Stile

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Scope and Sequence

NSW Syllabus

Years 7–10 Science, 2025

A world-class science education for *every* student

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Stile is for schools that are **serious about science.**
Serious about challenging their students.
Serious about supporting their teachers.

2025 edition, version 1.0

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Supplementary units 42

All units in Stile address the general capabilities of the Australian Curriculum. We have used the following symbols to indicate this:

- Ethical understanding
- Literacy
- Critical and creative thinking
- Numeracy
- Personal and social capability
- Digital literacy

Acknowledgement of Country

As a science education company, Stile recognises and appreciates the immense knowledge and understandings of both science and education that are held within the Aboriginal and Torres Strait Islander communities.

Stile HQ is located on the traditional lands of the Boon Wurrung and Woiwurrung (Wurundjeri) peoples of the Kulin Nation. We acknowledge that sovereignty was never ceded and pay our respects to Elders past, present and future.

Learn more from Indigenous astronomer, Karlie Noon

Image credit: University of Newcastle

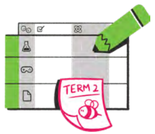
Watch this video!

stileapp.com/go/karlie

Artist: Tasha McAlpine (née Victor)
Language group: Nyul Nyul / Nyikina

Everything in one place

Teacher resources	Student resources



Before class

Find out everything you need to know from the unit's **Teaching Plan** and **Lab Guide**.

In **Prepare Mode** for each lesson, you can:
- Read the detailed teaching notes and lesson plan
- Print a copy to refer to in class
- Customise resources for the needs of your students

Stile companion app
- Front-load the unit's scientific terminology through flashcards and quizzes

During class

Within **Teach Mode** you can:
- Implement explicit teaching with learning goals and Key Questions
- Use videos, images and text to guide your instruction
- Facilitate discussion with live brainstorms and polls
- View student data instantly to inform your teaching

Stile Classroom
- Engage in real-world phenomena through:
  - Labs
  - Projects
  - Lessons
  - Hands-on activities
  - Simulations
  - Engineering challenges
  - Open-ended investigations
  - Extension lessons

After class

To **Analyse** student work:
- View data in Analyse Mode to determine your next teaching steps
- See a bird's-eye view of student progress in the Markbook
- Release model answers to students
- Provide written feedback where it matters most

Revision resources
- Consolidate and revise material learned in class by:
  - Creating structured revision notes
  - Recording definitions in the glossary
  - Completing practice test questions
  - Reviewing key terms with flashcards and quizzes
  - Recapping ideas in 60-second summary videos

Scan here to view **The Stile Guide**, the essential guide to supercharging your teaching with Stile

A note from our Head of Education

Clare Feeney | Head of Education
and the whole Stile team

Stile is a complete, coherent curriculum for New South Wales science classrooms. Our resources are designed to help students be the best learners they can be while supporting teachers to maximise their impact through evidence-based teaching strategies.

This scope and sequence document offers a world-class starting point for designing your school's science curriculum. It can be used in its current format alongside our comprehensive teaching plans to provide the support that graduate teachers need, or it can be customised to best suit your unique context and provide the flexibility that experienced teachers demand.

If you have any questions or would like to chat more about our science program please reach out. We're a bunch of teachers and science nerds based in Melbourne, with team members across the country, and we love chatting with fellow educators about awesome science education.

Call us on 1300 918 292

Email us at community@stileeducation.com

Stage 4 | Year 7

Suggested Scope & Sequence

All units, except for Student Research Project, have accompanying revision resources, including printable worksheets, flashcards, practice tests and glossary sheets. Interactive glossary quizzes and summary videos are available in Stile and the Stile X mobile app. Find out more about Stile X at **stileapp.com/go/stilex**

An artist's impression of an astronaut on Mars
If humans are to colonise Mars, we'll need to learn how to keep water in the states we can use.

Year 7 | Knowlege and Understanding

Download an editable spreadsheet version **here**.

Introduction
to Science
What is science and how can it help us solve global problems?

Mixtures
Can we 3D-print new bones to replace broken ones?

SC4-17CW

explains how scientific understanding of, and discoveries about, the properties of elements, compounds and mixtures relate to their uses in everyday life

States of Matter
Why is liquid water so important for humans to live on Mars?

SC4-16CW

describes the observed properties and behaviour of matter, using scientific models and theories about the motion and arrangement of particles

Food Chains and Food Webs
Why do cats have slit-shaped pupils?

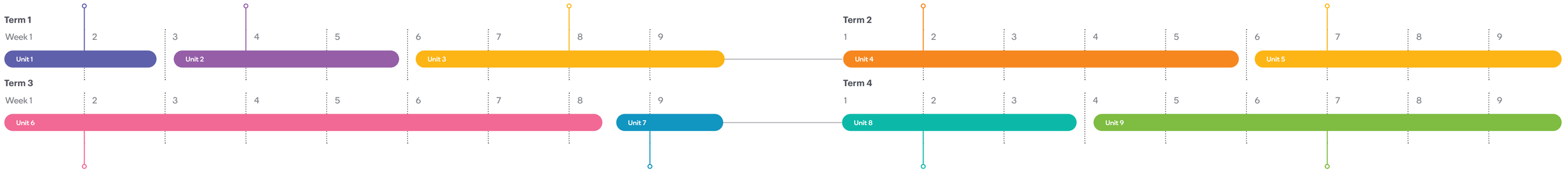
SC4-15LW

explains how new biological evidence changes people's understanding of the world

Classification and Biodiversity
Do we need to save the bees?

SC4-14LW

relates the structure and function of living things to their classification, survival and reproduction



Forces
How have people used forces for thousands of years?

SC4-10PW

describes the action of unbalanced forces in everyday situations

The Water Cycle
Would you ever drink your own urine?

SC4-13ES

explains how advances in scientific understanding of processes that occur within and on the Earth, influence the choices people make about resource use and management

Resources
How has our use of resources changed over time?

SC4-13ES

explains how advances in scientific understanding of processes that occur within and on the Earth, influence the choices people make about resource use and management

Our Place in Space
Can we travel to the Sun?

SC4-12ES

describes the dynamic nature of models, theories and laws in developing scientific understanding of the Earth and solar system

Year 7 | Working Scientifically

		Introduction to Science	Mixtures	States of Matter	Food Chains and Food Webs	Classification and Biodiversity	Forces	The Water Cycle	Resources	Our Place in Space
		Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6	Unit 7	Unit 8	Unit 9
SC4-4WS	identifies questions and problems that can be tested or researched and makes predictions based on scientific knowledge	✓		✓		✓	✓	✓	✓	
SC4-5WS	collaboratively and individually produces a plan to investigate questions and problems	✓	✓	✓			✓		✓	
SC4-6WS	follows a sequence of instructions to safely undertake a range of investigation types, collaboratively and individually	✓	✓	✓			✓	✓		✓
SC4-7WS	processes and analyses data from a first-hand investigation and secondary sources to identify trends, patterns and relationships, and draw conclusions	✓	✓	✓	✓	✓	✓	✓		✓
SC4-8WS	selects and uses appropriate strategies, understanding and skills to produce creative and plausible solutions to identified problems	✓		✓		✓	✓			
SC4-9WS	presents science ideas, findings and information to a given audience using appropriate scientific language, text types and representations	✓	✓	✓	✓	✓	✓		✓	✓

Year 7 | Content Statements

Unit 1 Introduction to Science

This unit has a focus on Working Scientifically skills. Refer to page 12 for alignment.

