

## Victorian Curriculum – Levels 7 and 8

### Introduction:

This document maps Education Perfect lessons to the Victorian Curriculum. A lesson may cover multiple standards, such as fulfilling both science as a human endeavour standards and other science understanding standards. In these cases, the lesson is found in both sections in the document.

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### Key:

-  Lessons that address the science understanding standard.
-  Lessons that elaborate or extend above and beyond the curriculum.
-  Lessons that also fulfil science as a human endeavour standards.
-  Lessons that also fulfil science inquiry skills standards.

# Science Understanding

## Science as a Human Endeavour

### Relevant section of the achievement standard:

By the end of Level 8, students explain how evidence has led to an improved understanding of a scientific idea. They discuss how science knowledge can be applied to generate solutions to contemporary problems and explain how these solutions may impact on society.

### Standards:

**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. ([VCSSU089](#))**

<a href="#">Carl Linnaeus</a>	The life of Carl Linnaeus and his contributions to Science.
<a href="#">Dragons in the Deep</a>	The discovery of a deep-sea sea dragon and its strange adaptations.
<a href="#">Identifying Species</a>	How scientists determine if two organisms are from the same species or different species.
<a href="#">Plant Divisions</a>	The classification of plants based on how they reproduce.
<a href="#">The Platypus</a>	How scientists classified the platypus.
<a href="#">Cell Theory</a>	The development of cell theory.
<a href="#">History of Microscopes</a>	The history and development of microscopes.
<a href="#">Antarctica</a>	The life on the icy continent of Antarctica.
<a href="#">Australian Bushfires</a>	Australian bushfires and aboriginal firestick farming.
<a href="#">Maple Syrup</a>	Where maple syrup comes from.
<a href="#">Blood as a Mixture</a>	Blood, focusing on how it is a mixture. Also covers the functions of the different components which make up blood.
<a href="#">Indigenous Art using Mixtures</a>	How Indigenous Australians used mixtures in their art.
<a href="#">Separation in Food</a>	Separation processes used to create specific food products.

<a href="#"><u>States of Matter in Space</u></a>	How the extreme temperatures of different planets and moons affects matter and how this affects their weather.
<a href="#"><u>When Water Freezes</u></a>	How changing state affects density and how water is an important exception to the rule.
<a href="#"><u>Carbon Chemistry</u></a>	Carbon and the many useful allotropes of carbon.
<a href="#"><u>Discovering Elements</u></a>	A history of the discovery of several notable elements.
<a href="#"><u>Marie Curie and Radioactivity</u></a>	Introduction to radioactivity, and the history of Marie Curie's discoveries.
<a href="#"><u>Alchemy</u></a>	Exploring alchemy and its contributions to modern chemistry.
<a href="#"><u>Synthetic Materials</u></a>	Fabrics; both natural and synthetic, with some understanding of the chemistry involved in making fabrics.
<a href="#"><u>Working in Chemistry</u></a>	The various occupations that use chemistry.
<a href="#"><u>Calendars and the Solar Year</u></a>	The development of calendars, including a section on the Indigenous Australian calendars.
<a href="#"><u>Exploring Space</u></a>	Humans in space and space missions including: Apollo 11, Curiosity, New Horizons and Voyager 1.
<a href="#"><u>Indigenous Constellations</u></a>	The use of constellations in Indigenous Australian peoples' lives.
<a href="#"><u>Models of the Solar System</u></a>	Development of the Geocentric and Heliocentric Models of the Solar System.
<a href="#"><u>Satellites</u></a>	Introducing satellites and their uses, including in GPS and the International Space Station.
<a href="#"><u>Telescopes</u></a>	How telescopes were developed, including the Hubble Space Telescope.
<a href="#"><u>Antarctica, a Shared Continent</u></a>	The shared scientific community of Antarctica.
<a href="#"><u>Changing Seasons</u></a>	How seasonal changes affect people in a variety of activities.
<a href="#"><u>Australian Fossils</u></a>	Palaeontology and fossils, with a focus on the Ediacaran biota, fish of Gogo Station and dinosaurs of Winton.
<a href="#"><u>Martian Geology</u></a>	The geology and history of Mars.
<a href="#"><u>Volcanology</u></a>	Volcanoes and how scientists study them.
<a href="#"><u>Ancient Tools and Weapons</u></a>	A look at some ancient weapons and tools, and the machines that made them work.
<a href="#"><u>Comparing Robots</u></a>	This lesson shows how robots all contain simple machines.
<a href="#"><u>Fact or Friction?</u></a>	This lesson describes useful friction and unwanted friction.
<a href="#"><u>Sports Science</u></a>	A lesson on how we use our knowledge of forces in Sports Science.
<a href="#"><u>The Development of Flight</u></a>	The history of airplanes, and their evolution in design and energy efficiency.
<a href="#"><u>The Power Grid and You</u></a>	How energy travels from power stations to the home.

**The History of Lenses**

The development of lenses and how they are used in telescopes, microscopes and cameras.

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. ([VCSSU090](#))

**What is Science?**

Introduction to science and how it is used in the world around us.

**Careers in Science**

The many different careers that can result from a science education.

**Antibiotics**

Introducing antibiotics and the issue of antibiotic resistance.

**Disease Treatment and Control**

Using good hygiene practices to control the spread of infectious diseases.

**Stem Cells**

Introducing embryonic and adult stem cells and their applications in medicine.

**Vaccination**

The importance of vaccines.

**Global Warming**

Global warming and what it does to ecosystems.

**Introduced and Invasive Species**

What introduced and invasive species are and how they can affect native species and ecosystems.

**Invasive Species in Australia**

The invasive cane toad and rabbits.

**Pollution and Ecosystems**

How pollution can affect whole ecosystems. It includes an example of how pollution affects the Great Barrier Reef.

**Saving the Tasmanian Devil**

The Tasmanian devil and the disease that threatens it with extinction.

**What is Pollution?**

What pollution is, where it comes from and what it does to living things.

**Contraception**

Explaining the different methods of contraception.

**Ethical Issues of Organ Transplants**

Smart Lesson explaining what ethical dilemmas are, using organ transplants as examples.

**Infertility**

Explaining infertility and the different reproductive techniques that are available.

**Lamb in a Bag**

Looking into the recent development of artificial wombs that were used to keep premature lambs alive, and how this relates to premature human babies.

**Organ Transplants**

What organ transplants are.

**Plant Cloning**

Plant and gene cloning and its use in growing crops.

**Recycling Sewage**

The methods used to treat sewage.

**Separation in Industries**

How separation is used in mining.

<a href="#"><u>Water Treatment</u></a>	How water is treated from source to tap. Discusses separation techniques used in the water treatment process.
<a href="#"><u>Heatpumps and Refrigerators</u></a>	How heatpumps and refrigerators use changes in temperature, pressure and state to heat a house and chill food.
<a href="#"><u>The Water Cycle and Weather</u></a>	How state changes affect the water cycle and weather.
<a href="#"><u>Materials Science</u></a>	A history of useful materials, from the Stone Age to modern times.
<a href="#"><u>Recycling</u></a>	Recycling, the physical changes that occur during recycling and why we recycle.
<a href="#"><u>Renewable Energy</u></a>	The renewable energy options that Australia has available.
<a href="#"><u>Science, Tradition and Modern Medicine</u></a>	Connections between science, tradition and modern medicine.
<a href="#"><u>Hydroelectricity</u></a>	Discussing how hydroelectricity works.
<a href="#"><u>Irrigation</u></a>	How we water our plants, covering the spray and flood irrigation types.
<a href="#"><u>Water Conservation</u></a>	How we recycle water and why we do it.
<a href="#"><u>Water Management</u></a>	The importance of effective water management skills in Australia.
<a href="#"><u>Minerals and Rocks as Resources</u></a>	Explanation of how rocks and minerals are used as resources.
<a href="#"><u>Mining and Mineral Exploration</u></a>	How coal and uranium are mined in Australia, with an emphasis on how geologists uncover these resources.
<a href="#"><u>Safety Systems</u></a>	This lesson describes how we use our knowledge of forces to stay safe.
<a href="#"><u>Cars of the Future</u></a>	How cars are designed to transfer energy, and the modern designs that are using clean energy.
<a href="#"><u>Energy Efficient Houses</u></a>	Smart Lesson on maximising energy efficiency in houses.
<a href="#"><u>Housing Insulation</u></a>	Explaining how insulation can be used to prevent heat from entering or exiting a house.
<a href="#"><u>Bionic Eye</u></a>	How an artificial eye could work, and the research being done into the concept.
<a href="#"><u>Electromagnetic Radiation and Medicine</u></a>	Explanation of how electromagnetic radiation can be used to detect and treat cancer.
<a href="#"><u>You, Me and UV</u></a>	How UV can result in skin cancer and the importance of practicing good sun protection.
<a href="#"><u>Bionic Ears</u></a>	Explanation of how cochlear implants can restore hearing.
<a href="#"><u>Turned Down for What: Workplace Noise</u></a>	Overview of why it is important to maintain safe noise levels in the workplace, in order to prevent hearing loss.
<a href="#"><u>Introduction to Ethics</u></a>	Explaining what ethics is, and how ethics can be influenced by a variety of cultural factors.
<a href="#"><u>Ethics Around the World</u></a>	Exploring the history of ethics in Europe, India, China, Japan and America.

## Biological Sciences

### Relevant section of the achievement standard:

By the end of Level 8, students ... analyse the relationship between structure and function at cell, organ and body system levels. They identify and classify living things. They explain how living organisms can be classified into major taxonomic groups based on observable similarities and differences. They predict the effect of environmental changes on feeding relationships between organisms in a food web.

### Standards:

**There are differences within and between groups of organisms; classification helps organise this diversity. ([VCSSU091](#))**

 <a href="#">Introduction to Classification</a>	The principles of classification.
 <a href="#">Uses of Classification</a>	Why classification is useful to scientists, especially biologists.
 <a href="#">Living or Non-Living?</a>	How to classify things as living or non-living, with an introduction to unicellular and multicellular organisms.
 <a href="#">MRS GREN</a>	Introduction to the seven life processes.
 <a href="#">Types of Keys</a>	How to read and build dichotomous keys.
 <a href="#">Linnaean Classification</a>	Carolus Linnaeus and his contributions to the field of taxonomy, including the seven levels of classification.
 <a href="#">Binomial Nomenclature</a>	Binomial nomenclature and writing scientific names.
 <a href="#">Species and Hybrids</a>	The reproductive definition of species and hybrids.
 <a href="#">Animal Phyla</a>	Animals classified at the level of phylum.
 <a href="#">The Six Kingdoms</a>	The six major kingdoms of life.
 <a href="#">Vertebrates</a>	Vertebrates and the place of humans on the Tree of Life.
 <a href="#">Carl Linnaeus</a>	The life of Carl Linnaeus and his contributions to Science.

