New South Wales Syllabus – Stage 4

Introduction:

This document maps Education Perfect lessons to the New South Wales Syllabus. When a lesson covers both scientific content and science skills, it will be listed in both sections.

Contents:

Key:

- Addresses the core science content.
- Contains additional content, as described on the NSW Syllabus webpage.
- Elaborates and extends beyond the syllabus.
- Also fulfils working scientifically (skills) curriculum standards.

Physical World

Outcomes:

A student describes the action of unbalanced forces in everyday situations.

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

Content:

PW1 Change to an object's motion is caused by unbalanced forces acting on the object.

What Are Forces?	An introduction into forces and their effects on objects.
Drawing Forces	How to draw the actions of forces onto objects to understand how they affect motion.
Balanced and Unbalanced Forces	Learning to identify unbalanced and balanced forces, and the applying and receiving forces.
Friction	An in-depth look at the causes and effects of friction and drag.
Fact or Friction?	This lesson describes useful friction and unwanted friction.
Safety Systems	This lesson describes how we use our knowledge of forces to stay safe.
Friction Investigation	This investigation will demonstrate friction in action.
Levers	Smart lesson on levers and the classes of levers.
Inclined Planes	Lesson on inclined planes and applications as wedges and screws.
Wheels, Axles and Pulleys	Simple machines lesson on the wheel and axle and the pulley.
Gears	Simple machines lesson on the gear.
Bicycle Investigation	Applying the knowledge of simple machines to investigate the use of gears, wheels, axles, pulleys and levels in bicycles.
Calculating Net Force	Introduction to calculating net force on objects.
Gear Ratio	Gear wheels and problems involving gear ratios.
Ancient Tools and Weapons	A look at some ancient weapons and tools, and the machines that made them work.

Comparing Robots	This lesson shows how robots all contain simple machines.
Sports Science	A lesson on how we use our knowledge of forces in Sports Science.
A Ramp as a Simple Machine	Quantitative investigation designed to study how a ramp works as an inclined plane.
Levers	Comparing the three classes of lever, with an emphasis on qualitative observations and real-life applications.
Newton's First Law	Lesson on inertia.
Newton's Second Law	Lesson on Newton's Second Law.
Newton's Third Law	Learning to identify unbalanced and balanced forces, and identifying the applying and receiving forces.
Build a Marshmallow Blaster	Quantitative investigation to study the relationship between mass and acceleration.

PW2 The action of forces that act at a distance may be observed and related to everyday situations.

Contact and Non-Contact Forces	Classifying forces based on whether they are contact or non-contact.
Gravity	An introduction to gravitational forces, weight, mass and gravity's effect in the solar system.
Magnetism	An introduction to magnets and magnetic fields.
Earth's Magnetic Field	Introduction to the Earth's magnetic field and compasses.
Electrostatic Force	A more in-depth look at the causes and effects of electrostatic forces.
Build an Electroscope	Investigation on static electricity and electrostatic forces.
Planetary Motion	Smart Lesson exploring how gravity causes planets and satellites to move in orbits.
Tides	Introduction to how the sun and moon control the tides.
Mapping Magnetic Fields	Investigation into the shapes of magnetic fields and the nature of magnetic forces.

PW3 Energy appears in different forms including movement (kinetic energy), heat and potential energy, and causes change within systems.

What Is Energy?	A quick introduction to energy.
Active Energy	Introduction to the types of kinetic energy.
Stored 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.
Introduction to Conductors and Insulators	Introduction to conductors and insulators.
Conductors and Insulators	Introduction to conductors and insulators with some common examples.
Electricity	An overview of electricity; current, resistance, voltage, series and parallel circuits.
Electric Currents	Introduction to energy transfer in electric circuits and symbols of common circuit components.
Building a Solar Oven	Investigation on constructing a solar oven to heat water.
Building Circuits	Investigation into light bulbs in series and parallel circuits.
Energy in Skate Parks	Investigation into the relationship between mass and gravitational potential energy using the PhET skate park simulation.
Investigating Heat Energy	Comparison of different materials and their heat conduction abilities.
Static Electricity	Investigation into static electricity and how it can be used to levitate objects.
Current	Explanation of electrical current and ammeters.
Resistance	Introduction to resistance in circuit components and wires.
Voltage	Introduction to voltage, voltmeters and voltage drops.
Introduction to Ohm's Law	Introduction to Ohm's Law and how it is used to relate current, voltage and resistance.

Batteries	Introduction to batteries focusing on the difference between wet cell and dry cell batteries.
Conductors and Insulators	Explanation of electrical conductors and insulators, and their use in circuits.
Circuits in Series	Introduction to series circuits focusing on current and voltage across circuit components.
Circuits in Parallel	Introduction to parallel circuits with an explanation of how current and voltage act in these circuits.
Circuits Comparison	Smart Lesson comparing series and parallel circuits with a focus on light bulb brightness and switch usage.
Energy Calculations	Calculating kinetic energy and gravitational potential energy.
Qualitative and Quantitative Data	Qualitative and quantitative methods for measuring energy.
Battery Voltages	An investigation where students measure the voltages on a range of batteries and compare this to the advertised voltages.
Ohm's Law	Investigation into Ohm's Law in a simple circuit.
Resistance	An investigation where students compare the measured resistance for a number of resistors to the resistance advertised by the resistors' coloured bands.

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.

Energy Transformations	Examples of energy being converted from one form to another.
Displaying Energy Transformations	Energy flow charts and Sankey diagrams.
Useful and Wasted Energy	Waste energy created in energy transformations.
Energy Efficient Houses	Smart Lesson on maximising energy efficiency in houses.
The Power Grid and You	How energy travels from power stations to the home.
Bouncy Balls and Energy Efficiency	Investigation on the energy transformations and efficiency in bouncy balls.
Energy Transformations	Investigation of energy transformations occurring in four scenarios.
Rube Goldberg Machine	Investigation into the energy transformations and transfers that take place in Rube Goldberg machines.
Cars of the Future	How cars are designed to transfer energy, and the modern designs that are using clean energy.
The Development of Flight	The history of airplanes, and their evolution in design and energy efficiency.

Energy Transformation and Food	How our bodies use energy from food.
Cogeneration and Engines	Internal and external combustion engines.

Earth and Space

Outcomes:

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

A student 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.

Content:

ES1 Sedimentary, igneous and metamorphic rocks contain minerals and are formed by processes that occur within Earth over a variety of timescales.

