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# SCIENCEWORLD

Scope and sequence for the Victorian Curriculum

**ScienceWorld** is a comprehensive 7–10 science textbook series for the Victorian Curriculum

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### Abbreviations:

- BS: Biological Sciences
- CS: Chemical Sciences
- ESS: Earth and Space Sciences
- PS: Physical Sciences
- SHE: Science as a Human Endeavour

**Note:** This scope and sequence specifically focusses on Science Understanding to the elaboration level, while also including a number of Science as a Human Endeavour content descriptions.



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# ScienceWorld 7



Chapter and unit titles	Science Understanding	Elaborations
<b>1 Introduction to the lab</b>		
1.1 Laboratory equipment	Science Inquiry Skills	
1.2 Safety in the laboratory	Science Inquiry Skills#	
1.3 Using a Bunsen burner	Science Inquiry Skills#	
1.4 Science is investigating	Science Inquiry Skills#	
<b>2 Working scientifically</b>		
2.1 Inferring and predicting	Science Inquiry Skills#	
2.2 Measuring	Science Inquiry Skills#	
2.3 Using graphs	Science Inquiry Skills#	
2.4 Experimenting	Science Inquiry Skills	
<b>3 Separating mixtures</b>		
3.1 What's a mixture?	CS: Mixtures, including solutions, contain a combination of pure substances that can be separated using a range of techniques ( <a href="#">VCSSU095</a> ).	<ul style="list-style-type: none"> <li>recognising the differences between pure substances and mixtures and identifying examples of each</li> </ul>
3.2 Solutions	CS: Mixtures, including solutions, contain a combination of pure substances that can be separated using a range of techniques ( <a href="#">VCSSU095</a> ).	<ul style="list-style-type: none"> <li>recognising the differences between pure substances and mixtures and identifying examples of each</li> <li>identifying the solvent and solute in solutions</li> </ul>
3.3 Separating mixtures	CS: Mixtures, including solutions, contain a combination of pure substances that can be separated using a range of techniques ( <a href="#">VCSSU095</a> ).	<ul style="list-style-type: none"> <li>investigating and using a range of physical separation techniques such as filtration, decantation, evaporation, crystallisation, chromatography and distillation</li> <li>exploring and comparing separation methods used in the home</li> </ul>
<b>4 Forces</b>		
4.1 Forces around you	PS: Change to an object's motion is caused by unbalanced forces acting on the object; Earth's gravity pulls objects towards the centre of Earth ( <a href="#">VCSSU103</a> ).	<ul style="list-style-type: none"> <li>investigating the effects of applying different forces to familiar objects</li> <li>investigating common situations where forces are balanced and unbalanced, for example, stationary and falling objects</li> </ul>

Chapter and unit titles	Science Understanding	Elaborations
4.2 Frictional forces	PS: Change to an object's motion is caused by unbalanced forces acting on the object; Earth's gravity pulls objects towards the centre of Earth ( <a href="#">VCSSU103</a> )	<ul style="list-style-type: none"> <li>investigating the effects of applying different forces to familiar objects</li> <li>investigating common situations where forces are balanced and unbalanced, for example, stationary and falling objects</li> </ul>
4.3 Gravitational forces	PS: Change to an object's motion is caused by unbalanced forces acting on the object; Earth's gravity pulls objects towards the centre of Earth ( <a href="#">VCSSU103</a> )	<ul style="list-style-type: none"> <li>exploring how gravity affects objects on the surface of Earth</li> </ul>
<b>5 Classifying living things</b>		
5.1 Classifying things	BS: There are differences within and between groups of organisms; classification helps organise this diversity ( <a href="#">VCSSU091</a> )	<ul style="list-style-type: none"> <li>grouping a variety of organisms on the basis of similarities and differences in particular features</li> <li>using scientific conventions for naming species</li> <li>using provided keys to identify organisms surveyed in a local habitat</li> </ul>
5.2 The five kingdoms	BS: There are differences within and between groups of organisms; classification helps organise this diversity ( <a href="#">VCSSU091</a> )	<ul style="list-style-type: none"> <li>grouping a variety of organisms on the basis of similarities and differences in particular features</li> <li>using scientific conventions for naming species</li> <li>using provided keys to identify organisms surveyed in a local habitat</li> </ul>
	BS: Cells are the basic units of living things and have specialised structures and functions ( <a href="#">VCSSU092</a> )	<ul style="list-style-type: none"> <li>recognising that some organisms consist of a single cell</li> </ul>
5.3 Animals and plants	BS: There are differences within and between groups of organisms; classification helps organise this diversity ( <a href="#">VCSSU091</a> )	<ul style="list-style-type: none"> <li>grouping a variety of organisms on the basis of similarities and differences in particular features</li> <li>using scientific conventions for naming species</li> <li>using provided keys to identify organisms surveyed in a local habitat</li> </ul>
<b>Doing a project</b>	Science Inquiry Skills	
<b>6 Sustainable Earth</b>		
6.1 Water as a resource	ESS: Water is an important resource that cycles through the environment ( <a href="#">VCSSU101</a> )	<ul style="list-style-type: none"> <li>considering the water cycle in terms of changes of state of water</li> <li>investigating factors that influence the water cycle in nature</li> <li>exploring how human management of water impacts on the water cycle</li> </ul>
6.2 Sustainable resources	ESS: Some of Earth's resources are renewable, but others are non-renewable ( <a href="#">VCSSU100</a> )	<ul style="list-style-type: none"> <li>considering what is meant by the term 'renewable' in relation to the Earth's resources</li> <li>considering timescales for regeneration of resources</li> </ul>
6.3 Minerals and energy	ESS: Some of Earth's resources are renewable, but others are non-renewable ( <a href="#">VCSSU100</a> )	<ul style="list-style-type: none"> <li>considering what is meant by the term 'renewable' in relation to the Earth's resources</li> <li>considering timescales for regeneration of resources</li> </ul>

