

BIOLOGY

UNITS 1 & 2

SUBJECT OVERVIEW

In Units 1 and 2 Biology, students learn about how life is sustained at cellular, systems, and species levels. Students learn about cells and cellular interactions, the inheritance of genetic traits, and how the scientific method and ethical considerations apply to biological concepts.

UNIT 1 DESCRIPTION

Students learn about cells as the base unit of life and the requirements for sustaining life. Students discover how substances cross the membrane of cells, and focus on cell growth, replacement and cell death, and how stem cells differentiate into a range of cell types. They explore systems in vascular plants and animals and learn about homeostasis for maintaining a healthy life. Students learn to design and run an investigation and present their findings in a scientific poster.

UNIT 2 DESCRIPTION

Students learn the fundamental concepts of genetics and inheritance in living things. They investigate reproductive strategies, survival through adaptations and regulation, and relationships between organisms within an ecosystem. They explore how ethics and biology are intertwined and investigate a contemporary bioethical issue.

WHAT KNOWLEDGE & SKILLS WILL I BUILD?

- Investigation design and communication
- Critical and creative thinking
- Bioethical analysis
- Collaborative teamwork in practical activities
- Mathematical knowledge in science

HOW WILL I BE ASSESSED IN THIS SUBJECT?

- Logbook of practical activities and application of knowledge
- Analysis of secondary data
- Scientific poster
- Case study analysis
- Problem solving
- Bioethical presentations
- Coursework
- Exams

WHAT ELSE DO I NEED TO KNOW?

- This subject involves many practical activities.

BIOLOGY

UNITS 3 & 4

SUBJECT OVERVIEW

Students learn about the process of gene to protein, then expand their knowledge to genetic manipulation. They apply this to cellular processes. Students learn about human immunity and evolution over time.

UNIT 3 DESCRIPTION

Students explore the relationship between nucleic acids and proteins, and how small changes to DNA can have significant repercussions. Students learn about a variety of methods used to manipulate DNA in modern science, agriculture, and society. They learn about cellular processes of photosynthesis and respiration. They analyse the societal, biological, and ethical impacts of DNA modification across a range of topics.

UNIT 4 DESCRIPTION

Students learn about the continual changes and challenges to life on Earth. They study the human immune system and responses to pathogens, and consider how modern science has changed immunity. Students learn about human evolution and how a range of techniques, including DNA analysis, can be used to identify evolutionary relationships between species.

WHAT KNOWLEDGE & SKILLS WILL I BUILD?

- Investigation design and communication
- Critical and creative thinking
- Bioethical analysis
- Collaborative teamwork in practical activities
- Mathematical knowledge in science

HOW WILL I BE ASSESSED IN THIS SUBJECT?

- Investigation design and communication
- Critical and creative thinking
- Bioethical analysis
- Collaborative teamwork in practical activities
- Mathematical knowledge in science

WHAT TYPES OF FURTHER STUDY OR CAREERS COULD THIS SUBJECT LEAD TO?

- Health care: nursing, medicine, and dentistry
- Botany and agriculture
- Biotechnology
- Genetics
- Microbiology
- Education

WHAT ELSE DO I NEED TO KNOW?

- This subject involves many practical activities.

CHEMISTRY

UNITS 1 & 2

SUBJECT OVERVIEW

In Units 1 and 2 Chemistry, students learn about the diversity of materials from an atomic and molecular level, and learn about the unique properties of water. Students analyse different types of chemical reactions and their applications to real life.

UNIT 1 DESCRIPTION

Students study the chemical structures of materials and explain their properties and reactions. They learn how materials are quantified and classified. Students gain a deeper understanding of the elements of the periodic table and structures of metals and ionic compounds. They learn to separate and identify mixtures and compounds.

UNIT 2 DESCRIPTION

Students learn how chemicals interact with water and how chemicals are measured and analysed. They explore a range of reactions including acid-base and redox reactions. They measure solubility and concentration of various solutions, conduct analyses of acids and bases and measure gases. Students learn to design, run and communicate a scientific investigation.

