

Note:

- Students should be given opportunities to develop their understanding and application of Ways of working through the experiments and investigations within each unit.
- The first unit overview (Forensics — Introduction to investigative processes) specifically identifies how the Ways of working may be enacted within a unit of work.
- An extended experimental investigation (EEI) would be a suitable assessment for use with these units. An EEI would provide students with the opportunity to demonstrate the Ways of working.
- When using Knowledge and understanding from Science as a human endeavour, use it with Knowledge and understanding from one or more of the other organisers. This helps situate science in real-world contexts.

Year level/s:	8				
Time allocation	Unit title	Targeted <i>Essential Learnings</i>		Unit overview topics	Assessable elements Assessment instruments and techniques
Approximately 4 weeks	Forensics — introduction to investigative processes	Ways of working Students are able to: <ul style="list-style-type: none"> • identify problems and issues, formulate scientific questions and design investigations • plan investigations guided by scientific concepts and design and carry out fair tests • research and analyse data, information and evidence • evaluate data, information and evidence to identify connections, construct arguments and link results to theory • select and use scientific equipment and technologies to enhance the reliability and accuracy of data collected in investigations 	Knowledge and understanding Natural and processed materials <ul style="list-style-type: none"> • Matter can be classified according to its structure. 	This unit primarily introduces students to the Ways of working. Initially students are given simple crime scenarios allowing them to: <ul style="list-style-type: none"> • distinguish between observation and inference develop a hypothesis based on observations • interpret evidence to determine whether a hypothesis is correct. Students then begin to gather their own first-hand evidence using appropriate equipment and technologies including: <ul style="list-style-type: none"> • fingerprinting • casts • chromatography. 	Assessable elements: <ul style="list-style-type: none"> • Investigating • Communicating • Reflecting Assessment instruments and techniques: “Who done it?” — analysis of crime scene scenario Students are provided with a crime scene scenario and associated evidence. If the evidence is second-hand, the students analyse it to determine the guilty party. Alternatively, the students gather their own evidence to solve the crime.



		<ul style="list-style-type: none"> • conduct and apply safety audits and identify and manage risks • draw conclusions that summarise and explain patterns, and that are consistent with the data and respond to the question • communicate scientific ideas, explanations, conclusions, decisions and data, using scientific argument and terminology, in appropriate formats • reflect on different perspectives and evaluate the influence of people’s values and culture on the applications of science • reflect on learning, apply new understandings and justify future applications. 			
Approximately 6 weeks	Understanding matter	<p>Ways of working Students are able to:</p> <ul style="list-style-type: none"> • research and analyse data, information and evidence • evaluate data, information and evidence to identify connections, construct arguments and link results to theory • draw conclusions that summarise and explain patterns, and that are consistent with the data and respond to the question. 	<p>Knowledge and understanding Natural and processed materials</p> <ul style="list-style-type: none"> • Changes in physical properties of substances can be explained using the particle model. • Matter can be classified according to its structure. <p>Energy and change</p> <ul style="list-style-type: none"> • Energy can be transferred from one medium to another. 	<p>This unit develops an understanding of the properties of different states of matter and the theory scientists use to explain the differences.</p> <p>Our universe is made up of matter that can be classified in a number of different ways.</p> <p>States of matter (solids, liquids and gases) provide one classification: Properties include shape, volume, compressibility.</p> <p>Scientists use a scientific model called the particle model to understand the structure of matter:</p> <p>The main difference between the states of matter is the distances and forces between particles, and</p>	<p>Assessable elements:</p> <ul style="list-style-type: none"> • Knowledge and understanding • Investigating • Communicating • Reflecting <p>Assessment instruments and techniques: Supervised assessment</p>

				<p>the energy of the particles.</p> <ul style="list-style-type: none"> Energy is involved when matter changes from one state to a different state. 	