Chapter and unit titles	Science Understanding	Elaborations
<b>7 Ecosystems</b>		
7.1 Living in a food web	BS: Interactions between organisms can be described in terms of food chains and food webs and can be affected by human activity ( <a href="#">VCSSU093</a> )	<ul style="list-style-type: none"> <li>constructing and interpreting food chains and food webs to show relationships between organisms in an environment</li> <li>recognising the role of microorganisms within food chains and food webs</li> </ul>
7.2 Ecosystems	BS: Interactions between organisms can be described in terms of food chains and food webs and can be affected by human activity ( <a href="#">VCSSU093</a> )	<ul style="list-style-type: none"> <li>constructing and interpreting food chains and food webs to show relationships between organisms in an environment</li> <li>recognising the role of microorganisms within food chains and food webs</li> </ul>
7.3 Ecosystems under threat	BS: Interactions between organisms can be described in terms of food chains and food webs and can be affected by human activity ( <a href="#">VCSSU093</a> )	<ul style="list-style-type: none"> <li>researching examples of human impacts on specific ecosystems, for example, the use of fire by traditional Aboriginal people, the effects of palm oil harvesting, deforestation, agricultural practices or the introduction of new species</li> </ul>
<b>8 Earth, moon and sun</b>		
8.1 How the Earth moves	ESS: Predictable phenomena on Earth, including seasons and eclipses, are caused by the relative positions of the Sun, Earth and the Moon ( <a href="#">VCSSU099</a> )	<ul style="list-style-type: none"> <li>comparing times for the rotation of Earth, Sun and Moon, and comparing the times for the orbits of Earth and the Moon</li> <li>explaining why different regions of Earth experience different seasonal conditions</li> </ul>
8.2 Phases, eclipses and tides	ESS: Predictable phenomena on Earth, including seasons and eclipses, are caused by the relative positions of the Sun, Earth and the Moon ( <a href="#">VCSSU099</a> )	<ul style="list-style-type: none"> <li>modelling the relative movements of the Earth, Sun and Moon and how natural phenomena such as solar and lunar eclipses and phases of the Moon occur</li> </ul>
8.3 Discovering space	SHE: Scientific knowledge and understanding of the world changes as new evidence becomes available; science knowledge can develop through collaboration and connecting ideas across the disciplines and practice of science ( <a href="#">VCSSU089</a> )	<ul style="list-style-type: none"> <li>investigating how advances in telescopes and space probes have provided new evidence about space</li> </ul>
<b>9 Simple machine technology</b>		
9.1 Simple machines	PS: Change to an object's motion is caused by unbalanced forces acting on the object; Earth's gravity pulls objects towards the centre of Earth ( <a href="#">VCSSU103</a> )	<ul style="list-style-type: none"> <li>investigating a simple machine such as a lever or a pulley system</li> </ul>
9.2 Pulleys and gears	PS: Change to an object's motion is caused by unbalanced forces acting on the object; Earth's gravity pulls objects towards the centre of Earth ( <a href="#">VCSSU103</a> )	<ul style="list-style-type: none"> <li>investigating a simple machine such as a lever or a pulley system</li> </ul>
9.3 How things fly	PS: Change to an object's motion is caused by unbalanced forces acting on the object; Earth's gravity pulls objects towards the centre of Earth ( <a href="#">VCSSU103</a> )	<ul style="list-style-type: none"> <li>investigating a simple machine such as a lever or a pulley system</li> <li>investigating common situations where forces are balanced and unbalanced, for example, stationary and falling objects</li> </ul>

Chapter and unit titles	Science Understanding	Elaborations
<b>10 Product testing</b>		
10.1 Consumer testing	Science Inquiry Skills	
10.2 Options	Science Inquiry Skills	

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Chapter and unit titles	Science Understanding	Elaborations
<b>1 Let's experiment</b>		
1.1 What is science?	Science Inquiry Skills#	
1.2 Experimenting	Science Inquiry Skills#	
1.3 Solving problems	Science Inquiry Skills#	
<b>2 Solids, liquids and gases</b>		
2.1 Properties of matter	CS: The properties of the different states of matter can be explained in terms of the motion and arrangement of particles ( <a href="#">VCSSU096</a> )	
2.2 Solids—liquid—gas	CS: The properties of the different states of matter can be explained in terms of the motion and arrangement of particles ( <a href="#">VCSSU096</a> )	<ul style="list-style-type: none"> <li>modelling the arrangement of particles in solids, liquids and gases</li> <li>using the particle model to distinguish between the properties of liquid water, ice and steam</li> </ul>
2.3 Using the particle theory	CS: The properties of the different states of matter can be explained in terms of the motion and arrangement of particles ( <a href="#">VCSSU096</a> )	<ul style="list-style-type: none"> <li>modelling the arrangement of particles in solids, liquids and gases</li> <li>using the particle model to distinguish between the properties of liquid water, ice and steam</li> </ul>
<b>3 Introducing energy</b>		
3.1 What is energy?	PS: Energy appears in different forms including movement (kinetic energy), heat, light, chemical energy and potential energy; devices can change energy from one form to another ( <a href="#">VCSSU104</a> )	
3.2 Forms of energy	PS: Energy appears in different forms including movement (kinetic energy), heat, light, chemical energy and potential energy; devices can change energy from one form to another ( <a href="#">VCSSU104</a> )	<ul style="list-style-type: none"> <li>recognising that kinetic energy is the energy possessed by moving bodies</li> <li>recognising that potential energy is stored energy, for example, gravitational, chemical and elastic energy</li> <li>using flow diagrams to illustrate changes between different forms of energy</li> <li>investigating the energy transformations in devices, for example, a catapult or a water wheel</li> </ul>
3.3 Energy comes—energy goes	PS: Energy appears in different forms including movement (kinetic energy), heat, light, chemical energy and potential energy; devices can change energy from one form to another ( <a href="#">VCSSU104</a> )	<ul style="list-style-type: none"> <li>investigating the energy transformations in devices, for example, a catapult or a water wheel</li> </ul>
	ESS: Some of Earth's resources are renewable, but others are non-renewable ( <a href="#">VCSSU100</a> )	<ul style="list-style-type: none"> <li>considering what is meant by the term 'renewable' in relation to the Earth's resources</li> <li>considering timescales for regeneration of resources</li> </ul>

