



# AC Science

EP Curriculum Map

## Year 5

### Science Understanding

Biological sciences

Content Descriptor	Lesson Names
Living things have structural features and adaptations that help them to survive in their environment	<p><i>Adaptations for Survival</i></p> <ul style="list-style-type: none"><li>● Introduction to Adaptations</li><li>● Adaptations in Shape or Form</li><li>● Adaptations Inside the Body</li><li>● Adaptations in Behaviour</li><li>● Nocturnal Activity</li><li>● Dune Plants</li><li>● Camouflage</li></ul> <p><i>Adaptations to Environments</i></p> <ul style="list-style-type: none"><li>● Environments</li><li>● Rock Pool Environments</li><li>● Life in a Rock Pool</li><li>● Desert Environments</li><li>● Life in the Desert</li><li>● Polar Environments</li><li>● Life at the Poles</li></ul>

Chemical sciences

Content Descriptor	Lesson Names
Solids, liquids and gases have different observable properties and behave in different ways	<p><i>States of Matter</i></p> <ul style="list-style-type: none"><li>● Introduction to Matter</li><li>● Solids</li><li>● Liquids</li><li>● Gases</li><li>● Gases have Masses?</li><li>● Comparing States of Water</li><li>● Secretive Substances</li><li>● Extreme Conditions</li></ul> <p><i>Changing States of Matter</i></p>

	<ul style="list-style-type: none"> <li>● Melting</li> <li>● Freezing</li> <li>● Condensation</li> <li>● Sublimation</li> <li>● Deposition</li> <li>● Boiling and Evaporation</li> <li>● Temperature and States of Matter</li> </ul>
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## 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"> <li>● Planet Earth</li> <li>● Introduction to the Solar System</li> <li>● The Sun</li> <li>● Years</li> <li>● Days</li> <li>● The Inner Planets</li> <li>● The Outer Planets</li> <li>● Sizes in Space</li> <li>● Distances in Space</li> <li>● The Solar System</li> </ul>

## Physical sciences

Content Descriptor	Lesson Names
Light from a source forms shadows and can be absorbed, reflected and refracted	<p><i>The Path of Light</i></p> <ul style="list-style-type: none"> <li>● Light</li> <li>● How Do We See?</li> <li>● The Movement of Light</li> <li>● The Speed of Light</li> <li>● Ray Diagrams</li> <li>● Shadows</li> <li>● Comparing Shadows</li> </ul> <p><i>Interaction with Light</i></p> <ul style="list-style-type: none"> <li>● Types of Objects</li> <li>● The Colour of Light</li> <li>● Absorption</li> <li>● Mirrors</li> <li>● Refraction</li> <li>● Extension: Refraction and Ray Diagrams</li> </ul>

# Year 6

## Science Understanding

### Biological sciences

Content Descriptor	Lesson Names
The growth and survival of living things are affected by physical conditions of their environment	<p><i>The Environment</i></p> <ul style="list-style-type: none"> <li>• Living and Non-Living Things</li> <li>• MRS GREN</li> <li>• Environments</li> <li>• Extreme Environments</li> </ul> <p><i>Living Things and their Environment</i></p> <ul style="list-style-type: none"> <li>• Non-Living Factors Affecting Plants</li> <li>• Migration</li> <li>• Hibernation</li> <li>• Living Factors Affecting Plants</li> <li>• Non-living Factors Affecting Fungi</li> <li>• Living Factors Affecting Fungi</li> <li>• Non-Living Factors Affecting Animals</li> <li>• Living Factors Affecting Animals</li> <li>• Extreme Environments: The Scorching Deserts</li> <li>• Extreme Environments: The Deep Dark Sea</li> <li>• Extreme Environments: The Freezing Poles</li> </ul>

### Chemical sciences

Content Descriptor	Lesson Names
Changes to materials can be reversible or irreversible	<p><i>Materials and Mixtures</i></p> <ul style="list-style-type: none"> <li>• Pure and Impure Substances</li> <li>• Mixtures</li> <li>• Solubility</li> <li>• Solvents and Solutes</li> </ul> <p><i>Changes in State</i></p> <ul style="list-style-type: none"> <li>• States of Matter</li> <li>• Changing States Through Heating</li> <li>• Changing States Through Cooling</li> </ul> <p><i>Irreversible and Reversible Reactions</i></p> <ul style="list-style-type: none"> <li>• Chemical Changes</li> </ul>

	<ul style="list-style-type: none"> <li>● Irreversible Reactions</li> <li>● Cooking and Burning</li> <li>● Rusting</li> <li>● Physical Changes and Reversible Reactions</li> <li>● Recycling Metal</li> <li>● Recycling Plastic</li> <li>● Recycling Glass</li> <li>● Refrigerators</li> <li>● Melting Polar Ice</li> </ul>
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## Earth and space sciences

Content Descriptor	Lesson Names
Sudden geological changes and extreme weather events can affect Earth's surface	<p><i>Introduction to Earth</i></p> <ul style="list-style-type: none"> <li>● Layers of the Earth</li> <li>● The Atmosphere</li> <li>● The Geosphere</li> </ul> <p><i>Drought</i></p> <ul style="list-style-type: none"> <li>● Weather in the Outback</li> <li>● Effects of Drought</li> <li>● Coping with Drought</li> </ul> <p><i>Cyclones and Floods</i></p> <ul style="list-style-type: none"> <li>● Tropical Cyclones</li> <li>● The Effects of Cyclones</li> <li>● Cyclone Winston 2016</li> <li>● The Queensland Floods of 2011</li> <li>● Bots to the Rescue!</li> </ul> <p><i>Earthquakes</i></p> <ul style="list-style-type: none"> <li>● Earthquakes</li> <li>● Earthquake Hazards</li> <li>● Measuring Earthquakes</li> <li>● Tsunamis</li> <li>● Relief Bots</li> </ul> <p><i>Volcanoes</i></p> <ul style="list-style-type: none"> <li>● Volcanic Eruptions</li> <li>● Living with Volcanoes</li> <li>● Disaster Recovery Robots</li> <li>● Extreme Natural Events</li> </ul>

## Physical sciences

Content Descriptor	Lesson Names
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Electrical energy can be transferred and transformed in electrical circuits and can be generated from a range of sources

#### *Energy*

- Energy
- Types of Energy
- Energy Conservation

#### *Circuits*

- Electricity
- What is Electricity?
- Where Electricity Comes From
- Circuitry
- Open and Closed Circuits
- Circuit Diagrams
- Conductors
- Insulators