Unit 2 Mixtures

CW3

Mixtures, including solutions, contain a combination of pure substances that can be separated using a range of techniques.

b. describe aqueous mixtures in terms of solute, solvent and solution

e. research how people in different occupations use understanding and skills from across the disciplines of Science in carrying out separation techniques

Unit 3 States of Matter

CW1

The properties of the different states of matter can be explained in terms of the motion and arrangement of particles.

a. describe the behaviour of matter in terms of particles that are continuously moving and interacting

b. Relate an increase or decrease in the amount of heat energy possessed by particles to changes in particle movement

c. use a simple particle model to predict the effect of adding or removing heat on different states of matter

d. relate changes in the physical properties of matter to heat energy and particle movement that occur during observations of evaporation, condensation, boiling, melting and freezing

f. identify the benefits and limitations of using models to explain the properties of solids, liquids and gases

Unit 4 Food Chains and Food Webs

LW5

Science and technology contribute to finding solutions to conserving and managing sustainable ecosystems.

a. construct and interpret food chains and food webs, including examples from Australian ecosystems

b. describe interactions between organisms in food chains and food webs, including producers, consumers and decomposers

d. describe interactions between organisms in food chains and food webs, including producers, consumers and decomposers

e. explain, using examples, how scientific evidence and/or technological developments contribute to developing solutions to manage the impact of natural events on Australian ecosystems

Unit 5 Classification and Biodiversity

LW1

There are differences within and between groups of organisms; classification helps organise this diversity

a. identify reasons for classifying living things

b. classify a variety of living things based on similarities and differences in structural features

c. use simple keys to identify a range of plants and animals

d. identify some examples of groups of micro-organisms

e. outline the structural features used to group living things, including plants, animals, fungi and bacteria

Unit 6 Forces

PW1

Change to an object's motion is caused by unbalanced forces acting on the object

a. identify changes that take place when particular forces are acting

b. predict the effect of unbalanced forces acting in everyday situations

c. describe some examples of technological developments that have contributed to finding solutions to reduce the impact of forces in everyday life, eg car safety equipment and footwear design

d. analyse some everyday common situations where friction operates to oppose motion and produce heat

e. investigate factors that influence the size and effect of frictional forces

Unit 7 The Water Cycle

ES4

Science understanding influences the development of practices in areas of human activity such as industry, agriculture and marine and terrestrial resource management.

a. identify that water is an important resource that cycles through the environment

b. explain the water cycle in terms of the physical processes involved

Unit 8 Resources

ES3

Scientific knowledge influences the choices people make in regard to the use and management of the Earth's resources.

a. classify a range of the Earth's resources as renewable or non-renewable

b. outline features of some non-renewable resources, including metal ores and fossil fuels

c. describe uses of a variety of natural and made resources extracted from the biosphere, atmosphere, lithosphere and hydrosphere

d. investigate some strategies used by people to conserve and manage non-renewable resources, eg recycling and the alternative use of natural and made resources

Unit 9 Our Place in Space

PW2

The action of forces that act at a distance may be observed and related to everyday situations

e. identify that the Earth's gravity pulls objects towards the centre of the Earth

f. describe everyday situations where gravity acts as an unbalanced force

g. distinguish between the terms 'mass' and 'weight'

ES2

Scientific knowledge changes as new evidence becomes available. Some technological developments and scientific discoveries have significantly changed people's understanding of the solar system.

a. explain that predictable phenomena on the Earth, including day and night, seasons and eclipses are caused by the relative positions of the sun, the Earth and the moon

b. demonstrate, using examples, how ideas by people from different cultures have contributed to the current understanding of the solar system

c. compare historical and current models of the solar system to show how models are modified or rejected as a result of new scientific evidence

d. describe some examples of how technological advances have led to discoveries and increased scientific understanding of the solar system

Stage 4 | Year 8

Suggested Scope & Sequence

All units, except for Student Research Project, have accompanying revision resources, including printable worksheets, flashcards, practice tests and glossary sheets. Interactive glossary quizzes and summary videos are available in Stile and the Stile X mobile app. Find out more about Stile X at **stileapp.com/go/stilex**

Unwrapping the secrets of chocolate
Cocoa beans are turned into delicious, melt-in-your-mouth chocolate by a sequence of physical and chemical changes.

Year 8 | Knowlege and Understanding

Download an editable spreadsheet version **here**.

Cells

Would you eat lab-grown meat?

SC4-14LW

relates the structure and function of living things to their classification, survival and reproduction

Body Systems

What does it take to be a cold-blooded killer?

SC4-14LW

relates the structure and function of living things to their classification, survival and reproduction

Plants

How do predatory plants survive?

SC4-14LW

relates the structure and function of living things to their classification, survival and reproduction

The Survival of Species

How do reproductive strategies help a species stay alive?

SC4-14LW

Electrical Circuits

How can wearable electronics help us?

SC4-11PW

discusses how scientific understanding and technological developments have contributed to finding solutions to problems involving energy transfers and transformations

Magnetism

What is wireless electricity?

SC4-10PW

describes the action of unbalanced forces in everyday situations

Term 1

Week 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9

Unit 1 | Unit 2

Term 2

1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9

Unit 3 | Unit 4 | Unit 5 | Unit 6

Term 3

Week 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9

Unit 7 | Unit 8 | Unit 9

Term 4

1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9

Unit 10 | Unit 11

Physical and Chemical Change

What does chemistry have to do with chocolate making?

SC4-17CW

explains how scientific understanding of, and discoveries about, the properties of elements, compounds and mixtures relate to their uses in everyday life

Elements and Compounds

Why is helium so rare?

SC4-17CW

explains how scientific understanding of, and discoveries about, the properties of elements, compounds and mixtures relate to their uses in everyday life

Student Research Project

Energy

What can we learn from nature's energy engineers?

SC4-11PW

discusses how scientific understanding and technological developments have contributed to finding solutions to problems involving energy transfers and transformations

Active Earth (Part 1: Rocks)

How do we build future-ready cities?

SC4-12ES

describes the dynamic nature of models, theories and laws in developing scientific understanding of the Earth and solar system

Year 8 | Working Scientifically

		Cells	Body Systems	Plants	The Survival of Species	Electrical Circuits	Magnetism	Physical and Chemical Change	Elements and Compounds	Student Research Project	Energy	Active Earth (Part 1)
		Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6	Unit 7	Unit 8	Unit 9	Unit 10	Unit 11
SC4-4WS	identifies questions and problems that can be tested or researched and makes predictions based on scientific knowledge	✓		✓		✓		✓	✓	✓	✓	✓
SC4-5WS	collaboratively and individually produces a plan to investigate questions and problems	✓	✓	✓			✓	✓	✓	✓	✓	✓
SC4-6WS	follows a sequence of instructions to safely undertake a range of investigation types, collaboratively and individually					✓		✓	✓	✓	✓	✓
SC4-7WS	processes and analyses data from a first-hand investigation and secondary sources to identify trends, patterns and relationships, and draw conclusions	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓
SC4-8WS	selects and uses appropriate strategies, understanding and skills to produce creative and plausible solutions to identified problems	✓						✓	✓	✓		✓
SC4-9WS	presents science ideas, findings and information to a given audience using appropriate scientific language, text types and representations	✓	✓		✓	✓		✓	✓	✓		✓

Year 8 | Content statements

* Outcomes marked with this symbol are from Stage 5 of the syllabus

Unit 1 Cells

LW2

Cells are the basic units of living things and have specialised structures and functions.

a. identify that living things are made of cells
b. identify structures within cells, including the nucleus, cytoplasm, cell membrane, cell wall and chloroplast, and describe their functions
d. identify that new cells are produced by cell division
e. distinguish between unicellular and multicellular organisms
f. identify that different types of cells make up the tissues, organs and organ systems of multicellular organisms

Unit 2 Body Systems

LW3

Multicellular organisms contain systems of organs that carry out specialised functions that enable them to survive and reproduce

b. explain that the systems in multicellular organisms work together to provide cell requirements, including gases, nutrients and water, and to remove cell wastes

Unit 3 Plants

LW3

Multicellular organisms contain systems of organs that carry out specialised functions that enable them to survive and reproduce

a. identify the materials required by multicellular organisms for the processes of respiration and photosynthesis
d. describe the role of the flower, root, stem and leaf in maintaining flowering plants as functioning organisms

Unit 4 The Survival of Species

LW1

There are differences within and between groups of organisms; classification helps organise this diversity

f. explain how the features of some Australian plants and animals are adaptations for survival and reproduction in their environment