Earth's Structure	Explanation of the layers of the Earth.
Earth Processes	Introduction to geological time, pressure and heat within the Earth.
Weathering and Erosion	Explanation of how erosion breaks rocks down.
Introduction to Minerals	Explanation of the criteria that a substance must meet to be classified as a mineral.
Identifying Minerals	Explanation of how we use physical features classify and identify minerals.
Igneous Rocks	Explanation of how igneous rocks form and the differences between intrusive and extrusive rocks.
Sedimentary Rocks	Introduction to the formation of sedimentary rocks and the difference between clastic, crystalline and organic sedimentary rocks.
Metamorphic Rocks	Explanation of how metamorphic rocks form.
The Rock Cycle	Explanation of the rock cycle.

Australian Landforms formed by Physical Weathering, Erosion and Sedimentation	A tour through Australian landforms and landscapes affected by physical weathering, erosion and sedimentation.
Australian Landforms formed by Volcanism and Chemical Weathering	A tour through Australian landforms and landscapes that have been affected by volcanism and chemical weathering.
Minerals and Rocks as Resources	Explanation of how rocks and minerals are used as resources.
Mining and Mineral Exploration	How coal and uranium are mined in Australia, with an emphasis on how geologists uncover these resources.
Build a Stratigraphic Column	Investigation in understanding how geologists use stratigraphic columns to study the Earth.
Simulating Erosion	Investigation in understanding the process of simulating erosion.
Comparing Minerals	Data on different minerals and their properties for students to interpret.
Baked Rocks in the Lachlan Fold Belt	Science Comprehension lesson about the Lachlan Fold Belt, a metamorphic rock structure.
Zircons are Forever	Science Comprehension lesson about zircons, a type of durable rock.
Cooling Crystals	Investigation in growing crystals.
Dissecting the Earth	A journey to the centre of the Earth, focusing on minerals that make up the Earth's layers
Geological Time	The concept of deep time and the Geological Timescale.
Australian Fossils	Palaeontology and fossils, with a focus on the Ediacaran biota, fish of Gogo Station and dinosaurs of Winton.
Martian Geology	The geology and history of Mars.
Volcanology	Volcanoes and how scientists study them.
Hot Rocks of the Cosgrove Hotspot Track	Science Comprehension lesson about the Cosgrove Hotspot Track, a chain of extinct volcanoes.
Build a Geological Timescale	Investigation in understanding the age of the Earth and everything in it.

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.

The Universe	Introducing the solar system, planets, stars and constellations.

Earth, Moon and Sun	Introduction to the positions and movements of the Earth, Moon and Sun.
Day and Night	Different day lengths at different times of the year.
Seasons	Why different seasons occur.
Phases	The different phases of the moon.
Lunar Eclipse	What Lunar Eclipses are and how they occur.
Solar Eclipse	What Solar Eclipses are and how they occur.
Calendars and the Solar Year	The development of calendars, including a section on the Indigenous Australian calendars.
Exploring Space	Humans in space and space missions including: Apollo 11, Curiosity, New Horizons and Voyager 1.
Indigenous Constellations	The use of constellations in Indigenous Australian peoples lives.
Models of the Solar System	Development of the Geocentric and Heliocentric Models of the Solar System.
Satellites	Introducing satellites and their uses, including in GPS and the International Space Station.
Telescopes	How telescopes were developed, including the Hubble Space Telescope.
Making a Sundial	Creating a sundial.
Modelling the Earth, Moon and Sun	Experiment using a light source to simulate day, night and eclipses with models of the Earth and Moon.
Sunlight and Seasons	Investigation to simulate how solar energy hits different parts of the Earth.
Tides	How the Sun, Moon, and Earth interact to create tides.
Gravity	Gravity and orbits.
Comets	Comets.
Asteroids and Meteoroids	Asteroids and meteoroids.
Time Zones	Time zones are and why they exist.
Earth's Magnetic Field	Introduction to the Earth's magnetic field, compasses and the aurora.
Planetary Motion	Extension lesson about how and why planets move around the Sun.
Earth's Structure	Explanation of the layers of the Earth.
Changing Seasons	How seasonal changes affect people in a variety of activities.
Modelling Gravity	Experiment to simulate the motion of planets around the Sun and the Moon around the Earth.
Making a Pinhole Camera	Investigation to indirectly observe the Sun with a pinhole camera.

Using a Pinhole Camera to Calculate Diameter of the Sun	Investigation to observe the sun and estimate its diameter with a pinhole camera.

ES3 Scientific knowledge influences the choices people make in regard to the use and management of the Earth's resources.

Introduction to Earth's Resources	Introduction to Earth resources, including renewable and non-renewable resources.
Renewable and Non-Renewable Energy Sources	Introduction to the different energy sources used in Australia and whether they are renewable or non-renewable.
Fossil Fuels as a Resource	The different types of fossil fuels and how they are formed.
Soil as a Resource	The formation of fertile soil and the importance of sustaining it.
Minerals and Ores as Resources	Other resources from rocks; especially gemstones and metals.
Mining	Mineral resources, processes of extraction and ways to make them more sustainable.
Nuclear Fuel as a Resource	Introduction to nuclear fuel as a non-renewable resource.
Living Things as a Resource	Introduction to the concept that living things are renewable resources.
Air as a Resource	Introduction to air as a resource. Focusing on how photosynthesis results in balanced oxygen and carbon dioxide levels.
Wind as a Resource	Wind, wind formation and convection cells.
Wind Turbines	How wind turbines are used to produce electricity.
Solar Energy	Introduction to solar energy, insolation and methods of collecting and using solar energy.
Water Power	The various ways we can use water to produce electricity.
Geothermal Energy	Smart Lesson on how geothermal power stations produce electrical energy.
Investigation: Coal vs. Solar for Australia's Future	Compares coal and solar energy as non-renewable and renewable resources.
Renewable Energy	The renewable energy options that Australia has available.
The Power of Sunshine	A Smart Lesson introducing some novel applications of solar energy. This lesson can be used to improve reading comprehension in students.
Solar Oven	Investigation in heating water with a solar oven.
Turbine Power	Investigation exploring how wind and hydro turbines respond to different loads.

Choosing Renewables	This Smart Lesson presents data on renewable and non-renewable energy use for students to interpret.
Antarctica, a Shared Continent	The shared scientific community of Antarctica.
Changing Seasons	How seasonal changes affect people in a variety of activities.

ES4 Science understanding influences the development of practices in areas of human activity such as industry, agriculture and marine and terrestrial resource management.