# Year 7

## Science Understanding

### Biological sciences

Content Descriptor	Lesson Names
<p>Classification helps organise the diverse group of organisms</p>	<p><i>What is Classification?</i></p> <ul style="list-style-type: none"> <li>● Introduction to Classification</li> </ul> <p><i>Living or Non-Living?</i></p> <ul style="list-style-type: none"> <li>● Living or Non-Living?</li> <li>● MRS GREN</li> </ul> <p><i>Dichotomous Keys</i></p> <ul style="list-style-type: none"> <li>● Introduction to Dichotomous Keys</li> <li>● Branching Keys</li> <li>● Circular Keys</li> <li>● Tabular Keys</li> <li>● Classifying Dinosaurs</li> </ul> <p><i>Linnaean Classification</i></p> <ul style="list-style-type: none"> <li>● Kangaroo Counter</li> <li>● Linnaean Classification</li> <li>● Binomial Nomenclature</li> <li>● Species and Hybrids</li> <li>● Carl Linnaeus</li> </ul> <p><i>Examples of Classification</i></p> <ul style="list-style-type: none"> <li>● Dragons in the Deep</li> <li>● Identifying Species</li> <li>● Introduction to Plant Classification</li> <li>● Tardigrades in Parking Lots</li> <li>● The Platypus</li> <li>● Animal Phyla</li> </ul>
<p>Interactions between organisms, including the effects of human activities can be represented by food chains and food webs</p>	<p><i>Ecosystems</i></p> <ul style="list-style-type: none"> <li>● Ecology</li> <li>● Species vs Organism</li> <li>● Ecosystems</li> <li>● Biotic and Abiotic Factors</li> <li>● Interdependent Relationships</li> </ul> <p><i>Food Chains and Food Webs</i></p> <ul style="list-style-type: none"> <li>● Food Chains</li> <li>● Predators, Prey and Competition</li> </ul>

	<ul style="list-style-type: none"> <li>● Food Webs</li> <li>● Decomposers</li> <li>● Consumers</li> </ul> <p><i>Changes in the Environment</i></p> <ul style="list-style-type: none"> <li>● Deforestation</li> <li>● Introduced Species</li> <li>● Cane Toads as an Introduced Species</li> <li>● An Agricultural Affair</li> <li>● Harnessing Fire in Australia</li> <li>● Oil Pollution and Industrial Waste</li> <li>● Pesticides</li> <li>● The Palm Oil Predicament</li> </ul> <p><i>Organisms in Ecosystems</i></p> <ul style="list-style-type: none"> <li>● Antarctica</li> <li>● Saving the Tasmanian Devil</li> <li>● Australian Bushfires</li> <li>● Climate Change</li> <li>● Introduced and Invasive Species</li> <li>● Invasive Species in Australia</li> <li>● Pollution and Ecosystems</li> <li>● What is Pollution?</li> </ul>
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## Chemical sciences

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

	<ul style="list-style-type: none"> <li>● Centrifuging</li> <li>● Magnetic and Electrostatic Separation</li> </ul> <p><i>Separating Solutions</i></p> <ul style="list-style-type: none"> <li>● Evaporation</li> <li>● Distillation</li> <li>● Extension: Crystallisation</li> <li>● orption</li> <li>● omatography</li> <li>● Open-Ended Separation Investigation</li> <li>● Separating Mixtures</li> </ul> <p><i>Mixtures around us</i></p> <ul style="list-style-type: none"> <li>● Blood as a Mixture</li> <li>● Indigenous Art using Mixtures</li> <li>● Recycling Sewage</li> <li>● Separation in Food</li> <li>● Separation in Industries</li> <li>● The Cave of the Crystals</li> <li>● The Mystery of Opals</li> <li>● The Zombie Apocalypse Water Shortage</li> <li>● Water Treatment</li> </ul>
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## Earth and space sciences

Content Descriptor	Lesson Names
<p>Predictable phenomena on Earth, including seasons and eclipses, are caused by the relative positions of the sun, Earth and the moon</p>	<p><i>Universe</i></p> <ul style="list-style-type: none"> <li>● The Universe</li> <li>● Gravity and Orbits</li> <li>● Comets</li> <li>● Asteroids and Meteoroids</li> <li>● Planetary Motion</li> <li>● Why Doesn't Earth Have Rings?</li> </ul> <p><i>Earth, Moon and Sun</i></p> <ul style="list-style-type: none"> <li>● Earth, Moon and Sun</li> <li>● Day and Night</li> <li>● Seasons</li> <li>● Time Zones</li> <li>● Days, Seasons and Time</li> </ul> <p><i>Moon and Eclipses</i></p> <ul style="list-style-type: none"> <li>● Lunar Eclipse</li> <li>● Phases of the Moon</li> <li>● Tides</li> <li>● Solar Eclipse</li> <li>● Tides and the Moon</li> </ul>



	<p><i>Astronomy</i></p> <ul style="list-style-type: none"> <li>● Calendars and the Solar Year</li> <li>● Changing Seasons</li> <li>● Earth's Structure</li> <li>● Exploring Space</li> <li>● Exploring the Moon, Mars and Beyond</li> <li>● Indigenous Constellations</li> <li>● Models of the Solar System</li> <li>● Pluto - The Big Little Planet</li> <li>● Satellites</li> <li>● Space Travel: The Weight Loss Sensation!</li> <li>● Telescopes</li> <li>● Extension: Earth's Magnetic Field</li> </ul>
<p>Predictable phenomena on Earth, including seasons and eclipses, are caused by the relative positions of the sun, Earth and the moon</p>	<p><i>Universe</i></p> <ul style="list-style-type: none"> <li>● The Universe</li> <li>● Gravity and Orbits</li> <li>● Comets</li> <li>● Asteroids and Meteoroids</li> <li>● Planetary Motion</li> <li>● Why Doesn't Earth Have Rings?</li> </ul> <p><i>Earth, Moon and Sun</i></p> <ul style="list-style-type: none"> <li>● Earth, Moon and Sun</li> <li>● Day and Night</li> <li>● Seasons</li> <li>● Time Zones</li> <li>● Days, Seasons and Time</li> </ul> <p><i>Moon and Eclipses</i></p> <ul style="list-style-type: none"> <li>● Lunar Eclipse</li> <li>● Phases of the Moon</li> <li>● Tides</li> <li>● Solar Eclipse</li> <li>● Tides and the Moon</li> </ul> <p><i>Astronomy</i></p> <ul style="list-style-type: none"> <li>● Calendars and the Solar Year</li> <li>● Changing Seasons</li> <li>● Earth's Structure</li> <li>● Exploring Space</li> <li>● Exploring the Moon, Mars and Beyond</li> <li>● Indigenous Constellations</li> <li>● Models of the Solar System</li> <li>● Pluto - The Big Little Planet</li> <li>● Satellites</li> <li>● Space Travel: The Weight Loss Sensation!</li> <li>● Telescopes</li> </ul>

