

VC Science

EP Curriculum Map

Levels 5-6

Science Understanding

Biological sciences

Content Descriptor	Lesson Names
<p>Living things have structural features and adaptations that help them to survive in their environment</p>	<p><i>Adaptations for Survival</i></p> <ul style="list-style-type: none"> ● Introduction to Adaptations ● Adaptations in Shape or Form ● Adaptations Inside the Body ● Adaptations in Behaviour ● Nocturnal Activity ● Dune Plants ● Camouflage <p><i>Adaptations to Environments</i></p> <ul style="list-style-type: none"> ● Environments ● Rock Pool Environments ● Life in a Rock Pool ● Desert Environments ● Life in the Desert ● Polar Environments ● Life at the Poles
<p>The growth and survival of living things are affected by the physical conditions of their environment</p>	<p><i>The Environment</i></p> <ul style="list-style-type: none"> ● Living and Non-Living Things ● MRS GREN ● Environments ● Extreme Environments <p><i>Living Things and Their Environment</i></p> <ul style="list-style-type: none"> ● Non-Living Factors Affecting Plants ● Living Factors Affecting Plants ● Non-living Factors Affecting Fungi ● Living Factors Affecting Fungi ● Non-Living Factors Affecting Animals ● Living Factors Affecting Animals ● Extreme Environments: The Scorching Deserts ● Extreme Environments: The Deep Dark Sea ● Extreme Environments: The Freezing Poles



- Migration
- Hibernation

Chemical sciences

Content Descriptor	Lesson Names
Solids, liquids and gases behave in different ways and have observable properties that help to classify them	<p><i>States of Matter</i></p> <ul style="list-style-type: none">● Introduction to Matter● Solids● Liquids● Gases● Gases have Masses?● Comparing States of Water● Secretive Substances● Extreme Conditions <p><i>Changing States of Matter</i></p> <ul style="list-style-type: none">● Temperature and States of Matter● Melting● Freezing● Boiling and Evaporation● Condensation● Sublimation● Deposition
Changes to materials can be reversible, including melting, freezing, evaporating, or irreversible, including burning and rusting	<p><i>Materials and Mixtures</i></p> <ul style="list-style-type: none">● Pure and Impure Substances● Mixtures● Solubility● Solvents and Solutes <p><i>Changes in State</i></p> <ul style="list-style-type: none">● States of Matter● Changing States Through Heating● Changing States Through Cooling <p><i>Irreversible and Reversible Reactions</i></p> <ul style="list-style-type: none">● Irreversible Reactions● Cooking and Burning● Rusting● Physical Changes and Reversible Reactions● Recycling Metal● Recycling Plastic● Recycling Glass● Refrigerators● Melting Polar Ice



Earth and space sciences

Content Descriptor	Lesson Names
The Earth is part of a system of planets orbiting around a star (the sun)	<ul style="list-style-type: none">● Planet Earth● Introduction to the Solar System● The Sun● Years● Days● The Inner Planets● The Outer Planets● Sizes in Space● Distances in Space
Sudden geological changes or extreme weather conditions can affect Earth's surface	<p><i>Introduction to Earth</i></p> <ul style="list-style-type: none">● Layers of the Earth● The Atmosphere● The Geosphere <p><i>Drought</i></p> <ul style="list-style-type: none">● Weather in the Outback● Effects of Drought● Coping with Drought <p><i>Cyclones and Floods</i></p> <ul style="list-style-type: none">● Tropical Cyclones● The Effects of Cyclones● Cyclone Winston 2016● The Queensland Floods of 2011 <p><i>Earthquakes</i></p> <ul style="list-style-type: none">● Earthquakes● Earthquake Hazards● Measuring Earthquakes● Tsunamis <p><i>Volcanoes</i></p> <ul style="list-style-type: none">● Volcanic Eruptions● Living with Volcanoes

Physical sciences

Content Descriptor	Lesson Names
<p>Light from a source forms shadows and can be absorbed, reflected and refracted</p>	<p><i>The Path of Light</i></p> <ul style="list-style-type: none"> ● Light ● How Do We See? ● The Movement of Light ● The Speed of Light ● Ray Diagrams ● Shadows ● Comparing Shadows <p><i>Interaction with Light</i></p> <ul style="list-style-type: none"> ● Types of Objects ● The Colour of Light ● Absorption ● Mirrors ● Refraction ● Extension: Refraction and Ray Diagrams
<p>Energy from a variety of sources can be used to generate electricity; electric circuits enable this energy to be transferred to another place and then to be transformed into another form of energy</p>	<p><i>Energy</i></p> <ul style="list-style-type: none"> ● Energy ● Types of Energy ● Energy Conservation <p><i>Circuits</i></p> <ul style="list-style-type: none"> ● What is Electricity? ● Where Electricity Comes From ● Circuitry ● Open and Closed Circuits ● Circuit Diagrams ● Conductors ● Insulators

