

INTEGRATED SCIENCE OVERVIEW MYP 1 TR NDOME

Year 1

Unit title	Key concept	Related concept(s)	Global context	Statement of inquiry	Objectives	ATL skills	Content
Unit 1 – What do scientists do?	Relationship	Evidence	Identities and relationships	To be a scientist means to gather evidence about similarity and difference in nature and to understand how things are related.	Criterion A; KNOWLEDGE AND UNDERSTANDING Demonstrate knowledge of safety rules and laboratory apparatus CRITERION B; INQUIRING AND DESIGNING Design a simple experiment using appropriate laboratory apparatus and adhere to safety protocols	RESEARCH SKILLS; Data collection. Identify different sources of information related to scientific evidence Social skills; Engage to group activities and discussions related to laboratory experiments and what scientists do. SELF MANAGEMENT SKILLS; Manage time and resources effectively when researching, planning and doing experiments involving evidence and what scientists do.	-Knowing what experiments are and their importance. -Laboratory safety rules. -Laboratory equipment's and their uses. -Knowing the world and work of scientists.

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2; What changes.	Change	Form Transformation	Fairness and development Unit	Science enables us to change the form of matter into useful materials that can make the world a better place.	CRITERION A- KNOWING AND UNDERSTANDING Learners will explain different states of matter and describe different methods of mixture separation. CRITERION B- INQUIRING AND DESIGNING- Design a simple experiment involving methods of mixture separation CRITERION D- REFLECTING ON THE IMPACTS OF SCIENCE Learners will write a reflective essay on different states of matter and different methods of mixture separation	Thinking–interpreting data gained from scientific investigations Social– Collaboration skills. Practice on group discussions and giving feedback on the design of experimental methods. Communication skills- use of appropriate scientific language in scientific presentations	-Investigation of matter and its changes from one form to another -Methods of mixture separation -Uses of different methods of separation.

Unit 3; How do living things work?	Relationships	Form Function	Globalization and sustainability.	By understanding the relationship between the necessities of life and the specialized forms and functions of living things, we can make decisions and take actions for healthier and more sustainable lifestyles	CRITERION A- KNOWING AND UNDERSTANDING- Demonstration of knowledge on living things and how they live. CRITERION B- INQUIRING AND DESIGNING- Design of simple experiments involving living things and their characteristics CRITERION C- PROCESSING AND EVALUATING- Effectively do	Thinking–Critical thinking skills, Creative and transfer skills. Social skills- Collaborating with others in group discussions involving living things and their characteristics.	Characteristics and needs all living things share; relationship between specialized forms and functions of living things and where and how they live

					presentations on how living things live and their characteristics through presentations		
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Unit 4; What makes change happen?	Change	Energy	Globalization and sustainability	Through controlling energy, we can make changes happen that have an impact on the way people live now and, in the future,	CRITERION A- KNOWING AND UNDERSTANDING G-Describe different types of energy and how to measure them and the different modes of heat transfer. CRITERION B- INQUIRING AND DESIGNING- Design a simple experiment involving energy transfer	Thinking skills; Analyze and evaluate different modes of heat transfer and types of energy. Self-management skills; Manage time and resources effectively when researching on different types of energy and different modes of heat transfer. Social skills-Engage in team-based activities related to studying energy, temperature and different modes of heat transfer	different types of energy how we can measure energy temperature, thermometers conduction, convection, radiation conductors, insulators energy saving in the house
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Unit 5 - How can we study living world?	Systems	Balance interaction	Scientific and technical innovation	Scientists have developed methods and maintain the interaction that keep ecosystem in balance.	CRITERION A- KNOWING AND UNDERSTANDING G-Describe an ecosystem and what makes it. CRITERION B; INQUIRING AND DESIGNING Design an experiment involving what makes a healthy ecosystem CRITERION C; PROCESSING AND EVALUATING	Research skills; Identify, evaluate and use reliable sources to collect information about ecosystem	ecosystem, sustainability in ecosystem, biomass, mesocosm in a bottle, what makes a healthy ecosystem