Water on Earth	Introduction to the distribution of water on Earth.
States of Water	Introduction to the states of water.
The Water Cycle as a Closed System	Introduction to closed and open systems with examples of each.
Water Cycle	Introduction to the water cycle.
Influences on the Water Cycle	Describes the factors that influence the progression of the water cycle.
Irrigation	How we water our plants, covering the spray and flood irrigation types.
Water Conservation	How we recycle water and why we do it.
Science, Tradition and Modern Medicine	Connections between science, tradition and modern medicine.
Water Management	The importance of effective water management skills in Australia.
Evaporation	Investigation exploring the connection between surface area and evaporation.
Weather In A Jar	Investigation exploring the factors that lead to cloud and rain formation.
Aquifers	Introduction to aquifers, how they form, and what they're used for.
Make Your Own Aquifer	Investigation exploring the formation and extraction of groundwater.
Reading a Weather Map	This Smart Lesson teaches students how to identify key features on weather maps, including pressure and temperature.

Living World

Outcomes:

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

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

Content:

LW1 There are differences within and between groups of organisms; classification helps organise this diversity.

Introduction to Classification	The principles of classification.
Uses of Classification	Why classification is useful to scientists, especially biologists.
Living or Non-Living?	How to classify things as living or non-living, with a introduction to unicellular and multicellular organisms.
MRS GREN	Introduction to the seven life processes.
Types of Keys	How to read and build dichotomous keys.
Linnaean Classification	Carolus Linnaeus and his contributions to the field of taxonomy, including the seven levels of classification.
Binomial Nomenclature	Binomial nomenclature and writing scientific names.
Species and Hybrids	The reproductive definition of species and hybrids.
Animal Phyla	Animals classified at the level of phylum.
The Six Kingdoms	The six major kingdoms of life.
Vertebrates	Vertebrates and the place of humans on the Tree of Life.
Plant Divisions	The classification of plants based on how they reproduce.
The Platypus	How scientists classified the platypus.
Classifying Leaves	Investigation in classifying leaves into groups based on their shape.
Researching Phyla	Using research to compare and contrast two animals from the same phylum.

Using Dichotomous Keys	Using a dichotomous key to identify dragons.
Building Dichotomous Keys	Investigation in classifying leaves with a dichotomous key.
Carl Linnaeus	The life of Carl Linnaeus and his contributions to Science.
Identifying Species	How scientists determine if two organisms are from the same species or different species.

LW2 Cells are the basic units of living things and have specialised structures and functions.

What is a Cell?	Introduction to cells.
Size of Cells	Introduction to the units and incredibly small size of cells.
Types of Microscopes	Different types of microscopes that can be used.
Prokaryotic Cells	Introductory Smart Lesson on prokaryotic cells and bacteria.
Bacterial Cell Structure	The organelles found in prokaryotes such as bacteria.
Eukaryotic Cells	Introductory Smart Lesson on eukaryotic cells and the organelles present in all eukaryotic cells.
Animal Cells	The organelles found in animal cells.
Plant Cell Structure	The organelles found in plant cells.
Fungal Cell Structure	Introduction to the structure of fungal cells.
Cell Division in Bacteria	Introducing binary fission in bacteria.
Cell Division in Humans	The concept of cell division, and the difference between mitosis and meiosis.
Specialised Animal Cells	Specialised animal cells, and how the structure of the cells relates to their function.
Specialised Plant Cells	Specialised plant cells, and how the structure of the cells relates to their function.
Levels of Organisation	The various levels of organisation in the human body, from the smallest cells up to organs.
Animal vs. Plant Cells	Comparing animal and plant cell organelles and structure.
Prokaryotic vs. Eukaryotic	Comparing prokaryotes and eukaryotes.
Introduction to Types of Cells: Pond Water Investigation	Introductory lesson on the different types of cells - prokaryotic and eukaryotic - structured as an investigation into the organisms found in pond water.
Jelly Cells	Experiment using jelly and lollies to make a model of a cell.
Pond Critters	Experiment collecting pond water examine under a microscope.

Preparing and Observing Cells	Experiment practicing proper microscope and slide preparation techniques.
Parts and Function of a Microscope	How microscopes work and what they are.
Magnification and Resolution	How magnification can be calculated and changed and how this relates to the field of view and resolution.
How to Use a Microscope	Instructions on how to properly use a microscope.
Using a Microscope	Investigation in how to use a microscope correctly.
Food Safety and Salmonella	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.
History of Microscopes	The history and development of microscopes.
Diffusion	A lesson explaining the process of diffusion and the surface area:volume ratio.
Diffusion and Cell Size	Diffusion and the surface area to volume ratio.
Antibiotics	Introducing antibiotics and the issue of antibiotic resistance.
Cell Theory	The development of cell theory.
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.

LW3 Multicellular organisms contain systems of organs that carry out specialised functions that enable them to survive and reproduce.

Introduction to Body Systems	The comparison of unicellular to multicellular organisms, how structure relates to function, and what body systems are.
Digestive System as a Whole	The different structures of the digestive system and describing how each function.
Food Groups	Three different food groups and what they consist of.
Mouth and Oesophagus	The start of the digestive system: the mouth, oesophagus and the sphincter. The difference between mechanical and chemical digestion is also explained.
Stomach and Small Intestine	How digestion occurs in the stomach and the small intestines.
Large Intestine and Rectum	How digestion takes place in the large intestines and rectum.
Introduction to Respiration	The different structures and functions of the respiratory system.

Breathing	The muscles responsible for breathing and the path air takes during inhalation and exhalation.
Gas Exchange	The exchange of oxygen and carbon dioxide takes place.
Respiration in Cells	Why cells need oxygen and what they use it for.
Introduction to the Circulatory System	Introduction and explanation of the circulatory system and how the heart works.
Heart	The parts of the heart and blood flow.
Blood Vessels	Explanation of types of blood vessels, including how to take your pulse.
Blood	The different components that make up blood.
Introduction to Excretory System	The excretory system and the structures involved.
Excretory Organs	The various excretory organs, such as the kidneys, liver, lungs and skin.
The Kidneys & Urine Production	How urine is produced in the kidneys.
Musculoskeletal System	The musculoskeletal system and its components.
Bones & Joints	Ossification, the cells involved in bone growth and remodelling, osteoporosis and the many different types of joints within the human body.
Muscles	The three different muscle types. Focusing on the types of movements muscles produce, and what the main muscles of the body are.
Puberty	Introducing and explaining puberty.
Male Reproduction	The male reproductive system.
Female Reproduction	The female reproductive system.
Pregnancy	Introducing and explaining pregnancy.
Birth	The birth process in humans.
Sexual Reproduction in Plants	Sexual reproduction in plants.
Pollination	Pollination and discussing why plants use it for reproductive purposes.
Seed Dispersal & Germination	Seed dispersal and discussing why plants use it for reproductive purposes.
Photosynthesis	Photosynthesis.
Plant Systems	The shoot and root systems of plants, as well as xylem and phloem.
Cross Pollination	Investigation into how plants in the school garden reproduce.
Flower Dissection	Experiment on the dissection of a flower.