<p>Approximately 6 weeks</p>	<p>Diversity of living things</p>	<p>Ways of working Students are able to:</p> <ul style="list-style-type: none"> select and use scientific equipment and technologies to enhance the reliability and accuracy of data collected in investigations conduct and apply safety audits and identify and manage risks communicate scientific ideas, explanations, conclusions, decisions and data, using scientific argument and terminology, in appropriate formats reflect on different perspectives and evaluate the influence of people's values and culture on the applications of science. 	<p>Knowledge and understanding Life and living</p> <ul style="list-style-type: none"> Complex organisms depend on interacting body systems to meet their needs internally and with respect to their environment. The diversity of plants and animals can be explained using the theory of evolution through natural selection. <p>Science as a human endeavour</p> <ul style="list-style-type: none"> Responsible, ethical and informed decisions about social priorities often require the application of scientific understanding. 	<p>This unit investigates the basic unit of all living things — the cell. It involves using a microscope to observe components of the cell and some of the differences between plant and animal cells. Cells may be specialised in order to perform specific functions:</p> <ul style="list-style-type: none"> cellular material including cell membrane, cell wall, nucleus, vacuole and cytoplasm interactions between and functions of various components of the cell differences between plants and animals observation of unicellular organisms differences between cells in different tissue. <p>The diversity of living is great so scientists have developed a system of classifying living things based on their characteristics. This classification system continues to change as more detailed information about living things becomes available:</p> <ul style="list-style-type: none"> basis of classification systems from six kingdoms to three domains diversity of living things from unicellular to multicellular and relationships between groups. <p>An understanding of micro-organisms has led to an</p>	<p>Assessable elements:</p> <ul style="list-style-type: none"> Knowledge and understanding Communicating Reflecting <p>Assessment instruments and techniques:</p> <ul style="list-style-type: none"> Make a model of a cell accompanied by a PowerPoint presentation or a poster describing the different organelles and their function. Research how vaccines were discovered and used, and present this electronically.



				<p>understanding of disease and how it is transmitted. It has also led to the development of vaccines:</p> <ul style="list-style-type: none"> • bacteria, infections and vaccines. 	
<p>Approximately 4 weeks</p>	<p>Our place in the universe</p>	<p>Ways of working Students are able to:</p> <ul style="list-style-type: none"> • research and analyse data, information and evidence • evaluate data, information and evidence to identify connections, construct arguments and link results to theory • draw conclusions that summarise and explain patterns, and that are consistent with the data and respond to the question • communicate scientific ideas, explanations, conclusions, decisions and data, using scientific argument and terminology, in appropriate formats • reflect on different perspectives and evaluate the influence of people's values and culture on the applications of science • reflect on learning, apply new understandings and justify future applications. 	<p>Knowledge and understanding Earth and beyond</p> <ul style="list-style-type: none"> • Scientific ideas and theories offer explanations about the earth that extend to the origins of the universe. • Global patterns of change on earth and in its atmosphere can be predicted and modelled. <p>Science as a human endeavour</p> <ul style="list-style-type: none"> • People from different cultures contribute to and shape the development of science. 	<p>This unit explores how scientific understanding of the universe have changed over time and the contribution made to current understanding by different scientists.</p> <p>Solar system:</p> <ul style="list-style-type: none"> • formation of the solar system • changing understandings of the Earth's place in the solar system • rocky planets • moons, satellites, comets, meteorites. <p>Different cultures have interpreted and used astronomical events in a variety of ways. Understanding of patterns and cycles have developed and so predictions about future events can also be made:</p> <ul style="list-style-type: none"> • phases of the moon • seasons • tides • eclipses. <p>Indigenous understanding:</p> <ul style="list-style-type: none"> • formation of the earth • seasons. 	<p>Assessable elements:</p> <ul style="list-style-type: none"> • Knowledge and understanding • Investigating • Communicating • Reflecting <p>Assessment instruments and techniques:</p> <p>Report on a global cycle, how it affects our lives and future predicted events related to that cycle.</p>