	<a href="#">Dragons in the Deep</a>	The discovery of a deep-sea sea dragon and its strange adaptations.
	<a href="#">Identifying Species</a>	How scientists determine if two organisms are from the same species or different species.
	<a href="#">Plant Divisions</a>	The classification of plants based on how they reproduce.
	<a href="#">The Platypus</a>	How scientists classified the platypus.
	<a href="#">Building Dichotomous Keys</a>	Investigation in classifying leaves with a dichotomous key.
	<a href="#">Classifying Leaves</a>	Investigation in classifying leaves into groups based on their shape.
	<a href="#">Researching Phyla</a>	Using research to compare and contrast two animals from the same phylum.
	<a href="#">Using Dichotomous Keys</a>	Using a dichotomous key to identify dragons.

Cells are the basic units of living things and have specialised structures and functions. ([VCSSU092](#))

	<a href="#">What is a Cell?</a>	Introduction to cells.
	<a href="#">Size of Cells</a>	Introduction to the units and incredibly small size of cells.
	<a href="#">Types of Microscopes</a>	Different types of microscopes that can be used.
	<a href="#">Introduction to Types of Cells: Pond Water Investigation</a>	Introductory lesson on the different types of cells - prokaryotic and eukaryotic - structured as an investigation into the organisms found in pond water.
	<a href="#">Prokaryotic Cells</a>	Introductory Smart Lesson on prokaryotic cells and bacteria.
	<a href="#">Bacterial Cell Structure</a>	The organelles found in prokaryotes such as bacteria.
	<a href="#">Eukaryotic Cells</a>	Introductory Smart Lesson on eukaryotic cells and the organelles present in all eukaryotic cells.
	<a href="#">Animal Cells</a>	The organelles found in animal cells.
	<a href="#">Plant Cell Structure</a>	The organelles found in plant cells.

 <a href="#">Fungal Cell Structure</a>	Introduction to the structure of fungal cells.
 <a href="#">Cell Division in Bacteria</a>	Introducing binary fission in bacteria.
 <a href="#">Cell Division in Humans</a>	The concept of cell division, and the difference between mitosis and meiosis.
 <a href="#">Specialised Animal Cells</a>	Specialised animal cells, and how the structure of the cells relates to their function.
 <a href="#">Specialised Plant Cells</a>	Specialised plant cells, and how the structure of the cells relates to their function.
 <a href="#">Levels of Organisation</a>	The various levels of organisation in the human body, from the smallest cells up to organs.
 <a href="#">Animal vs. Plant Cells</a>	Comparing animal and plant cell organelles and structure.
 <a href="#">Diffusion</a>	A lesson explaining the process of diffusion and the surface area: volume ratio.
 <a href="#">Diffusion and Cell Size</a>	Diffusion and the surface area to volume ratio.
 <a href="#">Prokaryotic vs. Eukaryotic</a>	Comparing prokaryotes and eukaryotes.
 <a href="#">Antibiotics</a>	Introducing antibiotics and the issue of antibiotic resistance.
 <a href="#">Cell Theory</a>	The development of cell theory.
 <a href="#">Disease Treatment and Control</a>	Using good hygiene practices to control the spread of infectious diseases.
 <a href="#">History of Microscopes</a>	The history and development of microscopes.
 <a href="#">Stem Cells</a>	Introducing embryonic and adult stem cells and their applications in medicine.
 <a href="#">Vaccination</a>	The importance of vaccines.
 <a href="#">Jelly Cells</a>	Experiment using jelly and lollies to make a model of a cell.
 <a href="#">Pond Critters</a>	Experiment collecting pond water examine under a microscope.
 <a href="#">Preparing and Observing Cells</a>	Experiment practicing proper microscope and slide preparation techniques.

	<a href="#">Using a Microscope:</a>	Investigation in how to use a microscope correctly.
	<a href="#">Parts and Function of a Microscope</a>	How microscopes work and what they are.
	<a href="#">Magnification and Resolution</a>	How magnification can be calculated and changed and how this relates to the field of view and resolution.
	<a href="#">How to Use a Microscope</a>	Instructions on how to properly use a microscope.
	<a href="#">Food Safety and Salmonella</a>	In this lesson, students interpret data on how temperature affects the rate of cell division in salmonella. From this, they draw conclusions about how to safely store food.

Interactions between organisms can be described in terms of food chains and food webs and can be affected by human activity. ([VCSSU093](#))

	<a href="#">Ecology</a>	Introducing ecology, the biosphere and biomes.
	<a href="#">Species vs Organism</a>	The difference between a species and an organism.
	<a href="#">Ecosystem</a>	Introductory lesson on ecosystems and what they contain.
	<a href="#">Biotic and Abiotic Factors</a>	The differences between biotic and abiotic factors in an ecosystem.
	<a href="#">Interdependent Relationships</a>	Introducing types of symbiotic relationships, including commensalism, mutualism and parasitism.
	<a href="#">Predators, Prey &amp; Competition</a>	Introducing and explaining predators, prey and competitors.
	<a href="#">Producers &amp; Photosynthesis</a>	Producers and the plant process of photosynthesis.
	<a href="#">Consumers</a>	Trophic levels and consumers.
	<a href="#">Food Chains</a>	Food chains.
	<a href="#">Food Webs</a>	Food webs.
	<a href="#">Adaptations</a>	What structural, behaviour and physiological adaptations are and how they aid in an organism's survival.
	<a href="#">Cane Toads as an Introduced Species</a>	The impact cane toads have on native ecosystems.

 <a href="#"><u>Deforestation</u></a>	The impact deforestation has on native ecosystems.
 <a href="#"><u>Diurnal vs Nocturnal</u></a>	The differences between diurnal and nocturnal animals.
 <a href="#"><u>Ecosystem Conservation</u></a>	The steps the Australian Government is taking to conserve native ecosystems.
 <a href="#"><u>Introduced Species</u></a>	The impact introduced species have on native ecosystems.
 <a href="#"><u>Oil Pollution &amp; Industrial Waste</u></a>	The impact industrial waste and oil spills have on ecosystems.
 <a href="#"><u>Pesticides</u></a>	The impact pesticides have on native ecosystems.
 <a href="#"><u>Scientific Methods of Conservation</u></a>	How scientific methods are used to protect native ecosystems and at-risk species
 <a href="#"><u>Species Conservation</u></a>	The steps the Australian Government is taking to protect native species
 <a href="#"><u>Water Pollution</u></a>	The impact water pollution has on ecosystems.
 <a href="#"><u>Antarctica</u></a>	The life on the icy continent of Antarctica.
 <a href="#"><u>Australian Bushfires</u></a>	Australian bushfires and aboriginal firestick farming.
 <a href="#"><u>Global Warming</u></a>	Global warming and what it does to ecosystems.
 <a href="#"><u>Introduced and Invasive Species</u></a>	What introduced and invasive species are and how they can affect native species and ecosystems.
 <a href="#"><u>Invasive Species in Australia</u></a>	The invasive cane toad and rabbits.
 <a href="#"><u>Pollution and Ecosystems</u></a>	How pollution can affect whole ecosystems. It includes an example of how pollution affects the Great Barrier Reef.
 <a href="#"><u>Saving the Tasmanian Devil</u></a>	The Tasmanian devil and the disease that threatens it with extinction.
 <a href="#"><u>What is Pollution?</u></a>	What pollution is, where it comes from and what it does to living things.
 <a href="#"><u>Build a Food Web</u></a>	Building a food web using a list of species and information about what they eat.
 <a href="#"><u>Collecting Invertebrates in Quadrats</u></a>	Collecting invertebrates and use them to estimate biodiversity.

 <a href="#">Extracting Leaf Pigments</a>	Extracting pigments from plant leaves.
 <a href="#">Growing Plants under Different Conditions</a>	Design an experiment for testing how plants grow under different conditions.
 <a href="#">Measuring Abiotic Factors in Water</a>	Measuring the abiotic factors temperature, pH, salinity and turbidity in three different water samples.
 <a href="#">Sustainable Bush Tucker</a>	This Smart Lesson describes some of the sustainable hunting and gathering techniques used by Australian Aboriginals. This lesson can be used to improve reading comprehension in students.
 <a href="#">Marine Ecosystems and Overfishing</a>	Data is presented on overfishing to read column graphs, pie charts and tables.

**Multicellular organisms contain systems of organs that carry out specialised functions that enable them to survive and reproduce.**  
**(VCSSU094)**

 <a href="#">Introduction to Body Systems</a>	The comparison of unicellular to multicellular organisms, how structure relates to function, and what body systems are.
 <a href="#">Digestive System as a Whole</a>	The different structures of the digestive system and describing how each function.
 <a href="#">Food Groups</a>	Three different food groups and what they consist of.
 <a href="#">Mouth and Oesophagus</a>	The start of the digestive system: the mouth, oesophagus and the sphincter. The difference between mechanical and chemical digestion is also explained.
 <a href="#">Stomach and Small Intestine</a>	How digestion occurs in the stomach and the small intestines.
 <a href="#">Large Intestine and Rectum</a>	How digestion takes place in the large intestines and rectum.
 <a href="#">Comparing Digestion in Other Animals</a>	Comparing and contrasting the digestive systems of koalas, cows, dingoes and humans.
 <a href="#">Introduction to Respiration</a>	The different structures and functions of the respiratory system.
 <a href="#">Breathing</a>	The muscles responsible for breathing and the path air takes during inhalation and exhalation.
 <a href="#">Gas Exchange</a>	The exchange of oxygen and carbon dioxide takes place.
 <a href="#">Respiration in Cells</a>	Why cells need oxygen and what they use it for.