WHAT KNOWLEDGE & SKILLS WILL I BUILD?

- Investigation design and communication
- Critical and creative thinking
- Collaborative teamwork in practical activities
- Mathematical knowledge in science

HOW WILL I BE ASSESSED IN THIS SUBJECT?

- Logbook of practical activities and application of knowledge
- Scientific poster
- Problem solving
- Coursework
- Exams

WHAT ELSE DO I NEED TO KNOW?

- This subject involves many practical activities.

CHEMISTRY

UNITS 3 & 4

SUBJECT OVERVIEW

Students learn sources of energy and fuels, and the impacts various fuels have on the environment. Students deepen their understanding of reactions and chemical laws. They learn about the uniqueness and significance of carbon and its place in organic chemistry, and investigate organic compounds in food.

UNIT 3 DESCRIPTION

Students explore different types of fuels and the environmental impacts of different methods for obtaining energy from fuels. They investigate the rate and extent of chemical reactions, the production of chemicals by electrolysis and rechargeable batteries.

UNIT 4 DESCRIPTION

Students learn about and analyse the structure and nomenclature of organic compounds, including their categories, properties and reactions. They investigate key food molecules, the metabolism of food in the human body, and the energy content of food. Students design, run and communicate a scientific investigation.

WHAT KNOWLEDGE & SKILLS WILL I BUILD?

- Investigation design and communication
- Critical and creative thinking
- Collaborative teamwork in practical activities
- Mathematical knowledge in science

HOW WILL I BE ASSESSED IN THIS SUBJECT?

- Analysis of secondary data
- Logbook of practical activities
- Scientific poster
- Coursework
- End of year exam

WHAT TYPES OF FURTHER STUDY OR CAREERS COULD THIS SUBJECT LEAD TO?

- Health care: nursing, medicine, and dentistry
- Pharmacy
- Agriculture and environmental studies
- Food technology and dietetics
- Engineering

WHAT ELSE DO I NEED TO KNOW?

- This subject involves many practical activities.

PHYSICS



UNITS 1 & 2

SUBJECT OVERVIEW

Students explore matter and energy interactions to understand the underlying laws of nature. They learn about heat, electricity and the origins and formations of matter, as well as explore a range of models and theories about the laws of the universe.

UNIT 1 DESCRIPTION

Students learn about interactions of light and heat, and apply this knowledge to real life observations like rainbows and mirages. They explore how electricity can be used to transfer energy, looking at electromagnetic radiation, thermal energy, radiation from the nucleus, and nuclear energy. They learn about circuit electricity and electrical safety in the home.

UNIT 2 DESCRIPTION

Students study the concepts used to model motion, including forces and energy. They apply mathematical concepts to conceptualise and display graphs of motion. Students explore how physics informs contemporary issues and applications in society across a range of issues. They design and run their own investigations and communicate the findings.

WHAT KNOWLEDGE & SKILLS WILL I BUILD?

- Investigation design and methodology
- Scientific communication
- Critical and creative thinking
- Understanding of ethical issues
- Application and extension of mathematical knowledge

HOW WILL I BE ASSESSED IN THIS SUBJECT?

- Logbook of practical activities
- Analysis of data
- Modelling and simulation of scenarios
- Problem-solving activities
- Coursework
- Exams

WHAT ELSE DO I NEED TO KNOW?

- This subject involves practical activities.
- This subject requires a thorough grasp of mathematical skills such as solving algebraic and linear equations, displaying real life scenarios as mathematical concepts, and reading, drawing and interpreting graphs.

PHYSICS

UNITS 3 & 4

SUBJECT OVERVIEW

Students deepen their understanding of the importance of energy in explaining and describing the physical world. Students examine the production of electricity and its delivery to homes. They explore wave and particle theories of light and matter.

UNIT 3 DESCRIPTION

Students deepen their understanding of the importance of energy in explaining and describing the physical world. Students examine the production of electricity and its delivery to homes. They explore wave and particle theories of light and matter.

