Year 9

Science Understanding

Biological sciences

Content Descriptor	Lesson Names
Multi-cellular organisms rely on coordinated and interdependent internal systems to respond to changes to their environment	*Homeostasis* • Basics of Homeostasis • Homeostatic Terms • Stimulus-Response Model • Negative and Positive Feedback • Control Systems • Modelling Human Thermoregulation • Body Temperature • Homeostatic Concepts *Nervous System* • Introduction To The Nervous System • Nerves and Neurons • Central and Peripheral Nervous System • Sympathetic and Parasympathetic Nervous System • Nerve Pathways • Sensory Organs • The Eye • From Zero to Hero! Honey Bee Mathematicians • Starfish Nervous System • The Nervous System *Endocrine System* • Introduction to the Endocrine System • Glands of the Endocrine System • Hormones of the Endocrine System • Regulating Blood Sugar • Endocrine Diseases • Regulating Blood Glucose Levels • Use of Hormones in the Dairy Industry *Diseases* • Introduction to Diseases • Vaccinations • Spread of Infectious Disease • Managing Pandemics in the Asia Region • Modelling Disease Outbreak and Spread

	• The Identification of a Mystery Disease • Bacterial Diseases • Viral Diseases • Viral Infection: Chickenpox • Parasitic Diseases • Parasitic Infection: Malaria • Fungal Diseases • Disease Transmission • Antibiotics • Degenerative Diseases • Pathogens • Smelly Socks and Malaria Transmission • Superbugs are the Real Super Villains • The History of Disease *Immune System* • Introduction to the Immune System • The Body's First and Second Lines of Defence • The Third Line of Defence • Pasteur & Koch • Snake Antivenom Production *Immune Response: Extension* • 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
Ecosystems consist of communities of interdependent organisms and abiotic components of the environment; matter and energy flow through these systems	*Introduction to Ecosystems* • Introduction to Ecology • The Biosphere and Biomes • Species and Organisms *Components of an Ecosystem* • Comprehension: Adapting for Survival • Biotic Factors and Competition • Abiotic Factors • Taking a Lichen to Moss • Predator-Prey Dynamics • Adaptations • Interactions Between Organisms • Symbiosis *Energy in Ecosystems* • Producers • Trophic Levels

	• The Carbon Cycle • Consumers and Decomposers • Food Chains and Food Webs • Producers, Consumers and Decomposers • The Nitrogen Cycle *Changes in Ecosystems* • STEM - Kangaroo Counter • Apocalypse Now: Natural Disasters of September, 2017 • Australian Bushfires • Bee Kind • Biodiversity • Drought • Flooding • History of Conservation • Human Impacts • Invasive Species • Life on Mars • Oil Spills • Pesticides • Predicting Population Changes • Saving Australia's Wildlife • The Greenhouse Effect • Will I Stay or Will I Go?

Chemical sciences

Content Descriptor	Lesson Names
All matter is made of atoms that are composed of protons, neutrons and electrons; natural radioactivity arises from the decay of nuclei in atoms	*Atomic Structure* • What are Atoms, Elements and Compounds? • The Structure of an Atom • Atomic Symbols • Models of the Atom • Watching Paint Dry *The Periodic Table* • The Periodic Table *Ions and Isotopes* • Introduction to Ions • Electron Configuration of Ions • Ionic Compounds • Ions in Solution • Naming Ionic Compounds • Polyatomic Ions and Compounds • The Cave of the Crystals

	• What are Isotopes? *Radioactivity* • What is Radioactivity? • Radioactivity in Industry • Radioactivity in Medicine • Effects of Radiation on Humans • Half-Lives • Marie Curie and Radioactivity • Name That Radiation! • Nuclear Bombs • Nuclear Fission • Nuclear Power • Properties of Radiation • Types of Radiation • Writing Nuclear Equations
Chemical reactions involve rearranging atoms to form new substances; during a chemical reaction mass is not created or destroyed	*Chemical Reactions* • Introduction to Chemical Reactions • Reactants and Products • Fermentation • Waste Management • Chemical Reactions Basics • Chemistry: Glorified Baking? *Chemical Equations* • Reaction in Action: Baking Soda and Vinegar • Writing Word Equations • Writing Chemical and Molecular Equations • Writing Chemical Equations *Conservation of Mass* • Conservation of Mass • Balancing Equations *Applications of Chemistry* • A Day in the Life of an Industrial Chemist • The Father of Modern Chemistry *Acids and Bases* • Acids • Bases • pH and Indicators • Acid-Metal Reactions • Neutralisation Reactions • Acids and Bases *Combustion* • Endothermic and Exothermic Reactions

	• Combustion Reactions • Oxidation Reactions • Identifying Chemical Reactions • Types of Chemical Reaction *Reactions Around Us* • Acid Rain: Reactions Around Us • Combustion and the Environment • Photosynthesis • Respiration

Earth and space sciences

Content Descriptor	Lesson Names
The theory of plate tectonics explains global patterns of geological activity and continental movement	*Structure of the Earth* • Mechanical Layers of the Earth *Plate Tectonics* • Wegener's Theory of Continental Drift • Plate Tectonics • Faults • Extension: Earth's Magnetic Field • Ice Tectonics on Europa • Plate Boundaries • Plate Tectonics • Seafloor Spreading & Magnetic Striping • Subduction Zones and Ophiolite Belts *Tectonic Events* • Volcano Formation • Types of Lava • Volcanic Hazards • Earthquakes • Measuring Earthquakes • Seismic Hazards • Understanding Megaquakes • Volcano Exploration Robots • Volcanoes and Earthquakes *Geological History* • Developing the Geological Timescale • Supercontinents • The Time Traveller's Holiday Guide!

Physical sciences

Content Descriptor	Lesson Names
Energy transfer through different mediums can be explained using wave and particle models	*Communication with Waves* • Cell Phones • Working in Physics • Internet • Radio Waves • The Branches of Physics • X-rays • Radar • History of Radio Communication *Electricity* • Electricity • Circuits • Resistance • Current • Voltage • Introduction to Ohm's Law • Batteries • Calculating Using Ohm's Law • Circuits in Parallel • Comparing Circuits • War of the Currents • Conductors and Insulators • Circuits in Series • Development of Light Bulbs • The Sixth Sense: Electroreception *Heat* • Introduction to Heat Transfer • Conductors and Insulators • Useful and Wasted Energy • Heat Transfer • Conduction • Convection • Focus on Data: The Speed of Heat Transfer • Radiation • Bushfires • Heat Transfer in the Atmosphere and the Oceans • The Cosmic Microwave Background • Editable Documents - Word (.docx) • Conductors and Insulators *Light* • Light as a Wave • Colour

	• 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