 <a href="#">Respiration Compare and Contrast</a>	The respiratory systems of fish, insects and humans.
 <a href="#">Introduction to the Circulatory System</a>	Introduction and explanation of the circulatory system and how the heart works.
 <a href="#">Heart</a>	The parts of the heart and blood flow.
 <a href="#">Blood Vessels</a>	Explanation of types of blood vessels, including how to take your pulse.
 <a href="#">Blood</a>	The different components that make up blood.
 <a href="#">Introduction to Excretory System</a>	The excretory system and the structures involved.
 <a href="#">Excretory Organs</a>	The various excretory organs, such as the kidneys, liver, lungs and skin.
 <a href="#">The Kidneys &amp; Urine Production</a>	How urine is produced in the kidneys.
 <a href="#">Kidney Disease</a>	UTIs and kidney stones.
 <a href="#">Musculoskeletal System</a>	The musculoskeletal system and its components.
 <a href="#">Bones &amp; Joints</a>	Ossification, the cells involved in bone growth and remodelling, osteoporosis and the many different types of joints within the human body.
 <a href="#">Muscles</a>	The three different muscle types. Focusing on the types of movements muscles produce, and what the main muscles of the body are.
 <a href="#">Injuries</a>	The different types of bone fractures and muscle injuries.
 <a href="#">Sexual Reproduction in Plants</a>	Sexual reproduction in plants.
 <a href="#">Pollination</a>	Pollination and discussing why plants use it for reproductive purposes.
 <a href="#">Seed Dispersal &amp; Germination</a>	Seed dispersal and discussing why plants use it for reproductive purposes.
 <a href="#">Asexual Reproduction in Plants</a>	Asexual reproduction in plants.
 <a href="#">Sexual Reproduction in Animals</a>	Sexual reproduction in animals.
 <a href="#">Asexual Reproduction in Animals</a>	Asexual reproduction in animals.

 <a href="#">Puberty</a>	Introducing and explaining puberty.
 <a href="#">Male Reproduction</a>	The male reproductive system.
 <a href="#">Female Reproduction</a>	The female reproductive system.
 <a href="#">Pregnancy</a>	Introducing and explaining pregnancy.
 <a href="#">Birth</a>	The birth process in humans.
 <a href="#">Photosynthesis</a>	Photosynthesis.
 <a href="#">Plant Systems</a>	The shoot and root systems of plants, as well as xylem and phloem.
 <a href="#">Adapting to Extreme Climates</a>	How humans adapt to different climates using homeostasis.
 <a href="#">Diffusion</a>	A lesson explaining the process of diffusion and the surface area: volume ratio.
 <a href="#">Diffusion and Body Systems</a>	How diffusion operates within the human body.
 <a href="#">Exercise and the Body</a>	How exercise affects the body, and the body's response.
 <a href="#">Stress Effects on the Body</a>	How stress affects the body, and the body's reaction.
 <a href="#">Contraception</a>	Explaining the different methods of contraception.
 <a href="#">Ethical Issues of Organ Transplants</a>	Smart Lesson explaining what ethical dilemmas are, using organ transplants as examples.
 <a href="#">Infertility</a>	Explaining infertility and the different reproductive techniques that are available.
 <a href="#">Lamb in a Bag</a>	Looking into the recent development of artificial wombs that were used to keep premature lambs alive, and how this relates to premature human babies.
 <a href="#">Maple Syrup</a>	Where maple syrup comes from.
 <a href="#">Organ Transplants</a>	What organ transplants are.
 <a href="#">Plant Cloning</a>	Plant and gene cloning and its use in growing crops.

 <a href="#">Cross Pollination</a>	Investigation into how plants in the school garden reproduce.
 <a href="#">First Aid and Body Systems</a>	Practical lesson in Basic first aid.
 <a href="#">Flower Dissection:</a>	Experiment on the dissection of a flower.
 <a href="#">Revision: Using a Microscope</a>	Revision lesson on how to use a microscope - bundled with the flower dissection.
 <a href="#">Heart Dissection</a>	Experiment on dissection of a heart.
 <a href="#">Ancient Anatomy</a>	In this lesson, students read a passage about the Ancient Egyptians' understanding of human anatomy. The lesson is designed to test the students' reading comprehension.
 <a href="#">Relative Heart Size</a>	In this lesson, students interpret data on the relative heart size in different species. They explore links between life style and heart size.

## Chemical Sciences

### Relevant section of the achievement standard:

By the end of Level 8, students ... describe and apply techniques to separate pure substances from mixtures. They provide evidence for observed chemical changes in terms of colour change, heat change, gas production and precipitate formation.

### Standards:

**Mixtures, including solutions, contain a combination of pure substances that can be separated using a range of techniques. ([VCSSU095](#))**

 <a href="#">Introduction to Mixtures</a>	Introducing concepts such as particles, mixtures, and pure versus impure substances.
 <a href="#">Pure and Impure Substances</a>	The difference between pure and impure substances
 <a href="#">Solute and Solvent</a>	The differences between solutes and solvents, and how they combine to form a solution.
 <a href="#">Concentrations</a>	Concentration, and comparing the amount of solute in a solution.
 <a href="#">Suspensions</a>	Suspensions, including how they are created.

 <a href="#">Colloids</a>	The definition of colloids, their common characteristics, and how they are produced.
 <a href="#">Emulsions</a>	Emulsions, including some common examples and how they are different from other colloids.
 <a href="#">Introduction to Separation</a>	Introduction to the various ways that mixtures can be separated, including straining and decanting.
 <a href="#">Filtration</a>	Filtration and its use in the laboratory.
 <a href="#">Centrifuging</a>	The use of centrifuging to separate suspensions.
 <a href="#">Evaporation</a>	Introduction to evaporation and how it can be used to separate solutions.
 <a href="#">Distillation</a>	Distillation and how it can be used to separate the liquid parts of a solution.
 <a href="#">Adsorption</a>	Adsorption and how it is used to remove dangerous particles from air or water.
 <a href="#">Chromatography</a>	Chromatography and how it is used to identify parts of a solution.
 <a href="#">Crystallisation</a>	Crystallisation and how it is used to bring solids out of solutions.
 <a href="#">Magnetic and Electrostatic Separation</a>	The use of magnetic and electrostatic suspension techniques.
 <a href="#">Open-Ended Separation Investigation</a>	Investigation into a mixture of many parts, and how we can use the techniques we have learned to separate it.
 <a href="#">Blood as a Mixture</a>	Blood, focusing on how it is a mixture. Also covers the functions of the different components which make up blood.
 <a href="#">Indigenous Art using Mixtures</a>	How Indigenous Australians used mixtures in their art.
 <a href="#">Recycling Sewage</a>	The methods used to treat sewage.
 <a href="#">Separation in Food</a>	Separation processes used to create specific food products.
 <a href="#">Separation in Industries</a>	How separation is used in mining.
 <a href="#">Water Treatment</a>	How water is treated from source to tap. Discusses separation techniques used in the water treatment process.
 <a href="#">Candy Crystals</a>	Create candy crystals.

 <a href="#">Chromatography: Separating Colours</a>	Paper chromatography.
 <a href="#">Filtration</a>	Hypothesis-driven investigation comparing the use of two different folds of filter paper.
 <a href="#">Making a Solar Still</a>	Building their own solar still as a way to create clean water from plants and dirty water.
 <a href="#">Separating a Basic Mixture</a>	Devising a method for separating a mixture.
 <a href="#">Temperature and Dissolving</a>	How dissolving is affected by the temperature of a solution.
 <a href="#">The Cave of the Crystals</a>	In this lesson, students watch a video about the Cave of the Crystals in Mexico, then answer questions testing their understanding.
 <a href="#">The Mystery of Opals</a>	Formation and structure of opals.
 <a href="#">Graphs and Tables of Mixtures</a>	Students interpret different types of graphs containing data on the contents of various mixtures. The graphs include pie charts, column graphs and tables.
 <a href="#">Saturation and Line Graphs</a>	Students practice interpret line graphs containing data on concentrations of solutions. From the graph, they identify the point of saturation.

The properties of the different states of matter can be explained in terms of the motion and arrangement of particles. ([VCSSU096](#))

 <a href="#">What is Matter?</a>	Introduction to matter.
 <a href="#">States of Matter</a>	Introduction to solids, liquids and gases.
 <a href="#">Particles</a>	Introduction to particles, energy state and bond strength.
 <a href="#">Solids</a>	How the properties of solids are a result of the behaviour of their particles.
 <a href="#">Liquids</a>	How the properties of liquids are a result of the behaviour of their particles.
 <a href="#">Gases</a>	How the properties of gases are a result of the behaviour of their particles.
 <a href="#">Particle Model of Matter</a>	Using the previous lessons to explain the particle model of matter. An ideal lesson for revising the particle model of matter.
 <a href="#">Changing State</a>	Introduction to the concept that substances can change their state.

 <a href="#">Melting and Freezing</a>	Explanation of melting and freezing, including how the behaviour and energy state of particles changes.
 <a href="#">Boiling, Evaporation and Condensation</a>	Explanation of boiling, evaporation and condensation, including how the behaviour and energy state of particles changes as substances change state.
 <a href="#">Sublimation and Deposition</a>	Sublimation and deposition and provides several examples of both changes of state.
 <a href="#">Temperature and Changing State</a>	The relatively advanced concept that the temperature of a substance does not change while it is changing its state.
 <a href="#">Mass and Volume</a>	How to measure mass and volume.
 <a href="#">Density</a>	Explains how to calculate density.
 <a href="#">Pressure</a>	Defining pressure and how the pressure a gas exerts on its container can change with volume and temperature.
 <a href="#">Energy in Matter</a>	How energy is transferred through and interacts with matter.
 <a href="#">Newtonian and Non-Newtonian Fluids</a>	Explanation on what non-Newtonian fluids are.
 <a href="#">Heatpumps and Refrigerators</a>	How heatpumps and refrigerators use changes in temperature, pressure and state to heat a house and chill food.
 <a href="#">States of Matter in Space</a>	How the extreme temperatures of different planets and moons affects matter and how this affects their weather.
 <a href="#">The Water Cycle and Weather</a>	How state changes affect the water cycle and weather.
 <a href="#">When Water Freezes</a>	How changing state affects density and how water is an important exception to the rule.
 <a href="#">Building a Density Tower</a>	Building a density tower and comparing the densities of different objects.
 <a href="#">Building a Steam Engine</a>	Building a simple steam engine called a Hero engine.
 <a href="#">Making Ice Cream</a>	How state changes can be used to make tasty treats, like ice cream!
 <a href="#">Observing Atmospheric Pressure</a>	How air pressure pushes upon the objects on Earth.
 <a href="#">What is the Matter?</a>	This Science Comprehension lesson follows the state of water as it travels from the chilly depths of the temperature scale to the scorching heights.

