

Sciences Subject Group Overview

Grade & Subject	Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6
6 Integrated Science	Ecosystems Concepts: Change Evidence, Environment Global Context: Globalization and sustainability - Consumption, conservation, scarcity Inquiry: Ecosystems function as systems and evidence shows how factors such as scarcity and conservation can change the environment. Assessment: 1. Research (Criteria D) 2. Unit Test (Criteria A) ATL skills: Communication skills: Take effective notes in class, make effective summary notes for studying Reflective Skills: Practise strategies to overcome distractions Organisational Skills: Bring necessary equipment and supplies to class Content summary: - Ecosystems: Abiotic and biotic factors - Habitats/biomes - Adaptations - Competition and interdependence - Food chains and webs	Micro & Macro Worlds Concepts: Systems Function, Form, Global Context: Orientation in space and time - Scale Inquiry: Life exists in different forms and is organised in specialised systems with specific functions that can be understood at different scales. Assessment: 1. Science Investigation Planning (Criteria B) 2. Process & Evaluated a Scientific Investigation (Criteria C) 3. Unit test (Criterion A) ATL skills: Social skills - Collaboration Skills: Listening actively to others. Practice empathy. Encourage others to contribute. Manage and resolve conflict and work collaboratively in teams. Content summary: - Microscopes - Cells & Organelles - Characteristics of living things - Specialised Cells - Levels of Organisation: Cells, tissues,	Energy Matters Concepts: Change Models & Energy Global Context: Scientific and Technological Innovation - Systems, models, methods Inquiry: Observations and models that allow us to study and understand changes of matter and the energy involved in those changes, have shaped scientific and technical innovation throughout history. Assessment: 1. Scientific Research Infographic (Criteria A & D) ATL skills: Communication skills: Organise and depict information logically Organisational skills: Completes assignments on time. Uses feedback in rubrics to improve levels of achievement Content summary: - States of matter - Changes of state - Water & Solutions - Separating Techniques - Bunsen burner safety - Changes of States - Graphing	Use the Force Concepts: Relationships Movement & Interactions Global Context: Orientation in Time and Space Inquiry: By investigating the relationships between movements and interactions one can reflect on humankind's orientation in both time and space. 1. Science Investigation Planning & Process & Evaluated a Scientific Investigation (Criteria B & C) 2. Unit test (Criterion A) ATL skills: Communication skills: Understand and use mathematical notation Transfer skills: Make connections between subject groups and disciplines. Critical-thinking skills: Evaluate evidence and arguments Content summary: - Forces & Newton Balances - Balanced & Unbalanced Forces - Newton's Laws - Weight, mass, gravity - Calculations		

	- Material Cycles (Water, Carbon Dioxide & Nitrogen) - Predator Prey Cycles - Plant Reproduction	organs, organ systems - Life cycles - Puberty - Human reproductive system - Fertilization and the human life cycle	Heat transfer	- Simple machines - Moment & Work done - Egg drop - Bottle rocket		
7 Integrated Science	Exploring Explosions Concepts: Relationships, Patterns, Interactions Global Context: Scientific and Technological Innovation Inquiry: Interactions between atoms follow patterns within the periodic table and can lead to reactions, which can be both beneficial and harmful; we can predict how elements will act and their uses based on these patterns and understanding of the atomic model. Assessment: 1. Film Canister Lab (Criteria B & C) 2. Bhopal Disaster Analysis (Criterion D) 3. Advertising an Element (Criteria A &, D) 4. <i>Boom!</i> Final Assessment (Criteria A & D) ATL skills: Communication skills: Use and interpret a range of discipline-specific terms and symbols Organization skills: Plan short- and long-term assignments; meet deadlines Information literacy skills: Collect, record and verify data	Life Through Time Concepts: Change, Evidence, Environment Global Context: Orientation in Time and Space Inquiry: Evidence shows that life has changed through time and continues to change as a consequence of environmental pressures. Assessment: 1. Fishbowl Debate (Criteria A & D) 2. Five second Rule analysis (Criteria B & C) ATL skills: Communication skills: Use a variety of speaking techniques to communicate with a variety of audiences Collaborate with peers and experts using a variety of