Levels 7-8

Science Understanding

Biological sciences

Content Descriptor	Lesson Names
<p>There are differences within and between groups of organisms;classification helps organise this diversity</p>	<p><i>What is Classification?</i></p> <ul style="list-style-type: none"> ● Introduction to Classification <p><i>Living or Non-Living?</i></p> <ul style="list-style-type: none"> ● Living or Non-Living? ● MRS GREN <p><i>Dichotomous Keys</i></p> <ul style="list-style-type: none"> ● Introduction to Dichotomous Keys ● Branching Keys ● Circular Keys ● Tabular Keys <p><i>Linnaean Classification</i></p> <ul style="list-style-type: none"> ● Linnaean Classification ● Binomial Nomenclature ● Species and Hybrids ● Carl Linnaeus <p><i>Examples of Classification</i></p> <ul style="list-style-type: none"> ● Dragons in the Deep ● Identifying Species ● Introduction to Plant Classification ● Tardigrades in Parking Lots ● The Platypus <p><i>Extension</i></p> <ul style="list-style-type: none"> ● Animal Phyla ● Classification of Life ● Vertebrates
<p>Cells are the basic units of living things and have specialised structures and functions</p>	<p><i>Introduction to Cells</i></p> <ul style="list-style-type: none"> ● An Introduction to Cells ● Size of Cells <p><i>Microscopes</i></p> <ul style="list-style-type: none"> ● Magnification ● Parts and Function of a Microscope ● Types of Microscopes

	<ul style="list-style-type: none"> ● Using a Microscope <p><i>Types of Cells</i></p> <ul style="list-style-type: none"> ● Introduction to Types of Cells: Pond Water Investigation ● Eukaryotic Cells ● Bacterial Cell Structure ● Prokaryotic Cells ● Animal Cell Structure ● Plant Cell Structure ● Fungal Cell Structure <p><i>Cell Division</i></p> <ul style="list-style-type: none"> ● Cell Division in Bacteria ● Cell Division in Humans - Mitosis ● Cell Division in Humans - Meiosis <p><i>Levels of Organisation</i></p> <ul style="list-style-type: none"> ● Specialised Animal Cells I ● Specialised Animal Cells II ● Specialised Plant Cells - Photosynthetic and Guard Cells ● Specialised Plant Cells - Root Hairs and Conducting Cells ● Types of Tissue ● Levels of Organisation <p><i>How Cells Have Shaped Biology</i></p> <ul style="list-style-type: none"> ● Cell Theory ● History of Microscopes ● Stem Cells ● Stem Cell Therapy <p><i>Treating and Preventing Disease</i></p> <ul style="list-style-type: none"> ● Pasteur & Koch ● Antibiotics ● Disease Treatment and Control ● Vaccination ● Pasteur & Koch <p><i>Extension</i></p> <ul style="list-style-type: none"> ● Animal vs. Plant Cells ● Diffusion ● Diffusion and Cell Size ● Prokaryotic vs. Eukaryotic
<p>Interactions between organisms can be described in terms of food chains and food webs and can be affected by human activity</p>	<p><i>Ecosystems</i></p> <ul style="list-style-type: none"> ● Ecology ● Species vs Organism

	<ul style="list-style-type: none"> ● Ecosystems ● Biotic and Abiotic Factors ● Interdependent Relationships <p><i>Food Chains and Food Webs</i></p> <ul style="list-style-type: none"> ● Food Chains ● Predators, Prey and Competition ● Food Webs ● Decomposers ● Consumers <p><i>Changes in the Environment</i></p> <ul style="list-style-type: none"> ● Deforestation ● Introduced Species ● Cane Toads as an Introduced Species ● An Agricultural Affair ● Harnessing Fire in Australia ● Oil Pollution and Industrial Waste ● Pesticides ● The Palm Oil Predicament <p><i>Organisms in Ecosystems</i></p> <ul style="list-style-type: none"> ● Antarctica ● Saving the Tasmanian Devil <p><i>Human Impacts on Ecosystems</i></p> <ul style="list-style-type: none"> ● Australian Bushfires ● Climate Change ● Introduced and Invasive Species ● Invasive Species in Australia ● Pollution and Ecosystems ● What is Pollution? <p><i>Extension</i></p> <ul style="list-style-type: none"> ● Adaptations ● Diurnal vs Nocturnal ● Ecosystem Conservation ● Scientific Methods of Conservation ● Species Conservation in Australia ● Water Pollution and Solutions
<p>Multicellular organisms contain systems of organs that carry out specialised functions that enable them to survive and reproduce</p>	<p><i>Introduction to Body Systems</i></p> <ul style="list-style-type: none"> ● Introduction to Body Systems ● Organ Systems <p><i>Digestive System</i></p> <ul style="list-style-type: none"> ● Digestive System As A Whole ● Food Groups ● Mouth and Oesophagus

- Stomach and Small Intestine
- Large Intestine and Rectum
- Comparing Digestion in Other Animals
- The Microbes That Control What We Do

Respiratory System

- Introduction to the Respiratory System
- Breathing
- Gas Exchange
- Respiration in Cells
- Comparing Respiration

Circulatory System

- Introduction to the Circulatory System
- Heart
- Blood Vessels
- Blood

Excretory System

- Introduction to Excretory System
- Excretory Organs
- The Kidneys & Urine Production
- Kidney Disease

Musculoskeletal System

- Musculoskeletal System
- Bones & Joints
- Muscles
- Injuries

Reproductive System

- Puberty
- Male Reproduction
- Female Reproduction
- Pregnancy
- Birth
- Sexual Reproduction in Animals
- Asexual Reproduction in Animals
- Sexual Reproduction in Plants
- Pollination
- Seed Dispersal & Germination
- Asexual Reproduction in Plants