<p>Some of Earth's resources are renewable, including water that cycles through the environment, but others are non-renewable</p>	<ul style="list-style-type: none"> <li>● Extension: Earth's Magnetic Field</li> </ul> <p><i>Introduction to Earth's Resources</i></p> <ul style="list-style-type: none"> <li>● Introduction to Earth's Resources</li> <li>● Renewable and Non-Renewable Energy Sources</li> </ul> <p><i>Non-Renewable Resources</i></p> <ul style="list-style-type: none"> <li>● Fossil Fuels as a Resource</li> <li>● Soil as a Resource</li> <li>● Minerals and Ores as Resources</li> <li>● Mining</li> <li>● Nuclear Fuel as a Resource</li> </ul> <p><i>Renewable Resources</i></p> <ul style="list-style-type: none"> <li>● Living Things as a Resource</li> <li>● Air as a Resource</li> <li>● Wind as a Resource</li> <li>● Wind Turbines</li> <li>● Solar Energy</li> <li>● Water Power</li> <li>● Geothermal Energy</li> <li>● A limitless Source Of Energy</li> <li>● Choosing Renewables</li> <li>● The Power of Sunshine</li> <li>● Types of Resources</li> </ul> <p><i>Ecological Energy</i></p> <ul style="list-style-type: none"> <li>● Antarctica, a Shared Continent</li> <li>● Changing Seasons</li> <li>● Investigation: Coal vs. Solar for Australia's Future</li> <li>● Renewable Energy</li> </ul> <p><i>The Water Cycle</i></p> <ul style="list-style-type: none"> <li>● Water on Earth</li> <li>● Water Cycle</li> <li>● States of Water</li> <li>● The Water Cycle as a Closed System</li> <li>● Influences on the Water Cycle</li> <li>● Cloudy with a Chance of Hamburgers</li> <li>● Reading a Weather Map</li> <li>● The Water Cycle</li> <li>● Water on Earth</li> </ul> <p><i>Water Management</i></p> <ul style="list-style-type: none"> <li>● Aquifers</li> <li>● Hydroelectricity</li> <li>● Irrigation</li> <li>● Our Water Use</li> <li>● Science, Tradition and Modern Medicine</li> </ul>
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	<ul style="list-style-type: none"> <li>• The Great Artesian Basin</li> <li>• Water Conservation</li> <li>• Water Management</li> </ul>
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## Physical sciences

Content Descriptor	Lesson Names
Change to an object's motion is caused by unbalanced forces, including Earth's gravitational attraction, acting on the object	<p><i>Introduction to Forces</i></p> <ul style="list-style-type: none"> <li>• What are Forces?</li> <li>• Drawing Forces</li> <li>• Balanced and Unbalanced Forces</li> <li>• What are Forces?</li> <li>• Drawing Forces</li> <li>• Balanced and Unbalanced Forces</li> </ul> <p><i>Types of Forces</i></p> <ul style="list-style-type: none"> <li>• Contact and Non-Contact Forces</li> <li>• Gravity</li> <li>• Magnetism</li> <li>• Electrostatic Force</li> <li>• Forces</li> </ul> <p><i>Simple Machines</i></p> <ul style="list-style-type: none"> <li>• Levers</li> <li>• Wheels, Axles and Pulleys</li> <li>• Inclined Planes</li> <li>• Gears</li> <li>• Bicycle Investigation</li> <li>• Gear Ratio</li> </ul> <p><i>Forces in Everyday Life</i></p> <ul style="list-style-type: none"> <li>• Friction</li> <li>• Ancient Tools and Weapons</li> <li>• Comparing Robots</li> <li>• Earth's Magnetic Field</li> <li>• Fact or Friction?</li> <li>• How Planes Stay Up</li> <li>• Maglev Trains</li> <li>• Planetary Motion</li> <li>• Safety Systems</li> <li>• Sports Science</li> <li>• Tides</li> </ul>

# Year 8

## Science Understanding

### Biological sciences

Content Descriptor	Lesson Names
<p>Cells are the basic units of living things; they have specialised structures and functions</p>	<p><i>Introduction to Cells</i></p> <ul style="list-style-type: none"> <li>● Size of Cells</li> <li>● The Size of Cells</li> <li>● What is a Cell?</li> </ul> <p><i>Microscopes</i></p> <ul style="list-style-type: none"> <li>● Magnification</li> <li>● Parts and Function of a Microscope</li> <li>● Types of Microscopes</li> <li>● Using a Microscope</li> </ul> <p><i>Types of Cells</i></p> <ul style="list-style-type: none"> <li>● Introduction to Types of Cells: Pond Water Investigation</li> <li>● Bacterial Cell Structure</li> <li>● Eukaryotic Cells</li> <li>● Prokaryotic Cells</li> <li>● Animal Cell Structure</li> <li>● Plant Cell Structure</li> <li>● Fungal Cell Structure</li> <li>● Animal and Plant Cells</li> <li>● Animal vs. Plant Cells</li> <li>● Comparing Plant and Animal Cells</li> <li>● Prokaryotic vs. Eukaryotic</li> <li>● The Origin of Mitochondria</li> </ul> <p><i>Cell Division</i></p> <ul style="list-style-type: none"> <li>● Cell Division in Bacteria</li> <li>● Cell Division in Humans - Mitosis</li> <li>● Cell Division in Humans - Meiosis</li> </ul> <p><i>Levels of Organisation</i></p> <ul style="list-style-type: none"> <li>● Specialised Animal Cells I</li> <li>● Specialised Animal Cells II</li> <li>● Specialised Plant Cells - Photosynthetic and Guard Cells</li> <li>● Specialised Plant Cells - Root Hairs and Conducting Cells</li> </ul>