Chapter and unit titles	Science Understanding	Elaborations
<b>4 Cells of life</b>		
4.1 Cells	BS: Cells are the basic units of living things and have specialised structures and functions ( <a href="#">VCSSU092</a> )	<ul style="list-style-type: none"> <li>examining a variety of cells using a light microscope, by digital technology or by viewing a simulation</li> <li>distinguishing plant cells from animal and fungal cells</li> <li>identifying structures within cells and describing their function</li> <li>recognising that some organisms consist of a single cell</li> </ul>
	BS: Multicellular organisms contain systems of organs that carry out specialised functions that enable them to survive and reproduce ( <a href="#">VCSSU094</a> )	<ul style="list-style-type: none"> <li>examining the specialised cells and tissues involved in structure and function of particular organs</li> </ul>
4.2 Cell processes	BS: Cells are the basic units of living things and have specialised structures and functions ( <a href="#">VCSSU092</a> )	<ul style="list-style-type: none"> <li>examining a variety of cells using a light microscope, by digital technology or by viewing a simulation</li> <li>distinguishing plant cells from animal and fungal cells</li> <li>identifying structures within cells and describing their function</li> </ul>
	BS: Multicellular organisms contain systems of organs that carry out specialised functions that enable them to survive and reproduce ( <a href="#">VCSSU094</a> )	<ul style="list-style-type: none"> <li>examining the specialised cells and tissues involved in structure and function of particular organs</li> </ul>
4.3 Investigating cells	BS: Cells are the basic units of living things and have specialised structures and functions ( <a href="#">VCSSU092</a> )	
<b>5 Chemical reactions</b>		
5.1 Physical and chemical properties	CS: Chemical change involves substances reacting to form new substances ( <a href="#">VCSSU098</a> )	<ul style="list-style-type: none"> <li>identifying the differences between chemical and physical changes</li> <li>identifying evidence that a chemical change has taken place</li> <li>investigating simple reactions, for example, combining elements to make a compound</li> </ul>
5.2 What is a chemical reaction?	CS: Chemical change involves substances reacting to form new substances ( <a href="#">VCSSU098</a> )	<ul style="list-style-type: none"> <li>identifying the differences between chemical and physical changes</li> <li>identifying evidence that a chemical change has taken place</li> <li>investigating simple reactions, for example, combining elements to make a compound</li> </ul>
5.3 Some common gases	CS: Chemical change involves substances reacting to form new substances ( <a href="#">VCSSU098</a> )	<ul style="list-style-type: none"> <li>investigating simple reactions, for example, combining elements to make a compound</li> </ul>
<b>6 Heat energy</b>		
6.1 Heat and temperature	PS: Energy appears in different forms including movement (kinetic energy), heat, light, chemical energy and potential energy; devices can change energy from one form to another ( <a href="#">VCSSU104</a> )	
6.2 Heat transfer	PS: Energy appears in different forms including movement (kinetic energy), heat, light, chemical energy and potential energy; devices can change energy from one form to another ( <a href="#">VCSSU104</a> )	<ul style="list-style-type: none"> <li>using flow diagrams to illustrate changes between different forms of energy</li> <li>investigating the energy transformations in devices, for example, a catapult or a water wheel</li> </ul>

Chapter and unit titles	Science Understanding	Elaborations
6.3 Exploring heat	PS: Energy appears in different forms including movement (kinetic energy), heat, light, chemical energy and potential energy; devices can change energy from one form to another ( <a href="#">VCSSU104</a> )	<ul style="list-style-type: none"> <li>using flow diagrams to illustrate changes between different forms of energy</li> <li>investigating the energy transformations in devices, for example, a catapult or a water wheel</li> </ul>
<b>7 The human body</b>		
7.1 How muscles work	BS: Multicellular organisms contain systems of organs that carry out specialised functions that enable them to survive and reproduce ( <a href="#">VCSSU094</a> )	<ul style="list-style-type: none"> <li>examining the specialised cells and tissues involved in structure and function of particular organs</li> <li>describing the structure of each organ in a system and relating its function to the overall function of the system</li> </ul>
7.2 Digestion	BS: Multicellular organisms contain systems of organs that carry out specialised functions that enable them to survive and reproduce ( <a href="#">VCSSU094</a> )	<ul style="list-style-type: none"> <li>examining the specialised cells and tissues involved in structure and function of particular organs</li> <li>describing the structure of each organ in a system and relating its function to the overall function of the system</li> <li>identifying the organs and overall function of a system of a multicellular organism in supporting life processes</li> </ul>
7.3 Body systems	BS: Multicellular organisms contain systems of organs that carry out specialised functions that enable them to survive and reproduce ( <a href="#">VCSSU094</a> )	<ul style="list-style-type: none"> <li>examining the specialised cells and tissues involved in structure and function of particular organs</li> <li>describing the structure of each organ in a system and relating its function to the overall function of the system</li> <li>identifying the organs and overall function of a system of a multicellular organism in supporting life processes</li> </ul>
<b>8 Elements and compounds</b>		
8.1 Atoms and molecules	CS: Differences between elements, compounds and mixtures can be described by using a particle model ( <a href="#">VCSSU097</a> )	<ul style="list-style-type: none"> <li>modelling the arrangement of particles in elements and compounds</li> </ul>
8.2 Elements and compounds	CS: Differences between elements, compounds and mixtures can be described by using a particle model ( <a href="#">VCSSU097</a> )	<ul style="list-style-type: none"> <li>modelling the arrangement of particles in elements and compounds</li> <li>recognising that elements and simple compounds can be represented by symbols and formulas</li> </ul>
8.3 Chemical reactions	CS: Differences between elements, compounds and mixtures can be described by using a particle model ( <a href="#">VCSSU097</a> )	<ul style="list-style-type: none"> <li>modelling the arrangement of particles in elements and compounds</li> <li>recognising that elements and simple compounds can be represented by symbols and formulas</li> <li>explaining why elements and compounds can be represented by chemical formulas while mixtures cannot</li> </ul>
	CS: Chemical change involves substances reacting to form new substances ( <a href="#">VCSSU098</a> )	<ul style="list-style-type: none"> <li>identifying evidence that a chemical change has taken place</li> <li>investigating simple reactions, for example, combining elements to make a compound</li> </ul>



Chapter and unit titles	Science Understanding	Elaborations
<b>9 Light and sound</b>		
9.1 Properties of light and sound	PS: Light can form images using the reflective feature of curved mirrors and the refractive feature of lenses, and can disperse to produce a spectrum which is part of a larger spectrum of radiation ( <a href="#">VCSSU105</a> )	<ul style="list-style-type: none"> <li>exploring how images can change when the arrangement of the mirror or lens system is altered</li> <li>exploring the mechanism of the human eye and corrective technologies</li> </ul>
	PS: The properties of sound can be explained by a wave model ( <a href="#">VCSSU106</a> )	<ul style="list-style-type: none"> <li></li> </ul>
	BS: Multicellular organisms contain systems of organs that carry out specialised functions that enable them to survive and reproduce ( <a href="#">VCSSU094</a> )	<ul style="list-style-type: none"> <li>examining the specialised cells and tissues involved in structure and function of particular organs</li> <li>describing the structure of each organ in a system and relating its function to the overall function of the system</li> <li>identifying the organs and overall function of a system of a multicellular organism in supporting life processes</li> </ul>
9.2 Light and colour	PS: Light can form images using the reflective feature of curved mirrors and the refractive feature of lenses, and can disperse to produce a spectrum which is part of a larger spectrum of radiation ( <a href="#">VCSSU105</a> )	<ul style="list-style-type: none"> <li>observing the spread and order of colours in the visible spectrum</li> </ul>
9.3 Light and sound as waves	PS: Light can form images using the reflective feature of curved mirrors and the refractive feature of lenses, and can disperse to produce a spectrum which is part of a larger spectrum of radiation ( <a href="#">VCSSU105</a> )	<ul style="list-style-type: none"> <li>describing the different types of radiation in the larger spectrum of radiation</li> </ul>
	PS: The properties of sound can be explained by a wave model ( <a href="#">VCSSU106</a> )	<ul style="list-style-type: none"> <li>describing how sounds are produced by different musical instruments</li> <li>measuring the speed of sound</li> <li>using a wave model to describe the measured properties of sound, wavelength and frequency</li> </ul>
9.4 Applications of sound	PS: The properties of sound can be explained by a wave model ( <a href="#">VCSSU106</a> )	<ul style="list-style-type: none"> <li>describing how sounds are produced by different musical instruments</li> <li>using a wave model to describe the measured properties of sound, wavelength and frequency</li> </ul>
	BS: Multicellular organisms contain systems of organs that carry out specialised functions that enable them to survive and reproduce ( <a href="#">VCSSU094</a> )	<ul style="list-style-type: none"> <li>examining the specialised cells and tissues involved in structure and function of particular organs</li> <li>describing the structure of each organ in a system and relating its function to the overall function of the system</li> <li>identifying the organs and overall function of a system of a multicellular organism in supporting life processes</li> </ul>
<b>10 Growth and reproduction</b>		
10.1 Growth	BS: Multicellular organisms contain systems of organs that carry out specialised functions that enable them to survive and reproduce ( <a href="#">VCSSU094</a> )	<ul style="list-style-type: none"> <li>examining the specialised cells and tissues involved in structure and function of particular organs</li> </ul>