Plant System

- Photosynthesis
- Plant Systems

In Vitro Babies and Reproduction

	<ul style="list-style-type: none"> ● Contraception ● Infertility ● Lamb in a Bag <p><i>Organ Transplants</i></p> <ul style="list-style-type: none"> ● Ctrl + X, Ctrl + V: Xenotransplants ● Ethical Issues of Organ Transplants ● Organ Transplants <p><i>Plants and Science</i></p> <ul style="list-style-type: none"> ● Maple Syrup: Xylem and Phloem ● Plant Cloning <p><i>Extension</i></p> <ul style="list-style-type: none"> ● Adapting to Extreme Climates ● Diffusion ● Diffusion and Body Systems ● Exercise and the Body ● Stress Effects on the Body ● Trapped in a Cave
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Chemical sciences

Content Descriptor	Lesson Names
Mixtures, including solutions, contain a combination of pure substances that can be separated using a range of techniques	<p><i>Mixtures and Substances</i></p> <ul style="list-style-type: none"> ● Introduction to Mixtures ● Pure and Impure Substances <p><i>Solutions</i></p> <ul style="list-style-type: none"> ● Solute and Solvent ● Concentration <p><i>Suspensions</i></p> <ul style="list-style-type: none"> ● Colloids ● Suspensions ● Emulsions <p><i>Separating Suspensions</i></p> <ul style="list-style-type: none"> ● Introduction to Separation ● Filtration ● Centrifuging <p><i>Separating Solutions</i></p> <ul style="list-style-type: none"> ● Evaporation ● Distillation <p><i>Mixtures Around Us</i></p>

	<ul style="list-style-type: none"> ● Blood as a Mixture ● Indigenous Art Using Mixtures ● Recycling Sewage ● Separation in Food ● Separation in Industries ● Water Treatment <p><i>Extension</i></p> <ul style="list-style-type: none"> ● Adsorption ● Chromatography ● Crystallisation ● Magnetic and Electrostatic Separation <p><i>Open-Ended Investigations</i></p> <ul style="list-style-type: none"> ● Open-Ended Separation Investigation
<p>The properties of the different states of matter can be explained in terms of the motion and arrangement of particles</p>	<p><i>Basics of Matter</i></p> <ul style="list-style-type: none"> ● Introduction to Particles <p><i>States of Matter</i></p> <ul style="list-style-type: none"> ● Introduction to Particles ● Particle Model of Matter ● Solids ● Liquids ● Gases <p><i>Changing States</i></p> <ul style="list-style-type: none"> ● Changing States ● Melting and Freezing ● Boiling, Evaporation and Condensation ● Sublimation and Deposition ● Heating and Cooling Curves <p><i>Properties of Matter</i></p> <ul style="list-style-type: none"> ● Mass and Volume ● Pressure ● Density <p><i>Matter in Nature</i></p> <ul style="list-style-type: none"> ● States of Matter in Space ● The Water Cycle and Weather ● When Water Freezes <p><i>Matter in Technology</i></p> <ul style="list-style-type: none"> ● Air Conditioners ● Refrigerators and Refrigerants <p><i>Extension</i></p> <ul style="list-style-type: none"> ● Energy in Matter

	<ul style="list-style-type: none"> ● Melting Polar Ice ● Newtonian and Non-Newtonian Fluids
<p>Differences between elements, compounds and mixtures can be described by using a particle model</p>	<p><i>Introduction to Elements, Compounds and Mixtures</i></p> <ul style="list-style-type: none"> ● Introduction to Elements, Compounds and Mixtures <p><i>Elements</i></p> <ul style="list-style-type: none"> ● Atoms ● Elements ● Metals, Non-Metals and Metalloids ● First 10 Elements ● Quiz- First 10 Elements (Name to Symbol) ● Quiz- First 10 Elements (Symbol to Name) <p><i>Compounds and Molecules</i></p> <ul style="list-style-type: none"> ● Chemical Formulas ● Molecules ● Compounds <p><i>Advances in Chemistry</i></p> <ul style="list-style-type: none"> ● Carbon Chemistry ● Discovering Elements ● Marie Curie and Radioactivity ● Materials Science <p><i>Extension</i></p> <ul style="list-style-type: none"> ● The Periodic Table ● Chemical Bonding
<p>Chemical change involves substances reacting to form new substances</p>	<p><i>Physical Properties and Physical Change</i></p> <ul style="list-style-type: none"> ● Physical Change ● Physical Properties ● Physical Properties of Metals and Non-Metals <p><i>Chemical Reactions and Properties</i></p> <ul style="list-style-type: none"> ● Chemical Changes ● Chemical Reactions ● Writing Word Reactions ● Chemical Properties <p><i>Compounds and Properties</i></p> <ul style="list-style-type: none"> ● Using Substances Based on their Properties <p><i>Transformations of Chemicals</i></p> <ul style="list-style-type: none"> ● Alchemy ● Recycling ● Synthetic Materials

	<ul style="list-style-type: none"> Working In Chemistry <p><i>Extension</i></p> <ul style="list-style-type: none"> Writing Symbol Equations
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Earth and space sciences