Revision: Using A Microscope	Revision lesson on how to use a microscope - bundled with the flower dissection.
Heart Dissection	Experiment on dissection of a heart.
Comparing Digestion in Other Animals	Comparing and contrasting the digestive systems of koalas, cows, dingoes and humans.
Respiration Compare and Contrast	The respiratory systems of fish, insects and humans.
Kidney Disease	UTIs and kidney stones.
Injuries	The different types of bone fractures and muscle injuries.
Sexual Reproduction in Animals	Sexual reproduction in animals.
Asexual Reproduction in Animals	Asexual reproduction in animals.
Asexual Reproduction in Plants	Asexual reproduction in plants.
Adapting to Extreme Climates	How humans adapt to different climates using homeostasis.
Diffusion	A lesson explaining the process of diffusion and the surface area:volume ratio.
Diffusion and Body Systems	How diffusion operates within the human body.
Exercise and the Body	How exercise affects the body, and the body's response.
Stress Effects on the Body	How stress affects the body, and the body's reaction.
Maple Syrup	Where maple syrup comes from.
Ancient Anatomy	In this lesson, students read a passage about the Ancient Egyptian's understanding of human anatomy. The lesson is designed to test the students' reading comprehension.
First Aid and Body Systems	Practical lesson in Basic first aid.
Relative Heart Size	In this lesson, students interpret data on the relative heart size in different species. They explore links between life style and heart size.

LW4 Scientific knowledge changes as new evidence becomes available, and some scientific discoveries have significantly changed people's understanding of the world.

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.

Organ Transplants	What organ transplantations are.
Plant Cloning	Plant and gene cloning and its use in growing crops.

LW5 Science and technology contribute to finding solutions to conserving and managing sustainable ecosystems.

Ecology	Introducing ecology, the biosphere and biomes.
Species vs Organism	The difference between a species and an organism.
Ecosystem	Introductory lesson on ecosystems and what they contain.
Biotic and Abiotic Factors	The differences between biotic and abiotic factors in an ecosystem.
Interdependent Relationships	Introducing types of symbiotic relationships, including commensalism, mutualism and parasitism.
Predators, Prey & Competition	Introducing and explaining predators, prey and competitors.
Producers & Photosynthesis	Producers and the plant process of photosynthesis.
Consumers	Trophic levels and consumers.
Food Chains	Food chains.
Food Webs	Food webs.
Cane Toads as an Introduced Species	The impact cane toads have on native ecosystems.
Deforestation	The impact deforestation has on native ecosystems.
Ecosystem Conservation	The steps the Australian Government is taking to conserve native ecosystems.
Introduced Species	The impact introduced species have on native ecosystems.
Oil Pollution & Industrial Waste	The impact industrial waste and oil spills have on ecosystems.
Pesticides	The impact pesticides have on native ecosystems.
Scientific Methods of Conservation	How scientific methods are used to protect native ecosystems and at-risk species
Species Conservation	The steps the Australian Government is taking to protect native species
Water Pollution	The impact water pollution has on ecosystems.
Australian Bushfires	Australian bushfires and aboriginal firestick farming.

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.
Plant Cloning	Plant and gene cloning and its use in growing crops.
Pollution and Ecosystems	How pollution can affect whole ecosystems. It includes an the example of how pollution affects the Great Barrier Reef.
What is Pollution?	What pollution is, where it comes from and what it does to living things.
Sustainable Bush Tucker	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.
Build a Food Web Investigation	Building a food web using a list of species and information about what they eat.
Extracting Leaf Pigments	Extracting pigments from plant leaves.
Growing Plants under Different Conditions	Design an experiment for testing how plants grow under different conditions.
Measuring Abiotic Factors in Water	Measuring the abiotic factors temperature, pH, salinity and turbidity in three different water samples.
Marine Ecosystems and Overfishing	Data is presented on overfishing to read column graphs, pie charts and tables.
Saving the Tasmanian Devil	The Tasmanian devil and the disease that threatens it with extinction.
Adaptations	What structural, behaviour and physiological adaptations are and how they aid in an organisms survival.
Diurnal vs Nocturnal	The differences between diurnal and nocturnal animals.
Antarctica	The life on the icy continent of Antarctica.
Collecting Invertebrates in Quadrats	Collecting invertebrates and use them to estimate biodiversity.

Chemical World

Outcomes:

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

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

Content:

CW1 The properties of the different states of matter can be explained in terms of the motion and arrangement of particles.

What is Matter?	Introduction to matter.
States of Matter	Introduction to solids, liquids and gases.
Particles	Introduction to particles, energy state and bond strength.
Solids	How the properties of solids are a result of the behaviour of their particles.
Liquids	How the properties of liquids are a result of the behaviour of their particles.
Gases	How the properties of gases are a result of the behaviour of their particles.
Particle Model of Matter	Using the previous lessons to explain the particle model of matter. An ideal lesson for revising the particle model of matter.
Changing State	Introduction to the concept that substances can change their state.
Melting and Freezing	Explanation of melting and freezing, including how the behaviour and energy state of particles changes.
Boiling, Evaporation and Condensation	Explanation of boiling, evaporation and condensation, including how the behaviour and energy state of particles changes as substances change state.
Sublimation and Deposition	Sublimation and deposition and provides several examples of both changes of state.
Temperature and Changing State	The relatively advanced concept that the temperature of a substance does not change while it is changing its state.