<p>Approximately 4 weeks</p>	<p>The heat is on</p>	<p>Ways of working Students are able to:</p> <ul style="list-style-type: none"> • identify problems and issues, formulate scientific questions and design investigations • research and analyse data, information and evidence • evaluate data, information and evidence to identify connections, construct arguments and link results to theory • select and use scientific equipment and technologies to enhance the reliability and accuracy of data collected in investigations • conduct and apply safety audits and identify and manage risks • draw conclusions that summarise and explain patterns, and that are consistent with the data and respond to the question • communicate scientific ideas, explanations, conclusions, decisions and data, using scientific argument and terminology, in appropriate formats • reflect on different perspectives and evaluate the influence of people's values and culture on the applications of science • reflect on learning, apply new understandings and justify future applications. 	<p>Knowledge and understanding Energy and change</p> <ul style="list-style-type: none"> • Energy can be transferred from one medium to another. • Transfer of energy can vary according to the medium in which it travels. • Energy is conserved when it is transferred or transformed. <p>Science as a human endeavour</p> <ul style="list-style-type: none"> • Responsible, ethical and informed decisions about social priorities often require the application of scientific understanding. 	<p>This unit investigates heat energy and how it is transferred and transformed. It investigates the different methods by which heat energy is transferred and compares the ability of different material to conduct heat. The concept of energy efficiency is considered.</p> <p>Energy:</p> <ul style="list-style-type: none"> • measuring temperature and temperature scales • heat energy • transformation between different forms of energy • law of conservation of energy • energy efficiency. <p>Transfer of heat energy:</p> <ul style="list-style-type: none"> • conduction, convection, radiation • particle model • conductors and insulators. <p>Energy use and related environmental consequences are addressed.</p> <p>Saving energy:</p> <ul style="list-style-type: none"> • alternate energy sources • renewable and non-renewable sources • energy-efficient devices. 	<p>Assessable elements:</p> <ul style="list-style-type: none"> • Knowledge and understanding • Investigating • Communicating • Reflecting <p>Assessment instruments and techniques:</p> <p>Design and report on an energy-efficient home which uses a minimal amount of energy.</p> <p>Consider:</p> <ul style="list-style-type: none"> • renewable and non-renewable sources • passive heating and cooling • types of construction materials • aspect/orientation of the house • type of insulation • energy efficient appliances • sources of heating and cooling.
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<p>Approximately 4 weeks</p>	<p>The changing Earth</p>	<p>Ways of working Students are able to:</p> <ul style="list-style-type: none"> • research and analyse data, information and evidence • evaluate data, information and evidence to identify connections, construct arguments and link results to theory • draw conclusions that summarise and explain patterns, and that are consistent with the data and respond to the question • communicate scientific ideas, explanations, conclusions, decisions and data, using scientific argument and terminology, in appropriate formats • reflect on different perspectives and evaluate the influence of people's values and culture on the applications of science. 	<p>Knowledge and understanding Earth and beyond</p> <ul style="list-style-type: none"> • Global patterns of change on Earth and in its atmosphere can be predicted and modelled. • Geological evidence can be interpreted to provide information about past and present events. <p>Natural and processed materials</p> <ul style="list-style-type: none"> • Matter can be classified according to its structure. <p>Science as a human endeavour</p> <ul style="list-style-type: none"> • Immediate and long-term consequences of human activity can be predicted by considering past and present events. 	<p>This unit focuses on the earth, its structures and materials. It considers how scientists use information gained from volcanoes and earth movements to develop scientific theories about the structure of the earth:</p> <ul style="list-style-type: none"> • layers of the earth • volcanoes. <p>The cycle of change from one rock type to another and the information provided by rocks and fossils is used to interpret geological events. Rock classification is also studied. The impact of human activity on the surface of the earth and consequences of this activity are also considered.</p> <ul style="list-style-type: none"> • Types of rocks: <ul style="list-style-type: none"> – formation and structure – igneous, sedimentary, metamorphic • Fossils • Rock cycle: <ul style="list-style-type: none"> – weathering and erosion – human impact changing the earth's surface (erosion, mining). 	<p>Assessable elements:</p> <ul style="list-style-type: none"> • Knowledge and understanding • Communicating <p>Assessment instruments and techniques:</p> <p>Supervised assessment</p>