digital environments and media. Make inferences and draw conclusions Take effective notes in class Organize and depict information logically Collaboration skills Take responsibility for one's own actions Listen actively to other perspectives and ideas Organization skills	Energy Concepts : Systems, Energy, Transformation Global Context: Scientific and Technological Innovation Inquiry: Scientists can influence transfers of energy in order to increase the usefulness of the energy to a given machine or system. Assessment: 1. Energy Transformations Investigation (Criteria B,C) 2. Energy Islands (Crit. A, D) 3. Unit Test (Criterion A) ATL skills: Communication skills: Use appropriate forms of writing for different purposes and audiences Organization skills: Plan short- and long-term assignments; meet deadlines Information literacy skills: Collect, record and verify data Make connections between various sources of information Critical-thinking skills: Practise observing carefully in order to recognize problems	Climate Change Concepts: Systems, Change, Balance, Consequences Global Context: Globalisation and Sustainability Inquiry: Planet Earth has a unique climate that is the result of a balance in interacting systems (biosphere, hydrosphere and atmosphere) and changes in this balance has consequences on living organisms. Assessment: 1. Unit Test (Criterion A) 2. Fishbowl debate (Crit A,D) ATL skills: Communication skills: Make inferences and draw conclusions; Use and interpret a range of discipline-specific terms and symbols; Preview and skim texts to build understanding; Take effective notes in class Collaboration skills: Take responsibility for one's own actions Reflection skills: Consider ethical, cultural and environmental implications Critical-thinking skills: Interpret data		

	Access information to be informed and inform others Process data and report results Critical-thinking skills: Practise observing carefully in order to recognize problems Gather and organize relevant information to formulate an argument; Interpret data Content summary: Chemical and physical changes Atomic model Molecules, elements, compounds, mixtures Reactivity of metals	Keep an organized and logical system of information files/notebooks Reflection skills Keep a journal to record reflections Critical-thinking skills Interpret data Draw reasonable conclusions and generalizations Content summary: Evolution Species Adaptation Classification Habitats and ecosystems Climate	Interpret data: Evaluate evidence and arguments; Draw reasonable conclusions and generalizations; Test generalizations and conclusions Creative-thinking skills: Use brainstorming and visual diagrams to generate new ideas and inquiries; Consider multiple alternatives, including those that might be unlikely or impossible Transfer skills: Transfer current knowledge to learning of new technologies Content summary: States of matter Transfer of energy and energy conservation Energy efficiency Global energy applications	Content summary: Greenhouse gases Water cycle Global warming States of matter Conservation of energy		
8 Integrated Science	Acids and alkalis Concepts: Change, consequences Global Context: Scientific and technical innovations (Systems, models, methods) Inquiry: Scientists and innovators can use their understanding of acids and alkalis to address consequences of global systems change such as ocean acidification. Assessment: 1. End of unit test (Crit A) 2. Blog about carbon capture techniques (Crit D) ATL skills: Critical Thinking: Evaluate sources	Human body systems Concepts: Systems, Interactions Global Context: Scientific and technical innovations (systems, models, methods) Inquiry: When the structures of the human body are unable to perform their functions, interactions across the body's systems are disrupted. Assessment: 1. End of unit test (Crit A) 2. Human body lab reports (Crit B & C) 3. Disease poster (Crit D) ATL skills: Self-management - Organization skills:	Reproduction Concepts: Relationships, Interaction and consequences Global Context: Identities and relationships (physical, psychological and social development) Inquiry: Sex and sexuality are foundational to identity, as young people reach sexual maturity the interactions they have can impact their relationships with the choices made having consequences for the well being and physical health of themselves and others. Assessment: 1. End of unit test (Crit A)	Electricity Concept: Systems, Models Global Context: Scientific and technical innovations (systems, models, methods) Inquiry: Knowledge of electrical models allows humans to build electrical systems that transfer and harness energy for many different functions. Assessment: 1. End of unit test (Crit A) 2. Static electricity lab report (Crit B & C) ATL skills: Social - Collaboration Skills: Use group roles to clarify and organize individual responsibilities	IDU (with English) Ocean Acidification Concepts: Change, communication, environment, purpose Global Context: Globalization and sustainability (Human impact on the environment) Inquiry: Purposeful communication can shape human behavior to drive positive environmental change. Assessment: 1. Eco-poem (Ai, Bi) 2. Reflective log (Aii, Bii, Ci, Cii) ATL skills: Thinking - Creative thinking skills: Generate multiple new	