Differences between elements, compounds and mixtures can be described by using a particle model. ([VCSSU097](#))

 <a href="#">Introduction to Elements, Compounds and Mixtures</a>	Introduction to the simple concepts of elements, compounds and mixtures.
 <a href="#">Atoms</a>	Introduction to atoms, atomic models and sub-atomic particles.
 <a href="#">Elements</a>	Introduction to elements, the Periodic Table and the organisation of the elements.
 <a href="#">Metals, Non-Metals and Metalloids</a>	Introduction to the three groups of elements - metals, metalloids and non-metals.
 <a href="#">First 10 Elements</a>	Introduction to the first 10 elements of the periodic table.
 <a href="#">Compounds</a>	Introduction to compounds and how they relate to mixtures and elements.
 <a href="#">Molecules</a>	Introduction to molecules and lattices, and how they relate to compounds.
 <a href="#">Chemical Formulas</a>	Introduction to chemical formulas and writing formulas for elements and compounds.
 <a href="#">Chemical Bonding</a>	Discussion of ions and how elements bond to make compounds and molecules.
 <a href="#">The Periodic Table</a>	A history of the periodic table.
 <a href="#">Carbon Chemistry</a>	Carbon and the many useful allotropes of carbon.
 <a href="#">Discovering Elements</a>	A history of the discovery of several notable elements.
 <a href="#">Marie Curie and Radioactivity</a>	Introduction to radioactivity, and the history of Marie Curie's discoveries.
 <a href="#">Materials Science</a>	A history of useful materials, from the Stone Age to modern times.
 <a href="#">Comparing Properties</a>	Comparing the different properties of metals, non-metals and metalloids.
 <a href="#">Flame Test</a>	Observing the different coloured flames produced by different elements.
 <a href="#">Indirect Observations</a>	Comparing direct and indirect observations.
 <a href="#">Making Models</a>	Making models of elements, compounds and molecules.

Chemical change involves substances reacting to form new substances. ([VCSSU098](#))

 <a href="#">Physical Properties</a>	Physical properties of substances.
 <a href="#">Physical Change</a>	The attributes of physical changes.
 <a href="#">Chemical Reactions</a>	The characteristics of chemical reactions.
 <a href="#">Writing Chemical Reactions</a>	How to write basic word equations to represent chemical reactions.
 <a href="#">Chemical Properties</a>	Chemical properties of substances.
 <a href="#">Using Substances Based on their Properties</a>	Finding uses for substances based on their properties.
 <a href="#">Writing Symbol Equations</a>	Writing symbol equations using chemical formulas.
 <a href="#">Alchemy</a>	Exploring alchemy and its contributions to modern chemistry.
 <a href="#">Recycling</a>	Recycling, the physical changes that occur during recycling and why we recycle.
 <a href="#">Synthetic Materials</a>	Fabrics; both natural and synthetic, with some understanding of the chemistry involved in making fabrics.
 <a href="#">Working in Chemistry</a>	The various occupations that use chemistry.
 <a href="#">Making Recycled Paper</a>	Making recycled paper through a series of physical changes.
 <a href="#">Observing Chemical Reactions</a>	Observations of some important chemical reactions.
 <a href="#">Observing Reactions with Fire</a>	The reactions that occur when substances are burned in oxygen.
 <a href="#">Rusting in Different Environments</a>	Using rusting nails to measure their change in weight to understand different reaction conditions.

## Earth and Space Sciences

### Relevant section of the achievement standard:

By the end of Level 8, students ... compare processes of rock formation, including the time scales involved, and analyse how the sustainable use of resources depends on the way they are formed and cycle through Earth systems. They model how the relative positions of Earth, the Sun and the Moon affect phenomena on Earth.

### Standards:

**Predictable phenomena on Earth, including seasons and eclipses, are caused by the relative positions of the Sun, Earth and the Moon.**

### [\(VCSSU099\)](#)

 <a href="#">The Universe</a>	Introducing the solar system, planets, stars and constellations.
 <a href="#">Gravity</a>	Gravity and orbits.
 <a href="#">Comets</a>	Comets.
 <a href="#">Asteroids and Meteoroids</a>	Asteroids and meteoroids.
 <a href="#">Earth, Moon and Sun</a>	Introduction to the positions and movements of the Earth, Moon and Sun.
 <a href="#">Day and Night</a>	Different day lengths at different times of the year.
 <a href="#">Time Zones</a>	Time zones are and why they exist.
 <a href="#">Seasons</a>	Why different seasons occur.
 <a href="#">Phases</a>	The different phases of the moon.
 <a href="#">Tides</a>	How the Sun, Moon, and Earth interact to create tides.
 <a href="#">Lunar Eclipse</a>	What Lunar Eclipses are and how they occur.
 <a href="#">Solar Eclipse</a>	What Solar Eclipses are and how they occur.

 <a href="#">Earth's Magnetic Field</a>	Introduction to the Earth's magnetic field, compasses and the aurora.
 <a href="#">Planetary Motion</a>	Extension lesson about how and why planets move around the Sun.
 <a href="#">Calendars and the Solar Year</a>	The development of calendars, including a section on the Indigenous Australian calendars.
 <a href="#">Exploring Space</a>	Humans in space and space missions including: Apollo 11, Curiosity, New Horizons and Voyager 1.
 <a href="#">Indigenous Constellations</a>	The use of constellations in Indigenous Australian peoples lives.
 <a href="#">Models of the Solar System</a>	Development of the Geocentric and Heliocentric Models of the Solar System.
 <a href="#">Satellites</a>	Introducing satellites and their uses, including in GPS and the International Space Station.
 <a href="#">Telescopes</a>	How telescopes were developed, including the Hubble Space Telescope.
 <a href="#">Making a Sundial</a>	Creating a sundial.
 <a href="#">Modelling Gravity</a>	Experiment to simulate the motion of planets around the Sun and the Moon around the Earth.
 <a href="#">Modelling the Earth, Moon and Sun</a>	Experiment using a light source to simulate day, night and eclipses with models of the Earth and Moon.
 <a href="#">Making a Pinhole Camera</a>	Investigation to indirectly observe the Sun with a pinhole camera.
 <a href="#">Using a Pinhole Camera to Calculate the Diameter of the Sun</a>	Investigation to observe the sun and estimate its diameter with a pinhole camera.
 <a href="#">Sunlight and Seasons</a>	Investigation to simulate how solar energy hits different parts of the Earth.

Some of Earth's resources are renewable, but others are non-renewable. ([VCSSU100](#))

 <a href="#">Introduction to Earth's Resources</a>	Introduction to Earth resources, including renewable and non-renewable resources.
 <a href="#">Renewable and Non-Renewable Energy Sources</a>	Introduction to the different energy sources used in Australia and whether they are renewable or non-renewable.
 <a href="#">Fossil Fuels as a Resource</a>	The different types of fossil fuels and how they are formed.

 <a href="#">Soil as a Resource</a>	The formation of fertile soil and the importance of sustaining it.
 <a href="#">Minerals and Ores as Resources</a>	Other resources from rocks; especially gemstones and metals.
 <a href="#">Mining</a>	Mineral resources, processes of extraction and ways to make them more sustainable.
 <a href="#">Nuclear Fuel as a Resource</a>	Introduction to nuclear fuel as a non-renewable resource.
 <a href="#">Living Things as a Resource</a>	Introduction to the concept that living things are renewable resources.
 <a href="#">Air as a Resource</a>	Introduction to air as a resource. Focusing on how photosynthesis results in balanced oxygen and carbon dioxide levels.
 <a href="#">Wind as a Resource</a>	Wind, wind formation and convection cells.
 <a href="#">Wind Turbines</a>	How wind turbines are used to produce electricity.
 <a href="#">Solar Energy</a>	Introduction to solar energy, insolation and methods of collecting and using solar energy.
 <a href="#">Water Power</a>	The various ways we can use water to produce electricity.
 <a href="#">Investigation: Coal vs. Solar for Australia's Future</a>	Compares coal and solar energy as non-renewable and renewable resources.
 <a href="#">Antarctica, a Shared Continent</a>	The shared scientific community of Antarctica.
 <a href="#">Changing Seasons</a>	How seasonal changes affect people in a variety of activities.
 <a href="#">Renewable Energy</a>	The renewable energy options that Australia has available.
 <a href="#">Science, Tradition and Modern Medicine</a>	Connections between science, tradition and modern medicine.
 <a href="#">Solar Oven</a>	Investigation in heating water with a solar oven.
 <a href="#">Turbine Power</a>	Investigation exploring how wind and hydro turbines respond to different loads.
 <a href="#">The Power of Sunshine</a>	A Smart Lesson introducing some novel applications of solar energy. This lesson can be used to improve reading comprehension in students.
 <a href="#">Choosing Renewables</a>	This Smart Lesson presents data on renewable and non-renewable energy use for students to interpret.

Water is an important resource that cycles through the environment. ([VCSSU101](#))

 <a href="#">Water on Earth</a>	Introduction to the distribution of water on Earth.
 <a href="#">States of Water</a>	Introduction to the states of water.
 <a href="#">The Water Cycle as a Closed System</a>	Introduction to closed and open systems with examples of each.
 <a href="#">Water Cycle</a>	Introduction to the water cycle.
 <a href="#">Influences on the Water Cycle</a>	Describes the factors that influence the progression of the water cycle.
 <a href="#">Aquifers</a>	Introduction to aquifers, how they form, and what they're used for.
 <a href="#">Desalination</a>	Explanation of how reverse osmosis and distillation are used to turn seawater into drinking water.
 <a href="#">Hydroelectricity</a>	Discussing how hydroelectricity works.
 <a href="#">Irrigation</a>	How we water our plants, covering the spray and flood irrigation types.
 <a href="#">Water Conservation</a>	How we recycle water and why we do it.
 <a href="#">Water Management</a>	The importance of effective water management skills in Australia.
 <a href="#">Evaporation</a>	Investigation exploring the connection between surface area and evaporation.
 <a href="#">Make Your Own Aquifer</a>	Investigation exploring the formation and extraction of groundwater.
 <a href="#">Weather in a Jar</a>	Investigation exploring the factors that lead to cloud and rain formation.
 <a href="#">Cloudy With a Chance of Hamburgers</a>	The shapes that raindrops take as they fall to Earth.
 <a href="#">The Great Artesian Basin</a>	Exploration of the largest aquifer in the world, and where it came from.
 <a href="#">Our Water Use</a>	How to read different graphs themed around water usage.
 <a href="#">Reading a Weather Map</a>	This Smart Lesson teaches students how to identify key features on weather maps, including pressure and temperature.