	<ul style="list-style-type: none"> <li>• Types of Tissue</li> <li>• Levels of Organisation</li> <li>• Diffusion</li> <li>• Diffusion and Cell Size</li> </ul> <p><i>How Cells Have Shaped Biology</i></p> <ul style="list-style-type: none"> <li>• Cell Theory</li> <li>• Stem Cells</li> <li>• Stem Cell Therapy</li> <li>• History of Microscopes</li> </ul> <p><i>Treating and Preventing Disease</i></p> <ul style="list-style-type: none"> <li>• Pasteur &amp; Koch</li> <li>• Antibiotics</li> <li>• Disease Treatment and Control</li> <li>• Food Safety and Salmonella</li> <li>• Vaccination</li> </ul>
<p>Multi-cellular organisms contain systems of organs carrying 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"> <li>• Extension: Adapting to Extreme Climates</li> <li>• Exercise and the Body</li> <li>• Introduction to Body Systems</li> <li>• Organ Systems</li> </ul> <p><i>Digestive System</i></p> <ul style="list-style-type: none"> <li>• Digestive System As A Whole</li> <li>• Food Groups</li> <li>• Mouth and Oesophagus</li> <li>• Stomach and Small Intestine</li> <li>• Large Intestine and Rectum</li> <li>• Comparing Digestion in Other Animals</li> <li>• The Microbes That Control What We Do</li> </ul> <p><i>Respiratory System</i></p> <ul style="list-style-type: none"> <li>• Introduction to Respiration</li> <li>• Breathing</li> <li>• Gas Exchange</li> <li>• Comparing Respiration</li> <li>• Diffusion</li> <li>• Diffusion and Body Systems</li> <li>• Respiration in Cells</li> <li>• Respiratory System</li> </ul> <p><i>Circulatory System</i></p> <ul style="list-style-type: none"> <li>• Introduction to the Circulatory System</li> <li>• Heart</li> <li>• Blood Vessels</li> <li>• Blood</li> <li>• Ancient Anatomy</li> </ul>

- Relative Heart Size

#### *Excretory System*

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

#### *Musculoskeletal System*

- Musculoskeletal System
- Bones & Joints
- Muscles
- Injuries
- Stress Effects on the Body
- Trapped in a Cave

#### *Reproductive System*

- Puberty
- Sexual Reproduction in Animals
- Asexual Reproduction in Animals
- Male Reproduction
- Female Reproduction
- Pregnancy
- Birth
- Infertility
- Contraception
- Lamb in a Bag

#### *Plant System*

- Photosynthesis
- Sexual Reproduction in Plants
- Plant Systems
- Pollination
- Asexual Reproduction in Plants
- Maple Syrup: Xylem and Phloem
- Plant Cloning
- Seed Dispersal & Germination

#### *Organ Transplants*

- Ctrl + X, Ctrl + V
- Ethical Issues of Organ Transplants
- Organ Transplants

## Chemical sciences

Content Descriptor	Lesson Names
<p>Properties of the different states of matter can be explained in terms of the motion and arrangement of particles</p>	<p><i>Matter Basics and States of Matter</i></p> <ul style="list-style-type: none"> <li>● States of Matter</li> <li>● Particle Model of Matter</li> <li>● Solids</li> <li>● Liquids</li> <li>● Gases</li> <li>● Introduction to Particles</li> </ul> <p><i>Changing States</i></p> <ul style="list-style-type: none"> <li>● Changing States</li> <li>● Melting and Freezing</li> <li>● Boiling, Evaporation and Condensation</li> <li>● Sublimation and Deposition</li> <li>● Heating and Cooling Curves *NEW*</li> <li>● Energy In Matter</li> <li>● What is the Matter?</li> </ul> <p><i>Properties of Matter</i></p> <ul style="list-style-type: none"> <li>● Density</li> <li>● Mass and Volume</li> <li>● Newtonian and Non-Newtonian Fluids</li> <li>● Pressure</li> </ul> <p><i>Matter in Nature</i></p> <ul style="list-style-type: none"> <li>● Melting Polar Ice</li> <li>● States of Matter in Space</li> <li>● The Water Cycle and Weather</li> <li>● When Water Freezes</li> </ul> <p><i>Matter in Technology</i></p> <ul style="list-style-type: none"> <li>● Air Conditioners</li> <li>● Refrigerators and Refrigerants</li> </ul>
<p>Chemical change involves substances reacting to form new substances</p>	<p><i>Physical Properties</i></p> <ul style="list-style-type: none"> <li>● Physical Change</li> <li>● Physical Properties</li> <li>● Physical Properties of Metals and Non-Metals</li> </ul> <p><i>Chemical Reactions and Properties</i></p> <ul style="list-style-type: none"> <li>● Chemical Changes</li> <li>● Chemical Reactions</li> <li>● Writing Word Reactions</li> <li>● Chemical Properties</li> <li>● Physical and Chemical Changes</li> <li>● Turning Observations Into Facts</li> </ul>

	<ul style="list-style-type: none"> <li>• Writing Symbol Equations</li> </ul> <p><i>Chemical Compounds</i></p> <ul style="list-style-type: none"> <li>• Alchemy</li> <li>• By Our Powers Combined</li> <li>• Recycling</li> <li>• Synthetic Materials</li> <li>• Using Substances Based on their Properties</li> <li>• Working In Chemistry</li> </ul>
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## Earth and space sciences

Content Descriptor	Lesson Names
<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"> <li>• Earth's Structure</li> <li>• Extension: Dissecting the Earth</li> <li>• Mechanical Layers of the Earth</li> </ul> <p><i>Earth's Processes</i></p> <ul style="list-style-type: none"> <li>• The Geological Timescale</li> <li>• Australian Landforms formed by Physical Weathering, Erosion and Sedimentation</li> <li>• Australian Landforms formed by Volcanism and Chemical Weathering</li> <li>• Developing the Geological Timescale</li> <li>• Earth Processes</li> <li>• Erosion and Sedimentation</li> <li>• Hot Rocks of the Cosgrove Hotspot Track</li> <li>• Weathering</li> </ul> <p><i>Minerals</i></p> <ul style="list-style-type: none"> <li>• Comparing Minerals</li> <li>• Identifying Minerals</li> <li>• Introduction to Minerals</li> <li>• Zircons are Forever</li> </ul> <p><i>Rock Types</i></p> <ul style="list-style-type: none"> <li>• Metamorphic Rocks</li> <li>• Australian Fossils</li> <li>• Baked Rocks in the Lachlan Fold Belt</li> <li>• Feathery Dinosaurs</li> <li>• Fossils</li> <li>• Igneous Rocks</li> <li>• Minerals and Rocks</li> <li>• Rock Density</li> <li>• Sedimentary Rocks</li> <li>• The Rock Cycle</li> </ul>



*Exploring Earth and Beyond*

- Martian Geology
- Minerals and Rocks as Resources
- Mining and Mineral Exploration
- Volcanology