Chapter and unit titles	Science Understanding	Elaborations
10.2 Reproduction	BS: Multicellular organisms contain systems of organs that carry out specialised functions that enable them to survive and reproduce ( <a href="#">VCSSU094</a> )	<ul style="list-style-type: none"> <li>examining the specialised cells and tissues involved in structure and function of particular organs</li> <li>describing the structure of each organ in a system and relating its function to the overall function of the system</li> <li>identifying the organs and overall function of a system of a multicellular organism in supporting life processes</li> <li>comparing reproductive systems of organisms</li> <li>comparing similar systems in different organisms, for example, digestive systems in herbivores and carnivores, respiratory systems in fish and mammals</li> </ul>
10.3 Reproduction and survival	BS: Multicellular organisms contain systems of organs that carry out specialised functions that enable them to survive and reproduce ( <a href="#">VCSSU094</a> )	<ul style="list-style-type: none"> <li>examining the specialised cells and tissues involved in structure and function of particular organs</li> <li>describing the structure of each organ in a system and relating its function to the overall function of the system</li> <li>identifying the organs and overall function of a system of a multicellular organism in supporting life processes</li> <li>comparing reproductive systems of organisms</li> </ul>
<b>11 The rock cycle</b>		
11.1 Rocks from fire	ESS: Sedimentary, igneous and metamorphic rocks contain minerals and are formed by processes that occur within Earth over a variety of timescales ( <a href="#">VCSSU102</a> )	<ul style="list-style-type: none"> <li>recognising that rocks are a collection of different minerals</li> <li>considering the role of forces and energy in the formation of different types of rocks and minerals</li> <li>identifying a range of common rock types using keys based on observable physical and chemical properties</li> </ul>
11.2 Weathering and erosion	ESS: Sedimentary, igneous and metamorphic rocks contain minerals and are formed by processes that occur within Earth over a variety of timescales ( <a href="#">VCSSU102</a> )	<ul style="list-style-type: none"> <li>recognising that rocks are a collection of different minerals</li> <li>considering the role of forces and energy in the formation of different types of rocks and minerals</li> <li>identifying a range of common rock types using keys based on observable physical and chemical properties</li> </ul>
11.3 The rock cycle	ESS: Sedimentary, igneous and metamorphic rocks contain minerals and are formed by processes that occur within Earth over a variety of timescales ( <a href="#">VCSSU102</a> )	<ul style="list-style-type: none"> <li>recognising that rocks are a collection of different minerals</li> <li>considering the role of forces and energy in the formation of different types of rocks and minerals</li> <li>identifying a range of common rock types using keys based on observable physical and chemical properties</li> </ul>

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Chapter and unit titles	Science Understanding	Elaborations
<b>1 Science is investigating</b>		
1.1 Steps in investigating	Science Inquiry Skills#	
1.2 Collecting data	Science Inquiry Skills#	
1.3 Processing data	Science Inquiry Skills#	
<b>2 Introducing electric circuits</b>		
2.1 Electric charges	PS: Electric circuits can be designed for diverse purposes using different components; the operation of circuits can be explained by the concepts of voltage and current ( <a href="#">VCSSU130</a> )	
2.2 Electric currents	PS: Electric circuits can be designed for diverse purposes using different components; the operation of circuits can be explained by the concepts of voltage and current ( <a href="#">VCSSU130</a> )	<ul style="list-style-type: none"> <li>investigating parallel and series circuits and measuring voltage drops across and currents through various components</li> </ul>
2.3 Electric circuits	PS: Electric circuits can be designed for diverse purposes using different components; the operation of circuits can be explained by the concepts of voltage and current ( <a href="#">VCSSU130</a> )	<ul style="list-style-type: none"> <li>investigating parallel and series circuits and measuring voltage drops across and currents through various components</li> </ul>
<b>3 Inside the atom</b>		
3.1 Atomic structure	CS: All matter is made of atoms which are composed of protons, neutrons and electrons; natural radioactivity arises from the decay of nuclei in atoms ( <a href="#">VCSSU122</a> )	<ul style="list-style-type: none"> <li>describing and modelling the structure of atoms in terms of the nucleus, protons, neutrons and electrons</li> <li>comparing the mass and charge of protons, neutrons and electrons</li> </ul>
3.2 Nuclear reactions	CS: All matter is made of atoms which are composed of protons, neutrons and electrons; natural radioactivity arises from the decay of nuclei in atoms ( <a href="#">VCSSU122</a> )	<ul style="list-style-type: none"> <li>describing in simple terms how alpha and beta particles and gamma radiation are released from unstable atoms</li> </ul>
	CS: Chemical reactions involve rearranging atoms to form new substances; during a chemical reaction mass is not created or destroyed ( <a href="#">VCSSU124</a> )	<ul style="list-style-type: none"> <li>recognising that the conservation of mass in a chemical reaction can be demonstrated by simple chemical equations</li> </ul>
3.3 Radioactivity	CS: All matter is made of atoms which are composed of protons, neutrons and electrons; natural radioactivity arises from the decay of nuclei in atoms ( <a href="#">VCSSU122</a> )	<ul style="list-style-type: none"> <li>describing in simple terms how alpha and beta particles and gamma radiation are released from unstable atoms</li> </ul>

