

Year 8 – Science 2024

| TERM 1 | | |
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| | <p>Elements, Compounds and Chemical Change: In this topic, students will learn about the periodic table and the differences between elements and compounds. Students will research the applications of elements and compounds used in daily life. Students will also learn about states of matter and the characteristics of physical and chemical changes.</p> | |
| | UNIT OVERVIEW | ASSESSMENT |
| <p>TIMING Weeks: 10</p> | <ul style="list-style-type: none"> • Describe the properties and uses of some common elements, including metals and non-metals • Explain why internationally recognised symbols are used for common elements • Identify how our understanding of the structure and properties of elements has changed as a result of some technological devices • Identify some examples of common compounds • Describe at a particle level the difference between elements, compounds and mixtures, including the type and arrangement of particles • Investigate how people in different cultures in the past have applied their knowledge of the properties of elements and compounds to their use in everyday life, e.g., utensils, weapons and tools • Identify when a chemical change is taking place by observing a change in temperature, the appearance of new substances or the disappearance of an original substance • Demonstrate that a chemical change involves substances reacting to form new substances • Investigate some examples of chemical change that occur in everyday life, e.g., photosynthesis, respiration and chemical weathering • Compare physical and chemical changes in terms of the arrangement of particles and reversibility of the process • Propose reasons why society should support scientific research, e.g., in the development of new pharmaceuticals and polymers • Investigate how the chemical properties of a substance will affect its use, e.g., flammability and ability to corrode | <p>Task Number: 1</p> <p>Nature of Task: Practical Examination</p> <p>Percentage: 40</p> <p>Week: 10</p> <p>Reported: Semester 1</p> |

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| TERM 2 | | |
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| | <p>Ecology: In this topic students look at the interactions between living organisms, investigate food chains, food webs and ecosystems. Additionally, students will explore the human impacts on ecosystems and how technology and scientific understanding can protect ecosystems and reduce the effects of natural environmental events.</p> | |
| TIMING Weeks: 5 | <p>UNIT OVERVIEW</p> <ul style="list-style-type: none"> • Construct and interpret food chains and food webs, including examples from Australian ecosystems • Describe interactions between organisms in food chains and food webs, including producers, consumers and decomposers • Explain how the features of some Australian plants and animals are adaptations for survival and reproduction in their environment • Describe examples of beneficial and harmful effects that micro-organisms can have on living things and the environment • Predict how human activities can affect interactions in food chains and food webs, including examples from Australian land or marine ecosystems • Identify that water is an important resource that cycles through the environment • Explain the water cycle in terms of the physical processes involved • Demonstrate how scientific knowledge of the water cycle has influenced the development of household, industrial and agricultural water management practices • Explain, using examples, how scientific evidence and/or technological developments contribute to developing solutions to manage the impact of natural events on Australian ecosystems • Describe how scientific knowledge has influenced the development of practices in agriculture, e.g., animal husbandry or crop cultivation to improve yields and sustainability, or the effect of plant-cloning techniques in horticulture | <p>ASSESSMENT</p> <p>Task Number: 2</p> <p>Nature of Task: Semester 1 Examination</p> <p>Percentage: 60</p> <p>Week: 4 and 5</p> <p>Reported: Semester 1</p> |
| | <p>Energy: Energy appears in different forms including movement (kinetic energy), heat and potential energy, and causes change within systems. Science and technology contribute to finding solutions to a range of contemporary issues; these solutions may impact on other areas of society and involve ethical considerations. In this topic, students will learn about the different types of energy and their uses in our everyday lives. Students will investigate energy transformations and conversions making relevant observations.</p> | |
| TIMING Weeks: 5 | <p>UNIT OVERVIEW</p> <ul style="list-style-type: none"> • Identify objects that possess energy because of their motion (kinetic) or because of other properties (potential) • Describe the transfer of heat energy by conduction, convection and radiation, including situations in which each occurs • Relate electricity with energy transfer in a simple circuit • Construct and draw circuits containing a number of components to show a transfer of electricity • Investigate some everyday energy transformations that cause change within systems, including motion, electricity, heat, sound and light • Identify that most energy conversions are inefficient and lead to the production of heat energy, e.g., in light bulbs • Research ways in which scientific knowledge and technological developments have led to finding a solution to a contemporary issue, e.g., improvements in devices to increase the efficiency of energy transfers or conversions • Discuss the implications for society and the environment of some solutions to increase the efficiency of energy conversions by reducing the production of heat energy | <p>ASSESSMENT</p> |