LW3

Multicellular organisms contain systems of organs that carry out specialised functions that enable them to survive and reproduce

f. outline the role of the reproductive system in humans

LW3*

Advances in scientific understanding often rely on developments in technology, and technological advances are often linked to scientific discoveries.

a. relate the organs involved in human reproductive systems to their function

Unit 5 Electrical Circuits

PW3

Energy appears in different forms including movement (kinetic energy), heat and potential energy, and causes change within systems

c. relate electricity with energy transfer in a simple circuit
d. construct and draw circuits containing a number of components to show a transfer of electricity
e. investigate some everyday energy transformations that cause change within systems, including motion, electricity, heat, sound and light

Unit 6 Magnetism

PW2

The action of forces that act at a distance may be observed and related to everyday situations

a. use the term 'field' in describing forces acting at a distance
c. describe the behaviour of charged objects when they are brought close to each other
h. describe the behaviour of magnetic poles when they are brought close together
i. investigate how magnets and electromagnets are used in some everyday devices or technologies used in everyday life

Unit 7 Physical and Chemical Change

CW4

In a chemical change, new substances are formed, which may have specific properties related to their uses in everyday life.

a. identify when a chemical change is taking place by observing a change in temperature, the appearance of new substances or the disappearance of an original substance
b. demonstrate that a chemical change involves substances reacting to form new substances
c. investigate some examples of chemical change that occur in everyday life, eg photosynthesis, respiration and chemical weathering
d. compare physical and chemical changes in terms of the arrangement of particles and reversibility of the process

Unit 8 Elements and Compounds

CW2

Scientific knowledge and developments in technology have changed our understanding of the structure and properties of matter.

a. describe the properties and uses of some common elements, including metals and non-metals
c. identify some examples of common compounds
d. explain why internationally recognised symbols are used for common elements
e. describe at a particle level the difference between elements, compounds and mixtures, including the type and arrangement of particles

Unit 9 Student Research Project

This unit has a focus on Working scientifically skills. Refer to page 21 for alignment.

Unit 10 Energy

PW3

Energy appears in different forms including movement (kinetic energy), heat and potential energy, and causes change within systems

a. identify objects that possess energy because of their motion (kinetic) or because of other properties (potential)

PW4

Scientific knowledge changes as new evidence becomes available, and some scientific discoveries have significantly changed people's understanding of the world.

a. identify that most energy conversions are inefficient and lead to the production of heat energy, eg in light bulbs
b. research ways in which scientific knowledge and technological developments have led to finding a solution to a contemporary issue, eg improvements in devices to increase the efficiency of energy transfers or conversions
c. describe, using examples, how developments in technology have contributed to finding solutions to a contemporary issue, eg organ transplantation, artificial joints/limbs, treatment for diabetes, asthma, kidney or heart disease

Unit 11 Active Earth (Part 1)

ES1

Sedimentary, igneous and metamorphic rocks contain minerals and are formed by processes that occur within Earth over a variety of timescales.

a. describe the structure of the Earth in terms of core, mantle, crust and lithosphere
b. relate the formation of a range of landforms to physical and chemical weathering, erosion and deposition
c. outline the origins of and relationships between sedimentary, igneous and metamorphic rocks
d. identify that sedimentary, igneous and metamorphic rocks contain minerals
e. classify a variety of common rocks and minerals into groups according to their observable properties
f. describe the conditions under which fossils form
g. outline how geological history can be interpreted in a sequence of horizontal sedimentary layers, in which the oldest are at the base and the youngest at the top

Stage 5 | Year 9

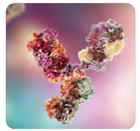
Suggested Scope & Sequence

All units, except for Student Research Project, have accompanying revision resources, including printable worksheets, flashcards, practice tests and glossary sheets. Interactive glossary quizzes and summary videos are available in Stile and the Stile X mobile app. Find out more about Stile X at **stileapp.com/go/stilex**

The aurora borealis or northern lights
This beautiful phenomenon is caused by energetic particles from the Sun interacting with the atmosphere, which is one of Earth's four systems.

Year 9 | Knowlege and Understanding

Download an editable spreadsheet version **here**.



The Immune System

How can we protect communities from diseases?

SC5-14LW

analyses interactions between components and processes within biological systems

SC5-15LW

explains how biological understanding has advanced through scientific discoveries, technological developments and the needs of society

Atoms

How can the building blocks of atoms help us see further?

SC5-16CW

explains how models, theories and laws about matter have been refined as new scientific evidence becomes available

Heat

How do you make the best pizza?

SC5-10PW

applies models, theories and laws to explain situations involving energy, force and motion

Waves

How does someone on the other side of the world see and hear you?

SC5-10PW

applies models, theories and laws to explain situations involving energy, force and motion

Energy Conservation

Can we use ocean waves to produce electricity?

SC5-11PW

explains how scientific understanding about energy conservation, transfers and transformations is applied in systems

Term 1

Week 1 2 3 4 5 6 7 8 9

Unit 1

Unit 2

Term 2

1 2 3 4 5 6 7 8 9

Unit 3

Unit 4

Unit 5

Term 3

Week 1 2 3 4 5 6 7 8 9

Unit 6

Unit 7

Unit 8

Term 4

1 2 3 4 5 6 7 8 9

Unit 9

Unit 10

Chemical Reactions

What happens when sodium explodes in water?

SC5-17CW

discusses the importance of chemical reactions in the production of a range of substances, and the influence of society on the development of new materials

Reactions and Energy

How can metals help us fight cancer?

SC5-17CW

discusses the importance of chemical reactions in the production of a range of substances, and the influence of society on the development of new materials

Active Earth

(Part 2: Plate Tectonics)

How do we build future-ready cities?

SC5-13ES

explains how scientific knowledge about global patterns of geological activity and interactions involving global systems can be used to inform decisions related to contemporary issues

Earth Systems

How does our planet recycle?

SC5-13ES

explains how scientific knowledge about global patterns of geological activity and interactions involving global systems can be used to inform decisions related to contemporary issues

Non-contact Forces and Electricity

Are we on track for sustainable transport?

SC5-11PW

explains how scientific understanding about energy conservation, transfers and transformations is applied in systems

Year 9 | Working Scientifically

		The Immune System	Atoms	Heat	Waves	Energy Conservation	Chemical Reactions	Reactions and Energy	Active Earth (Part 2)	Earth Systems	Non-contact Forces
		Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6	Unit 7	Unit 8	Unit 9	Unit 10
SC5-4WS	develops questions or hypotheses to be investigated scientifically	✓		✓	✓		✓	✓	✓	✓	✓
SC5-5WS	produces a plan to investigate identified questions, hypotheses or problems, individually and collaboratively	✓		✓					✓	✓	✓
SC5-6WS	undertakes first-hand investigations to collect valid and reliable data and information, individually and collaboratively	✓		✓				✓		✓	
SC5-7WS	processes, analyses and evaluates data from first-hand investigations and secondary sources to develop evidence-based arguments and conclusions	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
SC5-8WS	a student applies scientific understanding and critical thinking to suggest possible solutions to identified problems	✓						✓			
SC5-9WS	presents science ideas and evidence for a particular purpose and to a specific audience, using appropriate scientific language, conventions and representations	✓	✓	✓		✓	✓	✓	✓	✓	✓

Year 9 | Content Statements

* Outcomes marked with this symbol are from Stage 4 of the syllabus

Unit 1 The Immune System

LW1

Multicellular organisms rely on coordinated and interdependent internal systems to respond to changes in their environment.

a. describe some examples of how multicellular organisms respond to changes in their environment

c. outline some responses of the human body to infectious and non-infectious diseases

e. discuss, using examples, how the values and needs of contemporary society can influence the focus of scientific research, eg the occurrence of diseases affecting animals and plants, an epidemic or pandemic disease in humans or lifestyle related non-infectious diseases in humans