Content Descriptor	Lesson Names
Predictable phenomena on Earth, including seasons and eclipses, are caused by the relative positions of the Sun, Earth and the moon	<p><i>Universe</i></p> <ul style="list-style-type: none"> The Universe Gravity and Orbits Comets Asteroids and Meteoroids <p><i>Sun</i></p> <ul style="list-style-type: none"> Earth, Moon and Sun Day and Night Seasons Time Zones <p><i>Moon</i></p> <ul style="list-style-type: none"> Phases of the Moon Tides <p><i>Eclipses</i></p> <ul style="list-style-type: none"> Lunar Eclipse Solar Eclipse <p><i>Astronomy</i></p> <ul style="list-style-type: none"> Calendars and the Solar Year Changing Seasons Exploring Space Exploring the Moon, Mars and Beyond Indigenous Constellations Models of the Solar System Satellites Telescopes <p><i>Extension</i></p> <ul style="list-style-type: none"> Earth's Magnetic Field Earth's Structure Planetary Motion
Some of Earth's resources are renewable, but others are non-renewable	<p><i>Introduction to Earth's Resources</i></p> <ul style="list-style-type: none"> Introduction to Earth's Resources Renewable and Non-Renewable Energy Sources <p><i>Non-Renewable Resources</i></p>

	<ul style="list-style-type: none"> ● Fossil Fuels as a Resource ● Soil as a Resource ● Minerals and Ores as Resources ● Mining ● Nuclear Fuel as a Resource <p><i>Renewable Resources</i></p> <ul style="list-style-type: none"> ● Living Things as a Resource ● Air as a Resource ● Wind as a Resource ● Wind Turbines ● Solar Energy ● Water Power ● Geothermal Energy <p><i>Ecological Energy</i></p> <ul style="list-style-type: none"> ● Antarctica, a Shared Continent ● Changing Seasons ● Investigation: Coal vs. Solar for Australia's Future ● Renewable Energy <p><i>Extension</i></p> <ul style="list-style-type: none"> ● Investigation: Col vs. Solar for Australia's Future
<p>Water is an important resource that cycles through the environment</p>	<p><i>The Water Cycle</i></p> <ul style="list-style-type: none"> ● Water on Earth ● Water Cycle ● States of Water ● The Water Cycle as a Closed System ● Influences on the Water Cycle <p><i>Water Management</i></p> <ul style="list-style-type: none"> ● Hydroelectricity ● Irrigation ● Science, Tradition and Modern Medicine ● Water Conservation ● Water Management <p><i>Extension</i></p> <ul style="list-style-type: none"> ● Aquifers
<p>Sedimentary, igneous and metamorphic rocks contain minerals and are formed by processes that occur within Earth over a variety of timescales</p>	<p><i>Structure of the Earth</i></p> <ul style="list-style-type: none"> ● Earth's Structure ● Mechanical Layers of the Earth <p><i>Earth's Processes</i></p> <ul style="list-style-type: none"> ● Developing the Geological Timescale ● The Geological Timescale ● Erosion and Sedimentation

	<ul style="list-style-type: none"> • Weathering <p><i>Minerals</i></p> <ul style="list-style-type: none"> • Identifying Minerals • Introduction to Minerals <p><i>Rock Types</i></p> <ul style="list-style-type: none"> • The Rock Cycle • Igneous Rocks • Metamorphic Rocks • Sedimentary Rocks <p><i>Fossils</i></p> <ul style="list-style-type: none"> • Fossils • Australian Fossils • Feather Dinosaurs <p><i>Economic Geology</i></p> <ul style="list-style-type: none"> • Minerals and Rocks as Resources • Mining and Mineral Exploration <p><i>Exploring Earth and Beyond</i></p> <ul style="list-style-type: none"> • Martian Geology • Volcanology <p><i>Extension</i></p> <ul style="list-style-type: none"> • Australian Landforms formed by Physical Weathering, Erosion and Sedimentation • Australian Landforms formed by volcanism and Chemical Weathering • Dissecting the Earth
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Physical sciences

Content Descriptor	Lesson Names
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	<p><i>Introduction to Forces</i></p> <ul style="list-style-type: none"> • What are Forces? • Drawing Forces • Balanced and Unbalanced Forces <p><i>Types of Forces</i></p> <ul style="list-style-type: none"> • Contact and Non-Contact Forces • Gravity • Magnetism <p><i>Simple Machines</i></p>

	<ul style="list-style-type: none"> ● Levers ● Inclined Planes ● Gears ● Wheels, Axles and Pulleys ● Bicycle Investigation <p><i>Forces in Everyday Life</i></p> <ul style="list-style-type: none"> ● Friction ● Ancient Tools and Weapons ● Comparing Robots ● Safety Systems ● Sports Science <p><i>Extension</i></p> <ul style="list-style-type: none"> ● Calculating Net Force ● Electrostatic Force ● Gear Ratio ● Planetary Motion ● Tides ● Newton's First Law ● Newton's Second Law ● Newton's Third Law
<p>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</p>	<p><i>Introduction to Energy and Units of Energy</i></p> <ul style="list-style-type: none"> ● What is Energy? ● Kinetic Energy ● Potential Energy ● Identifying KE or PE <p><i>Units of Energy</i></p> <ul style="list-style-type: none"> ● Units of Energy ● Converting Between Joules (J) & Kilojoules (kJ) ● Converting Between Kilojoules (kJ) & Megajoules (MJ) <p><i>Energy Conservation</i></p> <ul style="list-style-type: none"> ● Law of Conservation of Energy <p><i>Energy Transfer and Transformation</i></p> <ul style="list-style-type: none"> ● Introduction to Heat Transfer ● Heat Transfer ● Conduction ● Convection ● Radiation ● Introduction to Conductors and Insulators ● Conductors and Insulators <p><i>Energy Transformation</i></p> <ul style="list-style-type: none"> ● Energy Transformation and Food