Density	Explains how to calculate density.
Mass and Volume	How to measure mass and volume.
Energy in Matter	How energy is transferred through and interacts with matter.
Building a Density Tower	Building a density tower and comparing the densities of different objects.
Building a Steam Engine	Building a simple steam engine called a Hero engine.
Making Ice Cream	How state changes can be used to make tasty treats, like ice cream!
Pressure	Defining pressure and how the pressure a gas exerts on its container can change with volume and temperature.
Observing Atmospheric Pressure	How air pressure pushes upon the objects on Earth.
Newtonian and Non-Newtonian Fluids	Explanation on what non-Newtonian fluids are.
Heat Pumps and Refrigerators	How heat pumps and refrigerators use changes in temperature, pressure and state to heat a house and chill food.
States of Matter in Space	How the extreme temperatures of different planets and moons affects matter and how this affects their weather.
The Water Cycle and Weather	How state changes affect the water cycle and weather.
When Water Freezes	How changing state affects density and how water is an important exception to the rule.
What is the Matter?	This Science Comprehension lesson follows the state of water as it travels from the chilly depths of the temperature scale to the scorching heights.

CW2 Scientific knowledge and developments in technology have changed our understanding of the structure and properties of matter.

Introduction to Elements, Compounds and Mixtures	Introduction to the simple concepts of elements, compounds and mixtures.
Atoms	Introduction to atoms, atomic models and sub-atomic particles.
Elements	Introduction to elements, the Periodic Table and the organisation of the elements.
Metals, Non-Metals and Metalloids	Introduction to the three groups of elements - metals, metalloids and non-metals.
First 10 Elements	Introduction to the first 10 elements of the periodic table.

Quiz- First 10 Elements (Name to Symbol)	Students identify the correct symbol for the first 10 elements in the Periodic Table.
Quiz- First 10 Elements (Symbol to Name)	Students identify what element a symbol represents, for the first 10 elements in the Periodic Table.
Compounds	Introduction to compounds and how they relate to mixtures and elements.
Molecules	Introduction to molecules and lattices, and how they relate to compounds.
Chemical Formulas	Introduction to chemical formulas and writing formulas for elements and compounds.
Discovering Elements	A history of the discovery of several notable elements.
Materials Science	A history of useful materials, from the Stone Age to modern times.
Comparing Properties	Comparing the different properties of metals, non-metals and metalloids.
Flame Test	Observing the different coloured flames produced by different elements.
Making Models	Making models of elements, compounds and molecules.
Chemical Bonding	Discussion of ions and how elements bond to make compounds and molecules.
The Periodic Table	A history of the periodic table.
Carbon Chemistry	Carbon and the many useful allotropes of carbon.
Marie Curie and Radioactivity	Introduction to radioactivity, and the history of Marie Curie's discoveries.
Indirect Observations	Comparing direct and indirect observations.

CW3 Mixtures, including solutions, contain a combination of pure substances that can be separated using a range of techniques.

Introduction to Mixtures	Introducing concepts such as particles, mixtures, and pure versus impure substances.
Pure and Impure Substances	The difference between pure and impure substances
Solute and Solvent	The differences between solutes and solvents, and how they combine to form a solution.
Concentrations	Concentration, and comparing the amount of solute in a solution.
Introduction to Separation	Introduction to the various ways that mixtures can be separated, including straining and decanting.
Filtration	Filtration and its use in the laboratory.
Evaporation	Introduction to evaporation and how it can be used to separate solutions.
Distillation	Distillation and how it can be used to separate the liquid parts of a solution.

Chromatography	Chromatography and how it is used to identify parts of a solution.
Crystallisation	Crystallisation and how it is used to bring solids out of solutions.
Blood as a Mixture	Blood, focusing on how it is a mixture. Also covers the functions of the different components which make up blood.
Recycling Sewage	The methods used to treat sewage.
Separation in Food	Separation processes used to create specific food products.
Separation in Industries	How separation is used in mining.
Water Treatment	How water is treated from source to tap. Discusses separation techniques used in the water treatment process.
Open-Ended Separation Investigation	Investigation into a mixture of many parts, and how we can use the techniques we have learned to separate it.
Chromatography: Separating Colours	Paper chromatography.
Filtration	Hypothesis-driven investigation comparing the use of two different folds of filter paper.
Making a Solar Still	Building their own solar still as a way to create clean water from plants and dirty water.
Separating a Basic Mixture	Devising a method for separating a mixture.
Graphs and Tables of Mixtures	Students interpret different types of graphs containing data on the contents of various mixtures. The graphs include pie charts, column graphs and tables.
Indigenous Art using Mixtures	How Indigenous Australians used mixtures in their art.
The Cave of Crystals	In this lesson, students watch a video about the Cave of the Crystals in Mexico, then answer questions testing their understanding.
The Mystery of Opals	Formation and structure of opals.
Candy Crystals	Create candy crystals.
Temperature and Dissolving	How dissolving is affected by the temperature of a solution.
Suspensions	Suspensions, including how they are created.
Colloids	The definition of colloids, their common characteristics, and how they are produced.
Emulsions	Emulsions, including some common examples and how they are different from other colloids.
Centrifuging	The use of centrifuging to separate suspensions.
Adsorption	Adsorption and how it is used to remove dangerous particles from air or water.

Magnetic and Electromagnetic Separation	The use of magnetic and electrostatic suspension techniques.
Saturation and Line Graphs	Students practice interpret line graphs containing data on concentrations of solutions. From the graph, they identify the point of saturation.

CW4 In a chemical change, new substances are formed, which may have specific properties related to their uses in everyday life.

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

Working Scientifically

Questioning and Predicting

Outcomes:

A student identifies questions and problems that can be tested or researched and makes predictions based on scientific knowledge.

Content:

WS4 Students question and predict.

A Ramp as a Simple Machine	Quantitative investigation designed to study how a ramp works as an inclined plane.
Build a Marshmallow Blaster	Quantitative investigation to study the relationship between mass and acceleration.
Friction Investigation	This investigation will demonstrate friction in action.
Battery Voltages	An investigation where students measure the voltages on a range of batteries and compare this to the advertised voltages.
Building a Solar Oven	Investigation on constructing a solar oven to heat water.
Building Circuits	Investigation into light bulbs in series and parallel circuits.
Energy in Skate Parks	Investigation into the relationship between mass and gravitational potential energy using the PhET skate park simulation.
Investigating Heat Energy	Comparison of different materials and their heat conduction abilities.
Bouncy Balls and Energy Efficiency	Investigation on the energy transformations and efficiency in bouncy balls.
Energy Transformations	Investigation of energy transformations occurring in four scenarios.
Rube Goldberg Machine	Investigation into the energy transformations and transfers that take place in Rube Goldberg machines.
Cooling Crystals	Investigation in growing crystals.
Modelling Gravity	Experiment to simulate the motion of planets around the Sun and the Moon around the Earth.