LW3

Advances in scientific understanding often rely on developments in technology, and technological advances are often linked to scientific discoveries

e. describe, using examples, how developments in technology have advanced biological understanding, eg vaccines, biotechnology, stem-cell research and in-vitro fertilisation

Unit 2 Atoms

CW1

Scientific understanding changes and is refined over time through a process of review by the scientific community.

a. identify that all matter is made of atoms which are composed of protons, neutrons and electrons

b. describe the structure of atoms in terms of the nucleus, protons, neutrons and electrons

d. identify that natural radioactivity arises from the decay of nuclei in atoms, releasing particles and energy

e. evaluate the benefits and problems associated with medical and industrial uses of nuclear energy

Unit 3 Heat

PW1

Energy transfer through different mediums can be explained using wave and particle models.

a. explain, in terms of the particle model, the processes underlying convection and conduction of heat energy

PW3*

Energy appears in different forms including movement (kinetic energy), heat and potential energy, and causes change within systems.

b. describe the transfer of heat energy by conduction, convection and radiation, including situations in which each occurs

Unit 4 Waves

PW1

Energy transfer through different mediums can be explained using wave and particle models.

b. identify situations where waves transfer energy

c. describe, using the wave model, the features of waves including wavelength, frequency and speed

d. explain, using the particle model, the transmission of sound in different mediums

e. relate the properties of different types of radiation in the electromagnetic spectrum to their uses in everyday life, including communications technology

f. describe the occurrence and some applications of absorption, reflection and refraction in everyday situations

Unit 5 Energy Conservation

PW4

Energy conservation in a system can be explained by describing energy transfers and transformations

a. apply the law of conservation of energy to account for the total energy involved in energy transfers and transformations

b. describe how, in energy transfers and transformations, a variety of processes can occur so that usable energy is reduced and the system is not 100% efficient

d. discuss viewpoints and choices that need to be considered in making decisions about the use of non-renewable energy resources

Unit 6 Chemical Reactions

CW3

Chemical reactions involve rearranging atoms to form new substances; during a chemical reaction mass is not created or destroyed.

a. recall that all matter is composed of atoms and has mass

b. identify a range of compounds using their common names and chemical formulae

f. construct word equations from observations and written descriptions of a range of chemical reactions

g. deduce that new substances are formed during chemical reactions by rearranging atoms rather than creating or destroying them

Unit 7 Reactions and Energy

CW3

Chemical reactions involve rearranging atoms to form new substances; during a chemical reaction mass is not created or destroyed.

e. identify some examples of important chemical reactions that occur in living systems and involve energy transfer, including respiration and reactions involving acids such as occur during digestion

LW2*

Cells are the basic units of living things and have specialised structures and functions.

c. outline the role of respiration in providing energy for the activities of cells

CW4

Different types of chemical reactions are used to produce a range of products and can occur at different rates and involve energy transfer.

a. identify that chemical reactions involve energy transfer and can be exothermic or endothermic

b. compare combustion and respiration as types of chemical reactions that release energy but occur at different rates

c. describe the effects of factors, eg temperature and catalysts, on the rate of some common chemical reactions

d. analyse how social, ethical and environmental considerations can influence decisions about scientific research related to the development and production of new materials

e. describe examples to show where advances in science and/or emerging science and technologies significantly affect people's lives, including generating new career opportunities in areas of chemical science such as biochemistry and industrial chemistry

Unit 8 Active Earth (Part 2)

ES2

The theory of plate tectonics explains global patterns of geological activity and continental movement.

a. outline how the theory of plate tectonics changed ideas about the structure of the Earth and continental movement over geological time

b. relate movements of the Earth's plates to mantle convection currents and gravitational forces

c. outline how the theory of plate tectonics explains earthquakes, volcanic activity and formation of new landforms

d. describe how some technological developments have increased scientific understanding of global patterns in geological activity, including in the Asia-Pacific region

ES3

People use scientific knowledge to evaluate claims, explanations or predictions in relation to interactions involving the atmosphere, biosphere, hydrosphere and lithosphere.

b. describe some impacts of natural events, including cyclones, volcanic eruptions or earthquakes, on the Earth's spheres

* Outcomes marked with this symbol are from Stage 4 of the syllabus

Unit 9 Earth Systems

ES3

People use scientific knowledge to evaluate claims, explanations or predictions in relation to interactions involving the atmosphere, biosphere, hydrosphere and lithosphere.

a. outline how global systems rely on interactions involving the biosphere, lithosphere, hydrosphere and atmosphere, including the carbon cycle

c. evaluate scientific evidence of some current issues affecting society that are the result of human activity on global systems, eg the greenhouse effect, ozone layer depletion, effect of climate change on sea levels, long-term effects of waste management and loss of biodiversity

LW2

Conserving and maintaining the quality and sustainability of the environment requires scientific understanding of interactions within, the cycling of matter and the flow of energy through ecosystems.

b. outline using examples how matter is cycled through ecosystems such as nitrogen

CW3

Chemical reactions involve rearranging atoms to form new substances; during a chemical reaction mass is not created or destroyed.

d. investigate a range of types of important chemical reactions that occur in non-living systems and involve energy transfer, including: Combustion

Unit 10 Non-contact Forces and Electricity

PW3

Scientific understanding of current electricity has resulted in technological developments designed to improve the efficiency in generation and use of electricity.

a. describe voltage, current and resistance in terms of energy applied, carried and dissipated

b. describe the relationship between voltage, resistance and current

c. compare the characteristics and applications of series and parallel electrical circuits

d. outline recent examples where scientific or technological developments have involved specialist teams from different branches of science, engineering and technology, eg low-emissions electricity generation and reduction in atmospheric pollution

PW2*

The action of forces that act at a distance may be observed and related to everyday situations.

b. identify ways in which objects acquire electrostatic charge

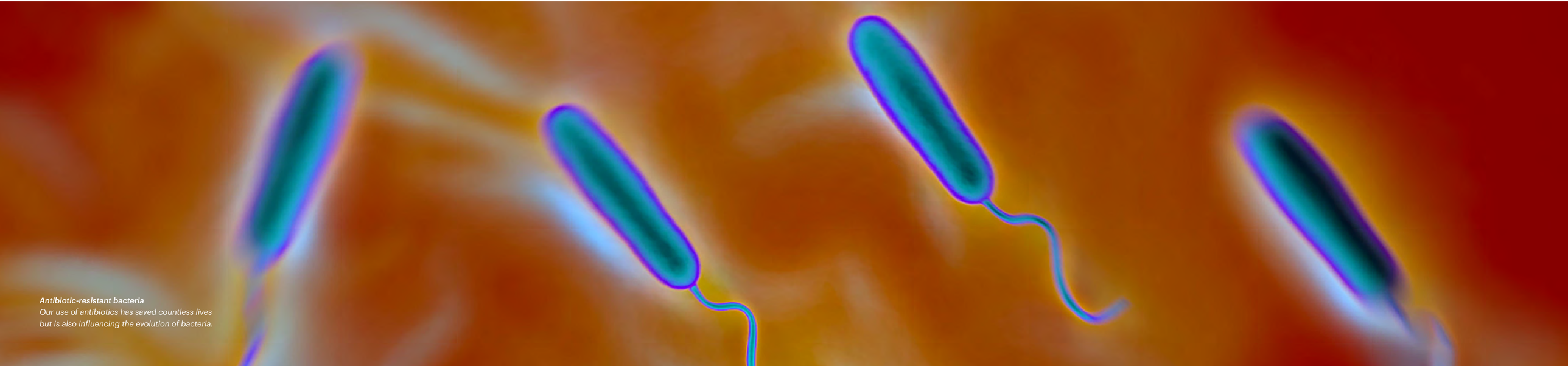
d. investigate everyday situations where the effects of electrostatic forces can be observed, eg lightning strikes during severe weather and dust storms

A seaweed farm in Indonesia
Seaweed is fast-growing and doesn't need fresh water or fertilizers, unlike crops grown on land. Scientists are developing new ways of using seaweed as a sustainable resource.