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<p>Approximately 4 weeks</p>	<p>Machines</p>	<p>Ways of working Students are able to:</p> <ul style="list-style-type: none"> • identify problems and issues, formulate scientific questions and design investigations • plan investigations guided by scientific concepts and design and carry out fair tests • evaluate data, information and evidence to identify connections, construct arguments and link results to theory • select and use scientific equipment and technologies to enhance the reliability and accuracy of data collected in investigations • conduct and apply safety audits and identify and manage risks • draw conclusions that summarise and explain patterns, and that are consistent with the data and respond to the question • communicate scientific ideas, explanations, conclusions, decisions and data, using scientific argument and terminology, in appropriate formats • reflect on learning, apply new understandings and justify future applications. 	<p>Knowledge and understanding Energy and change</p> <ul style="list-style-type: none"> • An unbalanced force acting on a body results in a change in motion. • Objects remain stationary or in constant motion under the influence of balanced forces. • Energy can be transferred from one medium to another. 	<p>This unit investigates to application of forces in simple machines and toys.</p> <p>Forces:</p> <ul style="list-style-type: none"> • types of forces (contact and non-contact) • conventions for drawing forces • balanced and unbalanced forces. <p>Simple machines:</p> <ul style="list-style-type: none"> • types of simple machines (inclined planes, levers, pulleys, gears) • application of forces • work. <p>Toys:</p> <ul style="list-style-type: none"> • energy sources and transfer • action and use of forces. 	<p>Assessable elements:</p> <ul style="list-style-type: none"> • Knowledge and understanding • Investigating • Communicating • Reflecting <p>Assessment instruments and techniques:</p> <ul style="list-style-type: none"> • Design and make a mouse trap racer, balloon-powered car or water-powered rocket. • Analyse the forces acting and suggest how these can be minimised or maximised.
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<p>Approximately 6 weeks</p>	<p>Living with and in water</p>	<p>Ways of working Students are able to:</p> <ul style="list-style-type: none"> • identify problems and issues, formulate scientific questions and design investigations • plan investigations guided by scientific concepts and design and carry out fair tests • research and analyse data, information and evidence • evaluate data, information and evidence to identify connections, construct arguments and link results to theory • select and use scientific equipment and technologies to enhance the reliability and accuracy of data collected in investigations • conduct and apply safety audits and identify and manage risks • draw conclusions that summarise and explain patterns, and that are consistent with the data and respond to the question • communicate scientific ideas, explanations, conclusions, decisions and data, using scientific argument and terminology, in appropriate formats • reflect on different perspectives and evaluate the influence of people's values and culture on the applications of science. 	<p>Knowledge and understanding Natural and processed materials</p> <ul style="list-style-type: none"> • Changes in physical properties of substances can be explained using the particle model. • Matter can be classified according to its structure. <p>Life and living</p> <ul style="list-style-type: none"> • In ecosystems, organisms interact with each other and their surroundings. • Changes in ecosystems have causes and consequences that may be predicted. <p>Science as a human endeavour</p> <ul style="list-style-type: none"> • Immediate and long-term consequences of human activity can be predicted by considering past and present events. • Responsible, ethical and informed decisions about social priorities often require the application of scientific understanding. 	<p>This unit considers water from a number of different perspectives — as a substance with certain properties, as ecosystem for living things and as a resource necessary for humans to survive.</p> <p>Water as a natural material:</p> <ul style="list-style-type: none"> • Water: <ul style="list-style-type: none"> – pure substance, compound, formula – solvent for a variety of substances – commonly found as part of a mixture • Using water: <ul style="list-style-type: none"> – separating mixtures – recycling water (natural and human processes) <p>Water as an ecosystem:</p> <ul style="list-style-type: none"> • Living in water: <ul style="list-style-type: none"> – diversity of water ecosystems – adaptations of organisms living in water – food chains and food webs <p>Issues related to water:</p> <ul style="list-style-type: none"> • Pollution: <ul style="list-style-type: none"> – affects of ecosystems – cleaning up the environment – dealing with water shortages. 	<p>Assessable elements:</p> <ul style="list-style-type: none"> • Knowledge and understanding • Investigating • Communicating • Reflecting <p>Assessment instruments and techniques:</p> <p>Design and perform an experiment to produce clean water from a polluted mixture.</p>