Sedimentary, igneous and metamorphic rocks contain minerals and are formed by processes that occur within Earth over a variety of timescales. ([VCSSU102](#))

 <a href="#">Earth's Structure</a>	Explanation of the layers of the Earth.
 <a href="#">Earth Processes</a>	Introduction to geological time, pressure and heat within the Earth.
 <a href="#">Weathering and Erosion</a>	Explanation of how erosion breaks rocks down.
 <a href="#">Introduction to Minerals</a>	Explanation of the criteria that a substance must meet to be classified as a mineral.
 <a href="#">Identifying Minerals</a>	Explanation of how we use physical features classify and identify minerals.
 <a href="#">Igneous Rocks</a>	Explanation of how igneous rocks form and the differences between intrusive and extrusive rocks.
 <a href="#">Sedimentary Rocks</a>	Introduction to the formation of sedimentary rocks and the difference between clastic, crystalline and organic sedimentary rocks.
 <a href="#">Metamorphic Rocks</a>	Explanation of how metamorphic rocks form.
 <a href="#">The Rock Cycle</a>	Explanation of the rock cycle.
 <a href="#">Australian Landforms formed by Physical Weathering, Erosion and Sedimentation</a>	A tour through Australian landforms and landscapes affected by physical weathering, erosion and sedimentation.
 <a href="#">Australian Landforms formed by Volcanism and Chemical Weathering</a>	A tour through Australian landforms and landscapes that have been affected by volcanism and chemical weathering.
 <a href="#">Dissecting the Earth</a>	A journey to the centre of the Earth, focusing on minerals that make up the Earth's layers
 <a href="#">Geological Time</a>	The concept of deep time and the Geological Timescale.
 <a href="#">Australian Fossils</a>	Palaeontology and fossils, with a focus on the Ediacaran biota, fish of Gogo Station and dinosaurs of Winton.
 <a href="#">Martian Geology</a>	The geology and history of Mars.
 <a href="#">Minerals and Rocks as Resources</a>	Explanation of how rocks and minerals are used as resources.

 <a href="#">Mining and Mineral Exploration</a>	How coal and uranium are mined in Australia, with an emphasis on how geologists uncover these resources.
 <a href="#">Volcanology</a>	Volcanoes and how scientists study them.
 <a href="#">Build a Geological Timescale</a>	Investigation in understanding the age of the Earth and everything in it.
 <a href="#">Build a Stratigraphic Column</a>	Investigation in understanding how geologists use stratigraphic columns to study the Earth.
 <a href="#">Cooling Crystals</a>	Investigation in growing crystals.
 <a href="#">Simulating Erosion</a>	Investigation in understanding the process of simulating erosion.
 <a href="#">Baked Rocks in the Lachlan Fold Belt</a>	Science Comprehension lesson about the Lachlan Fold Belt, a metamorphic rock structure.
 <a href="#">Hot Rocks of the Cosgrove Hotspot Track</a>	Science Comprehension lesson about the Cosgrove Hotspot Track, a chain of extinct volcanoes.
 <a href="#">Zircons are Forever</a>	Science Comprehension lesson about zircons, a type of durable rock.
 <a href="#">Comparing Minerals</a>	Data on different minerals and their properties for students to interpret.

## Physical Sciences

### Relevant section of the achievement standard:

By the end of Level 8, students ... investigate different forms of energy and explain how energy transfers and transformations cause change in simple systems. They use examples to illustrate how light forms images. They use a wave model to explain the properties of sound. They use the particle model to predict, compare and explain the physical and chemical properties and behaviours of substances. ... They distinguish between different types of simple machines and predict, represent and analyse the effects of unbalanced forces, including Earth's gravity, on motion.

### Standards:

**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. (VCSSU103)**

 <a href="#">What are Forces?</a>	An introduction into forces and their effects on objects.
 <a href="#">Drawing Forces</a>	How to draw the actions of forces onto objects to understand how they affect motion.
 <a href="#">Balanced and Unbalanced Forces</a>	Learning to identify unbalanced and balanced forces, and the applying and receiving forces.
 <a href="#">Contact and Non-Contact Forces</a>	Classifying forces based on whether they are contact or non-contact.
 <a href="#">Magnetism</a>	An introduction to magnets and magnetic fields.
 <a href="#">Gravity</a>	An introduction to gravitational forces, weight, mass and gravity's effect in the solar system.
 <a href="#">Levers</a>	Smart lesson on levers and the classes of levers.
 <a href="#">Inclined Planes</a>	Lesson on inclined planes and applications as wedges and screws.
 <a href="#">Wheels, Axles and Pulleys</a>	Simple machines lesson on the wheel and axle and the pulley.
 <a href="#">Gears</a>	Simple machines lesson on the gear.

 <a href="#">Bicycle Investigation</a>	Applying the knowledge of simple machines to investigate the use of gears, wheels, axles, pulleys and levels in bicycles.
 <a href="#">Newton's First Law</a>	Lesson on inertia.
 <a href="#">Newton's Second Law</a>	Lesson on Newton's Second Law.
 <a href="#">Newton's Third Law</a>	Learning to identify unbalanced and balanced forces, and identifying the applying and receiving forces.
 <a href="#">Calculating Net Force</a>	Introduction to calculating net force on objects.
 <a href="#">Earth's Magnetic Field</a>	Introduction to the Earth's magnetic field and compasses.
 <a href="#">Electrostatic Force</a>	A more in-depth look at the causes and effects of electrostatic forces.
 <a href="#">Friction</a>	An in-depth look at the causes and effects of friction and drag.
 <a href="#">Gear Ratio</a>	Gear wheels and problems involving gear ratios.
 <a href="#">Planetary Motion</a>	Smart Lesson exploring how gravity causes planets and satellites to move in orbits.
 <a href="#">Tides</a>	Introduction to how the sun and moon control the tides.
 <a href="#">Ancient Tools and Weapons</a>	A look at some ancient weapons and tools, and the machines that made them work.
 <a href="#">Comparing Robots</a>	This lesson shows how robots all contain simple machines.
 <a href="#">Fact or Friction?</a>	This lesson describes useful friction and unwanted friction.
 <a href="#">Safety Systems</a>	This lesson describes how we use our knowledge of forces to stay safe.
 <a href="#">Sports Science</a>	A lesson on how we use our knowledge of forces in Sports Science.
 <a href="#">A Ramp as a Simple Machine</a>	Quantitative investigation designed to study how a ramp works as an inclined plane.
 <a href="#">Build a Marshmallow Blaster</a>	Quantitative investigation to study the relationship between mass and acceleration.
 <a href="#">Build an Electroscope</a>	Investigation on static electricity and electrostatic forces.

-  [Friction Investigation](#) This investigation will demonstrate friction in action.
-  [Levers Investigation](#) Comparing the three classes of lever, with an emphasis on qualitative observations and real-life applications.
-  [Mapping Magnetic Fields](#) Investigation into the shapes of magnetic fields and the nature of magnetic forces.

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. ([VCSSU104](#))

-  [What is Energy?](#) A quick introduction to energy.
-  [Kinetic Energy](#) Introduction to the types of kinetic energy.
-  [Potential Energy](#) Introduction to the types of potential energy.
-  [Identifying KE or PE](#) Exercises in identifying types of energy.
-  [Units of Energy](#) Introduction to the SI units used to measure energy.
-  [Converting between Joules \(J\) & Kilojoules \(kJ\)](#) Practice of kilojoule to joule conversions.
-  [Converting between Kilojoules \(kJ\) & Megajoules \(MJ\)](#) Practice converting kilojoules to megajoules.
-  [Law of Conservation of Energy](#) Introduction to the Law of Conservation of Energy.
-  [Introduction to Heat Transfer](#) Introduction to the processes by which heat moves.
-  [Heat Transfer](#) Overview of conduction, convection, and radiation.
-  [Conduction](#) Explanation of conduction as a method of heat transfer and its relation to the particle model of matter.
-  [Convection](#) Explanation of convection as a method of heat transfer.
-  [Radiation](#) Explanation of radiation as a method of heat transfer and how different coloured objects absorb different amounts of radiation.

 <a href="#">Introduction to Conductors and Insulators</a>	Introduction to conductors and insulators.
 <a href="#">Conductors and Insulators</a>	Introduction to conductors and insulators with some common examples.
 <a href="#">Electricity</a>	An overview of electricity; current, resistance, voltage, series and parallel circuits.
 <a href="#">Electric Circuits</a>	Introduction to energy transfer in electric circuits and symbols of common circuit components.
 <a href="#">Current</a>	Explanation of electrical current and ammeters.
 <a href="#">Resistance</a>	Introduction to resistance in circuit components and wires.
 <a href="#">Voltage</a>	Introduction to voltage, voltmeters and voltage drops.
 <a href="#">Introduction to Ohm's Law</a>	Introduction to Ohm's Law and how it is used to relate current, voltage and resistance.
 <a href="#">Batteries</a>	Introduction to batteries focusing on the difference between wet cell and dry cell batteries.
 <a href="#">Conductors and Insulators</a>	Explanation of electrical conductors and insulators, and their use in circuits.
 <a href="#">Circuits in Series</a>	Introduction to series circuits focusing on current and voltage across circuit components.
 <a href="#">Circuits in Parallel</a>	Introduction to parallel circuits with an explanation of how current and voltage act in these circuits.
 <a href="#">Energy Transformations</a>	Examples of energy being converted from one form to another.
 <a href="#">Displaying Energy Transformations</a>	Energy flow charts and Sankey diagrams.
 <a href="#">Energy Transformation and Food</a>	How our bodies use energy from food.
 <a href="#">Useful and Wasted Energy</a>	Waste energy created in energy transformations.
 <a href="#">Cogeneration and Engines</a>	Internal and external combustion engines.
 <a href="#">Energy Calculations</a>	Calculating kinetic energy and gravitational potential energy.
 <a href="#">Qualitative and Quantitative Data</a>	Qualitative and quantitative methods for measuring energy.

 <a href="#">Cars of the Future</a>	How cars are designed to transfer energy, and the modern designs that are using clean energy.
 <a href="#">Energy Efficient Houses</a>	Smart Lesson on maximising energy efficiency in houses.
 <a href="#">Housing Insulation</a>	Explaining how insulation can be used to prevent heat from entering or exiting a house.
 <a href="#">The Development of Flight</a>	The history of airplanes, and their evolution in design and energy efficiency.
 <a href="#">The Power Grid and You</a>	How energy travels from power stations to the home.
 <a href="#">Bouncy Balls and Energy Efficiency</a>	Investigation on the energy transformations and efficiency in bouncy balls.
 <a href="#">Building a Solar Oven</a>	Investigation on constructing a solar oven to heat water.
 <a href="#">Energy in Skate Parks</a>	Investigation into the relationship between mass and gravitational potential energy using the PhET skate park simulation.
 <a href="#">Energy Transformations</a>	Investigation of energy transformations occurring in four scenarios.
 <a href="#">Investigating Heat Energy</a>	Comparison of different materials and their heat conduction abilities.
 <a href="#">Rube Goldberg Machine</a>	Investigation into the energy transformations and transfers that take place in Rube Goldberg machines.

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. ([VCSSU105](#))

 <a href="#">Light as a Wave</a>	Introduction to light as a transverse wave with a frequency and wavelength.
 <a href="#">Colour</a>	How different frequencies of light are different colours, white light, and how we see light.
 <a href="#">Materials</a>	Introduction to transparent, translucent, and opaque materials.
 <a href="#">Reflection</a>	The Law of Reflection and how images form in plane mirrors.
 <a href="#">Refraction</a>	Introduction to refraction and refractive indices.