Chapter and unit titles	Science Understanding	Elaborations
<b>4 Magnetism and electricity</b>		
4.1 Investigating magnets	PS: The interaction of magnets can be explained by a field model; magnets are used in the generation of electricity and the operation of motors ( <a href="#">VCSSU131</a> )	
4.2 Magnetic fields	PS: The interaction of magnets can be explained by a field model; magnets are used in the generation of electricity and the operation of motors ( <a href="#">VCSSU131</a> )	<ul style="list-style-type: none"> <li>investigating the action at a distance or the field model around magnets of different shapes</li> </ul>
4.3 Electricity and magnets	PS: The interaction of magnets can be explained by a field model; magnets are used in the generation of electricity and the operation of motors ( <a href="#">VCSSU131</a> )	<ul style="list-style-type: none"> <li>investigating the movement of a magnet and a wire to produce electricity</li> <li>investigating the effect of a magnet on a current from a battery to produce movement</li> </ul>
<b>5 Microbes</b>		
5.1 Microscopic life	BS: Ecosystems consist of communities of interdependent organisms and abiotic components of the environment; matter and energy flow through these systems ( <a href="#">VCSSU121</a> )	<ul style="list-style-type: none"> <li>exploring interactions between organisms, for example, predator/prey, parasites, competitors, pollinators and disease vectors</li> </ul>
5.2 Helpful microbes	BS: Ecosystems consist of communities of interdependent organisms and abiotic components of the environment; matter and energy flow through these systems ( <a href="#">VCSSU121</a> )	<ul style="list-style-type: none"> <li>exploring interactions between organisms, for example, predator/prey, parasites, competitors, pollinators and disease vectors</li> </ul>
5.3 Microbes and disease	BS: Multicellular organisms rely on coordinated and interdependent internal systems to respond to changes to their environment ( <a href="#">VCSSU117</a> )	<ul style="list-style-type: none"> <li>investigating the response of the body to changes as a result of the presence of micro-organisms</li> </ul>
<b>6 Everyday substances</b>		
6.1 Metals	CS: Different types of chemical reactions are used to produce a range of products and can occur at different rates; chemical reactions may be represented by balanced chemical equations ( <a href="#">VCSSU125</a> )	<ul style="list-style-type: none"> <li>investigating how chemical reactions result in the production of a range of useful substances, for example, fuels, metals and pharmaceuticals</li> <li>using word or symbol equations to represent chemical reactions</li> </ul>
6.2 Carbon compounds	CS: Different types of chemical reactions are used to produce a range of products and can occur at different rates; chemical reactions may be represented by balanced chemical equations ( <a href="#">VCSSU125</a> )	<ul style="list-style-type: none"> <li>investigating how chemical reactions result in the production of a range of useful substances, for example, fuels, metals and pharmaceuticals</li> <li>using word or symbol equations to represent chemical reactions</li> </ul>
6.3 Plastics and fibres	CS: Different types of chemical reactions are used to produce a range of products and can occur at different rates; chemical reactions may be represented by balanced chemical equations ( <a href="#">VCSSU125</a> )	<ul style="list-style-type: none"> <li>investigating how chemical reactions result in the production of a range of useful substances, for example, fuels, metals and pharmaceuticals</li> <li>using word or symbol equations to represent chemical reactions</li> </ul>

Chapter and unit titles	Science Understanding	Elaborations
<b>7 Body in balance</b>		
7.1 The nervous and endocrine systems	BS: Multicellular organisms rely on coordinated and interdependent internal systems to respond to changes to their environment ( <a href="#">VCSSU117</a> )	<ul style="list-style-type: none"> <li>describing how the requirements for life (oxygen, nutrients, water and removal of waste) are provided through the coordinated function of body systems, for example, the respiratory, circulatory, digestive, nervous and excretory systems</li> </ul>
	BS: An animal's response to a stimulus is coordinated by its central nervous system (brain and spinal cord); neurons transmit electrical impulses and are connected by synapses ( <a href="#">VCSSU118</a> )	<ul style="list-style-type: none"> <li>identifying functions for different areas of the brain</li> <li>modelling the 'knee jerk' reaction and explaining why it is a reflex action</li> <li>identifying responses involving the nervous and endocrine systems</li> <li>researching the causes and effects of spinal cord damage</li> </ul>
7.2 Plant responses	BS: Multicellular organisms rely on coordinated and interdependent internal systems to respond to changes to their environment ( <a href="#">VCSSU117</a> )	<ul style="list-style-type: none"> <li>describing how the requirements for life (oxygen, nutrients, water and removal of waste) are provided through the coordinated function of body systems, for example, the respiratory, circulatory, digestive, nervous and excretory systems</li> </ul>
7.3 Keeping the balance	BS: Multicellular organisms rely on coordinated and interdependent internal systems to respond to changes to their environment ( <a href="#">VCSSU117</a> )	<ul style="list-style-type: none"> <li>explaining (using models, flow diagrams or simulations) how body systems work together to maintain a functioning body</li> </ul>
<b>8 Dynamic Earth</b>		
8.1 Inside the Earth	ESS: The theory of plate tectonics explains global patterns of geological activity and continental movement ( <a href="#">VCSSU127</a> )	
8.2 Earthquakes	ESS: The theory of plate tectonics explains global patterns of geological activity and continental movement ( <a href="#">VCSSU127</a> )	<ul style="list-style-type: none"> <li>relating the occurrence of earthquakes and volcanic activity to constructive and destructive plate boundaries</li> </ul>
8.3 Earth plates	ESS: The theory of plate tectonics explains global patterns of geological activity and continental movement ( <a href="#">VCSSU127</a> )	<ul style="list-style-type: none"> <li>recognising the major plates on a world map</li> <li>considering the role of heat energy and convection currents in the movement of tectonic plates</li> <li>relating the occurrence of earthquakes and volcanic activity to constructive and destructive plate boundaries</li> </ul>
<b>9 Everyday reactions</b>		
9.1 Acids and bases	CS: Chemical reactions, including combustion and the reactions of acids, are important in both non-living and living systems and involve energy transfer ( <a href="#">VCSSU126</a> )	<ul style="list-style-type: none"> <li>investigating reactions of acids with metals, bases, and carbonates</li> </ul>
9.2 The pH scale	CS: Chemical reactions, including combustion and the reactions of acids, are important in both non-living and living systems and involve energy transfer ( <a href="#">VCSSU126</a> )	<ul style="list-style-type: none"> <li>investigating reactions of acids with metals, bases, and carbonates</li> </ul>
	CS: Chemical reactions involve rearranging atoms to form new substances; during a chemical reaction mass is not created or destroyed ( <a href="#">VCSSU124</a> )	<ul style="list-style-type: none"> <li>modelling chemical reactions in terms of rearrangement of atoms</li> </ul>