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<p>Approximately 4 weeks</p>	<p>Looking after the environment</p>	<p>Ways of working Students are able to:</p> <ul style="list-style-type: none"> • identify problems and issues, formulate scientific questions and design investigations • research and analyse data, information and evidence • evaluate data, information and evidence to identify connections, construct arguments and link results to theory • draw conclusions that summarise and explain patterns, and that are consistent with the data and respond to the question • communicate scientific ideas, explanations, conclusions, decisions and data, using scientific argument and terminology, in appropriate formats • reflect on different perspectives and evaluate the influence of people's values and culture on the applications of science. 	<p>Knowledge and understanding Science as a human endeavour</p> <ul style="list-style-type: none"> • Immediate and long-term consequences of human activity can be predicted by considering past and present events. • Responsible, ethical and informed decisions about social priorities often require the application of scientific understanding. <p>Energy and change</p> <ul style="list-style-type: none"> • Energy can be transferred from one medium to another. <p>Natural and processed materials</p> <ul style="list-style-type: none"> • Matter can be classified according to its structure. 	<p>This unit considers environmental issues and what needs to be done to protect the future. It considers the need to conserve natural resources and for individuals to take responsibility for protecting the environment. The contribution science can make to looking after the environment is a major focus.</p> <p>Energy production:</p> <ul style="list-style-type: none"> • renewable and non-renewable resources • saving energy • energy efficient appliances. <p>Recycling:</p> <ul style="list-style-type: none"> • types of waste • classifying plastics (polymers) • recycling symbols • recycling plastics, paper, organic waste • biodegradable materials. 	<p>Assessable elements:</p> <ul style="list-style-type: none"> • Knowledge and understanding • Investigating • Communicating • Reflecting <p>Assessment instruments and techniques:</p> <p>Develop an action plan to increase the amount of recycling and reduce energy usage in a local context.</p>
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Year level/s:	9				
Time allocation	Unit title	Targeted <i>Essential Learnings</i>		Unit overview topics	Assessable elements Assessment instruments and techniques
Approximately 6 weeks	Body systems	<p>Ways of working Students are able to:</p> <ul style="list-style-type: none"> • identify problems and issues, formulate scientific questions and design investigations • research and analyse data, information and evidence • evaluate data, information and evidence to identify connections, construct arguments and link results to theory • draw conclusions that summarise and explain patterns, and that are consistent with the data and respond to the question • communicate scientific ideas, explanations, conclusions, decisions and data, using scientific argument and terminology, in appropriate formats • reflect on different perspectives and evaluate the influence of people's values and culture on the applications of science • reflect on learning, apply new understandings and justify future applications. 	<p>Knowledge and understanding</p> <p>Life and living</p> <ul style="list-style-type: none"> • Complex organisms depend on interacting body systems to meet their needs internally and with respect to their environment. <p>Science as a human endeavour</p> <ul style="list-style-type: none"> • Responsible, ethical and informed decisions about social priorities often require the application of scientific understanding. • People from different cultures contribute to and shape the development of science. 	<p>This unit provides a general overview of the main systems of the human body. It considers how the systems must work together to keep us healthy.</p> <p>Two main body systems, the digestive and circulatory systems and their interactions are considered in detail. What happens when the balance is upset is also considered.</p> <p>Human body systems:</p> <ul style="list-style-type: none"> • cells and nutrition • unicellular verses multi-cellular organisms • overview of digestive, circulatory, excretory, respiratory. <p>Interacting systems:</p> <ul style="list-style-type: none"> • digestive and circulatory systems in detail • how these two systems work together. <p>Medicines:</p> <ul style="list-style-type: none"> • dealing with problems in these systems • alternative approaches to medicines, e.g. bush medicines. 	<p>Assessable elements:</p> <ul style="list-style-type: none"> • Knowledge and understanding • Investigating • Communicating • Reflecting <p>Assessment instruments and techniques:</p> <p>Report on an environmental impact on one body system, e.g. air pollution on the respiratory system, and how this affects the whole body.</p>