 <a href="#">Total Internal Reflection</a>	Introduction to total internal reflection.
 <a href="#">Lenses</a>	Comprehensive lesson on lenses, including the nature of images and practice drawing ray diagrams.
 <a href="#">Light: Summary</a>	Summary of light. All concepts mentioned here are covered in greater detail in the other Smart Lessons in this folder.
 <a href="#">Curved Mirrors</a>	Reflection of light by concave and convex mirrors.
 <a href="#">Plane Mirrors and Reflection</a>	Reflection of light and plane mirrors.
 <a href="#">Snell's Law</a>	Introduction to how to use Snell's Law to calculate the critical angle.
 <a href="#">Bionic Eye</a>	How an artificial eye could work, and the research being done into the concept.
 <a href="#">Electromagnetic Radiation and Medicine</a>	Explanation of how electromagnetic radiation can be used to detect and treat cancer.
 <a href="#">The History of Lenses</a>	The development of lenses and how they are used in telescopes, microscopes and cameras.
 <a href="#">You, Me and UV</a>	How UV can result in skin cancer and the importance of practicing good sun protection.
 <a href="#">Colourful Candy</a>	Investigation into why we see colour and the interaction of coloured light with coloured objects.
 <a href="#">Law of Reflection</a>	Investigation into the Law of Reflection.
 <a href="#">Lenses</a>	Investigation into concave and convex lenses.
 <a href="#">Build a Periscope</a>	Investigation into the uses of reflection.
 <a href="#">Refraction</a>	Investigation into how the refraction of light and refractive indices can be used to determine the material that a transparent block is made out of.

The properties of sound can be explained by a wave model. ([VCSSU106](#))

 <a href="#">Sound</a>	Overview of sound waves including how they are formed, pitch, and loudness.
 <a href="#">Sound Formation</a>	Introduction to how sound waves are formed and why they must travel through a medium.

 <a href="#">Pitch and Loudness</a>	Explanation of how the pitch and loudness of a sound wave are determined by its frequency and amplitude.
 <a href="#">Hearing Sound</a>	Explanation of how our ears enable us to interpret vibrations in the ear as sound.
 <a href="#">Bionic Ears</a>	Explanation of how cochlear implants can restore hearing.
 <a href="#">Turned Down for What: Workplace Noise</a>	Overview of why it is important to maintain safe noise levels in the workplace, in order to prevent hearing loss.
 <a href="#">Musical Bottles</a>	Investigation in which students make musical instruments out of glass bottles.
 <a href="#">Slinky Waves</a>	Investigation using a slinky to explore the difference between longitudinal and transverse waves.
 <a href="#">Speed of Sound</a>	Investigation measuring the speed of sound.
 <a href="#">Straw Instruments</a>	Investigation into the importance of resonance frequency in music.
 <a href="#">Ultrasound</a>	Reading comprehension lesson on ultrasound and its uses.

# Science Inquiry Skills

## Relevant section of the achievement standard:

By the end of Level 8, students ... identify and construct questions and problems that they can investigate scientifically and make predictions based on scientific knowledge. They plan experiments, identifying variables to be changed, measured and controlled. They consider accuracy and ethics when planning investigations, including designing field or experimental methods. Students summarise data from different sources and construct representations of their data to reveal and analyse patterns and relationships, and use these when justifying their conclusions. They explain how modifications to methods could improve the quality of their data and apply their scientific knowledge and investigation findings to evaluate claims made by others. They use appropriate scientific language, representations and simple word equations to communicate science ideas, methods and findings.

## Questioning and Predicting

Identify questions, problems and claims that can be investigated scientifically and make predictions based on scientific knowledge.

[\(VCSIS107\)](#)

<a href="#"><u>Scientific Method</u></a>	The scientific method and how to write a scientific report.
<a href="#"><u>Hypothesising and Predicting</u></a>	How to make a scientific hypothesis and predict results of experiments.
<a href="#"><u>Researching Phyla</u></a>	Using research to compare and contrast two animals from the same phylum.
<a href="#"><u>Jelly Cells</u></a>	Experiment using jelly and lollies to make a model of a cell.
<a href="#"><u>Pond Critters</u></a>	Experiment collecting pond water examine under a microscope.
<a href="#"><u>Build a Food Web</u></a>	Building a food web using a list of species and information about what they eat.
<a href="#"><u>Growing Plants Under Different Conditions</u></a>	Design an experiment for testing how plants grow under different conditions.
<a href="#"><u>Candy Crystals</u></a>	Create candy crystals.
<a href="#"><u>Chromatography: Separating Colours</u></a>	Paper chromatography.
<a href="#"><u>Filtration</u></a>	Hypothesis-driven investigation comparing the use of two different folds of filter paper.
<a href="#"><u>Making a Solar Still</u></a>	Building their own solar still as a way to create clean water from plants and dirty water.

<a href="#">Separating a Basic Mixture</a>	Devising a method for separating a mixture.
<a href="#">Temperature and Dissolving</a>	How dissolving is affected by the temperature of a solution.
<a href="#">Building a Density Tower</a>	Building a density tower and comparing the densities of different objects.
<a href="#">Observing Atmospheric Pressure</a>	How air pressure pushes upon the objects on Earth.
<a href="#">Observing Chemical Reactions</a>	Observations of some important chemical reactions.
<a href="#">Rusting in Different Environments</a>	Using rusting nails to measure their change in weight to understand different reaction conditions.
<a href="#">Modelling Gravity</a>	Experiment to simulate the motion of planets around the Sun and the Moon around the Earth.
<a href="#">Modelling the Earth, Moon and Sun</a>	Experiment using a light source to simulate day, night and eclipses with models of the Earth and Moon.
<a href="#">Solar Oven</a>	Investigation in heating water with a solar oven.
<a href="#">Evaporation</a>	Investigation exploring the connection between surface area and evaporation.
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<a href="#">A Ramp as a Simple Machine</a>	Quantitative investigation designed to study how a ramp works as an inclined plane.
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<a href="#">Investigating Heat Energy</a>	Comparison of different materials and their heat conduction abilities.
<a href="#">Slinky Waves</a>	Investigation using a slinky to explore the difference between longitudinal and transverse waves.

## Planning and Conducting

Collaboratively and individually plan and conduct a range of investigation types, including fieldwork and experiments, ensuring safety and ethical guidelines are followed. ([VCSIS108](#))

<a href="#">Safety Guidelines</a>	Some useful rules for keeping safe in the lab.
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<a href="#"><u>Accuracy</u></a>	Accuracy and selecting measuring equipment that will give a more accurate result.
<a href="#"><u>Control Variables and Control Groups</u></a>	The importance of control variables and control groups, and the importance of using these for results to be meaningful.
<a href="#"><u>Fair Tests</u></a>	Fair tests and how to control variables.
<a href="#"><u>Repeatability and Reliability</u></a>	Introduction to repeatability and reliability and their importance when carrying out experiments.
<a href="#"><u>Sample Size</u></a>	The importance of large sample sizes in collecting accurate results.
<a href="#"><u>Validity</u></a>	Validity when performing an experiment, and how changing variables can invalidate an experiment.
<a href="#"><u>Variables</u></a>	Independent variables, dependent variables and control variables.
<a href="#"><u>Building Dichotomous Keys</u></a>	Investigation in classifying leaves with a dichotomous key.
<a href="#"><u>Classifying Leaves</u></a>	Investigation in classifying leaves into groups based on their shape.
<a href="#"><u>Researching Phyla</u></a>	Using research to compare and contrast two animals from the same phylum.
<a href="#"><u>Jelly Cells</u></a>	Experiment using jelly and lollies to make a model of a cell.
<a href="#"><u>Pond Critters</u></a>	Experiment collecting pond water examine under a microscope.
<a href="#"><u>Preparing and Observing Cells</u></a>	Experiment practicing proper microscope and slide preparation techniques.
<a href="#"><u>Using a Microscope</u></a>	Investigation in how to use a microscope correctly.
<a href="#"><u>Build a Food Web</u></a>	Building a food web using a list of species and information about what they eat.
<a href="#"><u>Collecting Invertebrates in Quadrats</u></a>	Collecting invertebrates and use them to estimate biodiversity.
<a href="#"><u>Extracting Leaf Pigments</u></a>	Extracting pigments from plant leaves.
<a href="#"><u>Growing Plants Under Different Conditions</u></a>	Design an experiment for testing how plants grow under different conditions.
<a href="#"><u>Measuring Abiotic Factors in Water</u></a>	Measuring the abiotic factors temperature, pH, salinity and turbidity in three different water samples.
<a href="#"><u>Cross Pollination</u></a>	Investigation into how plants in the school garden reproduce.
<a href="#"><u>First Aid and Body Systems</u></a>	Practical lesson in Basic first aid.
<a href="#"><u>Flower Dissection</u></a>	Experiment on the dissection of a flower.
<a href="#"><u>Heart Dissection</u></a>	Experiment on dissection of a heart.
<a href="#"><u>Candy Crystals</u></a>	Create candy crystals.
<a href="#"><u>Chromatography: Separating Colours</u></a>	Paper chromatography.