	Communication skills: Take effective notes in class Content summary: • Ocean acidification • Atomic structure • Atoms, elements, compounds, mixtures • Acids and alkalis • carbonates • Neutralisation • Writing word equations	Set goals that are challenging and realistic Thinking - Critical thinking skills: Analyse complex information Content summary: • Lab investigation skills • Cells, tissues, organs, organ systems • Microscopes • Structures, function and failures of respiratory and cellular respiration; Circulatory system; Digestive system; Musculoskeletal system; Nervous system; Immune system • Diseases	2. Contraception fishbowl debate (Crit D) ATL skills: Communication: Listen actively and respectfully Thinking - Critical thinking skills: Consider ideas from multiple perspectives Content summary: • Asexual vs sexual reproduction • Human reproductive organs • Fertilisation • Contraception • DNA and chromosomes • Genes and traits • Mutations	Thinking - Critical thinking skills: Analyse complex information Content summary: • Static electricity • Van der Graaf • Triboelectric series • Series and parallel circuits • Current and voltage • Switches • Resistance and Ohm's law • Global electricity problems	ideas, solutions and inquiries Self-management - Reflection skills: Reflect on and evaluate content learning Content summary from science: • What ocean acidification is and its causes , Equation explaining ocean acidification • Impacts of ocean acidification. • How a technology or practice can contribute to the reduction of carbon being absorbed by the ocean.	
9 Integrated Science	Ecology Concepts: Systems, Interaction Global Context: Globalization and sustainability Inquiry: Interactions between organisms and their environment can affect the ways systems work Assessment: 1. End of unit test (Crit A) 2. Lab report (Crit B&C) ATL skills: Social - Collaboration Skills: Use group roles to clarify and organize	Atomic theory Concepts: Models, Patterns Global Context: Scientific and Technical Innovation Inquiry: Patterns in the periodic table allow scientists to create models of atoms and predict how they bond Assessment: 1. End of unit test (Crit A, strand 3) 2. Simple covalent bonding presentation (Crit D) ATL skills:	Forces and energy Concepts: Change, Balance Global Context: Orientation in Space and Time Inquiry: Understanding the relationships within simple machines allows humans to balance and move objects Assessment: 1. End of unit test (Crit A) 2. Pyramids essay (Crit D) ATL skills: Self-management: Reflect on and evaluate content learning	Chemical reactions Concepts: Patterns Transformation Global Context: Scientific and Technical Innovation Inquiry: By interpreting patterns of transformation, students can explain changes in reactions. Assessment: 1. End of unit test (Crit A) 2. Dilutions lab report (Crit B&C) ATL skills: Thinking - Critical thinking skills: Identify connections (patterns,		

	individual responsibilities Thinking - Critical thinking skills: Identify connections (patterns, trends and relationships) Content summary: • Biotic and Abiotic Factors • Feeding Interactions • Measuring ecosystem factors • Food Chains/Webs • Fieldtrip - Pond Dip • Biodiversity Calculation	Communication: Receive and carefully consider feedback Thinking - Critical thinking skills: Analyse complex information Content summary: • Atomic structure • History of the atom • Isotopes • Ionic, covalent and metallic bonding • Elements and the periodic table • Groups in the periodic table • Writing ionic formulae • Balancing equations	Critical Thinking: Evaluate sources Content summary: • Forces, mass, and weight • Work and power • Efficiency and Sankey diagrams • Ramps, levers and pulleys • Energy types and transfers • KE and GPE calculations • Upthrust & Buoyancy	trends and relationships) Social - Collaboration Skills: Use group roles to clarify and organize individual responsibilities Content summary: • Metal reactions with water, acids and oxygen • Metal carbonate and acid • Acid and alkali • Displacement reactions • Reactivity Series • Dilutions	