<p>Approximately 6 weeks</p>	<p>Cracked up</p>	<p>Ways of working Students are able to:</p> <ul style="list-style-type: none"> • research and analyse data, information and evidence • evaluate data, information and evidence to identify connections, construct arguments and link results to theory • draw conclusions that summarise and explain patterns, and that are consistent with the data and respond to the question • communicate scientific ideas, explanations, conclusions, decisions and data, using scientific argument and terminology, in appropriate formats • reflect on different perspectives and evaluate the influence of people's values and culture on the applications of science. 	<p>Knowledge and understanding Earth and beyond</p> <ul style="list-style-type: none"> • Scientific ideas and theories offer explanations about the earth that extend to the origins of the universe. • Global patterns of change on earth and in its atmosphere can be predicted and modelled. • Geological evidence can be interpreted to provide information about past and present events. <p>Life and living</p> <ul style="list-style-type: none"> • The diversity of plants and animals can be explained using the theory of evolution through natural selection. <p>Science as a human endeavour</p> <ul style="list-style-type: none"> • People from different cultures contribute to and shape the development of science. 	<p>This unit begins by looking at how the earth was formed. It revisits the structure of the earth and introduces the concept of continental drift. It considers how the geological evidence gathered by scientists over time has led to evolving theories not only about the structure of the earth but also about the evolution of living things.</p> <ul style="list-style-type: none"> • Plate tectonics: <ul style="list-style-type: none"> – early structure of the earth – continental drift – earthquakes – seismic waves, measuring earthquakes, – tectonic plates – plate boundaries – faulting and folding – tsunami • Fossil record: <ul style="list-style-type: none"> – sediment and sedimentary rock – fossil formation • Geological ages • Evolutionary theory: <ul style="list-style-type: none"> – origin of the species – development of different theories – current scientifically accepted theory and supporting evidence. 	<p>Assessable elements:</p> <ul style="list-style-type: none"> • Knowledge and understanding • Communicating • Reflecting <p>Assessment instruments and techniques:</p> <p>Supervised assessment</p>
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<p>Approximately 4 weeks</p>	<p>The birds and the bees</p>	<p>Ways of working Students are able to:</p> <ul style="list-style-type: none"> • research and analyse data, information and evidence • evaluate data, information and evidence to identify connections, construct arguments and link results to theory • draw conclusions that summarise and explain patterns, and that are consistent with the data and respond to the question • communicate scientific ideas, explanations, conclusions, decisions and data, using scientific argument and terminology, in appropriate formats. 	<p>Knowledge and understanding Life and living</p> <ul style="list-style-type: none"> • All the information required for life is a result of genetic information being passed from parent to offspring. • The diversity of plants and animals can be explained using the theory of evolution through natural selection. 	<p>This unit explores and compares reproduction which is a fundamental feature of all living things, important for the continuation of a species. The concept of genetic information in the form of DNA, genes and chromosomes is introduced. The passing on of genetic information through sexual and asexual reproduction is evaluated.</p> <p>Reproduction:</p> <ul style="list-style-type: none"> • compare asexual and sexual reproduction • human reproductive system in males and females • fertilisation and offspring development • sexually transmitted diseases • contraception • flowering plants and sexual reproduction. <p>Inheritance:</p> <ul style="list-style-type: none"> • DNA, genes and chromosomes • evolution. 	<p>Assessable elements:</p> <ul style="list-style-type: none"> • Knowledge and understanding • Investigating • Communicating <p>Assessment instruments and techniques:</p> <p>Compare and contrast reproductive systems in humans and flowering plants.</p>
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<p>Approximately 6 weeks</p>	<p>And then there was matter</p>	<p>Ways of working Students are able to:</p> <ul style="list-style-type: none"> • research and analyse data, information and evidence • evaluate data, information and evidence to identify connections, construct arguments and link results to theory • select and use scientific equipment and technologies to enhance the reliability and accuracy of data collected in investigations • conduct and apply safety audits and identify and manage risks • draw conclusions that summarise and explain patterns, and that are consistent with the data and respond to the question • communicate scientific ideas, explanations, conclusions, decisions and data, using scientific argument and terminology, in appropriate formats • reflect on different perspectives and evaluate the influence of people's values and culture on the applications of science. 	