<a href="#"><u>Filtration</u></a>	Hypothesis-driven investigation comparing the use of two different folds of filter paper.
<a href="#"><u>Making a Solar Still</u></a>	Building their own solar still as a way to create clean water from plants and dirty water.
<a href="#"><u>Separating a Basic Mixture</u></a>	Devising a method for separating a mixture.
<a href="#"><u>Temperature and Dissolving</u></a>	How dissolving is affected by the temperature of a solution.
<a href="#"><u>Building a Density Tower</u></a>	Building a density tower and comparing the densities of different objects.
<a href="#"><u>Building a Steam Engine</u></a>	Building a simple steam engine called a Hero engine.
<a href="#"><u>Making Ice Cream</u></a>	How state changes can be used to make tasty treats, like ice cream!
<a href="#"><u>Observing Atmospheric Pressure</u></a>	How air pressure pushes upon the objects on Earth.
<a href="#"><u>Comparing Properties</u></a>	Comparing the different properties of metals, non-metals and metalloids.
<a href="#"><u>Flame Test</u></a>	Observing the different coloured flames produced by different elements.
<a href="#"><u>Indirect Observations</u></a>	Comparing direct and indirect observations.
<a href="#"><u>Making Models</u></a>	Making models of elements, compounds and molecules.
<a href="#"><u>Making Recycled Paper</u></a>	Making recycled paper through a series of physical changes.
<a href="#"><u>Observing Chemical Reactions</u></a>	Observations of some important chemical reactions.
<a href="#"><u>Observing Reactions with Fire</u></a>	The reactions that occur when substances are burned in oxygen.
<a href="#"><u>Rusting in Different Environments</u></a>	Using rusting nails to measure their change in weight to understand different reaction conditions.
<a href="#"><u>Making a Sundial</u></a>	Creating a sundial.
<a href="#"><u>Modelling Gravity</u></a>	Experiment to simulate the motion of planets around the Sun and the Moon around the Earth.
<a href="#"><u>Modelling the Earth, Moon and Sun</u></a>	Experiment using a light source to simulate day, night and eclipses with models of the Earth and Moon.
<a href="#"><u>Making a Pinhole Camera</u></a>	Investigation to indirectly observe the Sun with a pinhole camera.
<a href="#"><u>Using a Pinole Camera to Calculate Diameter of the Sun</u></a>	Investigation to observe the sun and estimate its diameter with a pinhole camera.
<a href="#"><u>Sunlight and Seasons</u></a>	Investigation to simulate how solar energy hits different parts of the Earth.
<a href="#"><u>Solar Oven</u></a>	Investigation in heating water with a solar oven.
<a href="#"><u>Turbine Power</u></a>	Investigation exploring how wind and hydro turbines respond to different loads.
<a href="#"><u>Evaporation</u></a>	Investigation exploring the connection between surface area and evaporation.

<a href="#"><u>Make Your Own Aquifer</u></a>	Investigation exploring the formation and extraction of groundwater.
<a href="#"><u>Weather in a Jar</u></a>	Investigation exploring the factors that lead to cloud and rain formation.
<a href="#"><u>Build a Geological Timescale</u></a>	Investigation in understanding the age of the Earth and everything in it.
<a href="#"><u>Build a Stratigraphic Column</u></a>	Investigation in understanding how geologists use stratigraphic columns to study the Earth.
<a href="#"><u>Cooling Crystals</u></a>	Investigation in growing crystals.
<a href="#"><u>Simulating Erosion</u></a>	Investigation in understanding the process of simulating erosion.
<a href="#"><u>A Ramp as a Simple Machine</u></a>	Quantitative investigation designed to study how a ramp works as an inclined plane.
<a href="#"><u>Build a Marshmallow Blaster</u></a>	Quantitative investigation to study the relationship between mass and acceleration.
<a href="#"><u>Build an Electroscope</u></a>	Investigation on static electricity and electrostatic forces.
<a href="#"><u>Friction Investigation</u></a>	This investigation will demonstrate friction in action.
<a href="#"><u>Levers Investigation</u></a>	Comparing the three classes of lever, with an emphasis on qualitative observations and real-life applications.
<a href="#"><u>Mapping Magnetic Fields</u></a>	Investigation into the shapes of magnetic fields and the nature of magnetic forces.
<a href="#"><u>Bouncy Balls and Energy Efficiency</u></a>	Investigation on the energy transformations and efficiency in bouncy balls.
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<a href="#"><u>Energy in Skate Parks</u></a>	Investigation into the relationship between mass and gravitational potential energy using the PhET skate park simulation.
<a href="#"><u>Energy Transformations</u></a>	Investigation of energy transformations occurring in four scenarios.
<a href="#"><u>Investigating Heat Energy</u></a>	Comparison of different materials and their heat conduction abilities.
<a href="#"><u>Rube Goldberg Machines</u></a>	Investigation into the energy transformations and transfers that take place in Rube Goldberg machines.
<a href="#"><u>Colourful Candy</u></a>	Investigation into why we see colour and the interaction of coloured light with coloured objects.
<a href="#"><u>Law of Reflection</u></a>	Investigation into the Law of Reflection.
<a href="#"><u>Lenses</u></a>	Investigation into concave and convex lenses.
<a href="#"><u>Build a Periscope</u></a>	Investigation into the uses of reflection.
<a href="#"><u>Refraction</u></a>	Investigation into how the refraction of light and refractive indices can be used to determine the material that a transparent block is made out of.
<a href="#"><u>Musical Bottles</u></a>	Investigation in which students make musical instruments out of glass bottles.

<a href="#">Slinky Waves</a>	Investigation using a slinky to explore the difference between longitudinal and transverse waves.
<a href="#">Speed of Sound</a>	Investigation measuring the speed of sound.
<a href="#">Straw Instruments</a>	Investigation into the importance of resonance frequency in music.

**In fair tests, measure and control variables, and select equipment to collect data with accuracy appropriate to the task. ([VCSIS109](#))**

<a href="#">Safety Equipment</a>	The different types of safety equipment and when to use them.
<a href="#">Equipment Types</a>	Basic laboratory equipment and its uses.
<a href="#">Bunsen Burner</a>	The design and makeup of the Bunsen burner.
<a href="#">Separating Substances and Other Equipment</a>	Introduction to some important pieces of scientific equipment and their uses with a focus on equipment needed to separate mixtures.
<a href="#">Equipment Quiz</a>	Quiz on identifying different pieces of scientific equipment.
<a href="#">Measuring in Science</a>	How to read different measuring tools. The tools discussed are rulers, measuring cylinders, protractors, thermometers and scales.
<a href="#">Reading the Meniscus</a>	The way to read a measurement from a fluid which has a meniscus.
<a href="#">Pond Critters</a>	Experiment collecting pond water examine under a microscope.
<a href="#">Using a Microscope</a>	Investigation in how to use a microscope correctly.
<a href="#">Collecting Invertebrates in Quadrats</a>	Collecting invertebrates and use them to estimate biodiversity.
<a href="#">Extracting Leaf Pigments</a>	Extracting pigments from plant leaves.
<a href="#">Growing Plants Under Different Conditions</a>	Design an experiment for testing how plants grow under different conditions.
<a href="#">Measuring Abiotic Factors in Water</a>	Measuring the abiotic factors temperature, pH, salinity and turbidity in three different water samples.
<a href="#">Filtration</a>	Hypothesis-driven investigation comparing the use of two different folds of filter paper.
<a href="#">Rusting in Different Environments</a>	Using rusting nails to measure their change in weight to understand different reaction conditions.
<a href="#">Using a Pinole Camera to Calculate Diameter of the Sun</a>	Investigation to observe the sun and estimate its diameter with a pinhole camera.
<a href="#">Sunlight and Seasons</a>	Investigation to simulate how solar energy hits different parts of the Earth.
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<a href="#">Refraction</a>	Investigation into how the refraction of light and refractive indices can be used to determine the material that a transparent block is made out of.
<a href="#">Speed of Sound</a>	Investigation measuring the speed of sound.
<a href="#">Measuring Electricity</a>	How to measure voltage, current and resistance using ammeters, voltmeters and multimeters.
<a href="#">Magnification</a>	How magnification can be calculated and changed and how this relates to the field of view and resolution.
<a href="#">Parts and Function of a Microscope</a>	How optical microscopes work and what they are.
<a href="#">Types of Microscopes</a>	The different types of microscopes that can be used.
<a href="#">Using a Microscope</a>	How to prepare wet mounts and use a microscope.
<a href="#">Observations and Inferences</a>	Comparing observations and inferences, and the difference between qualitative and quantitative data.

## Recording and Processing

Construct and use a range of representations including graphs, keys and models to record and summarise data from students' own investigations and secondary sources, and to represent and analyse patterns and relationships. ([VCSIS110](#))

<a href="#">Observations and Inferences</a>	How to make observations and inferences using qualitative and quantitative methods.
<a href="#">Organising Data into a Data Table from an Experiment</a>	How to format data tables using scientific conventions, and how to create and input data into data tables.

<a href="#"><u>Graphs in Science</u></a>	How graphs are used in science.
<a href="#"><u>Bar Graphs</u></a>	Bar graphs, and what type of information is best represented in bar graphs.
<a href="#"><u>Line Graphs</u></a>	How to make and read a line graph.
<a href="#"><u>Matching Tables to Graphs</u></a>	Whether data should be presented in a table or a graph.
<a href="#"><u>Building Dichotomous Keys</u></a>	Investigation in classifying leaves with a dichotomous key.
<a href="#"><u>Researching Phyla</u></a>	Using research to compare and contrast two animals from the same phylum.
<a href="#"><u>Using Dichotomous Keys</u></a>	Using a dichotomous key to identify dragons.
<a href="#"><u>Jelly Cells</u></a>	Experiment using jelly and lollies to make a model of a cell.
<a href="#"><u>Preparing and Observing Cells</u></a>	Experiment practicing proper microscope and slide preparation techniques.
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<a href="#"><u>Making Models</u></a>	Making models of elements, compounds and molecules.
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<a href="#"><u>Build a Periscope</u></a>	Investigation into the uses of reflection.
<a href="#"><u>Slinky Waves</u></a>	Investigation using a slinky to explore the difference between longitudinal and transverse waves.
<a href="#"><u>Organising Data into a Data Table from an Experiment</u></a>	How to format data tables using scientific conventions, and how to create and input data into data tables.
<a href="#"><u>Food Webs</u></a>	Interpreting food web diagrams to teach interpretation skills.
<a href="#"><u>Interpreting Diagrams</u></a>	Exercises on interpreting food chains, flow charts, dichotomous keys and force diagrams.
<a href="#"><u>Water Cycle</u></a>	Introduction to interpreting diagrams using the water cycle as an example.
<a href="#"><u>A Guide for Making Graphs in Excel (Mac Version)</u></a>	How to make scatter plots, histograms and column graphs in Excel, when using a Mac computer.
<a href="#"><u>A Guide for Making Graphs in Excel (Windows Version)</u></a>	How to make scatter plots, histograms and column graphs in Excel, when using a Windows computer.
<a href="#"><u>Scatter Graphs</u></a>	Explanation of scatter graphs and lines of best fit.
<a href="#"><u>Graphs in Science</u></a>	How graphs are used in science.

## Analysing and Evaluating

Use scientific knowledge and findings from investigations to identify relationships, evaluate claims and draw conclusions. ([VCSIS111](#))

<a href="#">Interpreting Data Tables</a>	How to interpret data tables, and the difference between directly proportional and inversely proportional relationships.
<a href="#">Graphs in Science</a>	How graphs are used in science.
<a href="#">Bar Graphs</a>	Bar graphs, and what type of information is best represented in bar graphs.
<a href="#">Line Graphs</a>	How to make and read a line graph.
<a href="#">Matching Tables to Graphs</a>	Whether data should be presented in a table or a graph.
<a href="#">Evaluating in Science</a>	How to evaluate experimental results.
<a href="#">Building Dichotomous Keys</a>	Investigation in classifying leaves with a dichotomous key.
<a href="#">Classifying Leaves</a>	Investigation in classifying leaves into groups based on their shape.
<a href="#">Researching Phyla</a>	Using research to compare and contrast two animals from the same phylum.
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<a href="#">Flower Dissection</a>	Experiment on the dissection of a flower.
<a href="#">Heart Dissection</a>	Experiment on dissection of a heart.