	<ul style="list-style-type: none"> • Energy Transformations • Displaying Energy Transformations <p><i>Energy Efficiency</i></p> <ul style="list-style-type: none"> • Useful and Wasted Energy <p><i>Electrical Energy</i></p> <ul style="list-style-type: none"> • Electricity • Electric Circuits • Current • Voltage • Resistance • Introduction to Ohm's Law • Batteries • Electrical Conductors and Insulators • Circuits in Series • Circuits in Parallel • Comparing Circuits <p><i>Energy and You</i></p> <ul style="list-style-type: none"> • Energy Efficient Houses • Housing Insulation • The Power Grid and You <p><i>Extension</i></p> <ul style="list-style-type: none"> • Cogeneration and Engines • Energy Calculations
<p>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</p>	<p><i>Light</i></p> <ul style="list-style-type: none"> • Light as a Wave • Colour • Materials • Reflection • Refraction • Refractive Index • Total Internal Reflection • Lenses • Drawing Ray Diagrams • Light: Summary <p><i>Optical Instruments</i></p> <ul style="list-style-type: none"> • Bionic Eyes • The History of Lenses <p><i>Electromagnetic Radiation</i></p> <ul style="list-style-type: none"> • Electromagnetic Radiation and Medicine • The Electromagnetic Spectrum • You, Me and UV

	<p><i>Extension</i></p> <ul style="list-style-type: none"> ● Curved Mirrors ● Plane Mirrors and Reflection ● Snell's Law
<p>The properties of sound can be explained by a wave model</p>	<p><i>Sound</i></p> <ul style="list-style-type: none"> ● Sound Waves ● Sound Formation ● Pitch and Loudness <p><i>Hearing</i></p> <ul style="list-style-type: none"> ● Hearing Sound ● Bionic Ears ● Turned Down for What: Workplace Noise ● The Tiny Toadlet's Conundrum <p><i>Music</i></p> <ul style="list-style-type: none"> ● Australian Aboriginal Music

Levels 9-10

Science Understanding

Biological sciences

Content Descriptor	Lesson Names
<p>Multi-cellular organisms rely on coordinated and interdependent internal systems to respond to changes to their environment</p>	<p><i>Homeostasis</i></p> <ul style="list-style-type: none"> ● Basics of Homeostasis ● Homeostatic Terms ● Stimulus-Response Model ● Negative and Positive Feedback ● Control Systems ● Modelling Human Thermoregulation <p><i>Endocrine System</i></p> <ul style="list-style-type: none"> ● Introduction to the Endocrine System ● Glands of the Endocrine System ● Hormones of the Endocrine System ● Regulating Blood Sugar <p><i>Disease</i></p> <ul style="list-style-type: none"> ● Introduction to Diseases ● Bacterial Diseases ● Viral Diseases ● Viral Infection: Chickenpox ● Parasitic Diseases

	<ul style="list-style-type: none"> ● Parasitic Infection: Malaria ● Fungal Diseases ● Disease Transmission ● Antibiotics ● Vaccinations ● Spread of Infectious Disease ● Managing Pandemics in the Asia Region ● Modelling Disease Outbreak and Spread ● The Identification of a Mystery Disease ● Smelly Socks and Malaria Transmission ● Superbugs are the Real Super Villains <p><i>Immune System</i></p> <ul style="list-style-type: none"> ● Introduction to the Immune System ● The Body's First and Second Lines of Defence ● The Third Line of Defence <p><i>Homeostasis in Industry</i></p> <ul style="list-style-type: none"> ● Snake Antivenom Production ● Use of Hormones in the Dairy Industry <p><i>Immune Response and Defence Against Disease</i></p> <ul style="list-style-type: none"> ● Introduction to the Immune Response ● Plant Defence Systems ● Innate Immune Response I ● Innate Immune Response II ● Adaptive Immune Response I ● Adaptive Immune Response II ● Active & Passive Immunity <p><i>Extension</i></p> <ul style="list-style-type: none"> ● Degenerative Diseases ● Endocrine Diseases
<p>An animal's response to a stimulus is coordinated by its central nervous system (brain and spinal cord); neurons transmit electrical impulses and are connected by synapses</p>	<p><i>Nervous System</i></p> <ul style="list-style-type: none"> ● Introduction To The Nervous System ● Nerves and Neurons ● Central and Peripheral Nervous System ● Sympathetic and Parasympathetic Nervous System ● Nerve Pathways ● Sensory Organs ● The Eye ● Components of Neural Pathways ● Passage of Nerve Impulses <p><i>Invertebrate Nervous Systems</i></p> <ul style="list-style-type: none"> ● From Zero to Hero! Honey Bee Mathematicians ● Starfish Nervous System