10 Biology	Cells Concepts: Systems, Models & Movement Global Context: Scientific and technical innovation: The biological revolution Inquiry: Scientists use models of cells and movement to explore potential benefits for humankind. Assessment: 1. Cells Test (Criteria A) 2. Transport Lab Report (Criteria B & C) 3. Stem Cell Ethics Fishbowl Discussion (Criteria D) ATL skills: Communication: Understand mathematical notation Collaboration skills: Listen actively to other perspectives and ideas;	Human anatomy & physiology Concepts: Relationships, Form & Function Global Context: Identities and relationships :Health and well-being Inquiry: Scientists examine the relationship between form and function to understand more about human health and well-being. Assessment: 1. Anatomy & Physiology Test (Criteria A) 2. Effects of Exercise Lab Skills Assessment (Criteria B & C) 3. Reaction Times Lab Report (Criteria B & C) 4. Nervous System Test (Criteria A) ATL skills: Communication skills	Genetics & Evolution Concepts: Change, Patterns & Evidence Global Context: Orientation in space and time:Evolution, constraints and adaptation Inquiry: Scientists examine inheritance patterns and evaluate evidence to understand evolutionary change. 1. Genetics & Evolution Test (Criteria A) 2. Embryo Screening Ethics Fishbowl Discussion (Criteria D) ATL skills: Critical-thinking skills: Gather and organize relevant information to formulate an argument; Consider ideas from multiple perspectives	Plants & photosynthesis Concepts: Systems, Balance & Environment Global Context: Globalization and sustainability: global food security. Inquiry: Scientists consider how plants, as open systems, interact with their environment to support balanced ecosystems. Assessment: 1. Photosynthesis Lab Report (Criteria B & C) 2. End of Semester Exam (Criteria A) ATL skills: Reflection skills: Consider ATL skills development Information literacy skills: Use memory techniques to develop	IDU (with Mathematics) - Rising above misrepresentation Concepts: Relationships, Evidence, Representation, Validity Inquiry: The representation of evidence has the potential to significantly impact the fairness, validity, and accuracy of reporting on relationships between variables. Assessment: 1. Climate change data report (Ai, Bi) 2. Presentation to interview panel (Aii, Bii; Ci, Cii) ATL skills: Communication skills: Negotiate ideas and knowledge with peers and teachers

	Give and receive meaningful feedback Organization skills: Plan short- and long-term assignments; meet deadlines Content summary: • Structure and function of plant and animal cells • Microscope calculations • Cell transport - diffusion, osmosis, active transport • Stem cells and ethics	Take effective notes in class Make effective summary notes for studying Information literacy skills: Process data and report results Critical-thinking skills: Interpret data Content summary: • Structure and function in the respiratory system • Aerobic and anaerobic respiration; gas exchange • Measuring the effects of exercise on the body • The heart, blood and blood vessels • Structure and function in the nervous system (central and peripheral) • Reflex actions and reaction times • Action potentials and synaptic transmission	Creative-thinking skills: Practise flexible thinking—develop multiple opposing, contradictory and complementary arguments Content summary: • Structure of DNA, RNA and protein synthesis • Inheritance and genetic disorders • Embryo screening and ethics • Mitosis and meiosis • Natural selection and evolution, ring species	long-term memory; Process data and report results Content summary: • Structure of flowering plants and plant reproduction • Seed dispersal, fruit formation, germination • Transpiration • Structure and function in a leaf; leaf chromatography • Photosynthesis and limiting factors • Measuring rates of photosynthesis	Media literacy skills: Understand the impact of media representations and modes of presentation Content summary from science: • Creating correctly formatted graphs and tables • Processing data • Evaluating the validity of data to support a claim • Identifying patterns in data • Identifying sources of uncertainty or possible bias in data • Suggesting improvements to data processing	