<a href="#"><u>Candy Crystals</u></a>	Create candy crystals.
<a href="#"><u>Chromatography: Separating Colours</u></a>	Paper chromatography.
<a href="#"><u>Filtration</u></a>	Hypothesis-driven investigation comparing the use of two different folds of filter paper.
<a href="#"><u>Making a Solar Still</u></a>	Building their own solar still as a way to create clean water from plants and dirty water.
<a href="#"><u>Separating a Basic Mixture</u></a>	Devising a method for separating a mixture.
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<a href="#"><u>Build a Periscope</u></a>	Investigation into the uses of reflection.
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<a href="#">Musical Bottles</a>	Investigation in which students make musical instruments out of glass bottles.
<a href="#">Slinky Waves</a>	Investigation using a slinky to explore the difference between longitudinal and transverse waves.
<a href="#">Speed of Sound</a>	Investigation measuring the speed of sound.
<a href="#">Straw Instruments</a>	Investigation into the importance of resonance frequency in music.
<a href="#">Algebra in Science</a>	Introduction to how algebra is used in science with the examples of calculating net force and using Newton's Second Law.
<a href="#">Rearranging Equations</a>	Introduction on how to rearrange simple algebraic equations.
<a href="#">Choosing Appropriate Units</a>	Practice choosing appropriate units for volumes, distances, energies and speeds.
<a href="#">Units of Distance</a>	Introduction to the SI units used to measure distance, and how to convert between the units.
<a href="#">Units of Energy</a>	Introduction to the SI units used to measure energy, and how to convert between the units.
<a href="#">Units of Speed</a>	Introduction to the SI units used to measure speed, and how to convert between the units.
<a href="#">Units of Volume</a>	Introduction to the SI units used to measure volume, and how to convert between the units.
<a href="#">A Guide for Making Graphs in Excel (Mac Version)</a>	How to make scatter plots, histograms and column graphs in Excel, when using a Mac computer.
<a href="#">A Guide for Making Graphs in Excel (Windows Version)</a>	How to make scatter plots, histograms and column graphs in Excel, when using a Windows computer.
<a href="#">Scatter Graphs</a>	Explanation of scatter graphs and lines of best fit.
<a href="#">Scientific Notation</a>	How to write large and small numbers in scientific notation.
<a href="#">Significant Figures</a>	How to write numbers to significant figures, and how to identify significant figures.

**Reflect on the method used to investigate a question or solve a problem, including evaluating the quality of the data collected, and identify improvements to the method. ([VCSIS112](#))**

<a href="#">Evaluating in Science</a>	How to evaluate experimental results.
<a href="#">Building Dichotomous Keys</a>	Investigation in classifying leaves with a dichotomous key.
<a href="#">Classifying Leaves</a>	Investigation in classifying leaves into groups based on their shape.
<a href="#">Jelly Cells</a>	Experiment using jelly and lollies to make a model of a cell.
<a href="#">Preparing and Observing Cells</a>	Experiment practicing proper microscope and slide preparation techniques.

<a href="#"><u>Collecting Invertebrates in Quadrats</u></a>	Collecting invertebrates and use them to estimate biodiversity.
<a href="#"><u>Growing Plants Under Different Conditions</u></a>	Design an experiment for testing how plants grow under different conditions.
<a href="#"><u>Measuring Abiotic Factors in Water</u></a>	Measuring the abiotic factors temperature, pH, salinity and turbidity in three different water samples.
<a href="#"><u>Cross Pollination</u></a>	Investigation into how plants in the school garden reproduce.
<a href="#"><u>Candy Crystals</u></a>	Create candy crystals.
<a href="#"><u>Chromatography: Separating Colours</u></a>	Paper chromatography.
<a href="#"><u>Making a Solar Still</u></a>	Building their own solar still as a way to create clean water from plants and dirty water.
<a href="#"><u>Separating a Basic Mixture</u></a>	Devising a method for separating a mixture.
<a href="#"><u>Temperature and Dissolving</u></a>	How dissolving is affected by the temperature of a solution.
<a href="#"><u>Building a Density Tower</u></a>	Building a density tower and comparing the densities of different objects.
<a href="#"><u>Building a Steam Engine</u></a>	Building a simple steam engine called a Hero engine.
<a href="#"><u>Making Ice Cream</u></a>	How state changes can be used to make tasty treats, like ice cream!
<a href="#"><u>Observing Atmospheric Pressure</u></a>	How air pressure pushes upon the objects on Earth.
<a href="#"><u>Comparing Properties</u></a>	Comparing the different properties of metals, non-metals and metalloids.
<a href="#"><u>Flame Test</u></a>	Observing the different coloured flames produced by different elements.
<a href="#"><u>Indirect Observations</u></a>	Comparing direct and indirect observations.
<a href="#"><u>Making Models</u></a>	Making models of elements, compounds and molecules.
<a href="#"><u>Making Recycled Paper</u></a>	Making recycled paper through a series of physical changes.
<a href="#"><u>Observing Chemical Reactions</u></a>	Observations of some important chemical reactions.
<a href="#"><u>Observing Reactions with Fire</u></a>	The reactions that occur when substances are burned in oxygen.
<a href="#"><u>Rusting in Different Environments</u></a>	Using rusting nails to measure their change in weight to understand different reaction conditions.
<a href="#"><u>Making a Sundial</u></a>	Creating a sundial.
<a href="#"><u>Modelling Gravity</u></a>	Experiment to simulate the motion of planets around the Sun and the Moon around the Earth.
<a href="#"><u>Modelling the Earth, Moon and Sun</u></a>	Experiment using a light source to simulate day, night and eclipses with models of the Earth and Moon.
<a href="#"><u>Making a Pinhole Camera</u></a>	Investigation to indirectly observe the Sun with a pinhole camera.

<a href="#"><u>Using a Pinole Camera to Calculate Diameter of the Sun</u></a>	Investigation to observe the sun and estimate its diameter with a pinhole camera.
<a href="#"><u>Sunlight and Seasons</u></a>	Investigation to simulate how solar energy hits different parts of the Earth.
<a href="#"><u>Solar Oven</u></a>	Investigation in heating water with a solar oven.
<a href="#"><u>Turbine Power</u></a>	Investigation exploring how wind and hydro turbines respond to different loads.
<a href="#"><u>Evaporation</u></a>	Investigation exploring the connection between surface area and evaporation.
<a href="#"><u>Make Your Own Aquifer</u></a>	Investigation exploring the formation and extraction of groundwater.
<a href="#"><u>Weather in a Jar</u></a>	Investigation exploring the factors that lead to cloud and rain formation.
<a href="#"><u>Cooling Crystals</u></a>	Investigation in growing crystals.
<a href="#"><u>A Ramp as a Simple Machine</u></a>	Quantitative investigation designed to study how a ramp works as an inclined plane.
<a href="#"><u>Build a Marshmallow Blaster</u></a>	Quantitative investigation to study the relationship between mass and acceleration.
<a href="#"><u>Build an Electroscope</u></a>	Investigation on static electricity and electrostatic forces.
<a href="#"><u>Friction Investigation</u></a>	This investigation will demonstrate friction in action.
<a href="#"><u>Levers Investigation</u></a>	Comparing the three classes of lever, with an emphasis on qualitative observations and real-life applications.
<a href="#"><u>Mapping Magnetic Fields</u></a>	Investigation into the shapes of magnetic fields and the nature of magnetic forces.
<a href="#"><u>Bouncy Balls and Energy Efficiency</u></a>	Investigation on the energy transformations and efficiency in bouncy balls.
<a href="#"><u>Building a Solar Oven</u></a>	Investigation on constructing a solar oven to heat water.
<a href="#"><u>Energy in Skate Parks</u></a>	Investigation into the relationship between mass and gravitational potential energy using the PhET skate park simulation.
<a href="#"><u>Energy Transformations</u></a>	Investigation of energy transformations occurring in four scenarios.
<a href="#"><u>Investigating Heat Energy</u></a>	Comparison of different materials and their heat conduction abilities.
<a href="#"><u>Rube Goldberg Machines</u></a>	Investigation into the energy transformations and transfers that take place in Rube Goldberg machines.
<a href="#"><u>Law of Reflection</u></a>	Investigation into the Law of Reflection.
<a href="#"><u>Refraction</u></a>	Investigation into how the refraction of light and refractive indices can be used to determine the material that a transparent block is made out of.
<a href="#"><u>Speed of Sound</u></a>	Investigation measuring the speed of sound.
<a href="#"><u>Evaluating in Science</u></a>	How to evaluate experimental results.

## Communicating

Communicate ideas, findings and solutions to problems including identifying impacts and limitations of conclusions and using appropriate scientific language and representations. ([VCSIS113](#))

<a href="#">Scientific Method</a>	The scientific method and how to write a scientific report.
<a href="#">Graphs in Science</a>	How graphs are used in science.
<a href="#">Researching Phyla</a>	Using research to compare and contrast two animals from the same phylum.
<a href="#">Growing Plants Under Different Conditions</a>	Design an experiment for testing how plants grow under different conditions.
<a href="#">First Aid and Body Systems</a>	Practical lesson in Basic first aid.
<a href="#">Filtration</a>	Hypothesis-driven investigation comparing the use of two different folds of filter paper.
<a href="#">Rusting in Different Environments</a>	Using rusting nails to measure their change in weight to understand different reaction conditions.
<a href="#">Solar Oven</a>	Investigation in heating water with a solar oven.
<a href="#">Build a Geological Timescale</a>	Investigation in understanding the age of the Earth and everything in it.
<a href="#">Cooling Crystals</a>	Investigation in growing crystals.
<a href="#">A Ramp as a Simple Machine</a>	Quantitative investigation designed to study how a ramp works as an inclined plane.
<a href="#">Build a Marshmallow Blaster</a>	Quantitative investigation to study the relationship between mass and acceleration.
<a href="#">Bouncy Balls and Energy Efficiency</a>	Investigation on the energy transformations and efficiency in bouncy balls.
<a href="#">Energy in Skate Parks</a>	Investigation into the relationship between mass and gravitational potential energy using the PhET skate park simulation.
<a href="#">Slinky Waves</a>	Investigation using a slinky to explore the difference between longitudinal and transverse waves.
<a href="#">Straw Instruments</a>	Investigation into the importance of resonance frequency in music.