<p>The transmission of heritable characteristics from one generation to the next involves DNA and genes</p>	<p><i>DNA the Molecule</i></p> <ul style="list-style-type: none"> • Basics of DNA • Structure of DNA • Nitrogenous Bases <p><i>Genes and Chromosomes</i></p> <ul style="list-style-type: none"> • Genes and Genetic Information • Homologous Chromosomes • Sex Chromosomes <p><i>Cell Division</i></p> <ul style="list-style-type: none"> • DNA Replication • Mitosis • Gametes and Fertilisation • Meiosis • Mitosis vs. Meiosis <p><i>Inheritance</i></p> <ul style="list-style-type: none"> • Mendel • Alleles • Inheriting Alleles and Punnett Squares • Making Punnett Squares • Dominant/Recessive Interactions • Incomplete Dominance • Codominance • Pedigrees • Sex Linkage • Sex Linkage, Punnett Squares and Pedigrees <p><i>Genetics Through History</i></p> <ul style="list-style-type: none"> • The History of Genetic Thought • Discovering the Double Helix • Genomics • The Knotty New DNA Structure! <p><i>Ethics of Genetics</i></p> <ul style="list-style-type: none"> • The Ethics of Genetics <p><i>Extension</i></p> <ul style="list-style-type: none"> • Asexual and Sexual Reproduction • Chromosomal Abnormalities • Proteins
<p>The theory of evolution by natural selection explains the diversity of living things and is supported by a range of scientific evidence</p>	<p><i>Geological Time</i></p> <ul style="list-style-type: none"> • Geological Time <p><i>Evidence of Evolution</i></p> <ul style="list-style-type: none"> • Theories and Evidence • Fossils and the Fossil Record

	<ul style="list-style-type: none"> ● Evidence from Living Species ● Geographical Distribution <p><i>Biodiversity</i></p> <ul style="list-style-type: none"> ● Biodiversity ● Extinction <p><i>Explaining Evolution</i></p> <ul style="list-style-type: none"> ● Darwin's Theory of Evolution ● Mechanisms of Evolution ● Natural Selection ● Artificial Selection ● The Science of Puppy Dog Eyes <p><i>Human Evolution</i></p> <ul style="list-style-type: none"> ● Our Evolution ● Writing Human History <p><i>The Evolutionary Path</i></p> <ul style="list-style-type: none"> ● Artificial Selection: The Good, the Bad and the Downright Strange ● Back to the Sea: Cetacean Evolution ● Feathery Dinosaurs ● The Wallace Line <p><i>Extension</i></p> <ul style="list-style-type: none"> ● Bacterial Resistance ● Coevolution ● Mimicry ● Sexual Selection ● The History of Evolutionary Thought
<p>Ecosystems consist of communities of interdependent organisms and abiotic components of the environment; matter and energy flow through these systems</p>	<p><i>Introduction to Ecosystems</i></p> <ul style="list-style-type: none"> ● Introduction to Ecology ● The Biosphere and Biomes ● Species and Organisms <p><i>Components of an Ecosystem</i></p> <ul style="list-style-type: none"> ● Parts of an Ecosystem ● Abiotic Factors ● Biotic Factors and Competition ● Adaptations ● Symbiosis <p><i>Energy in Ecosystems</i></p> <ul style="list-style-type: none"> ● Producers ● Trophic Levels ● The Carbon Cycle ● Consumers and Decomposers

	<ul style="list-style-type: none"> • Food Chains and Food Webs <p><i>Changes in Ecosystems</i></p> <ul style="list-style-type: none"> • Australian Bushfires • Biodiversity • Drought • Flooding • Will I Stay or Will I Go? <p><i>Impacts on Ecosystems</i></p> <ul style="list-style-type: none"> • Apocalypse Now: Natural Disasters of September, 2017 • Human Impacts • Invasive Species • Oil Spills • Pesticides <p><i>Conservation in Context</i></p> <ul style="list-style-type: none"> • History of Conservation • Predicting Population Changes • <p><i>Extension</i></p> <ul style="list-style-type: none"> • The Greenhouse Effect • The Nitrogen Cycle
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Chemical sciences

Content Descriptor	Lesson Names
<p>All matter is made of atoms which are composed of protons, neutrons and electrons;natural radioactivity arises from the decay of nuclei in atoms</p>	<p><i>Atomic Structure</i></p> <ul style="list-style-type: none"> • What are Atoms, Elements and Compounds? • The Structure of an Atom • Atomic Symbols • Models of the Atom <p><i>Isotopes</i></p> <ul style="list-style-type: none"> • What are Isotopes? <p><i>The Periodic Table</i></p> <ul style="list-style-type: none"> • The Periodic Table <p><i>Ions and Isotopes</i></p> <ul style="list-style-type: none"> • What are Ions? • Ionic Compounds • Ions in Solution • Naming Ionic Compounds

Radioactivity

- What is Radioactivity?
- Radioactivity in Industry
- Radioactivity in Medicine
- Effects of Radiation on Humans
- Marie Curie and Radioactivity

Extension

- Half-Lives
- Nuclear Bombs
- Nuclear Fission
- Nuclear Power
- Properties of Radiation
- Types of Radiation
- Writing Nuclear Equations

The atomic structure and properties of elements are used to organise them in the periodic table

Structure of Atoms and the Periodic Table

- What are Atoms, Elements and Compounds?
- The Structure of an Atom
- Atomic Symbols
- History of the Atomic Model
- Electron Arrangement of Atoms
- The Periodic Table
- Organisation of the Periodic Table
- Quiz- First 20 Elements (Name to Symbol)
- Quiz- First 20 Elements (Symbol to Name)