## Physical sciences

Content Descriptor	Lesson Names
<p>Energy appears in different forms, including movement (kinetic energy), heat and potential energy, and energy transformations and transfers cause change within systems</p>	<p><i>Introduction to Energy and Units of Energy</i></p> <ul style="list-style-type: none"> <li>● Identifying KE or PE</li> <li>● Potential Energy</li> <li>● Units of Energy</li> <li>● What is Energy?</li> <li>● Converting between Joules (J) &amp; Kilojoules (kJ)</li> <li>● Kinetic Energy</li> <li>● Converting between Kilojoules (kJ) &amp; Megajoules (MJ)</li> <li>● Energy Calculations</li> <li>● Qualitative and Quantitative Data</li> </ul> <p><i>Energy Transfer and Transformation</i></p> <ul style="list-style-type: none"> <li>● Energy Transformation and Food</li> <li>● Energy Transformations</li> <li>● Introduction to Heat Transfer</li> <li>● Conductors and Insulators</li> <li>● Displaying Energy Transformations</li> <li>● Cars of the Future</li> <li>● Law of Conservation of Energy</li> <li>● Types of Energy</li> </ul> <p><i>Energy Efficiency</i></p> <ul style="list-style-type: none"> <li>● Cogeneration and Engines</li> <li>● Energy Efficiency</li> <li>● Energy Efficient Houses</li> <li>● The Development of Flight</li> <li>● The Power Grid and You</li> <li>● Useful and Wasted Energy</li> </ul> <p><i>Electrical Energy</i></p> <ul style="list-style-type: none"> <li>● Electricity</li> <li>● Circuits in Parallel</li> <li>● Comparing Circuits</li> <li>● Electric Circuits</li> <li>● Current</li> <li>● Voltage</li> </ul>



- Resistance
- Introduction to Ohm's Law
- Batteries
- Electrical Conductors and Insulators
- Circuits in Series
- A Bright Idea

# Year 9

## 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"> <li>● Basics of Homeostasis</li> <li>● Homeostatic Terms</li> <li>● Stimulus-Response Model</li> <li>● Negative and Positive Feedback</li> <li>● Control Systems</li> <li>● Modelling Human Thermoregulation</li> <li>● Body Temperature</li> <li>● Homeostatic Concepts</li> </ul> <p><i>Nervous System</i></p> <ul style="list-style-type: none"> <li>● Introduction To The Nervous System</li> <li>● Nerves and Neurons</li> <li>● Central and Peripheral Nervous System</li> <li>● Sympathetic and Parasympathetic Nervous System</li> <li>● Nerve Pathways</li> <li>● Sensory Organs</li> <li>● The Eye</li> <li>● From Zero to Hero! Honey Bee Mathematicians</li> <li>● Starfish Nervous System</li> <li>● The Nervous System</li> </ul> <p><i>Endocrine System</i></p> <ul style="list-style-type: none"> <li>● Introduction to the Endocrine System</li> <li>● Glands of the Endocrine System</li> <li>● Hormones of the Endocrine System</li> <li>● Regulating Blood Sugar</li> <li>● Endocrine Diseases</li> <li>● Regulating Blood Glucose Levels</li> <li>● Use of Hormones in the Dairy Industry</li> </ul> <p><i>Diseases</i></p> <ul style="list-style-type: none"> <li>● Introduction to Diseases</li> <li>● Vaccinations</li> <li>● Spread of Infectious Disease</li> <li>● Managing Pandemics in the Asia Region</li> <li>● Modelling Disease Outbreak and Spread</li> </ul>

	<ul style="list-style-type: none"> <li>● The Identification of a Mystery Disease</li> <li>● Bacterial Diseases</li> <li>● Viral Diseases</li> <li>● Viral Infection: Chickenpox</li> <li>● Parasitic Diseases</li> <li>● Parasitic Infection: Malaria</li> <li>● Fungal Diseases</li> <li>● Disease Transmission</li> <li>● Antibiotics</li> <li>● Degenerative Diseases</li> <li>● Pathogens</li> <li>● Smelly Socks and Malaria Transmission</li> <li>● Superbugs are the Real Super Villains</li> <li>● The History of Disease</li> </ul> <p><i>Immune System</i></p> <ul style="list-style-type: none"> <li>● Introduction to the Immune System</li> <li>● The Body's First and Second Lines of Defence</li> <li>● The Third Line of Defence</li> <li>● Pasteur &amp; Koch</li> <li>● Snake Antivenom Production</li> </ul> <p><i>Immune Response: Extension</i></p> <ul style="list-style-type: none"> <li>● Introduction to the Immune Response</li> <li>● Plant Defence Systems</li> <li>● Innate Immune Response I</li> <li>● Innate Immune Response II</li> <li>● Adaptive Immune Response I</li> <li>● Adaptive Immune Response II</li> <li>● Active &amp; Passive Immunity</li> </ul>
<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"> <li>● Introduction to Ecology</li> <li>● The Biosphere and Biomes</li> <li>● Species and Organisms</li> </ul> <p><i>Components of an Ecosystem</i></p> <ul style="list-style-type: none"> <li>● Comprehension: Adapting for Survival</li> <li>● Biotic Factors and Competition</li> <li>● Abiotic Factors</li> <li>● Taking a Lichen to Moss</li> <li>● Predator-Prey Dynamics</li> <li>● Adaptations</li> <li>● Interactions Between Organisms</li> <li>● Symbiosis</li> </ul> <p><i>Energy in Ecosystems</i></p> <ul style="list-style-type: none"> <li>● Producers</li> <li>● Trophic Levels</li> </ul>

	<ul style="list-style-type: none"> <li>● The Carbon Cycle</li> <li>● Consumers and Decomposers</li> <li>● Food Chains and Food Webs</li> <li>● Producers, Consumers and Decomposers</li> <li>● The Nitrogen Cycle</li> </ul> <p><i>Changes in Ecosystems</i></p> <ul style="list-style-type: none"> <li>● STEM - Kangaroo Counter</li> <li>● Apocalypse Now: Natural Disasters of September, 2017</li> <li>● Australian Bushfires</li> <li>● Bee Kind</li> <li>● Biodiversity</li> <li>● Drought</li> <li>● Flooding</li> <li>● History of Conservation</li> <li>● Human Impacts</li> <li>● Invasive Species</li> <li>● Life on Mars</li> <li>● Oil Spills</li> <li>● Pesticides</li> <li>● Predicting Population Changes</li> <li>● Saving Australia's Wildlife</li> <li>● The Greenhouse Effect</li> <li>● Will I Stay or Will I Go?</li> </ul>
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## Chemical sciences

Content Descriptor	Lesson Names
<p>All matter is made of atoms that 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"> <li>● What are Atoms, Elements and Compounds?</li> <li>● The Structure of an Atom</li> <li>● Atomic Symbols</li> <li>● Models of the Atom</li> <li>● Watching Paint Dry</li> </ul> <p><i>The Periodic Table</i></p> <ul style="list-style-type: none"> <li>● The Periodic Table</li> </ul> <p><i>Ions and Isotopes</i></p> <ul style="list-style-type: none"> <li>● Introduction to Ions</li> <li>● Electron Configuration of Ions</li> <li>● Ionic Compounds</li> <li>● Ions in Solution</li> <li>● Naming Ionic Compounds</li> <li>● Polyatomic Ions and Compounds</li> <li>● The Cave of the Crystals</li> </ul>