10 Chemistry	Ions and Our Health Concepts: Evidence, Relationships Inquiry: Scientists continue to seek better understandings of the role of various elements in human health Assessment: 1. Test (Criteria A) 2. Water hardness Lab Report (Criteria B & C)	Molecules and our Lives Concepts: Environment, consequences, transfer, relationships Inquiry: The idea of 'think globally, act locally' is so important to the protection of fragile ecosystems Assessment:	Moles Concepts: Balance, Models, Patterns, Change Inquiry: The mole is simply a way to measure the amount of a substance Assessment: 1. Test (Criteria A) 2. Empirical Formula Lab (Criteria B & C)	Drugs and Medicine Concepts: Function, Models, Relationships Inquiry: The relationship between functional groups and shape in molecules may influence the way they affect the body Assessment: 1. Test (Criteria A)	Rates Concepts: Conditions, Evidence, Change Inquiry: The evidence provided by changing the conditions of a chemical reaction suggests that some reactions take place faster than others Assessment: 1. Test (Criteria A)	IDU (with Mathematics) - Rising above misrepresentation Concept: Relationships, Evidence, Representation, Validity, Systems Inquiry: The representation of evidence has the potential to significantly impact the fairness,

	3. Arsenic Essay (Criteria D) ATL skills: Reflection skills Consider ethical, cultural and environmental implications Media literacy skills Seek a range of perspectives from multiple and varied sources Critical-thinking skills Gather and organize relevant information to formulate an argument Content summary: • Atoms and ions • Ionic bonding • Understand why • Polyatomic ions. • The periodic table • Transition metal ions • Writing formulae • Naming compounds • Hard water • Negative and positive effects of hardness. • Hardness removal • Structure and properties of ionic compounds • Precipitation reactions. • Testing for metal, halide, sulfate and carbonate ions	1. Viscosity Lab (Criteria B) ATL skills: Communication skills Make inferences and draw conclusions Understand and use mathematical notation Take effective notes in class Organize and depict information logically Content summary: • Covalent bonding • Lewis structures • Inter-molecular forces. • Structure and properties of simple and giant molecular substances • Explain the • Diamond vs. graphite. • Compare the bonding and properties of ionic, simple molecular and giant molecular substances. • Crude oil • Homologous series - alkanes • Structural and molecular formulae of alkanes. • Trends in the alkanes - investigation • Isomerism - C₄H₁₀. • Combustion of alkanes • Fractional distillation and	ATL skills: Communication skills Understand and use mathematical notation Content summary: • Isotopes • The Mole • Triangle • Relative atomic mass (RAM) • Calculating relative formula mass (RFM) • The mole expression • Empirical Formulae • Balanced Equations • Calculations from equations	2. Lab Report (Criteria B & C) 3. Drug Safety Essay (Criteria D) ATL skills: Information literacy skills Collect and analyse data to identify solutions and make informed decisions Media literacy skills Demonstrate awareness of media interpretations of events and ideas (including digital social media) Critical-thinking skills Recognize unstated assumptions and bias Content summary: • Functional groups in diagrams. • Short and long term effects of different medicines and drugs: stimulants, depressants, analgesics, anti-depressants, amphetamines, mind-altering drugs • Types, functions and workings of analgesics • Placebos • Breathalysers • Structure of drugs eg, indole rings	2. Rates of Reactions (Criteria B & C) 3. Fishbowl Presentation (Criteria D) ATL skills: Reflection skills: Consider content Information literacy skills: Collect, record and verify data Critical-thinking skills: Interpret data Creative-thinking skills: Make guesses, ask "what if" questions and generate testable hypotheses Content summary: • Following the course of a reaction • Measuring the rate of reactions • Calculate the rate of reactions • Factors that affect reaction rate • Collision theory • Catalysts	validity, and accuracy of reporting on relationships between variables. Assessment: 1. Climate change data report (Ai, Bi) 2. Presentation to interview panel (Aii, Bii; Ci, Cii) ATL skills: Communication skills: Negotiate ideas and knowledge with peers and teachers Media literacy skills: Understand the impact of media representations and modes of presentation Content summary from science: • Creating correctly formatted graphs and tables • Processing data • Evaluating the validity of data to support a claim • Identifying patterns in data • Identifying sources of uncertainty or possible bias in data • Suggesting improvements to data processing
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		properties of each fraction • CFCs and their history. •				