Chapter and unit titles	Science Understanding	Elaborations
9.3 Reactions of acids and bases	CS: Chemical reactions, including combustion and the reactions of acids, are important in both non-living and living systems and involve energy transfer ( <a href="#">VCSSU126</a> )	<ul style="list-style-type: none"> <li>investigating reactions of acids with metals, bases, and carbonates</li> </ul>
	CS: Chemical reactions involve rearranging atoms to form new substances; during a chemical reaction mass is not created or destroyed ( <a href="#">VCSSU124</a> )	<ul style="list-style-type: none"> <li>modelling chemical reactions in terms of rearrangement of atoms</li> </ul>
9.4 Energy in reactions	CS: Chemical reactions, including combustion and the reactions of acids, are important in both non-living and living systems and involve energy transfer ( <a href="#">VCSSU126</a> )	<ul style="list-style-type: none"> <li>investigating a range of different reactions to classify them as exothermic or endothermic</li> <li>comparing respiration and photosynthesis and their role in biological processes</li> <li>investigating how chemical reactions result in the production of a range of useful substances, for example, fuels, metals and pharmaceuticals</li> </ul>
	CS: Chemical reactions involve rearranging atoms to form new substances; during a chemical reaction mass is not created or destroyed ( <a href="#">VCSSU124</a> )	<ul style="list-style-type: none"> <li>modelling chemical reactions in terms of rearrangement of atoms</li> <li>considering the role of energy in chemical reactions</li> </ul>
	ESS: Global systems, including the carbon cycle, rely on interactions involving the atmosphere, biosphere, hydrosphere and lithosphere ( <a href="#">VCSSU128</a> )	<ul style="list-style-type: none"> <li>investigating how human activity affects global systems</li> </ul>
	SHE: The values and needs of contemporary society can influence the focus of scientific research ( <a href="#">VCSSU116</a> )	<ul style="list-style-type: none"> <li>investigating how social actions have led to changed government policies and social behavioural change in relation to the use of chlorofluorocarbons (CFCs) in aerosol spray cans</li> </ul>
<b>10 Energy in ecosystems</b>		
10.1 Living in ecosystems	BS: Ecosystems consist of communities of interdependent organisms and abiotic components of the environment; matter and energy flow through these systems ( <a href="#">VCSSU121</a> )	<ul style="list-style-type: none"> <li>exploring interactions between organisms, for example, predator/prey, parasites, competitors, pollinators and disease vectors</li> <li>using modelling to examine factors that affect population sizes, for example, seasonal changes, destruction of habitats, introduced species</li> </ul>
10.2 Matter and energy in food webs	BS: Ecosystems consist of communities of interdependent organisms and abiotic components of the environment; matter and energy flow through these systems ( <a href="#">VCSSU121</a> )	<ul style="list-style-type: none"> <li>exploring interactions between organisms, for example, predator/prey, parasites, competitors, pollinators and disease vectors</li> <li>using modelling to examine factors that affect population sizes, for example, seasonal changes, destruction of habitats, introduced species</li> </ul>
10.3 Human impact on ecosystems	BS: Ecosystems consist of communities of interdependent organisms and abiotic components of the environment; matter and energy flow through these systems ( <a href="#">VCSSU121</a> )	<ul style="list-style-type: none"> <li>using modelling to examine factors that affect population sizes, for example, seasonal changes, destruction of habitats, introduced species</li> </ul>

Chapter and unit titles	Science Understanding	Elaborations
<b>11 Digital technology</b>		
11.1 Communication	SHE: Advances in scientific understanding often rely on developments in technology and technological advances are often linked to scientific discoveries ( <a href="#">VCSSU115</a> )	<ul style="list-style-type: none"> <li>considering how the properties of electromagnetic radiation relate to its uses, for example, radar, medical diagnosis and treatment, mobile phone communications and microwave cooking</li> </ul>
11.2 Electronics	PS: Electric circuits can be designed for diverse purposes using different components; the operation of circuits can be explained by the concepts of voltage and current ( <a href="#">VCSSU130</a> )	<ul style="list-style-type: none"> <li>investigating the properties of components such as LEDs, and temperature and light sensors</li> </ul>
11.3 Robotics and control	PS: Electric circuits can be designed for diverse purposes using different components; the operation of circuits can be explained by the concepts of voltage and current ( <a href="#">VCSSU130</a> )	<ul style="list-style-type: none"> <li>investigating the properties of components such as LEDs, and temperature and light sensors</li> <li>exploring the use of sensors in robotics and control device</li> </ul>

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Chapter and unit titles	Science Understanding	Elaborations
<b>Chemical sciences</b>		
<b>1 Investigating reactions</b>		
1.1 Reaction rates	CS: Chemical reactions involve rearranging atoms to form new substances; during a chemical reaction mass is not created or destroyed ( <a href="#">VCSSU124</a> )	<ul style="list-style-type: none"> <li>modelling chemical reactions in terms of rearrangement of atoms</li> <li>considering the role of energy in chemical reactions</li> </ul>
	CS: Different types of chemical reactions are used to produce a range of products and can occur at different rates; chemical reactions may be represented by balanced chemical equations ( <a href="#">VCSSU125</a> )	<ul style="list-style-type: none"> <li>investigating the effect of a range of factors, for example, temperature and catalysts, on the rate of chemical reactions</li> </ul>
1.2 Catalysts	CS: Chemical reactions involve rearranging atoms to form new substances; during a chemical reaction mass is not created or destroyed ( <a href="#">VCSSU124</a> )	<ul style="list-style-type: none"> <li>modelling chemical reactions in terms of rearrangement of atoms</li> <li>considering the role of energy in chemical reactions</li> </ul>
	CS: Different types of chemical reactions are used to produce a range of products and can occur at different rates; chemical reactions may be represented by balanced chemical equations ( <a href="#">VCSSU125</a> )	<ul style="list-style-type: none"> <li>investigating the effect of a range of factors, for example, temperature and catalysts, on the rate of chemical reactions</li> </ul>
1.3 Energy and mass in reactions	CS: Chemical reactions involve rearranging atoms to form new substances; during a chemical reaction mass is not created or destroyed ( <a href="#">VCSSU124</a> )	<ul style="list-style-type: none"> <li>modelling chemical reactions in terms of rearrangement of atoms</li> <li>considering the role of energy in chemical reactions</li> <li>recognising that the conservation of mass in a chemical reaction can be demonstrated by simple chemical equations</li> </ul>
	CS: Chemical reactions, including combustion and the reactions of acids, are important in both non-living and living systems and involve energy transfer ( <a href="#">VCSSU126</a> )	<ul style="list-style-type: none"> <li>investigating a range of different reactions to classify them as exothermic or endothermic</li> <li>comparing respiration and photosynthesis and their role in biological processes</li> </ul>
<b>2 Explaining reactions</b>		
2.1 Chemical bonds	Science Inquiry Skills	
2.2 Formulas and equations	CS: Chemical reactions involve rearranging atoms to form new substances; during a chemical reaction mass is not created or destroyed ( <a href="#">VCSSU124</a> )	<ul style="list-style-type: none"> <li>modelling chemical reactions in terms of rearrangement of atoms</li> </ul>
	CS: Different types of chemical reactions are used to produce a range of products and can occur at different rates; chemical reactions may be represented by balanced chemical equations ( <a href="#">VCSSU125</a> )	<ul style="list-style-type: none"> <li>investigating how chemical reactions result in the production of a range of useful substances, for example, fuels, metals and pharmaceuticals</li> <li>using word or symbol equations to represent chemical reactions</li> </ul>