	<ul style="list-style-type: none"> <li>• What are Isotopes?</li> </ul> <p><i>Radioactivity</i></p> <ul style="list-style-type: none"> <li>• What is Radioactivity?</li> <li>• Radioactivity in Industry</li> <li>• Radioactivity in Medicine</li> <li>• Effects of Radiation on Humans</li> <li>• Half-Lives</li> <li>• Marie Curie and Radioactivity</li> <li>• Name That Radiation!</li> <li>• Nuclear Bombs</li> <li>• Nuclear Fission</li> <li>• Nuclear Power</li> <li>• Properties of Radiation</li> <li>• Types of Radiation</li> <li>• Writing Nuclear Equations</li> </ul>
<p>Chemical reactions involve rearranging atoms to form new substances; during a chemical reaction mass is not created or destroyed</p>	<p><i>Chemical Reactions</i></p> <ul style="list-style-type: none"> <li>• Introduction to Chemical Reactions</li> <li>• Reactants and Products</li> <li>• Fermentation</li> <li>• Waste Management</li> <li>• Chemical Reactions Basics</li> <li>• Chemistry: Glorified Baking?</li> </ul> <p><i>Chemical Equations</i></p> <ul style="list-style-type: none"> <li>• Reaction in Action: Baking Soda and Vinegar</li> <li>• Writing Word Equations</li> <li>• Writing Chemical and Molecular Equations</li> <li>• Writing Chemical Equations</li> </ul> <p><i>Conservation of Mass</i></p> <ul style="list-style-type: none"> <li>• Conservation of Mass</li> <li>• Balancing Equations</li> </ul> <p><i>Applications of Chemistry</i></p> <ul style="list-style-type: none"> <li>• A Day in the Life of an Industrial Chemist</li> <li>• The Father of Modern Chemistry</li> </ul> <p><i>Acids and Bases</i></p> <ul style="list-style-type: none"> <li>• Acids</li> <li>• Bases</li> <li>• pH and Indicators</li> <li>• Acid-Metal Reactions</li> <li>• Neutralisation Reactions</li> <li>• Acids and Bases</li> </ul> <p><i>Combustion</i></p> <ul style="list-style-type: none"> <li>• Endothermic and Exothermic Reactions</li> </ul>

	<ul style="list-style-type: none"> <li>● Combustion Reactions</li> <li>● Oxidation Reactions</li> <li>● Identifying Chemical Reactions</li> <li>● Types of Chemical Reaction</li> </ul> <p><i>Reactions Around Us</i></p> <ul style="list-style-type: none"> <li>● Acid Rain: Reactions Around Us</li> <li>● Combustion and the Environment</li> <li>● Photosynthesis</li> <li>● Respiration</li> </ul>
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## 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"> <li>● Mechanical Layers of the Earth</li> </ul> <p><i>Plate Tectonics</i></p> <ul style="list-style-type: none"> <li>● Wegener's Theory of Continental Drift</li> <li>● Plate Tectonics</li> <li>● Faults</li> <li>● Extension: Earth's Magnetic Field</li> <li>● Ice Tectonics on Europa</li> <li>● Plate Boundaries</li> <li>● Plate Tectonics</li> <li>● Seafloor Spreading &amp; Magnetic Striping</li> <li>● Subduction Zones and Ophiolite Belts</li> </ul> <p><i>Tectonic Events</i></p> <ul style="list-style-type: none"> <li>● Volcano Formation</li> <li>● Types of Lava</li> <li>● Volcanic Hazards</li> <li>● Earthquakes</li> <li>● Measuring Earthquakes</li> <li>● Seismic Hazards</li> <li>● Understanding Megaquakes</li> <li>● Volcano Exploration Robots</li> <li>● Volcanoes and Earthquakes</li> </ul> <p><i>Geological History</i></p> <ul style="list-style-type: none"> <li>● Developing the Geological Timescale</li> <li>● Supercontinents</li> <li>● The Time Traveller's Holiday Guide!</li> </ul>

## Physical sciences

Content Descriptor	Lesson Names
<p>Energy transfer through different mediums can be explained using wave and particle models</p>	<p><i>Communication with Waves</i></p> <ul style="list-style-type: none"> <li>● Cell Phones</li> <li>● Working in Physics</li> <li>● Internet</li> <li>● Radio Waves</li> <li>● The Branches of Physics</li> <li>● X-rays</li> <li>● Radar</li> <li>● History of Radio Communication</li> </ul> <p><i>Electricity</i></p> <ul style="list-style-type: none"> <li>● Electricity</li> <li>● Circuits</li> <li>● Resistance</li> <li>● Current</li> <li>● Voltage</li> <li>● Introduction to Ohm's Law</li> <li>● Batteries</li> <li>● Calculating Using Ohm's Law</li> <li>● Circuits in Parallel</li> <li>● Comparing Circuits</li> <li>● War of the Currents</li> <li>● Conductors and Insulators</li> <li>● Circuits in Series</li> <li>● Development of Light Bulbs</li> <li>● The Sixth Sense: Electroreception</li> </ul> <p><i>Heat</i></p> <ul style="list-style-type: none"> <li>● Introduction to Heat Transfer</li> <li>● Conductors and Insulators</li> <li>● Useful and Wasted Energy</li> <li>● Heat Transfer</li> <li>● Conduction</li> <li>● Convection</li> <li>● Focus on Data: The Speed of Heat Transfer</li> <li>● Radiation</li> <li>● Bushfires</li> <li>● Heat Transfer in the Atmosphere and the Oceans</li> <li>● The Cosmic Microwave Background</li> <li>● Editable Documents - Word (.docx)</li> <li>● Conductors and Insulators</li> </ul> <p><i>Light</i></p> <ul style="list-style-type: none"> <li>● Light as a Wave</li> <li>● Colour</li> </ul>



- Materials
- Electromagnetic Radiation and Medicine
- The Electromagnetic Spectrum
- You, Me and UV
- Extension: Curved Mirrors
- Reflection
- Refraction
- Refractive Index
- Total Internal Reflection
- Lenses
- Drawing Ray Diagrams
- Bionic Eyes
- Plane Mirrors and Reflection
- Snell's Law
- The History of Lenses

*Sound*

- Sound Waves
- Sound Formation
- Pitch and Loudness
- Australian Aboriginal Music
- Ultrasound
- Hearing Sound
- Bionic Ears
- Turned Down for What: Workplace Noise
- The Tiny Toadlet's Conundrum

