

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: SM3: I can apply organisational strategies to manage time and resources effectively. S2: I can build relationships and work effectively with diverse peers. Content summary: • Ecosystems: Abiotic and biotic factors • Habitats/biomes • Adaptations • Competition and interdependence • Food chains and webs • Material Cycles (Water, Carbon Dioxide & Nitrogen)	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: C2: I can express clear, concise, and relevant ideas using subject-specific language. C5: I can effectively structure and organise information using an appropriate format. 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: R5: I can conduct research ethically and with academic integrity, managing and citing sources correctly. T5: I can critically evaluate ideas and decisions with attention to ethics and sustainability. Content summary: • States of matter • Changes of state • Water & Solutions • Separating Techniques • Bunsen burner safety	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: SM5: I can reflect on my strengths and areas for development, acting on feedback to grow. S3: I can support others to participate and succeed through inclusive and productive collaboration. Content summary: • Forces & Newton Balances • Balanced & Unbalanced Forces • Newton's Laws • Weight, mass, gravity - Calculations • Simple machines		

	- Predator Prey Cycles - Plant Reproduction	organs, organ systems - Life cycles - Puberty - Human reproductive system - Fertilization and the human life cycle	- Changes of States - Graphing - Heat transfer	- Moment & Work done - Bottle rocket		
7 Integrated Science	Exploring Explosions Concepts: Relationships, Patterns, Interactions Global Context: Scientific and Technical 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: C2: I can express clear, concise, and relevant ideas using	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: R2: I can access a variety of credible sources, evaluating for	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: C1: I can listen actively to understand information and ideas. S3: I can support others to participate and	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: C5: I can effectively structure and organise	

	subject-specific language. R4: I can extract, summarise, and organise key points from research sources. Content summary: • Ocean acidification • Atomic structure • Atoms, elements, compounds, mixtures • Acids and alkalis • carbonates • Neutralisation • Writing word equations	bias, accuracy, and reliability. SM3: I can apply organisational strategies to manage time and resources effectively. 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: S4: I can consider and take responsibility for the impact of my actions on others. T2: I can interpret, analyse, and synthesise information to form evidence-based conclusions. Content summary: • Asexual vs sexual reproduction • Human reproductive organs • Fertilisation • Contraception • DNA and chromosomes • Genes and traits • Mutations	succeed through inclusive and productive collaboration. 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	information using an appropriate format. 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: C5: I can effectively structure and organise	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. Ramps assessment (Crit C) 3. Pyramids essay (Crit D) ATL skills:	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 assessment (Crit B) ATL skills: S3: I can support others to participate and succeed through		

	information using an appropriate format. T3: I can draw meaningful connections from my learning and apply them to unfamiliar contexts. Content summary: • Biotic and Abiotic Factors • Feeding Interactions • Measuring ecosystem factors • Food Chains/Webs • Fieldtrip - Pond Dip • Biodiversity Calculation	C2: I can express clear, concise, and relevant ideas using subject-specific language. 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	SM5: I can reflect on my strengths and areas for development, acting on feedback to grow. T1: I can explore concepts and develop solutions with curiosity and creativity . 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 • Uplthrust & Buoyancy	inclusive and productive collaboration. Content summary: • Metal reactions with water, acids and oxygen • Metal carbonate and acid • Acid and alkali • Dilutions • Writing ionic formulae • Balancing equations		
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: R2: I can access a variety of credible sources, evaluating for bias, accuracy, and reliability. R5: I can conduct research	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:	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. Assessment: 1. Genetics & Evolution Test (Criteria A) 2. Embryo Screening Ethics Fishbowl Discussion (Criteria D) ATL skills: C3: I can engage meaningfully in discussions to explore ideas critically and creatively. T5: I can critically evaluate ideas and decisions with	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: C2: I can express clear, concise, and relevant ideas using subject-specific language. T3: I can draw meaningful	IDU Data for Change (with Mathematics) Concepts: Relationships, Energy, Representation. Inquiry: Representations of data reveal relationships in energy systems that can inform our understanding of environmental challenges. Assessment: 1. Data report (Ai, Bi) 2. Case study (Cii) 3. Reflection (Aii, Bii, Ci) ATL skills: S3: I can support others to participate and succeed through inclusive and productive collaboration. T2: I can interpret, analyse, and synthesise information to form	

	ethically and with academic integrity, managing and citing sources correctly Content summary: - Structure and function of plant and animal cells - Microscope calculations - Cell transport - diffusion, osmosis, active transport - Stem cells and ethics	SM3: I can apply organisational strategies to manage time and resources effectively. S2: I can build relationships and work effectively with diverse peers. 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	attention to ethics and sustainability. 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	connections from my learning and apply them to unfamiliar contexts. 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	evidence-based conclusions. Content summary: - Subject specific content (energy related) - Creating correctly formatted graphs and tables - Processing data - calculating means and standard deviation - Drawing conclusions from data - Identifying patterns in data - Applying patterns and data to real life contexts	
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: - Test (Criteria A) - Water hardness Lab Report (Criteria C) - Ionic compound essay (Criteria D)	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: Viscosity Lab (Criteria B)	Moles Concepts: Balance, Models, Patterns, Change Inquiry: The mole is simply a way to measure the amount of a substance Assessment: - Test (Criteria A) - Empirical Formula Lab (Criteria C) ATL skills:	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: Drug Safety Essay (Criteria D) ATL skills:	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: - Test (Criteria A) - Rates of Reactions (Criteria B & C)	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, validity, and accuracy of

	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	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 properties of each fraction	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	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 of analgesics • Placebos • Breathalysers • Structure of drugs eg, indole rings	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	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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		CFCs and their history.				
10 Physics	Further, faster, higher, 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 - Energy conversion and transfer	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 - Describe the VI graph for ohmic resistances of different values.	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 - Evaluating the validity of data to support a

			• Forces and drawing force (free body) diagrams • Collisions -forces, energy, and momentum • Safety features of vehicles using concepts of forces, energy, and momentum			claim • Identifying patterns in data • Identifying sources of uncertainty or possible bias in data • Suggesting improvements to data processing
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