Chapter and unit titles	Science Understanding	Elaborations
2.3 Predicting a reaction	CS: Chemical reactions involve rearranging atoms to form new substances; during a chemical reaction mass is not created or destroyed ( <a href="#">VCSSU124</a> )	<ul style="list-style-type: none"> <li>modelling chemical reactions in terms of rearrangement of atoms</li> </ul>
	CS: Different types of chemical reactions are used to produce a range of products and can occur at different rates; chemical reactions may be represented by balanced chemical equations ( <a href="#">VCSSU125</a> )	<ul style="list-style-type: none"> <li>investigating how chemical reactions result in the production of a range of useful substances, for example, fuels, metals and pharmaceuticals</li> <li>using word or symbol equations to represent chemical reactions</li> </ul>
<b>3 The periodic table</b>		
3.1 The periodic table	CS: The atomic structure and properties of elements are used to organise them in the periodic table ( <a href="#">VCSSU123</a> )	<ul style="list-style-type: none"> <li>describing the structure of atoms in terms of electron shells</li> <li>explaining how the electronic structure of an atom determines its position in the periodic table and its properties</li> </ul>
3.2 Chemical families	CS: The atomic structure and properties of elements are used to organise them in the periodic table ( <a href="#">VCSSU123</a> )	<ul style="list-style-type: none"> <li>investigating the chemical activity of metals</li> <li>explaining how the electronic structure of an atom determines its position in the periodic table and its properties</li> </ul>
3.3 Extracting metals	CS: The atomic structure and properties of elements are used to organise them in the periodic table ( <a href="#">VCSSU123</a> )	<ul style="list-style-type: none"> <li>investigating the chemical activity of metals</li> </ul>
	CS: Different types of chemical reactions are used to produce a range of products and can occur at different rates; chemical reactions may be represented by balanced chemical equations ( <a href="#">VCSSU125</a> )	<ul style="list-style-type: none"> <li>investigating how chemical reactions result in the production of a range of useful substances, for example, fuels, metals and pharmaceuticals</li> </ul>
<b>Physical sciences</b>		
<b>4 Road science</b>		
4.1 Speed and acceleration	PS: The description and explanation of the motion of objects involves the interaction of forces and the exchange of energy and can be described and predicted using the laws of physics ( <a href="#">VCSSU133</a> )	<ul style="list-style-type: none"> <li>recognising that a stationary object, or a moving object with constant motion, has balanced forces acting on it</li> <li>gathering data to analyse everyday motion produced by forces, for example, measurements of distance and time, velocity, mass, acceleration and force</li> <li>investigating the effects of applying different forces, including Earth's gravitational force, to familiar objects</li> </ul>
4.2 Stopping	PS: The description and explanation of the motion of objects involves the interaction of forces and the exchange of energy and can be described and predicted using the laws of physics ( <a href="#">VCSSU133</a> )	<ul style="list-style-type: none"> <li>recognising that a stationary object, or a moving object with constant motion, has balanced forces acting on it</li> <li>gathering data to analyse everyday motion produced by forces, for example, measurements of distance and time, velocity, mass, acceleration and force</li> <li>investigating the effects of applying different forces, including Earth's gravitational force, to familiar objects</li> </ul>

Chapter and unit titles	Science Understanding	Elaborations
4.3 Collisions	PS: The description and explanation of the motion of objects involves the interaction of forces and the exchange of energy and can be described and predicted using the laws of physics ( <a href="#">VCSSU133</a> )	<ul style="list-style-type: none"> <li>recognising that a stationary object, or a moving object with constant motion, has balanced forces acting on it</li> <li>gathering data to analyse everyday motion produced by forces, for example, measurements of distance and time, velocity, mass, acceleration and force</li> <li>investigating the effects of applying different forces, including Earth's gravitational force, to familiar objects</li> </ul>
	PS: Energy flow in Earth's atmosphere can be explained by the processes of heat transfer ( <a href="#">VCSSU132</a> )	<ul style="list-style-type: none"> <li>recognising that the Law of Conservation of Energy explains that total energy is maintained in energy transfers and transformations</li> <li>recognising that in energy transfers and transformations, a number of steps can occur and the system is not 100% efficient so that usable energy is reduced</li> <li>comparing energy changes in physical events, for example, car crashes, the motion of pendulums, lifting and dropping</li> </ul>
<b>5 Space engineering</b>		
5.1 Getting into space	PS: The description and explanation of the motion of objects involves the interaction of forces and the exchange of energy and can be described and predicted using the laws of physics ( <a href="#">VCSSU133</a> )	<ul style="list-style-type: none"> <li>recognising that a stationary object, or a moving object with constant motion, has balanced forces acting on it</li> <li>gathering data to analyse everyday motion produced by forces, for example, measurements of distance and time, velocity, mass, acceleration and force</li> <li>investigating the effects of applying different forces, including Earth's gravitational force, to familiar objects</li> </ul>
5.2 Satellites and orbit	PS: The description and explanation of the motion of objects involves the interaction of forces and the exchange of energy and can be described and predicted using the laws of physics ( <a href="#">VCSSU133</a> )	<ul style="list-style-type: none"> <li>recognising that a stationary object, or a moving object with constant motion, has balanced forces acting on it</li> <li>gathering data to analyse everyday motion produced by forces, for example, measurements of distance and time, velocity, mass, acceleration and force</li> <li>investigating the effects of applying different forces, including Earth's gravitational force, to familiar objects</li> </ul>
5.3 Living in space	PS: Advances in scientific understanding often rely on developments in technology and technological advances are often linked to scientific discoveries ( <a href="#">VCSSU115</a> )	
	SHE: The values and needs of contemporary society can influence the focus of scientific research ( <a href="#">VCSSU116</a> )	
<b>6 Using electricity</b>		
6.1 Electrical safety	PS: Electric circuits can be designed for diverse purposes using different components; the operation of circuits can be explained by the concepts of voltage and current ( <a href="#">VCSSU130</a> )	<ul style="list-style-type: none"> <li>investigating parallel and series circuits and measuring voltage drops across and currents through various components</li> <li>comparing circuit design to household wiring</li> </ul>
6.2 Measuring electricity	PS: Electric circuits can be designed for diverse purposes using different components; the operation of circuits can be explained by the concepts of voltage and current ( <a href="#">VCSSU130</a> )	<ul style="list-style-type: none"> <li>investigating parallel and series circuits and measuring voltage drops across and currents through various components</li> </ul>