<p>Knowledge and understanding Earth and beyond</p> <ul style="list-style-type: none"> • Scientific ideas and theories offer explanations about the earth that extend to the origins of the universe. <p>Natural and processed materials</p> <ul style="list-style-type: none"> • Matter can be classified according to its structure. • Chemical reactions can be described using word and balanced equations. 	<p>This unit begins by looking at early understanding of matter and how scientists' understanding of matter developed over time. The concept of the Big Bang theory and the creation of elements will be explored.</p> <p>The periodic table provides a convenient way of understanding relationships between elements and allows predictions of properties to be made. Molecules and compounds are also considered.</p> <p>Big bang theory:</p> <ul style="list-style-type: none"> • theories of the universe depend on the amount of matter present • life of a star • nuclear reactions and element formation. <p>Matter:</p> <ul style="list-style-type: none"> • atomic structure • elements, symbols and the periodic table • metals and non-metals • molecules • compounds and formula • chemical reactions. 	<p>Assessable elements:</p> <ul style="list-style-type: none"> • Knowledge and understanding • Communicating <p>Assessment instruments and techniques:</p> <p>Supervised assessment</p>
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<p>Approximately 6 weeks</p>	<p>Fun park physics</p>	<p>Ways of working Students are able to:</p> <ul style="list-style-type: none"> • identify problems and issues, formulate scientific questions and design investigations • research and analyse data, information and evidence • evaluate data, information and evidence to identify connections, construct arguments and link results to theory • select and use scientific equipment and technologies to enhance the reliability and accuracy of data collected in investigations • conduct and apply safety audits and identify and manage risks • draw conclusions that summarise and explain patterns, and that are consistent with the data and respond to the question • communicate scientific ideas, explanations, conclusions, decisions and data, using scientific argument and terminology, in appropriate formats • reflect on learning, apply new understandings and justify future applications. 	<p>Knowledge and understanding Energy and change</p> <ul style="list-style-type: none"> • An unbalanced force acting on a body results in a change in motion. • Objects remain stationary or in constant motion under the influence of balanced forces. • Energy can be transferred from one medium to another. 	<p>This unit considers further applications of forces in different contexts. It examines the interactions of forces and energy through an examination of roller-coasters and other fun park rides.</p> <ul style="list-style-type: none"> • Roller-coasters • Electromagnets • Centre of gravity 	<p>Assessable elements:</p> <ul style="list-style-type: none"> • Knowledge and understanding • Investigating • Communicating • Reflecting <p>Assessment instruments and techniques:</p> <p>Design and conduct an experiment to measure the effects on an object when to centre of gravity is changed.</p>
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<p>Approximately 6 weeks</p>	<p>Managing natural ecosystems</p>	<p>Ways of working Students are able to:</p> <ul style="list-style-type: none"> • identify problems and issues, formulate scientific questions and design investigations • plan investigations guided by scientific concepts and design and carry out fair tests • research and analyse data, information and evidence • evaluate data, information and evidence to identify connections, construct arguments and link results to theory • draw conclusions that summarise and explain patterns, and that are consistent with the data and respond to the question • communicate scientific ideas, explanations, conclusions, decisions and data, using scientific argument and terminology, in appropriate formats • reflect on different perspectives and evaluate the influence of people's values and culture on the applications of science • reflect on learning, apply new understandings and justify future applications. 	<p>Knowledge and understanding Life and living</p> <ul style="list-style-type: none"> • In ecosystems, organisms interact with each other and their surroundings. • Changes in ecosystems have causes and consequences that may be predicted. <p>Science as a human endeavour</p> <ul style="list-style-type: none"> • Immediate and long-term consequences of human activity can be predicted by considering past and present events. • Responsible, ethical and informed decisions about social priorities often require the application of scientific understanding. <p>Energy and change</p> <ul style="list-style-type: none"> • Energy is conserved when it is transferred or transformed. 	<p>This unit focuses on the need to understand natural environments so they can be protected and managed. It considers how humans are changing the environment and the possible consequences of these changes.</p> <p>Ecosystems:</p> <ul style="list-style-type: none"> • populations • biodiversity • adaptations • relationships between organisms • habitats. <p>Food chains and food webs:</p> <ul style="list-style-type: none"> • producers, consumers, decomposers. • energy pyramids. <p>Human impact:</p> <ul style="list-style-type: none"> • endangered species • ecotourism • Indigenous understandings. 	<p>Assessable elements:</p> <ul style="list-style-type: none"> • Knowledge and understanding • Investigating • Communicating • Reflecting <p>Assessment instruments and techniques:</p> <p>Report on the effects of tourism on a particular ecosystem and how this can be minimised.</p>