Stage 5 | Year 10

Suggested Scope & Sequence

All units, except for Student Research Project, have accompanying revision resources, including printable worksheets, flashcards, practice tests and glossary sheets. Interactive glossary quizzes and summary videos are available in Stile and the Stile X mobile app. Find out more about Stile X at **stileapp.com/go/stilex**



Antibiotic-resistant bacteria
Our use of antibiotics has saved countless lives but is also influencing the evolution of bacteria.

Year 10 | Knowlege and Understanding

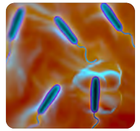
Download an editable spreadsheet version **here**.

Genetics

Can genes increase the risk of cancer?

SC5-14LW

analyses interactions between components and processes within biological systems



Evolution

Are we responsible for the rise of antibiotic-resistant superbugs?

SC5-14LW

analyses interactions between components and processes within biological systems

Kinematics

Are self-driving cars the way of the future?

SC5-10PW

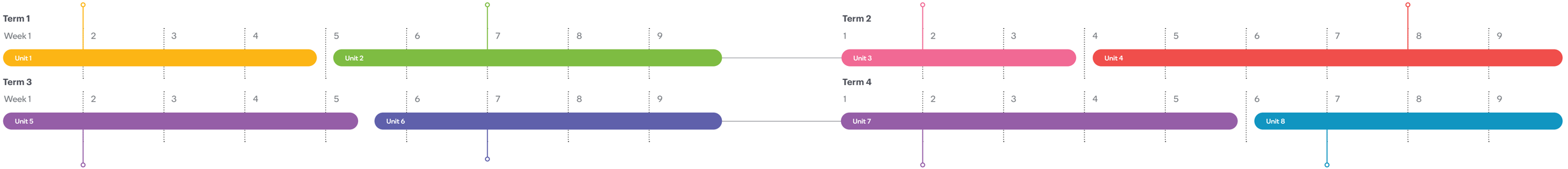
applies models, theories and laws to explain situations involving energy, force and motion

Newton's Laws of Motion

How can we apply Newton's Laws to car crash investigations?

SC5-10PW

applies models, theories and laws to explain situations involving energy, force and motion



Reaction Types

Are self-healing space suits science fiction or just science?

SC5-17CW

discusses the importance of chemical reactions in the production of a range of substances, and the influence of society on the development of new materials

The Periodic Table

How do exploding stars create heavy metals?

SC5-16CW

explains how models, theories and laws about matter have been refined as new scientific evidence becomes available

Ecosystems

How can we prevent plastic from harming marine life?

SC5-14LW

analyses interactions between components and processes within biological systems

The Universe

How do gravitational waves give us a new way of understanding the universe?

SC5-12ES

describes changing ideas about the structure of the Earth and the universe to illustrate how models, theories and laws are refined over time by the scientific community

Year 10 | Working Scientifically

		Genetics	Evolution	Kinematics	Newton's Laws of Motion	Reaction Types	The Periodic Table	Ecosystems	The Universe
		Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6	Unit 7	Unit 8
SC5-4WS	develops questions or hypotheses to be investigated scientifically		✓		✓			✓	
SC5-5WS	produces a plan to investigate identified questions, hypotheses or problems, individually and collaboratively		✓	✓	✓	✓		✓	✓
SC5-6WS	undertakes first-hand investigations to collect valid and reliable data and information, individually and collaboratively	✓	✓	✓	✓		✓	✓	
SC5-7WS	processes, analyses and evaluates data from first-hand investigations and secondary sources to develop evidence-based arguments and conclusions	✓	✓	✓	✓	✓	✓	✓	✓
SC5-8WS	a student applies scientific understanding and critical thinking to suggest possible solutions to identified problems							✓	
SC5-9WS	presents science ideas and evidence for a particular purpose and to a specific audience, using appropriate scientific language, conventions and representations	✓	✓	✓	✓	✓		✓	✓

Unit 1 Genetics

LW3

Advances in scientific understanding often rely on developments in technology, and technological advances are often linked to scientific discoveries.

b. identify that during reproduction the transmission of heritable characteristics from one generation to the next involves DNA and genes (ACSSU184)

c. identify that genetic information is transferred as genes in the DNA of chromosomes

d. outline how the Watson-Crick model of DNA explains:
- the exact replication of DNA
- changes in genes (mutation)

Unit 2 Evolution

LW4

The theory of evolution by natural selection explains the diversity of living things and is supported by a range of scientific evidence.

a. describe scientific evidence that present-day organisms have evolved from organisms in the past

b. relate the fossil record to the age of the Earth and the time over which life has been evolving

c. explain, using examples, how natural selection relates to changes in a population, eg in the development of resistance of bacteria to antibiotics and insects to pesticides

d. outline the roles of genes and environmental factors in the survival of organisms in a population

f. discuss some advantages and disadvantages of the use and applications of biotechnology, including social and ethical considerations

LW3

Advances in scientific understanding often rely on developments in technology, and technological advances are often linked to scientific discoveries.

f. discuss some advantages and disadvantages of the use and applications of biotechnology, including social and ethical considerations

Unit 3 Kinematics

PW2

The motion of objects can be described and predicted using the laws of physics.

b. relate acceleration to a change in speed and/or direction as a result of a net force

c. relate acceleration to a change in speed and/or direction as a result of a net force

Unit 4 Newton's Laws of Motion

PW2

The motion of objects can be described and predicted using the laws of physics.

a. describe the relationship between force, mass and acceleration

d. analyse everyday situations involving motion in terms of Newton's laws

Unit 5 Reaction Types

CW3

Chemical reactions involve rearranging atoms to form new substances; during a chemical reaction mass is not created or destroyed.

d. investigate a range of types of important chemical reactions that occur in non-living systems and involve energy transfer, including:
- precipitation
- decomposition

Unit 6 The Periodic Table

CW2

The atomic structure and properties of elements are used to organise them in the Periodic Table.

a. identify the atom as the smallest unit of an element and that it can be represented by a symbol

b. distinguish between the atoms of some common elements by comparing information about the numbers of protons, neutrons and electrons

c. describe the organisation of elements in the Periodic Table using their atomic number

d. relate the properties of some common elements to their position in the Periodic Table

e. predict, using the Periodic Table, the properties of some common elements

f. outline some examples to show how creativity, logical reasoning and the scientific evidence available at the time, contributed to the development of the modern Periodic Table

CW3

Chemical reactions involve rearranging atoms to form new substances; during a chemical reaction mass is not created or destroyed.

c. classify compounds into groups based on common chemical characteristics

Unit 7 Ecosystems

LW2

Conserving and maintaining the quality and sustainability of the environment requires scientific understanding of interactions within, the cycling of matter and the flow of energy through ecosystems.

a. recall that ecosystems consist of communities of interdependent organisms and abiotic components of the environment

c. describe how energy flows through ecosystems, including input and output through food webs

d. analyse how changes in some biotic and abiotic components of an ecosystem affect populations and/or communities

f. evaluate some examples in ecosystems, of strategies used to balance conserving, protecting and maintaining the quality and sustainability of the environment with human activities and needs

Unit 8 The Universe

ES1

Scientific understanding, including models and theories, are contestable and are refined over time through a process of review by the scientific community.

a. outline some of the major features contained in the universe, including galaxies, stars, solar systems and nebulae

b. describe, using examples, some technological developments that have advanced scientific understanding about the universe

c. use appropriate scales to describe differences in sizes of and distances between structures making up the universe

d. Identify that all objects exert a force of gravity on all other objects in the universe

e. use scientific evidence to outline how the Big Bang theory can be used to explain the origin of the universe and its age

f. outline how scientific thinking about the origin of the universe is refined over time through a process of review by the scientific community

Supplementary units

These units can be used in addition to those within the scope and sequence to elaborate on the content descriptors listed.

Metals

How can metals help us fight cancer?