Chapter and unit titles	Science Understanding	Elaborations
6.3 Where does electricity come from?	PS: Electric circuits can be designed for diverse purposes using different components; the operation of circuits can be explained by the concepts of voltage and current <a href="#">(VCSSU130)</a>	<ul style="list-style-type: none"> <li>investigating parallel and series circuits and measuring voltage drops across and currents through various components</li> </ul>
	PS: The interaction of magnets can be explained by a field model; magnets are used in the generation of electricity and the operation of motors <a href="#">(VCSSU131)</a>	<ul style="list-style-type: none"> <li>investigating the movement of a magnet and a wire to produce electricity</li> </ul>
<b>Biological sciences</b>		
<b>7 Inheritance</b>		
7.1 Chromosomes	BS: The transmission of heritable characteristics from one generation to the next involves DNA and genes <a href="#">(VCSSU119)</a>	<ul style="list-style-type: none"> <li>recognising that genetic information passed on to offspring is from both parents and involves the processes of fertilisation and meiosis</li> </ul>
7.2 DNA	BS: The transmission of heritable characteristics from one generation to the next involves DNA and genes <a href="#">(VCSSU119)</a>	<ul style="list-style-type: none"> <li>using models and diagrams to represent the relationship between DNA, genes and chromosomes</li> <li>describing mutations as changes in DNA or chromosomes and outlining the factors that contribute to causing mutations</li> </ul>
7.3 Genes	BS: The transmission of heritable characteristics from one generation to the next involves DNA and genes <a href="#">(VCSSU119)</a>	<ul style="list-style-type: none"> <li>representing patterns of inheritance of a simple dominant/recessive characteristic through generations of a family</li> </ul>
<b>8 Evolution of life</b>		
8.1 Biodiversity and variation	BS: The theory of evolution by natural selection explains the diversity of living things and is supported by a range of scientific evidence <a href="#">(VCSSU120)</a>	<ul style="list-style-type: none"> <li>describing biodiversity as a function of evolution</li> </ul>
8.2 Natural selection	BS: The theory of evolution by natural selection explains the diversity of living things and is supported by a range of scientific evidence <a href="#">(VCSSU120)</a>	<ul style="list-style-type: none"> <li>outlining processes involved in natural selection including variation, isolation and selection</li> <li>investigating changes caused by natural selection in a particular population as a result of a specified selection pressure, for example, artificial selection in breeding for desired characteristics</li> </ul>
8.3 Evolution	BS: The theory of evolution by natural selection explains the diversity of living things and is supported by a range of scientific evidence <a href="#">(VCSSU120)</a>	<ul style="list-style-type: none"> <li>evaluating and interpreting evidence for evolution, including the fossil record, chemical and anatomical similarities, and the geographical distribution of species</li> </ul>
8.4 Biotechnology	BS: The transmission of heritable characteristics from one generation to the next involves DNA and genes <a href="#">(VCSSU119)</a>	<ul style="list-style-type: none"> <li>investigating changes caused by natural selection in a particular population as a result of a specified selection pressure, for example, artificial selection in breeding for desired characteristics</li> </ul>
	BS: The theory of evolution by natural selection explains the diversity of living things and is supported by a range of scientific evidence <a href="#">(VCSSU120)</a>	

Chapter and unit titles	Science Understanding	Elaborations
	SHE: Advances in scientific understanding often rely on developments in technology and technological advances are often linked to scientific discoveries <a href="#">(VCSSU115)</a>	<ul style="list-style-type: none"> <li>considering how information technology can be applied to different areas of science, for example, bioinformatics, the Square Kilometre Array, DNA sequencing and the analysis of radio astronomy signals</li> </ul>
<b>Earth and space sciences</b>		
<b>9 Earth systems</b>		
9.1 The Earth's cycles	ESS: Global systems, including the carbon cycle, rely on interactions involving the atmosphere, biosphere, hydrosphere and lithosphere <a href="#">(VCSSU128)</a>	<ul style="list-style-type: none"> <li>investigating how human activity affects global systems</li> <li>investigating the effect of climate change on sea levels and biodiversity</li> </ul>
	PS: Energy flow in Earth's atmosphere can be explained by the processes of heat transfer <a href="#">(VCSSU132)</a>	<ul style="list-style-type: none"> <li>recognising that the Law of Conservation of Energy explains that total energy is maintained in energy transfers and transformations</li> <li>recognising that in energy transfers and transformations, a number of steps can occur and the system is not 100% efficient so that usable energy is reduced</li> <li>comparing energy changes in physical events, for example, car crashes, the motion of pendulums, lifting and dropping</li> </ul>
9.2 Effects of human activity	ESS: Global systems, including the carbon cycle, rely on interactions involving the atmosphere, biosphere, hydrosphere and lithosphere <a href="#">(VCSSU128)</a>	<ul style="list-style-type: none"> <li>modelling a nutrient cycle within the biosphere, for example, the carbon, nitrogen or phosphorus cycle</li> </ul>
9.3 The atmosphere and pollution	ESS: Global systems, including the carbon cycle, rely on interactions involving the atmosphere, biosphere, hydrosphere and lithosphere <a href="#">(VCSSU128)</a>	<ul style="list-style-type: none"> <li>investigating how human activity affects global systems</li> <li>distinguishing between 'natural' and 'enhanced' greenhouse effects</li> </ul>
	PS: Energy flow in Earth's atmosphere can be explained by the processes of heat transfer <a href="#">(VCSSU132)</a>	<ul style="list-style-type: none"> <li>recognising that in energy transfers and transformations, a number of steps can occur and the system is not 100% efficient so that usable energy is reduced</li> </ul>
<b>10 Origin of the universe</b>		
10.1 The night sky	ESS: The Universe contains features including galaxies, stars and solar systems; the Big Bang theory can be used to explain the origin of the Universe <a href="#">(VCSSU129)</a>	<ul style="list-style-type: none"> <li>describing how the evolution of the Universe, including the formation of galaxies and stars, has continued since the Big Bang</li> </ul>
10.2 Stars and galaxies	ESS: The Universe contains features including galaxies, stars and solar systems; the Big Bang theory can be used to explain the origin of the Universe <a href="#">(VCSSU129)</a>	<ul style="list-style-type: none"> <li>describing how the evolution of the Universe, including the formation of galaxies and stars, has continued since the Big Bang</li> </ul>
10.3 Life of stars and the Big Bang theory	ESS: The Universe contains features including galaxies, stars and solar systems; the Big Bang theory can be used to explain the origin of the Universe <a href="#">(VCSSU129)</a>	<ul style="list-style-type: none"> <li>describing how the evolution of the Universe, including the formation of galaxies and stars, has continued since the Big Bang</li> <li>recognising that the age of the Universe can be derived by applying knowledge of the Big Bang theory</li> <li>identifying the evidence supporting the Big Bang theory, for example, Edwin Hubble's observations and the detection of microwave radiation</li> </ul>

**Acknowledgement**

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