UNIT 4 DESCRIPTION

Students learn about the impact of Physics on humanity's understanding of the earth and universe. They learn how understanding of light, matter and motion have changed over time, and explore Einstein's view of the Universe. They design and conduct a scientific investigation about fields, motion or light, and communicate their findings.

WHAT KNOWLEDGE & SKILLS WILL I BUILD?

- Investigation design and methodology
- Scientific communication
- Critical and creative thinking
- Understanding of ethical issues
- Application and extension of mathematical knowledge

HOW WILL I BE ASSESSED IN THIS SUBJECT?

- Logbook of practical activities
- Analysis of data
- Modelling and simulation of scenarios
- Problem-solving activities
- Coursework
- Exams

WHAT TYPES OF FURTHER STUDY OR CAREERS COULD THIS SUBJECT LEAD TO?

- Physicist
- Engineer
- Medical radiographer
- Astronomer
- Meteorology
- Architect
- Avionics

WHAT ELSE DO I NEED TO KNOW?

- This subject involves practical activities.
- This subject requires a thorough grasp of mathematical skills such as solving algebraic and linear equations, displaying real life scenarios as mathematical concepts, and reading, drawing and interpreting graphs.

PSYCHOLOGY

UNITS 1 & 2



SUBJECT OVERVIEW

Students explore how people think, feel and behave through a biopsychosocial approach, and learn about connections between the brain and behaviour. Students investigate a range of psychological models and theories across the history of Psychology.

UNIT 1 DESCRIPTION

Students explore how biological, psychological and social factors interact to contribute to a person's psychological development. They learn about concepts of normality and neurotypicality and how development is defined and influenced by culture. Students learn about brain structure and function, and explore neuroplasticity as the result of experience and brain trauma. Students develop a research question and conduct an investigation.

UNIT 2 DESCRIPTION

Students explore the interaction of psychological and social factors that influence identity and behaviour of individuals and groups. They learn about cognitive bias, stereotype and prejudice. They extend their understanding of the brain and perception to learn about visual perception and illusions. Students conduct a survey or investigation and analyse the results.

WHAT KNOWLEDGE & SKILLS WILL I BUILD?

- Investigation design and communication
- Ethical considerations
- Critical and creative thinking

HOW WILL I BE ASSESSED IN THIS SUBJECT?

- Research reports
- Case studies
- Data analysis
- Practical activities
- Coursework
- Exams

WHAT ELSE DO I NEED TO KNOW?

- This subject involves practical activities.

PSYCHOLOGY

UNITS 3 & 4



SUBJECT OVERVIEW

Students learn about the nervous system and impacts of stress on the body and brain. They explore connections between memory and learning. They learn about sleep and and mental wellbeing.

UNIT 3 DESCRIPTION

Students learn about the different branches and components of the nervous system, and the effect of neurotransmitters and neuromodulators on brain activity. They explore current research about the connections between gut bacteria and brain activity. Students investigate memory and learning, and analyse different models of each.

UNIT 4 DESCRIPTION

Students focus on sleep as an example of an altered state of consciousness and how sleep demands change over the span of life. They analyse the effects of sleep deprivation on cognitive functioning and mental wellbeing. They also investigate other internal and external factors that influence mental wellbeing over time. Students design, conduct and communicate findings from their own investigation.

WHAT KNOWLEDGE & SKILLS WILL I BUILD?

- Investigation design and communication
- Ethical considerations
- Critical and creative thinking

HOW WILL I BE ASSESSED IN THIS SUBJECT?

- Research reports
- Case studies
- Data analysis
- Practical activities
- Coursework
- Exams

WHAT TYPES OF FURTHER STUDY OR CAREERS COULD THIS SUBJECT LEAD TO?

- Psychology – clinical and social
- Applied psychology – environmental, health, and organisational
- Counselling and mental health care
- Education
- Forensic psychology
- Sport psychology

WHAT ELSE DO I NEED TO KNOW?

- This subject involves practical activities.