responses and the chemicals that coordinate them. Plants, like animals, can reproduce sexually and asexually. The sexual organs of a flowering plant are its flowers, which produce pollen and ovules containing the flower's gametes. This chapter looks at both types of reproduction and flowering plants.

Specific objectives with the Edexcel syllabus covered:

- Unit 2i. Excretion in plants
- Unit 2j. Co-ordination and response in plants
- Unit 3a. Reproduction in plants

Animal Physiology**Approximate length: 12 hours**

In this topic, students will learn about the excretory products of animals. They learn that kidneys are involved in the process of excretion through nephrons. They will also explore the fact that animals respond to their stimuli through central nervous system, reflex arc and sense organs. In this chapter, they look at the structure and function of the eye. The body has a second coordination system, which does not involve nerves. This is the endocrine system. It consists of organs called endocrine glands, which make chemical messenger substances called hormones. Hormones are carried in the bloodstream. The students will also explore that the characteristics of living organisms are passed on from their parents to the offsprings. This is done through special sex cells or gametes. In this chapter, we also look at the differences between sexual and asexual reproduction and study in detail the process of human reproduction.

Specific objectives with the Edexcel syllabus covered:

- Unit 2i. Excretion in animals
- Unit 2j. Co-ordination and response in animals
- Unit 3a. Reproduction in animals

Textbooks: Pearson Edexcel GCSE (9-1) Biology Student book.

Assessment

Formative: Throughout the chapters, the students will complete end of chapter assessments, quizzes and problem-solving activities which will allow the teacher to assess the students' progress and inform their planning.

Summative: At the end of each term, we will complete internal assessments which will be based on certain units. There will also be Mid-term, End of term and End of year assessments conducted. This allows us to measure the students' attainment throughout the term and year.