Bonding

- Introduction to Bonding
- Metals in the Periodic Table
- Metallic Bonding
- Introduction to Ions
- Electron Arrangement of Ions
- Ionic Compounds
- Ions in Solution
- Naming Ionic Compounds
- Ionic Bonding
- Polyatomic Ions and Compounds
- Covalent Bonding

Patterns in the Periodic Table

- Trends in the Periodic Table
- Groups 1 and 2
- Group 14
- Group 17
- Group 18
- Other Groups
- The Periodic Table
- Designing the Periodic Table

	<p><i>Spectroscopy</i></p> <ul style="list-style-type: none"> ● Analysing the Structure of Materials ● Spectroscopy <p><i>Chemicals: Friend or Foe?</i></p> <ul style="list-style-type: none"> ● Chemicals: Friend or Foe?
<p>Chemical reactions involve rearranging atoms to form new substances; during a chemical reaction mass is not created or destroyed</p>	<p><i>Conservation of Mass</i></p> <ul style="list-style-type: none"> ● Breaking the Law (of Conservation of Mass)? <p><i>Balancing Equations</i></p> <ul style="list-style-type: none"> ● Chemical Reactions and Equations ● Conservation of Mass ● Reactants and Products ● Writing Chemical Equations 1 ● Writing Chemical Equations 2 ● Balancing Chemical Equations ● Reaction Equations ● Chemical Reactions Basics ● Chemistry: Glorified Baking?
<p>Different types of chemical reactions are used to produce a range of products and can occur at different rates; chemical reactions may be represented by balanced chemical equations</p>	<p><i>Types of Reactions</i></p> <ul style="list-style-type: none"> ● Chemical vs. Physical ● Chemical Reactions ● Combination and Decomposition Reactions ● Acid Reactions ● Precipitation Reactions ● Oxidation and Reduction <p><i>Rates of Reaction</i></p> <ul style="list-style-type: none"> ● Rate of Reaction ● Agitation, Concentration and Surface Area ● Activation Energy, Temperature and Catalysts <p><i>Metals</i></p> <ul style="list-style-type: none"> ● Physical Properties of Metals ● Alloys and Their Uses ● Chemical Properties of Metals ● Metal Reactions with Oxygen ● Metal Reactions with Water ● Metal Reactions with Acid ● Metal Displacement Reactions <p><i>Polymers</i></p> <ul style="list-style-type: none"> ● Polymers <p><i>Fuels and Pharmaceuticals</i></p> <ul style="list-style-type: none"> ● Analytical Chemistry

	<ul style="list-style-type: none"> Fuels and Pharmaceuticals <p><i>Extension</i></p> <ul style="list-style-type: none"> Collision Theory Rate of Reaction Equations Factors Affecting Reaction Rates Extension: Collision Theory and Rate of Reaction Reaction Equations The Mole Empirical and Molecular Formulae Moles and Equations
<p>Chemical reactions, including combustion and the reactions of acids, are important in both non-living and living systems and involve energy transfer</p>	<p><i>Chemical Reactions</i></p> <ul style="list-style-type: none"> Introduction to Chemical Reactions Reactants and Products Fermentation Waste Management Reaction in Action: Baking Soda and Vinegar <p><i>Combustion</i></p> <ul style="list-style-type: none"> Endothermic and Exothermic Reactions Combustion Reactions Oxidation Reactions <p><i>Acids and Bases</i></p> <ul style="list-style-type: none"> Acids Bases pH and Indicators Acid-Metal Reactions Neutralisation Reactions <p><i>Reactions Around Us</i></p> <ul style="list-style-type: none"> Acid Rain: Reactions Around Us Combustion and the Environment Photosynthesis Respiration The Father of Modern Chemistry <p><i>Extension</i></p> <ul style="list-style-type: none"> A Day in the Life of an Industrial Chemist Types of Chemical Reactions

Earth and space sciences

Content Descriptor	Lesson Names
<p>The theory of plate tectonics explains global patterns of geological activity and continental movement</p>	<p><i>Structure of the Earth</i></p> <ul style="list-style-type: none"> Earth's Structure

	<ul style="list-style-type: none"> ● Mechanical Layers of the Earth <p><i>Plate Tectonics</i></p> <ul style="list-style-type: none"> ● Wegener's Theory of Continental Drift ● Seafloor Spreading & Magnetic Striping ● Plate Tectonics ● Plate Boundaries ● Faults <p><i>Tectonic Events</i></p> <ul style="list-style-type: none"> ● Volcano Formation ● Types of Lava ● Volcanic Hazards ● Earthquakes ● Measuring Earthquakes ● Seismic Hazards <p><i>Geological History</i></p> <ul style="list-style-type: none"> ● The Geological Timescale ● Developing the Geological Timescale ● Supercontinents <p><i>Looking Inside the Earth</i></p> <ul style="list-style-type: none"> ● Evidence for the Earth's Structure ● Volcano Exploration Robots <p><i>Extension</i></p> <ul style="list-style-type: none"> ● Earth's Magnetic Field
<p>Global systems, including the carbon cycle, rely on interactions involving the atmosphere, biosphere, hydrosphere and lithosphere</p>	<p><i>Spheres and Global Cycles</i></p> <ul style="list-style-type: none"> ● Spheres ● Water Cycle ● Carbon Cycle ● Nitrogen Cycle ● Phosphorus Cycle <p><i>A Changing Climate</i></p> <ul style="list-style-type: none"> ● Climate and Weather ● Ocean Currents ● El Nino and La Nina ● The Greenhouse Effect ● The Enhanced Greenhouse Effect ● Human Influences on Climate <p><i>Effects of Climate Change</i></p> <ul style="list-style-type: none"> ● Disappearing Polar Ice ● Apocalypse Now: Natural Disasters ● Effects of Climate Change on Biodiversity ● Effects of Temperature on Permafrost