SC4-17CW

explains how scientific understanding of, and discoveries about the properties of elements, compounds and mixtures relate to their uses in everyday life

Human Impacts on Ecosystems

Are corals going extinct...again?

SC5-14LW

analyses interactions between components and processes within biological systems

Sound

In space no one can hear you scream – or can they?

SC5-10PW

Radiation

Why is cosmic radiation so dangerous?

SC5-10PW

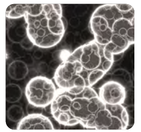
applies models, theories and laws to explain situations involving energy, force and motion

Light

Can you turn your smartphone into a microscope?

SC5-10PW

applies models, theories and laws to explain situations involving energy, force and motion



Reproduction

Which was the first species to have sex?

SC5-15LW

explains how biological understanding has advanced through scientific discoveries, technological developments and the needs of society

Classification

Why do zebras have stripes?

SC4-14LW

analyses interactions between components and processes within biological systems

Simple Machines

How do machines make life easier?

SC4-10PW

describes the action of unbalanced forces in everyday situations

Acids and Bases

Why are our oceans becoming more acidic?

SC5-17CW

discusses the importance of chemical reactions in the production of a range of substances, and the influence of society on the development of new materials

Supporting resources

Use these units to support students' learning beyond the science understanding strand of the Australian Curriculum.

Skill builders
Lessons to boost your students' science inquiry skills

Women in STEM career profiles
Explore a range of careers in STEM

Science news lessons
Real-world science based on the news

Breaking news lessons
Short, literacy-focused lessons about news you need to know

Escape rooms
Engage your students in fun scientific puzzles

Teacher Resources and Templates
Useful resources to help you get the most out of Stile

A photograph of trees during fall. *The seasons are caused by the tilt of the Earth on its axis.*

Stage 4 | Content Statements

Download an editable spreadsheet version **here**.

* Content statements marked with this symbol are addressed by units taught in years 9 and 10.
** The Stile unit listed contributes towards this content statement. Some customisation may be required to provide complete coverage.

PW1 **Change to an object's motion is caused by unbalanced forces acting on the object.**	a. identify changes that take place when particular forces are acting	Forces
	b. predict the effect of unbalanced forces acting in everyday situations	
	c. describe some examples of technological developments that have contributed to finding solutions to reduce the impact of forces in everyday life, eg car safety equipment and footwear design	
	d. analyse some everyday common situations where friction operates to oppose motion and produce heat	
	e. investigate factors that influence the size and effect of frictional forces	
PW2 **The action of forces that act at a distance may be observed and related to everyday situations.**	a. use the term 'field' in describing forces acting at a distance	Magnetism
	b. identify ways in which objects acquire electrostatic charge*	Non-contact Forces and Electricity
	c. describe the behaviour of charged objects when they are brought close to each other	Magnetism
	d. investigate everyday situations where the effects of electrostatic forces can be observed, eg lightning strikes during severe weather and dust storms*	Non-contact Forces and Electricity
	e. identify that the Earth's gravity pulls objects towards the centre of the Earth	
	f. describe everyday situations where gravity acts as an unbalanced force	Our Place in Space
	g. distinguish between the terms 'mass' and 'weight'	
	h. describe the behaviour of magnetic poles when they are brought close together	
	i. investigate how magnets and electromagnets are used in some everyday devices or technologies used in everyday life	Magnetism
PW3 **Energy appears in different forms including movement (kinetic energy), heat and potential energy, and causes change within systems.**	a. identify objects that possess energy because of their motion (kinetic) or because of other properties (potential)	Energy
	b. describe the transfer of heat energy by conduction, convection and radiation, including situations in which each occurs*	Heat
	c. relate electricity with energy transfer in a simple circuit	Electrical Circuits
	d. construct and draw circuits containing a number of components to show a transfer of electricity	
	e. investigate some everyday energy transformations that cause change within systems, including motion, electricity, heat, sound and light	
PW4 **Science and technology contribute to finding solutions to a range of contemporary issues; these solutions may impact on other areas of society and involve ethical considerations.**	a. identify that most energy conversions are inefficient and lead to the production of heat energy, eg in light bulbs	Energy
	b. research ways in which scientific knowledge and technological developments have led to finding a solution to a contemporary issue, eg improvements in devices to increase the efficiency of energy transfers or conversions	
	c. discuss the implications for society and the environment of some solutions to increase the efficiency of energy conversions by reducing the production of heat energy	

Stage 4 | Content Statements

* Content statements marked with this symbol are addressed by units taught in years 9 and 10.
** The Stile unit listed contributes towards this content statement. Some customisation may be required to provide complete coverage.

ES1 **Sedimentary, igneous and metamorphic rocks contain minerals and are formed by processes that occur within Earth over a variety of timescales.**	a. describe the structure of the Earth in terms of core, mantle, crust and lithosphere b. relate the formation of a range of landforms to physical and chemical weathering, erosion and deposition c. outline the origins of and relationships between sedimentary, igneous and metamorphic rocks d. identify that sedimentary, igneous and metamorphic rocks contain minerals e. classify a variety of common rocks and minerals into groups according to their observable properties f. describe the conditions under which fossils form g. outline how geological history can be interpreted in a sequence of horizontal sedimentary layers, in which the oldest are at the base and the youngest at the top	Active Earth (Part 1)
	h. describe examples to show how people use understanding and skills from across the disciplines of science in occupations related to the exploration, mining or processing of minerals in Australia**	Resources
ES2 **Scientific knowledge changes as new evidence becomes available. Some technological developments and scientific discoveries have significantly changed people's understanding of the solar system.**	a. explain that predictable phenomena on the Earth, including day and night, seasons and eclipses are caused by the relative positions of the sun, the Earth and the moon b. demonstrate, using examples, how ideas by people from different cultures have contributed to the current understanding of the solar system c. compare historical and current models of the solar system to show how models are modified or rejected as a result of new scientific evidence d. describe some examples of how technological advances have led to discoveries and increased scientific understanding of the solar system	Our Place in Space
ES3 **Scientific knowledge influences the choices people make in regard to the use and management of the Earth's resources.**	a. classify a range of the Earth's resources as renewable or non-renewable b. outline features of some non-renewable resources, including metal ores and fossil fuels c. describe uses of a variety of natural and made resources extracted from the biosphere, atmosphere, lithosphere and hydrosphere d. investigate some strategies used by people to conserve and manage non-renewable resources, eg recycling and the alternative use of natural and made resources e. discuss different viewpoints people may use to weight criteria in making decisions about the use of a major non-renewable resource found in Australia** f. outline the choices that need to be made when considering whether to use scientific and technological advances to obtain a resource from Earth's spheres**	Resources
ES4 **Science understanding influences the development of practices in areas of human activity such as industry, agriculture and marine and terrestrial resource management.**	a. identify that water is an important resource that cycles through the environment b. explain the water cycle in terms of the physical processes involved c. demonstrate how scientific knowledge of the water cycle has influenced the development of household, industrial and agricultural water management practices** d. research how Aboriginal and Torres Strait Islander Peoples' knowledge is being used in decisions to care for country and place, eg terrestrial and aquatic resource management**	The Water Cycle