Modelling the Earth, Moon and Sun	Experiment using a light source to simulate day, night and eclipses with models of the Earth and Moon.
Using a Pinhole Camera to Calculate Diameter of the Sun	Investigation to observe the sun and estimate its diameter with a pinhole camera.
Solar Oven	Investigation in heating water with a solar oven.
Turbine Power	Investigation exploring how wind and hydro turbines respond to different loads.
Evaporation	Investigation exploring the connection between surface area and evaporation.
Make Your Own Aquifer	Investigation exploring the formation and extraction of groundwater.
Jelly Cells	Experiment using jelly and lollies to make a model of a cell.
Pond Critters	Experiment collecting pond water examine under a microscope.
Preparing and Observing Cells	Experiment practicing proper microscope and slide preparation techniques.
Growing Plants under Different Conditions	Design an experiment for testing how plants grow under different conditions.
Observing Atmospheric Pressure	How air pressure pushes upon the objects on Earth.
Comparing Properties	Comparing the different properties of metals, non-metals and metalloids.
Candy Crystals	Create candy crystals.
Filtration	Hypothesis-driven investigation comparing the use of two different folds of filter paper.
Making a Solar Still	Building their own solar still as a way to create clean water from plants and dirty water.
Temperature and Dissolving	How dissolving is affected by the temperature of a solution.
Saturation and Line Graphs	Students practice interpret line graphs containing data on concentrations of solutions. From the graph, they identify the point of saturation.
Rusting in Different Environments	Using rusting nails to measure their change in weight to understand different reaction conditions.

Planning Investigations

Outcomes:

A student collaboratively and individually produces a plan to investigate questions and problems.

Content:

WS5.1 Students identify data to be collected in an investigation.

Build a Marshmallow Blaster	Quantitative investigation to study the relationship between mass and acceleration.
Friction Investigation	This investigation will demonstrate friction in action.
Building a Solar Oven	Investigation on constructing a solar oven to heat water.
Energy in Skate Parks	Investigation into the relationship between mass and gravitational potential energy using the PhET skate park simulation.
Investigating Heat Energy	Comparison of different materials and their heat conduction abilities.
Bouncy Balls and Energy Efficiency	Investigation on the energy transformations and efficiency in bouncy balls.
Energy Transformations	Investigation of energy transformations occurring in four scenarios.
Rube Goldberg Machine	Investigation into the energy transformations and transfers that take place in Rube Goldberg machines.
Cooling Crystals	Investigation in growing crystals.

Modelling Gravity	Experiment to simulate the motion of planets around the Sun and the Moon around the Earth.
Modelling the Earth, Moon and Sun	Experiment using a light source to simulate day, night and eclipses with models of the Earth and Moon.
Using a Pinhole Camera to Calculate Diameter of the Sun	Investigation to observe the sun and estimate its diameter with a pinhole camera.
Solar Oven	Investigation in heating water with a solar oven.
Turbine Power	Investigation exploring how wind and hydro turbines respond to different loads.

Evaporation	Investigation exploring the connection between surface area and evaporation.
Make Your Own Aquifer	Investigation exploring the formation and extraction of groundwater.
Researching Phyla	Using research to compare and contrast two animals from the same phylum.
Jelly Cells	Experiment using jelly and lollies to make a model of a cell.
Pond Critters	Experiment collecting pond water examine under a microscope.
Preparing and Observing Cells	Experiment practicing proper microscope and slide preparation techniques.
Growing Plants under Different Conditions	Design an experiment for testing how plants grow under different conditions.
Comparing Properties	Comparing the different properties of metals, non-metals and metalloids.
Open-Ended Separation Investigation	Investigation into a mixture of many parts, and how we can use the techniques we have learned to separate it.
Candy Crystals	Create candy crystals.
Filtration	Hypothesis-driven investigation comparing the use of two different folds of filter paper.
Making a Solar Still	Building their own solar still as a way to create clean water from plants and dirty water.
Separating a Basic Mixture	Devising a method for separating a mixture.
Temperature and Dissolving	How dissolving is affected by the temperature of a solution.
Rusting in Different Environments	Using rusting nails to measure their change in weight to understand different reaction conditions.

WS5.2 Students plan first-hand investigations.

A Ramp as a Simple Machine	Quantitative investigation designed to study how a ramp works as an inclined plane.
Build a Marshmallow Blaster	Quantitative investigation to study the relationship between mass and acceleration.
Friction Investigation	This investigation will demonstrate friction in action.
Building a Solar Oven	Investigation on constructing a solar oven to heat water.
Energy in Skate Parks	Investigation into the relationship between mass and gravitational potential energy using the PhET skate park simulation.

Investigating Heat Energy	Comparison of different materials and their heat conduction abilities.
Ohm's Law	Investigation into Ohm's Law in a simple circuit.
Bouncy Balls and Energy Efficiency	Investigation on the energy transformations and efficiency in bouncy balls.
Rube Goldberg Machine	Investigation into the energy transformations and transfers that take place in Rube Goldberg machines.

Cooling Crystals	Investigation in growing crystals.
Solar Oven	Investigation in heating water with a solar oven.
Evaporation	Investigation exploring the connection between surface area and evaporation.
Growing Plants under Different Conditions	Design an experiment for testing how plants grow under different conditions.
Open-Ended Separation Investigation	Investigation into a mixture of many parts, and how we can use the techniques we have learned to separate it.
Filtration	Hypothesis-driven investigation comparing the use of two different folds of filter paper.
Separating a Basic Mixture	Devising a method for separating a mixture.
Rusting in Different Environments	Using rusting nails to measure their change in weight to understand different reaction conditions.

WS5.3 Students choose equipment or resources for an investigation.

Growing Plants under Different Conditions	Design an experiment for testing how plants grow under different conditions.
Open-Ended Separation Investigation	Investigation into a mixture of many parts, and how we can use the techniques we have learned to separate it.
Separating a Basic Mixture	Devising a method for separating a mixture.

Conducting Investigations

Outcomes:

A student follows a sequence of instructions to safely undertake a range of investigation types, collaboratively and individually.

Content:

WS6 Students conduct investigations.