	<p><i>Climate Technology</i></p> <ul style="list-style-type: none"> • Carbon Capture • Carbon Footprints • CFCs and the Ozone Layer • Computer Modelling and the Environment • Save the Great Barrier Reef! <p><i>Extension</i></p> <ul style="list-style-type: none"> • Pollution • Where Have all the Turtles Gone?
<p>The Universe contains features including galaxies, stars and solar systems; the Big Bang theory can be used to explain the origin of the Universe</p>	<p><i>Introduction to the Universe</i></p> <ul style="list-style-type: none"> • The Solar System and Beyond • Models of the Solar System • Scientific Notation • Scientific Theory <p><i>Measuring the Universe</i></p> <ul style="list-style-type: none"> • Gravity • Light Speed • Light Years • Seconds and Years • Converting Light Years • Radar Ranging • Observing Space <p><i>Galaxies and Stars</i></p> <ul style="list-style-type: none"> • The Life Cycle of Stars • Parallax and Distances Between Stars • Distances to Stars and Parsecs • Properties of Stars • Reading Hertzsprung-Russell Diagrams • Calculating Distance to Stars • The Secret Lives of Ultra-Cool Dwarf Stars • The James Webb Space Telescope <p><i>Evidence for the Big Bang</i></p> <ul style="list-style-type: none"> • The Big Bang Theory • Cosmic Background Radiation • Red Shift <p><i>Theories of the Universe</i></p> <ul style="list-style-type: none"> • Life • End of the Universe <p><i>Extension</i></p> <ul style="list-style-type: none"> • Heat & The Cosmic Microwave Background • Relativity

Physical sciences

Content Descriptor	Lesson Names
<p>Electric circuits can be designed for diverse purposes using different components; the operation of circuits can be explained by the concepts of voltage and current</p>	<p><i>Electric Circuits</i></p> <ul style="list-style-type: none"> ● Electricity ● Circuits ● Resistance ● Current ● Voltage ● Introduction to Ohm's Law ● Batteries ● Circuits in Parallel ● Comparing Circuits ● War of the Currents ● Conductors and Insulators ● Circuits in Series <p><i>Electricity and Living Things</i></p> <ul style="list-style-type: none"> ● The Sixth Sense: Electroreception <p><i>Extension</i></p> <ul style="list-style-type: none"> ● Calculating Using Ohm's Law
<p>The interaction of magnets can be explained by a field model; magnets are used in the generation of electricity and the operation of motors</p>	<p><i>Magnets</i></p> <ul style="list-style-type: none"> ● Magnetism ● Magnetic Fields ● Examples of Magnetic Fields ● Magnetic Force on a Wire ● Magnetic Force on a Charged Particle ● Electromagnetic Induction ● Generators ● Motors ● Earth's Magnetic Field <p><i>Extension</i></p> <ul style="list-style-type: none"> ● Maglev Trains
<p>Energy flow in Earth's atmosphere can be explained by the processes of heat transfer</p>	<p><i>Heat Transfer</i></p> <ul style="list-style-type: none"> ● Heat Transfer ● Conduction ● Convection ● Radiation ● Bushfires <p><i>Conductors and Insulators</i></p> <ul style="list-style-type: none"> ● Conductors and Insulators ● Housing Insulation

	<p><i>Extension</i></p> <ul style="list-style-type: none"> ● The Cosmic Microwave Background
<p>The description and explanation of the motion of objects involves the interaction of forces and the exchange of energy and can be described and predicted using the laws of physics</p>	<p><i>Motion</i></p> <ul style="list-style-type: none"> ● Distance and Time ● Displacement and Compass Directions ● Calculating Displacement ● Speed ● Acceleration ● Using the Acceleration Formula to Calculate Final Velocity ● Using the Acceleration Formula to Calculate Initial Velocity ● Using the Acceleration Formula to Calculate Time <p><i>Graphing Motion</i></p> <ul style="list-style-type: none"> ● Distance-Time Graphs ● Displacement-Time Graphs ● Velocity-Time Graphs ● Acceleration-Time Graphs ● Summary of Motion Graphs <p><i>Force</i></p> <ul style="list-style-type: none"> ● Introduction to Forces ● Types of Forces: Gravity ● Types of Forces: Magnetism and Friction ● Weight and Mass ● Newton's First Law ● Newton's Second Law ● Newton's Third Law <p><i>Applications of Force</i></p> <ul style="list-style-type: none"> ● Car Safety Systems ● Rockets ● How BB-8 Works ● Sports Science <p><i>Extension</i></p> <ul style="list-style-type: none"> ● Car Safety Systems Investigation ● Earth's Magnetic Field ● Friction ● Planetary Motion ● Pressure ● Tides