10 Physics	Further, faster, higher, Change Concepts: Change Models, movement Global Context: Orientation in space and time - Scale, duration, frequency and variability Inquiry: We can describe movement (change of position over duration of time in space) using mathematical and graphical models. Assessment: 1. Test (Criteria A) 2. Lab Report - Mini Launchers (Criteria B & C) ATL skills: Communication skills Use a variety of speaking techniques to communicate with a variety of audiences Collaboration skills Give and receive meaningful feedback Organisation skills Plan short- and long-term assignments; meet deadlines Content summary: • Kinematics • Motion graphs • Equations of motion • Circular Motion (Velocity & Acceleration), • Dynamics • Stopping Distance	Sound of Music Concepts: Change Energy, movement Global Context: Orientation in space and time - Scale, duration, frequency and variability Inquiry: Waves caused by a change in the position of the oscillators in the medium of a certain time period and frequency propagate and transfer energy in space through a medium. Assessment: 1. Test (Criteria A) 2. Sem 1 Exam, ATL skills: Communication skills Understand and use mathematical notation Make effective summary notes for studying Reflection skills Consider content Content summary: • Wave Properties • Wave Behavior • Wave Types • Sound Waves • String instruments & calculations • Wind instruments & calculations	Road Safety Concepts: Relationships Movement; Energy Global Context: Scientific and technical innovation - Modernization, industrialization and engineering Inquiry: By using our understanding of mechanics and the technical improvements in transport, the relationship between matter, motion and energy can be studied to make transport safer. Assessment: 1. Unit Test (Criteria A) 2. Paper Helicopter (Criteria B & C) 3. Car Safety Essay (Criteria D) ATL skills: Communication skills Give and receive meaningful feedback Organization skills Plan short- and long-term assignments; meet deadlines Information literacy skills Process data and report results Content summary: • Newton's Laws of Motion • Momentum and its calculation, conservation, and impulse	EM waves Concepts: Change Models & Movement Global Context: Orientation in time and space - Scale, duration, frequency and variability Inquiry: Using models we can interpret the movement and characteristics of different wave frequencies. Assessment: Formative focused ATL skills: Communication skills Give and receive meaningful feedback Content summary: • Properties of EM Waves • EM spectrum • Refraction • TIR - Total Internal Reflection • Snell's law • Lenses • Eye • Radioactivity • Structure of atom • Fission and Fusion • Nuclear power	Electricity Concepts: Relationships Interaction, Energy Global Context: Scientific and technical innovation - products, processes and solutions Inquiry: By understanding electricity, the interactions and relationship between current, PD, resistance and energy, one can generate solutions. Assessment: 1. End of Semester Test (Criteria A) ATL skills: Collaboration skills Take responsibility for one's own actions Organization skills Use appropriate strategies for organizing complex information Creative-thinking skills Use brainstorming and visual diagrams to generate new ideas and inquiries Content summary: • Potential Difference • Series Circuits • Parallel Circuits • Resistance Calculations • Circuits Data, Graph Plotting & Interpreting	IDU (with Mathematics) - Rising above misrepresentation Concepts: Systems Relationships, Evidence, Representation, Validity Global Context: Fairness and Development - Fair and accurate reporting Inquiry: The representation of evidence has the potential to significantly impact the fairness, validity, and accuracy of reporting on relationships between variables. Assessment: 1. Climate change data report (Ai, Bi) 2. Presentation to interview panel (Aii, Bii; Ci, Cii) ATL skills: Communication skills: Negotiate ideas and knowledge with peers and teachers Media literacy skills: Understand the impact of media representations and modes of presentation Content summary from science: • Creating correctly formatted graphs and tables • Processing data

			• Energy conversion and transfer • Forces and drawing force (free body) diagrams • Collisions -forces, energy, and momentum • Safety features of vehicles using concepts of forces, energy, and momentum		• Describe the VI graph for ohmic resistances of different values.	• Evaluating the validity of data to support a claim • Identifying patterns in data • Identifying sources of uncertainty or possible bias in data • Suggesting improvements to data processing
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