A Ramp as a Simple Machine	Quantitative investigation designed to study how a ramp works as an inclined plane.
Build a Marshmallow Blaster	Quantitative investigation to study the relationship between mass and acceleration.
Friction Investigation	This investigation will demonstrate friction in action.
Levers	Comparing the three classes of lever, with an emphasis on qualitative observations and real-life applications.
Build an Electroscope	Investigation on static electricity and electrostatic forces.
Mapping Magnetic Fields	Investigation into the shapes of magnetic fields and the nature of magnetic forces.
Battery Voltages	An investigation where students measure the voltages on a range of batteries and compare this to the advertised voltages.
Building a Solar Oven	Investigation on constructing a solar oven to heat water.
Building Circuits	Investigation into light bulbs in series and parallel circuits.
Energy in Skate Parks	Investigation into the relationship between mass and gravitational potential energy using the PhET skate park simulation.
Investigating Heat Energy	Comparison of different materials and their heat conduction abilities.
Ohm's Law	Investigation into Ohm's Law in a simple circuit.
Resistance	An investigation where students compare the measured resistance for a number of resistors to the resistance advertised by the resistors' coloured bands.
Static Electricity	Investigation into static electricity and how it can be used to levitate objects.
Bouncy Balls and Energy Efficiency	Investigation on the energy transformations and efficiency in bouncy balls.

Energy Transformations	Investigation of energy transformations occurring in four scenarios.
Rube Goldberg Machine	Investigation into the energy transformations and transfers that take place in Rube Goldberg machines.
Build a Geological Timescale	Investigation in understanding the age of the Earth and everything in it.
Build a Stratigraphic Column	Investigation in understanding how geologists use stratigraphic columns to study the Earth.
Cooling Crystals	Investigation in growing crystals.
Simulating Erosion	Investigation in understanding the process of simulating erosion.
Making a Sundial	Creating a sundial.
Modelling Gravity	Experiment to simulate the motion of planets around the Sun and the Moon around the Earth.
Modelling the Earth, Moon and Sun	Experiment using a light source to simulate day, night and eclipses with models of the Earth and Moon.
Making a Pinhole Camera	Investigation to indirectly observe the Sun with a pinhole camera.
Using a Pinhole Camera to Calculate Diameter of the Sun	Investigation to observe the sun and estimate its diameter with a pinhole camera.
Sunlight and Seasons	Investigation to simulate how solar energy hits different parts of the Earth.
Solar Oven	Investigation in heating water with a solar oven.
Turbine Power	Investigation exploring how wind and hydro turbines respond to different loads.
Evaporation	Investigation exploring the connection between surface area and evaporation.
Make Your Own Aquifer	Investigation exploring the formation and extraction of groundwater.
Weather In A Jar	Investigation exploring the factors that lead to cloud and rain formation.
Building Dichotomous Keys	Investigation in classifying leaves with a dichotomous key.
Classifying Leaves	Investigation in classifying leaves into groups based on their shape.
Using Dichotomous Keys	Using a dichotomous key to identify dragons.
Parts and Function of a Microscope	How microscopes work and what they are.
Magnification	How magnification can be calculated and changed and its relation to the field of view and resolution.
Using a Microscope	How to use a microscope.

Introduction to Types of Cells: Pond Water Investigation	Introductory lesson on the different types of cells - prokaryotic and eukaryotic - structured as an investigation into the organisms found in pond water.
Jelly Cells	Experiment using jelly and lollies to make a model of a cell.
Pond Critters	Experiment collecting pond water examine under a microscope.
Preparing and Observing Cells	Experiment practicing proper microscope and slide preparation techniques.
Cross Pollination	Investigation into how plants in the school garden reproduce.
Flower Dissection	Experiment on the dissection of a flower.
Heart Dissection	Experiment on dissection of a heart.
First Aid and Body Systems	Practical lesson in Basic first aid.
Build a Food Web Investigation	Building a food web using a list of species and information about what they eat.
Collecting Invertebrates in Quadrats	Collecting invertebrates and use them to estimate biodiversity.
Extracting Leaf Pigments	Extracting pigments from plant leaves.
Growing Plants under Different Conditions	Design an experiment for testing how plants grow under different conditions.
Measuring Abiotic Factors in Water	Measuring the abiotic factors temperature, pH, salinity and turbidity in three different water samples.
Building a Density Tower	Building a density tower and comparing the densities of different objects.
Building a Steam Engine	Building a simple steam engine called a Hero engine.
Making Ice Cream	How state changes can be used to make tasty treats, like ice cream!
Observing Atmospheric Pressure	How air pressure pushes upon the objects on Earth.
Comparing Properties	Comparing the different properties of metals, non-metals and metalloids.
Flame Test	Observing the different coloured flames produced by different elements.
Indirect Observations	Comparing direct and indirect observations.
Making Models	Making models of elements, compounds and molecules.
Candy Crystals	Create candy crystals.

Chromatography: Separating Colours	Paper chromatography.
Filtration	Hypothesis-driven investigation comparing the use of two different folds of filter paper.
Making a Solar Still	Building their own solar still as a way to create clean water from plants and dirty water.
Separating a Basic Mixture	Devising a method for separating a mixture.
Temperature and Dissolving	How dissolving is affected by the temperature of a solution.
Making Recycled Paper	Making recycled paper through a series of physical changes.
Observing Chemical Reactions	Observations of some important chemical reactions.
Observing Reactions with Fire	The reactions that occur when substances are burned in oxygen.
Rusting in Different Environments	Using rusting nails to measure their change in weight to understand different reaction conditions.

Processing and Analysing Data and Information

Outcomes:

A student processes and analyses data from a first-hand investigation and secondary sources to identify trends, patterns and relationships, and draw conclusions.

Content:

WS7.1 Students process data and information.

A Ramp as a Simple Machine	Quantitative investigation designed to study how a ramp works as an inclined plane.
Build a Marshmallow Blaster	Quantitative investigation to study the relationship between mass and acceleration.
Friction Investigation	This investigation will demonstrate friction in action.

Levers	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.
Building a Solar Oven	Investigation on constructing a solar oven to heat water.
Energy in Skate Parks	Investigation into the relationship between mass and gravitational potential energy using the PhET skate park simulation.
Investigating Heat Energy	Comparison of different materials and their heat conduction abilities.
Ohm's Law	Investigation into Ohm's Law in a simple circuit.
Resistance	An investigation where students compare the measured resistance for a number of resistors to the resistance advertised by the resistors' coloured bands.
Bouncy Balls and Energy Efficiency	Investigation on the energy transformations and efficiency in bouncy balls.
Cooling Crystals	Investigation in growing crystals.
Comparing Minerals	Data on different minerals and their properties for students to interpret.
Using a Pinhole Camera to Calculate Diameter of the Sun	Investigation to observe the sun and estimate its diameter with a pinhole camera.
Solar Oven	Investigation in heating water with a solar oven.
Choosing Renewables	This Smart Lesson presents data on renewable and non-renewable energy use for students to interpret.
Evaporation	Investigation exploring the connection between surface area and evaporation.
Reading a Weather Map	This Smart Lesson teaches students how to identify key features on weather maps, including pressure and temperature.
Building Dichotomous Keys	Investigation in classifying leaves with a dichotomous key.
Researching Phyla	Using research to compare and contrast two animals from the same phylum.
Jelly Cells	Experiment using jelly and lollies to make a model of a cell.
Pond Critters	Experiment collecting pond water examine under a microscope.
Food Safety and Salmonella	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.
Cross Pollination	Investigation into how plants in the school garden reproduce.
Flower Dissection	Experiment on the dissection of a flower.