# Year 10

## Science Understanding

### Biological sciences

Content Descriptor	Lesson Names
<p>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"> <li>● Basics of DNA</li> <li>● The History of Genetic Thought</li> <li>● Discovering the Double Helix</li> <li>● Structure of DNA</li> <li>● Nitrogenous Bases</li> <li>● The Knotty New DNA Structure!</li> <li>● DNA Fingerprinting: Thirsty Thievery</li> <li>● Proteins</li> </ul> <p><i>Genes and Chromosomes</i></p> <ul style="list-style-type: none"> <li>● Genes and Genetic Information</li> <li>● Homologous Chromosomes</li> <li>● Genomics</li> <li>● Sex Chromosomes</li> <li>● Attraction: It's all in the Armpits</li> <li>● Chromosomal Abnormalities</li> <li>● The Ethics of Genetics</li> </ul> <p><i>Cell Division</i></p> <ul style="list-style-type: none"> <li>● DNA Replication</li> <li>● Mitosis</li> <li>● Gametes and Fertilisation</li> <li>● Meiosis</li> <li>● Mitosis vs. Meiosis</li> <li>● Asexual and Sexual Reproduction</li> </ul> <p><i>Inheritance</i></p> <ul style="list-style-type: none"> <li>● Mendel</li> <li>● Sex Linkage, Punnett Squares and Pedigrees</li> <li>● Alleles</li> <li>● Inheriting Alleles and Punnett Squares</li> <li>● Making Punnett Squares</li> <li>● Dominant/Recessive Interactions</li> <li>● Incomplete Dominance</li> <li>● Codominance</li> <li>● Pedigrees</li> <li>● Sex Linkage</li> </ul>

	<ul style="list-style-type: none"> <li>● Epigenetics: Inheritance is Strange</li> <li>● The Blue People of Troublesome Creek</li> </ul>
<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>The Theory of Evolution</i></p> <ul style="list-style-type: none"> <li>● Darwin's Theory of Evolution</li> <li>● Theories and Evidence</li> <li>● Geological Time</li> <li>● The History of Evolutionary Thought</li> </ul> <p><i>Evidence of Evolution</i></p> <ul style="list-style-type: none"> <li>● Evidence from Living Species</li> <li>● Fossils and the Fossil Record</li> <li>● Geographical Distribution</li> <li>● The Evidence for Evolution</li> <li>● The Wallace Line</li> </ul> <p><i>Mechanisms of Evolution</i></p> <ul style="list-style-type: none"> <li>● Biodiversity</li> <li>● Mechanisms of Evolution</li> <li>● Natural Selection</li> <li>● Artificial Selection</li> <li>● Focus on Data: Natural Selection in Action!</li> <li>● Artificial Selection: The Good, the Bad and the Downright Strange</li> <li>● Coevolution</li> <li>● Sexual Selection</li> <li>● The Biodiversity Gradient</li> <li>● The Mechanisms of Evolution</li> </ul> <p><i>Explaining Evolution</i></p> <ul style="list-style-type: none"> <li>● Extinction</li> <li>● The Science of Puppy Dog Eyes</li> <li>● Back to the Sea: Cetacean Evolution</li> <li>● Bacterial Resistance</li> <li>● Evolution and Extinction</li> <li>● Feathery Dinosaurs</li> <li>● Mimicry</li> <li>● Our Evolution</li> <li>● Rewriting Human History</li> <li>● The Ancestor of All Things</li> </ul>

## Chemical sciences

<b>Content Descriptor</b>	<b>Lesson Names</b>
<p>The atomic structure and properties of elements are used to organise them in the Periodic Table</p>	<p><i>Structure of Atoms</i></p> <ul style="list-style-type: none"> <li>● What are Atoms, Elements and Compounds?</li> <li>● The Structure of an Atom</li> <li>● Atomic Symbols</li> </ul>

	<ul style="list-style-type: none"> <li>● History of the Atomic Model</li> <li>● Electron Configuration</li> <li>● Chemicals: Friend or Foe?</li> </ul> <p><i>The Periodic Table</i></p> <ul style="list-style-type: none"> <li>● Trends in the Periodic Table</li> <li>● Groups 1 and 2</li> <li>● Group 14</li> <li>● Group 17</li> <li>● Group 18</li> <li>● Other Groups</li> <li>● The Periodic Table</li> <li>● Quiz- First 20 Elements (Name to Symbol)</li> <li>● Quiz- First 20 Elements (Symbol to Name)</li> <li>● Designing the Periodic Table</li> <li>● Helium: More Than a Bit of Squeaky Fun</li> <li>● Metallic Hydrogen or: How I Learned to Stop Worrying and Love the Scientific Process</li> <li>● Understanding the Periodic Table</li> </ul> <p><i>Bonding</i></p> <ul style="list-style-type: none"> <li>● Introduction to Bonding</li> <li>● Types of Bonding</li> <li>● Introduction to Ions</li> <li>● Electron Arrangement of Ions</li> <li>● Ionic Compounds</li> <li>● Ions in Solution</li> <li>● Naming Ionic Compounds</li> <li>● Ionic Bonding</li> <li>● Polyatomic Ions and Compounds</li> <li>● Metals in the Periodic Table</li> <li>● Metallic Bonding</li> <li>● Covalent Bonding</li> </ul> <p><i>Spectroscopy</i></p> <ul style="list-style-type: none"> <li>● Analysing the Structure of Materials</li> <li>● Spectroscopy</li> </ul>
<p>Different types of chemical reactions are used to produce a range of products and can occur at different rates</p>	<p><i>The Law of Conservation of Mass</i></p> <ul style="list-style-type: none"> <li>● Breaking the Law (of Conservation of Mass)?</li> <li>● Chemical Reactions and Equations</li> <li>● Conservation of Mass</li> <li>● Reactants and Products</li> <li>● Writing Chemical Equations 1</li> <li>● Writing Chemical Equations 2</li> <li>● Balancing Chemical Equations</li> <li>● Reaction Equations</li> <li>● Chemical Reactions Basics</li> <li>● Chemistry: Glorified Baking?</li> </ul>