Stage 4 | Content Statements

* Content statements marked with this symbol are addressed by units taught in years 9 and 10.
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LW1 **There are differences within and between groups of organisms; classification helps organise this diversity.**	a. identify reasons for classifying living things	Classification and Biodiversity
	b. classify a variety of living things based on similarities and differences in structural features	
	c. use simple keys to identify a range of plants and animals	
	d. identify some examples of groups of micro-organisms	
	e. outline the structural features used to group living things, including plants, animals, fungi and bacteria	
	f. explain how the features of some Australian plants and animals are adaptations for survival and reproduction in their environment	The Survival of Species
LW2 **Cells are the basic units of living things and have specialised structures and functions.**	a. identify that living things are made of cells	Cells
	b. identify structures within cells, including the nucleus, cytoplasm, cell membrane, cell wall and chloroplast, and describe their functions	
	c. outline the role of respiration in providing energy for the activities of cells*	Reactions and Energy
	d. identify that new cells are produced by cell division	Cells
	e. distinguish between unicellular and multicellular organisms	
	f. identify that different types of cells make up the tissues, organs and organ systems of multicellular organisms	
LW3 **Multicellular organisms contain systems of organs that carry out specialised functions that enable them to survive and reproduce. Scientific knowledge influences the choices people make in regard to the use and management of the Earth's resources.**	a. identify the materials required by multicellular organisms for the processes of respiration and photosynthesis	Plants
	b. explain that the systems in multicellular organisms work together to provide cell requirements, including gases, nutrients and water, and to remove cell wastes	Body Systems
	c. outline the role of cell division in growth, repair and reproduction in multicellular organisms**	Cells
	d. describe the role of the flower, root, stem and leaf in maintaining flowering plants as functioning organisms	Plants
	e. describe the role of the digestive, circulatory, excretory, skeletal/muscular and respiratory systems in maintaining a human as a functioning multicellular organism**	Body Systems
	f. outline the role of the reproductive system in humans	The Survival of Species
LW4 **Scientific knowledge changes as new evidence becomes available, and some scientific discoveries have significantly changed people's understanding of the world.**	a. research an example of how changes in scientific knowledge have contributed to finding a solution to a human health issue**	The Survival of Species
	b. recount how evidence from a scientific discovery has changed understanding and contributed to solving a real world problem, eg animal or plant disease, hygiene, food preservation, sewage treatment or biotechnology**	States of Matter
	c. describe, using examples, how developments in technology have contributed to finding solutions to a contemporary issue, eg organ transplantation, artificial joints/limbs, treatment for diabetes, asthma, kidney or heart disease**	Energy
	d. give examples to show that groups of people in society may use or weight criteria differently in making decisions about the application of a solution to a contemporary issue, eg organ transplantation, control and prevention of diseases and dietary deficiencies**	Body Systems
LW5 **Science and technology contribute to finding solutions to conserving and managing sustainable ecosystems.**	a. construct and interpret food chains and food webs, including examples from Australian ecosystems	Food Chains and Food Webs
	b. describe interactions between organisms in food chains and food webs, including producers, consumers and decomposers	
	c. describe examples of beneficial and harmful effects that micro-organisms can have on living things and the environment**	Body Systems
	d. predict how human activities can affect interactions in food chains and food webs, including examples from Australian land or marine ecosystems	Food Chains and Food Webs
	e. explain, using examples, how scientific evidence and/or technological developments contribute to developing solutions to manage the impact of natural events on Australian ecosystems	
	f. describe how scientific knowledge has influenced the development of practices in agriculture, eg animal husbandry or crop cultivation to improve yields and sustainability, or the effect of plant-cloning techniques in horticulture**	Plants

* Content statements marked with this symbol are addressed by units taught in years 9 and 10.
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CW1 **The properties of the different states of matter can be explained in terms of the motion and arrangement of particles.**	a. describe the behaviour of matter in terms of particles that are continuously moving and interacting	States of Matter
	b. relate an increase or decrease in the amount of heat energy possessed by particles to changes in particle movement	
	c. use a simple particle model to predict the effect of adding or removing heat on different states of matter	
	d. relate changes in the physical properties of matter to heat energy and particle movement that occur during observations of evaporation, condensation, boiling, melting and freezing	
	e. explain density in terms of a simple particle model**	Mixtures
	f. identify the benefits and limitations of using models to explain the properties of solids, liquids and gases	States of Matter
CW2 **Scientific knowledge and developments in technology have changed our understanding of the structure and properties of matter.**	a. describe the properties and uses of some common elements, including metals and non-metals	Elements and Compounds
	b. identify how our understanding of the structure and properties of elements has changed as a result of some technological devices**	
	c. identify some examples of common compounds	
	d. explain why internationally recognised symbols are used for common elements	
	e. describe at a particle level the difference between elements, compounds and mixtures, including the type and arrangement of particles	
	f. investigate how people in different cultures in the past have applied their knowledge of the properties of elements and compounds to their use in everyday life, eg utensils, weapons and tools**	
CW3 **Mixtures, including solutions, contain a combination of pure substances that can be separated using a range of techniques.**	a. describe the importance of water as a solvent in daily life, industries and the environment**	Mixtures
	b. describe aqueous mixtures in terms of solute, solvent and solution	
	c. relate a range of techniques used to separate the components of some common mixtures to the physical principles involved in each process, including filtration, decantation, evaporation, crystallisation, chromatography and distillation**	
	d. investigate the application of a physical separation technique used in everyday situations or industrial processes, eg water filtering, sorting waste materials, extracting pigments or oils from plants, separating blood products or cleaning up oil spills**	
	e. research how people in different occupations use understanding and skills from across the disciplines of Science in carrying out separation techniques	
CW4 **In a chemical change, new substances are formed, which may have specific properties related to their uses in everyday life.**	a. identify when a chemical change is taking place by observing a change in temperature, the appearance of new substances or the disappearance of an original substance	Physical and Chemical Change
	b. demonstrate that a chemical change involves substances reacting to form new substances	
	c. investigate some examples of chemical change that occur in everyday life, eg photosynthesis, respiration and chemical weathering**	
	d. compare physical and chemical changes in terms of the arrangement of particles and reversibility of the process	
	e. propose reasons why society should support scientific research, eg in the development of new pharmaceuticals and polymers**	Elements and Compounds
	f. describe, using examples, how science knowledge can develop through collaboration and connecting ideas across the disciplines of science, eg making or obtaining new substances from Earth's spheres**	Physical and Chemical Change

Stage 5 | Content Statements

Download an editable spreadsheet version **here**.

* Content statements marked with this symbol are addressed by units taught in years 7 and 8.
** The Stile unit listed contributes towards this content statement. Some customisation may be required to provide complete coverage.

PW1 **Energy transfer through different mediums can be explained using wave and particle models.**	a. explain, in terms of the particle model, the processes underlying convection and conduction of heat energy	Heat
	b. identify situations where waves transfer energy	Waves
	c. describe using the wave model, the features of waves including wavelength, frequency and speed	
	d. explain, using the particle model, the transmission of sound in different mediums	
	e. relate the properties of different types of radiation in the electromagnetic spectrum to their uses in everyday life, including communications technology	
	f. describe the occurrence and some applications of absorption, reflection and refraction in everyday situations	
PW2 **The motion of objects can be described and predicted using the laws of physics.**	a. describe the relationship between force, mass and acceleration	Newton's Laws of Motion
	b. explain the relationship between distance, speed and time	Kinematics
	c. relate acceleration to a change in speed and/or direction as a result of a net force	
	d. analyse everyday situations involving motion in terms of Newton's laws	Newton's Laws of Motion
PW3 **Scientific understanding of current electricity has resulted in technological developments designed to improve the efficiency in generation and use of electricity.**	a. describe voltage, current and resistance in terms of energy applied, carried and dissipated	Non-contact Forces and Electricity
	b. describe the relationship between voltage, resistance and current	
	c. compare the characteristics and applications of series and parallel electrical circuits	
	d. outline recent examples where scientific or technological developments have involved specialist teams from different branches of science, engineering and technology, eg low-emissions electricity generation and reduction in atmospheric pollution	
PW4 **Energy conservation in a system can be explained by describing energy transfers and transformations.**	a. apply the law of conservation of energy to account for the total energy involved in energy transfers and transformations	Energy Conservation
	b. describe how, in energy transfers and transformations, a variety of processes can occur so that usable energy is reduced and the system is not 100% efficient	
	c. discuss, using examples, how the values and needs of contemporary society can influence the focus of scientific research in the area of increasing efficiency of the use of electricity by individuals and society**	
	d. discuss viewpoints and choices that need to be considered in making decisions about the use of non-renewable energy resources	

Stage 5 | Content Statements

* Content statements marked with this symbol are addressed by units taught in years 7 and 8.
** The Stile unit listed contributes towards this content statement. Some customisation may be required to provide complete coverage.