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<p>Approximately 4 weeks</p>	<p>Electricity</p>	<ul style="list-style-type: none"> • Ways of working • Students are able to: • identify problems and issues, formulate scientific questions and design investigations • research and analyse data, information and evidence • evaluate data, information and evidence to identify connections, construct arguments and link results to theory • select and use scientific equipment and technologies to enhance the reliability and accuracy of data collected in investigations • conduct and apply safety audits and identify and manage risks • draw conclusions that summarise and explain patterns, and that are consistent with the data and respond to the question • communicate scientific ideas, explanations, conclusions, decisions and data, using scientific argument and terminology, in appropriate formats • reflect on different perspectives and evaluate the influence of people's values and culture on the applications of science. 	<p>Knowledge and understanding</p> <p>Energy and change</p> <ul style="list-style-type: none"> • Energy can be transferred from one medium to another. • Transfer of energy can vary according to the medium in which it travels. • Energy is conserved when it is transferred or transformed. <p>Science as a human endeavour</p> <ul style="list-style-type: none"> • Responsible, ethical and informed decisions about social priorities often require the application of scientific understanding. 	<p>This unit begins by exploring static electricity then moves to examining current electricity and how it is produced.</p> <p>Simple circuits are constructed and energy transformations that take place in electrical circuits are examined. The concepts of current and voltage are introduced and series and parallel circuits are compared.</p> <ul style="list-style-type: none"> • Static electricity • Electricity production: <ul style="list-style-type: none"> – fossil fuels – hydro-electricity – solar power – batteries. • Circuits: <ul style="list-style-type: none"> – series and parallel – resistance – circuit diagrams – conductors and insulators – short circuit. • Energy efficiency 	<p>Assessable elements:</p> <ul style="list-style-type: none"> • Knowledge and understanding • Investigating • Communicating • Reflecting <p>Assessment instruments and techniques:</p> <p>Supervised assessment</p>
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<p>Approximately 4 weeks</p>	<p>The chemical environment</p>	<ul style="list-style-type: none"> Identify problems and issues, formulate scientific questions and design investigations Plan investigations guided by scientific concepts and design and carry out fair tests Research and analyse data, information and evidence Evaluate data, information and evidence to identify connections, construct arguments and link results to theory Select and use scientific equipment and technologies to enhance the reliability and accuracy of data collected in investigations Conduct and apply safety audits and identify and manage risks Draw conclusions that summarise and explain patterns, and that are consistent with the data and respond to the question Communicate scientific ideas, explanations, conclusions, decisions and data, using scientific argument and terminology, in appropriate formats Reflect on different perspectives and evaluate the influence of people's values and culture on the applications of science Reflect on learning, apply new understandings and justify future applications. 	<p>Knowledge and understanding</p> <p>Natural and processed materials</p> <ul style="list-style-type: none"> Changes in physical properties of substances can be explained using the particle model. Matter can be classified according to its structure. Chemical reactions can be described using word and balanced equations. Reaction rate is affected by various factors, including temperature, concentration and surface area. 	<p>This unit will focus on acids and bases, their properties and reactions. The environment is naturally acidic and acids are important components of many living things (DNA, fatty acids, amino acids). The pH scale and use of indicators to measure acid strength will be explored. How the strength of an acid affects the reactions which occur will be investigated.</p> <p>Acids and bases:</p> <ul style="list-style-type: none"> acid rain, food, cleaning products properties reactions equations formula. <p>Reaction rates:</p> <ul style="list-style-type: none"> surface area temperature concentration catalysts. 	<p>Assessable elements:</p> <ul style="list-style-type: none"> Knowledge and Understanding Investigating Communicating Reflecting <p>Assessment instruments and techniques:</p> <p>Design and perform an experiment to determine how one factor affects the rate of reaction.</p>
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