	<ul style="list-style-type: none"> <li>• Writing Chemical Equations</li> </ul> <p><i>Types of Chemical Reactions</i></p> <ul style="list-style-type: none"> <li>• Chemical vs. Physical</li> <li>• Chemical Reactions</li> <li>• Combination and Decomposition Reactions</li> <li>• Acid Reactions</li> <li>• Precipitation Reactions</li> <li>• Oxidation and Reduction</li> <li>• Polymers</li> <li>• Types of Chemical Reaction</li> </ul> <p><i>Types of Reactions</i></p> <ul style="list-style-type: none"> <li>• Physical Properties of Metals</li> <li>• Alloys and Their Uses</li> <li>• Chemical Properties of Metals</li> <li>• Metal Reactions with Oxygen</li> <li>• Metal Reactions with Water</li> <li>• Metal Reactions with Acid</li> <li>• Metal Displacement Reactions</li> </ul> <p><i>Rates of Reaction</i></p> <ul style="list-style-type: none"> <li>• Collision Theory</li> <li>• Rate of Reaction</li> <li>• Agitation, Concentration and Surface Area</li> <li>• Activation Energy, Temperature and Catalysts</li> <li>• Rate of Reaction Equations</li> <li>• Factors Affecting Reaction Rates</li> <li>• Extension: Collision Theory and Rate of Reaction</li> <li>• Chemical Clocks</li> <li>• Graphing Rate of Reaction</li> </ul> <p><i>Creating with Chemistry</i></p> <ul style="list-style-type: none"> <li>• Analytical Chemistry</li> <li>• Fuels and Pharmaceuticals</li> <li>• STEM: Alternate Fuels</li> </ul> <p><i>Stoichiometry</i></p> <ul style="list-style-type: none"> <li>• Reaction Equations</li> <li>• The Mole</li> <li>• Empirical and Molecular Formulae</li> <li>• Moles and Equations</li> </ul>
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## Earth and space sciences

Content Descriptor	Lesson Names
The universe contains features including galaxies, stars	<i>Introduction to the Universe</i>

and solar systems, and the Big Bang theory can be used to explain the origin of the universe

- The Solar System and Beyond
- Models of the Solar System
- Scientific Notation
- Scientific Theory

#### *Measuring the Universe*

- Gravity
- Light Speed
- Light Years
- Seconds and Years
- Converting Light Years
- Radar Ranging
- Observing Space
- Measuring the Universe
- Relativity

#### *Galaxies and Stars*

- 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
- Black Holes
- Life

#### *Evidence for the Big Bang*

- The Big Bang Theory
- Cosmic Background Radiation
- Red Shift
- End of the Universe
- Red Shift and the Expanding Universe
- The Cosmic Microwave Background

Global systems, including the carbon cycle, rely on interactions involving the biosphere, lithosphere, hydrosphere and atmosphere

#### *Spheres and Global Cycles*

- Spheres
- Water Cycle
- Carbon Cycle
- Nitrogen Cycle
- Phosphorus Cycle
- Carbon Capture
- Global Cycles

#### *A Changing Climate*

- Climate and Weather
- Ocean Currents
- The Enhanced Greenhouse Effect

	<ul style="list-style-type: none"> <li>● El Nino and La Nina</li> <li>● The Greenhouse Effect</li> <li>● Human Influences on Climate</li> <li>● Arguing For or Against Climate Change</li> <li>● CFCs and the Ozone Layer</li> <li>● Climate Change</li> <li>● Examining Past Climate</li> <li>● If Climate Change is Real, How Come...?</li> <li>● The Southern Oscillation Index</li> </ul> <p><i>Effects of Climate Change</i></p> <ul style="list-style-type: none"> <li>● It's Getting Hot in Here</li> <li>● Disappearing Polar Ice</li> <li>● Apocalypse Now: Natural Disasters</li> <li>● Effects of Climate Change on Biodiversity</li> <li>● Carbon Footprints</li> <li>● Pollution</li> <li>● Save the Great Barrier Reef!</li> <li>● Troubled Waters</li> <li>● Where Have all the Turtles Gone?</li> </ul> <p><i>Climate Technology</i></p> <ul style="list-style-type: none"> <li>● Cleaning Up Our Litter</li> <li>● Computer Modelling and the Environment</li> <li>● Cool Robots</li> <li>● Reclaiming our Climate</li> <li>● STEM: Alternate Fuels</li> </ul>
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## Physical sciences

Content Descriptor	Lesson Names
Energy conservation in a system can be explained by describing energy transfers and transformations	<p><i>Types of Energy</i></p> <ul style="list-style-type: none"> <li>● Types of Energy</li> <li>● Gravitational Potential Energy</li> <li>● Kinetic Energy</li> </ul> <p><i>The Law of Conservation of Energy</i></p> <ul style="list-style-type: none"> <li>● Conservation of Energy</li> <li>● Energy Transfer</li> <li>● Energy Transformations</li> <li>● Work and Power</li> </ul> <p><i>Energy Efficiency</i></p> <ul style="list-style-type: none"> <li>● Useful and Wasted Energy</li> <li>● Energy Efficiency</li> <li>● Energy Calculations</li> <li>● A Green Utopia</li> </ul>

	<ul style="list-style-type: none"> <li>• Electricity Generation</li> </ul> <p><i>Energy Changes Around Us</i></p> <ul style="list-style-type: none"> <li>• Electricity Generation In Australia</li> <li>• Energy in Food</li> <li>• Energy in Rockets</li> <li>• Levitation at UChicago!</li> <li>• Steam Engines</li> <li>• STEM: Life on Mars</li> </ul>
<p>The motion of objects can be described and predicted using the laws of physics</p>	<p><i>Introduction to Motion</i></p> <ul style="list-style-type: none"> <li>• Distance and Time</li> <li>• Displacement and Compass Directions</li> <li>• Calculating Displacement</li> <li>• Speed</li> <li>• Acceleration</li> <li>• Using the Acceleration Formula to Calculate Final Velocity</li> <li>• Using the Acceleration Formula to Calculate Initial Velocity</li> <li>• Using the Acceleration Formula to Calculate Time</li> <li>• Crashing Drones</li> </ul> <p><i>Graphing Motion</i></p> <ul style="list-style-type: none"> <li>• Distance-Time Graphs</li> <li>• Displacement-Time Graphs</li> <li>• Velocity-Time Graphs</li> <li>• Acceleration-Time Graphs</li> <li>• Summary of Motion Graphs</li> <li>• Graphing and Analysing Motion</li> <li>• Motion</li> </ul> <p><i>Introduction to Forces</i></p> <ul style="list-style-type: none"> <li>• Introduction to Forces</li> <li>• Types of Forces: Gravity</li> <li>• STEM: The Mass of an Email</li> <li>• Types of Forces: Magnetism and Friction</li> <li>• Weight and Mass</li> <li>• Extension: Earth's Magnetic Field</li> <li>• Focus on Data: Space Travel: The Weight Loss Sensation!</li> <li>• Friction</li> <li>• Pressure</li> <li>• Tides</li> </ul> <p><i>Newton's Laws of Motion</i></p> <ul style="list-style-type: none"> <li>• Newton's First Law</li> <li>• Comprehension: How Planes Stay Up</li> <li>• Newton's Second Law</li> </ul>





- Newton's Third Law
- Car Safety Systems
- Car Safety Systems Investigation
- History of Rockets
- How BB-8 Works
- Planetary Motion
- Rockets
- Sports Science