ES1 **Scientific understanding, including models and theories, are contestable and are refined over time through a process of review by the scientific community.**	a. outline some of the major features contained in the universe, including galaxies, stars, solar systems and nebulae	The Universe
	b. describe, using examples, some technological developments that have advanced scientific understanding about the universe	
	c. use appropriate scales to describe differences in sizes of and distances between structures making up the universe	
	d. identify that all objects exert a force of gravity on all other objects in the universe	
	e. use scientific evidence to outline how the Big Bang theory can be used to explain the origin of the universe and its age	
	f. outline how scientific thinking about the origin of the universe is refined over time through a process of review by the scientific community	
ES2 **The theory of plate tectonics explains global patterns of geological activity and continental movement.**	a. outline how the theory of plate tectonics changed ideas about the structure of the Earth and continental movement over geological time	Active Earth (Part 2)
	b. relate movements of the Earth's plates to mantle convection currents and gravitational forces	
	c. outline how the theory of plate tectonics explains earthquakes, volcanic activity and formation of new landformsAsia and Australia's engagement with Asia	
	d. describe how some technological developments have increased scientific understanding of global patterns in geological activity, including in the Asia-Pacific region	
ES3 **People use scientific knowledge to evaluate claims, explanations or predictions in relation to interactions involving the atmosphere, biosphere, hydrosphere and lithosphere.**	a. outline how global systems rely on interactions involving the biosphere, lithosphere, hydrosphere and atmosphere, including the carbon cycle	Earth Systems
	b. describe some impacts of natural events, including cyclones, volcanic eruptions or earthquakes, on the Earth's spheres	Active Earth (Part 2)
	c. evaluate scientific evidence of some current issues affecting society that are the result of human activity on global systems, eg the greenhouse effect, ozone layer depletion, effect of climate change on sea levels, long-term effects of waste management and loss of biodiversity	Earth Systems
	d. discuss the reasons different groups in society may use or weight criteria differently to evaluate claims, explanations or predictions in making decisions about contemporary issues involving interactions of the Earth's spheres**	

Stage 5 | Content Statements

* Content statements marked with this symbol are addressed by units taught in years 7 and 8.
** The Stile unit listed contributes towards this content statement. Some customisation may be required to provide complete coverage.

LW1 **Multicellular organisms rely on coordinated and interdependent internal systems to respond to changes in their environment.**	a. describe some examples of how multicellular organisms respond to changes in their environment	The Immune System
	b. describe how the coordinated function of internal systems in multicellular organisms provides cells with requirements for life, including gases, nutrients and water, and removes cell wastes*	Body Systems
	c. outline some responses of the human body to infectious and non-infectious diseases	
	d. describe the role of, and interaction between, the coordination systems in maintaining humans as functioning organisms**	The Immune System
	e. discuss, using examples, how the values and needs of contemporary society can influence the focus of scientific research, eg the occurrence of diseases affecting animals and plants, an epidemic or pandemic disease in humans or lifestyle related non-infectious diseases in humans	
LW2 **Conserving and maintaining the quality and sustainability of the environment requires scientific understanding of interactions within, the cycling of matter and the flow of energy through ecosystems.**	a. recall that ecosystems consist of communities of interdependent organisms and abiotic components of the environment	Ecosystems
	b. outline using examples how matter is cycled through ecosystems such as nitrogen	Earth Systems
	c. describe how energy flows through ecosystems, including input and output through food webs	
	d. analyse how changes in some biotic and abiotic components of an ecosystem affect populations and/or communities	
	e. assess ways that Aboriginal and Torres Strait Islander Peoples' cultural practices and knowledge of the environment contribute to the conservation and management of sustainable ecosystems**	Ecosystems
	f. evaluate some examples in ecosystems, of strategies used to balance conserving, protecting and maintaining the quality and sustainability of the environment with human activities and needs	
LW3 **Advances in scientific understanding often rely on developments in technology, and technological advances are often linked to scientific discoveries.**	a. relate the organs involved in human reproductive systems to their function*	The Survival of Species
	b. identify that during reproduction the transmission of heritable characteristics from one generation to the next involves DNA and genes	Genetics
	c. identify that genetic information is transferred as genes in the DNA of chromosomes	
	d. outline how the Watson-Crick model of DNA explains: the exact replication of DNA; changes in genes (mutation)	
	e. describe, using examples, how developments in technology have advanced biological understanding, eg vaccines, biotechnology, stem-cell research and in-vitro fertilisation	The Immune System
	f. discuss some advantages and disadvantages of the use and applications of biotechnology, including social and ethical considerations	Evolution
LW4 **The theory of evolution by natural selection explains the diversity of living things and is supported by a range of scientific evidence.**	a. describe scientific evidence that present-day organisms have evolved from organisms in the past	Evolution
	b. relate the fossil record to the age of the Earth and the time over which life has been evolving	
	c. explain, using examples, how natural selection relates to changes in a population, eg in the development of resistance of bacteria to antibiotics and insects to pesticides	
	d. outline the roles of genes and environmental factors in the survival of organisms in a population	

* Content statements marked with this symbol are addressed by units taught in years 7 and 8.
** The Stile unit listed contributes towards this content statement. Some customisation may be required to provide complete coverage.

CW1 **Scientific understanding changes and is refined over time through a process of review by the scientific community.**	a. identify that all matter is made of atoms which are composed of protons, neutrons and electrons	Atoms
	b. describe the structure of atoms in terms of the nucleus, protons, neutrons and electrons	
	c. outline historical developments of the atomic theory to demonstrate how models and theories have been contested and refined over time through a process of review by the scientific community**	
	d. identify that natural radioactivity arises from the decay of nuclei in atoms, releasing particles and energy	
	e. evaluate the benefits and problems associated with medical and industrial uses of nuclear energy	
CW2 **The atomic structure and properties of elements are used to organise them in the Periodic Table.**	a. identify the atom as the smallest unit of an element and that it can be represented by a symbol	The Periodic Table
	b. distinguish between the atoms of some common elements by comparing information about the numbers of protons, neutrons and electrons	
	c. describe the organisation of elements in the Periodic Table using their atomic number	
	d. relate the properties of some common elements to their position in the Periodic Table	
	e. predict, using the Periodic Table, the properties of some common elements	
	f. outline some examples to show how creativity, logical reasoning and the scientific evidence available at the time, contributed to the development of the modern Periodic Table	
CW3 **Chemical reactions involve rearranging atoms to form new substances; during a chemical reaction mass is not created or destroyed.**	a. recall that all matter is composed of atoms and has mass	Chemical Reactions
	b. identify a range of compounds using their common names and chemical formulae	
	c. classify compounds into groups based on common chemical characteristics	The Periodic Table
	d. investigate a range of types of important chemical reactions that occur in non-living systems and involve energy transfer, including: combustion, the reaction of acids inclouding metals and carbonates, corrosion, precipitation, neutralisation, decomposition	Reaction Types Earth Systems
	e. identify some examples of important chemical reactions that occur in living systems and involve energy transfer, including respiration and reactions involving acids such as occur during digestion	Reactions and Energy
	f. construct word equations from observations and written descriptions of a range of chemical reactions	Chemical Reactions
	g. deduce that new substances are formed during chemical reactions by rearranging atoms rather than creating or destroying them	
CW4 **Different types of chemical reactions are used to produce a range of products and can occur at different rates and involve energy transfer.**	a. identify that chemical reactions involve energy transfer and can be exothermic or endothermic	Reactions and Energy
	b. compare combustion and respiration as types of chemical reactions that release energy but occur at different rates	
	c. describe the effects of factors, eg temperature and catalysts, on the rate of some common chemical reactions	
	d. analyse how social, ethical and environmental considerations can influence decisions about scientific research related to the development and production of new materials	
	e. describe examples to show where advances in science and/or emerging science and technologies significantly affect people's lives, including generating new career opportunities in areas of chemical science such as biochemistry and industrial chemistry	

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