Heart Dissection	Experiment on dissection of a heart.
Relative Heart Size	In this lesson, students interpret data on the relative heart size in different species. They explore links between life style and heart size.
Build a Food Web Investigation	Building a food web using a list of species and information about what they eat.
Collecting Invertebrates in Quadrats	Collecting invertebrates and use them to estimate biodiversity.
Growing Plants under Different Conditions	Design an experiment for testing how plants grow under different conditions.
Marine Ecosystems and Overfishing	Data is presented on overfishing to read column graphs, pie charts and tables.
Graphs and Tables of Mixtures	Students interpret different types of graphs containing data on the contents of various mixtures. The graphs include pie charts, column graphs and tables.
Saturation and Line Graphs	Students practice interpret line graphs containing data on concentrations of solutions. From the graph, they identify the point of saturation.
Rusting in Different Environments	Using rusting nails to measure their change in weight to understand different reaction conditions.

WS7.2 Students analyse data and information.

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First Aid and Body Systems	Practical lesson in Basic first aid.
Relative Heart Size	In this lesson, students interpret data on the relative heart size in different species. They explore links between life style and heart size.
Build a Food Web Investigation	Building a food web using a list of species and information about what they eat.
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Growing Plants under Different Conditions	Design an experiment for testing how plants grow under different conditions.
Measuring Abiotic Factors in Water	Measuring the abiotic factors temperature, pH, salinity and turbidity in three different water samples.

Marine Ecosystems and Overfishing	Data is presented on overfishing to read column graphs, pie charts and tables.
Building a Density Tower	Building a density tower and comparing the densities of different objects.
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Comparing Properties	Comparing the different properties of metals, non-metals and metalloids.
Flame Test	Observing the different coloured flames produced by different elements.
Indirect Observations	Comparing direct and indirect observations.
Making Models	Making models of elements, compounds and molecules.
Candy Crystals	Create candy crystals.
Chromatography: Separating Colours	Paper chromatography.
Filtration	Hypothesis-driven investigation comparing the use of two different folds of filter paper.
Making a Solar Still	Building their own solar still as a way to create clean water from plants and dirty water.
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Temperature and Dissolving	How dissolving is affected by the temperature of a solution.
Graphs and Tables of Mixtures	Students interpret different types of graphs containing data on the contents of various mixtures. The graphs include pie charts, column graphs and tables.
Saturation and Line Graphs	Students practice interpret line graphs containing data on concentrations of solutions. From the graph, they identify the point of saturation.
Making Recycled Paper	Making recycled paper through a series of physical changes.
Observing Chemical Reactions	Observations of some important chemical reactions.
Observing Reactions with Fire	The reactions that occur when substances are burned in oxygen.
Rusting in Different Environments	Using rusting nails to measure their change in weight to understand different reaction conditions.

Problem Solving

Outcomes:

A student selects and uses appropriate strategies, understanding and skills to produce creative and plausible solutions to identified problems.

Content:

WS8 Students solve problems.

Build a Marshmallow Blaster	Quantitative investigation to study the relationship between mass and acceleration.
Levers	Comparing the three classes of lever, with an emphasis on qualitative observations and real-life applications.
Build an Electroscope	Investigation on static electricity and electrostatic forces.
Battery Voltages	An investigation where students measure the voltages on a range of batteries and compare this to the advertised voltages.
Building a Solar Oven	Investigation on constructing a solar oven to heat water.
Investigating Heat Energy	Comparison of different materials and their heat conduction abilities.
Static Electricity	Investigation into static electricity and how it can be used to levitate objects.
Rube Goldberg Machine	Investigation into the energy transformations and transfers that take place in Rube Goldberg machines.
Evaporation	Investigation exploring the connection between surface area and evaporation.
Food Safety and Salmonella	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.
Relative Heart Size	In this lesson, students interpret data on the relative heart size in different species. They explore links between life style and heart size.
Growing Plants under Different Conditions	Design an experiment for testing how plants grow under different conditions.

Communicating

Outcomes:

A student presents science ideas, findings and information to a given audience using appropriate scientific language, text types and representations.

Content:

WS9 Students communicate.

A Ramp as a Simple Machine	Quantitative investigation designed to study how a ramp works as an inclined plane.
Build a Marshmallow Blaster	Quantitative investigation to study the relationship between mass and acceleration.
Friction Investigation	This investigation will demonstrate friction in action.
Levers	Comparing the three classes of lever, with an emphasis on qualitative observations and real-life applications.
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Building Circuits	Investigation into light bulbs in series and parallel circuits.
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Ohm's Law	Investigation into Ohm's Law in a simple circuit.
Resistance	An investigation where students compare the measured resistance for a number of resistors to the resistance advertised by the resistors' coloured bands.
Static Electricity	Investigation into static electricity and how it can be used to levitate objects.
Bouncy Balls and Energy Efficiency	Investigation on the energy transformations and efficiency in bouncy balls.
Energy Transformations	Investigation of energy transformations occurring in four scenarios.
Solar Oven	Investigation in heating water with a solar oven.
Building Dichotomous Keys	Investigation in classifying leaves with a dichotomous key.

Researching Phyla	Using research to compare and contrast two animals from the same phylum.
Pond Critters	Experiment collecting pond water examine under a microscope.
Cross Pollination	Investigation into how plants in the school garden reproduce.
Flower Dissection	Experiment on the dissection of a flower.
Heart Dissection	Experiment on dissection of a heart.
First Aid and Body Systems	Practical lesson in Basic first aid.
Build a Food Web Investigation	Building a food web using a list of species and information about what they eat.
Growing Plants under Different Conditions	Design an experiment for testing how plants grow under different conditions.
Rusting in Different Environments	Using rusting nails to measure their change in weight to understand different reaction conditions.