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TERM 3

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| | <p>Student Research Project: In this topic, students will carry out a first-hand investigation in class. They will write a scientific report including all relevant sections. They will conduct a fair test changing only one variable at a time, controlling all other factors. They will gather and analyse a set of primary and secondary data. Students will work both independently and in groups to conduct the investigation.</p> | |
| TIMING Weeks: 3 | UNIT OVERVIEW | ASSESSMENT |
| | <p>Students will write a scientific report that includes the following sections:</p> <ul style="list-style-type: none"> • Aim • Hypothesis • Method • Variables • Results including drawing relevant graphs and tables • Discussion • Conclusion | <p>Task Number: 3 Nature of Task: Student Research Project Percentage: 50 Week: 4 Reported: Semester 2</p> |
| TIMING Weeks: 7 | <p>The Earth and its Resources: In this topic, students learn about the structure of earth and its physical and chemical forces that shape the Earth’s landforms. This chapter will introduce students to a range of common rock types. They will classify rocks by using properties they can observe such as colour, lustre, structure, and hardness. Students will describe the difference between igneous, sedimentary, and metamorphic rock, explain their formation and construct a diagram of the rock cycle. They will also learn about weathering processes, erosion and sedimentation.</p> | |
| | UNIT OVERVIEW | ASSESSMENT |
| | <ul style="list-style-type: none"> • Describe the structure of the Earth in terms of core, mantle, crust and lithosphere • Relate the formation of a range of landforms to physical and chemical weathering, erosion, and deposition • Outline the origins of and relationships between sedimentary, igneous and metamorphic rocks • Classify a variety of common rocks and minerals into groups according to their observable properties • Describe the conditions under which fossils form • Outline how geological history can be interpreted in a sequence of horizontal sedimentary layers, in which the oldest are at the base and the youngest at the top • Describe examples to show how people use understanding and skills from across the disciplines of science in occupations related to the exploration, mining or processing of minerals in Australia • Classify a range of the Earth's resources as renewable or non-renewable • Outline features of some non-renewable resources, including metal ores and fossil fuels • Describe uses of a variety of natural and made resources extracted from the biosphere, atmosphere, lithosphere, and hydrosphere • Investigate some strategies used by people to conserve and manage non-renewable resources, e.g., recycling and the alternative use of natural and made resources • Discuss different viewpoints people may use to weight criteria in making decisions about the use of a major non-renewable resource found in Australia • Outline the choices that need to be made when considering whether to use scientific and technological advances to obtain a resource from Earth's spheres • Describe some methods used by scientists to determine the relative age of rock layers | |

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TERM 4

Organ Systems and Disease: This topic is about multicellular organisms and how they function at their optimal levels. Students learn how multicellular organisms have specialized organs and systems to carry out different jobs within the body. Students develop their understanding about the significance of reproduction in the continuity of species

UNIT OVERVIEW

- Identify the materials required by multicellular organisms for the processes of respiration and photosynthesis
- Explain that the systems in multicellular organisms work together to provide cell requirements, including gases, nutrients, and water, and to remove cell wastes
- Outline the role of cell division in growth, repair and reproduction in multicellular organisms
- Describe the role of the flower, root, stem and leaf in maintaining flowering plants as functioning organisms
- Describe the role of the digestive, circulatory, excretory, skeletal/muscular and respiratory systems in maintaining a human as a functioning multicellular organism
- Outline the role of the reproductive system in humans
- Research an example of how changes in scientific knowledge have contributed to finding a solution to a human health issue
- Recount how evidence from a scientific discovery has changed understanding and contributed to solving a real-world problem, e.g., animal or plant disease, hygiene, food preservation, sewage treatment or biotechnology
- Describe, using examples, how developments in technology have contributed to finding solutions to a contemporary issue, e.g., organ transplantation, artificial joints/limbs, treatment for diabetes, asthma, kidney, or heart disease
- Give examples to show that groups of people in society may use or weigh criteria differently in making decisions about the application of a solution to a contemporary issue, e.g., organ transplantation, control and prevention of diseases and dietary deficiencies
- Describe how people in occupations that involve the biological sciences use understanding and skills from across the disciplines of science

ASSESSMENT

Task Number: 4
 Nature of Task:
 Semester 2
 Examination
 Percentage: 50
 Week: 5
 Reported:
 Semester 2

TIMING
 Weeks: 10