					Evaluate and communicate systems related to the ecosystem.		
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Unit 6 - Where do we fit in the world	Systems	Models Environment	Orientation in space and time	We have learnt about our place in the systems that affect life on Earth through looking beyond into space and making models.	CRITERION A; KNOWLEDGE AND UNDERSTAN DIN G Demonstrate a thorough understanding of the solar system, including the characteristics and dynamics of celestial bodies and their interactions. CRITERION B; INQUIRING AND DESIGNING Design an experiment involving the solar system, different planets and layers of the earth's atmosphere. CRITERION C; PROCESSING AND EVALUATING Effectively communicate understanding and analyses of	Communication skills . Presentation skills, present information about the solar system and formation of rocks Thinking skills; Analyze and evaluate the solar system, earths layers and formation of rocks Self-management skills; Manage time and resources effectively when conducting experiments and adhering to deadlines when given some research projects on the solar system and the earths layers	Solar system, planets and other orbiting objects Earth layers, tectonic plates, formation of rocks Layers of the Earth's atmosphere
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					the solar system		
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					through various forms of presentation		
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INTEGRATED SCIENCE OVERVIEW MYP 2 TR. WANJIRA

Unit title and teaching hours	Key concept	Related concepts	Global context	Statement of inquiry	Objectives	ATL skills	Content
Unit 1 – How do we respond to our world? 6 Weeks 18 hours	Change	Consequences	Scientific and Technical innovation AOE: Adaptation	Scientific innovations designed to enhance our ability to perceive and respond to change in our surroundings have consequences on our survival.	Criterion A Students complete a summative quiz or written test with short answer, multiple choice, and diagram-labeling questions. Criterion D Students research a scientific or technological development related to human response and reception and reflect on its impact on society.	Thinking skills Creative thinking Creative thinking will be nurtured early in the unit, students will be guided to generate original ideas by brainstorming how different organisms might respond to extreme or unfamiliar environmental changes. Critical Thinking Skills Critical thinking will be developed through structured inquiry and analysis. Students will be explicitly taught how to ask precise, investigable questions and how to evaluate information critically. This will involve interpreting data from experiments, identifying patterns, and forming reasoned conclusions based on evidence.	How organisms perceive and respond to changes in their surroundings. Nervous system How species adapt to conditions in their environment Natural selection

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Unit 2- How do we map matter? 6 Weeks 18 hours	Change	Models, Patterns	Scientific and Technical innovation AOE: Models	By changing matter , we can identify patterns in properties that help us to make models , and the models help us invent new kind of material .	Criteria A: Knowledge and Understanding Students will complete a written task to show their understanding of matter. Criterion B: Inquiring and Designing Students will create a testable question, identify variables, and write a clear, detailed method to show their planning skills. Criterion C: Processing and evaluating After performing their experiment, students will organize their results, identify signs of chemical change, and explain what the results mean. Criterion D: Reflecting on the impacts of science Students will research how a chemical product or material is used in everyday life. They will explain the science behind it and reflect on its benefits, risks, and impact on people and the environment.	Thinking skills Critical thinking is promoted through activities like comparing substances, predicting reaction outcomes, and evaluating classification systems. Creative thinking is encouraged through modeling atoms and compounds, and suggesting alternative experiments or real-world applications, helping students apply and extend their learning in meaningful ways. Research skills Information literacy skills Are developed as students investigate substance interactions, the Periodic Table, and real-life uses of chemicals. They learn to create focused questions, use keywords, find reliable sources, and cite them properly.	What substances are pure? What substances are impure? How do pure substances combine? What is an atom? How can patterns of properties be used to organize elements? What kind of chemical reactions can take place? How can we represent chemical change? How do we exploit properties of chemicals?

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Unit 3 – What does a wave tell us?	Relationship	Energy Form	Personal and Cultural	Understanding the relationships between different forms of wave energy helps us better communicate and express our thoughts.	Criteria A: Knowledge and Understanding	Social Skills – Collaboration	What is a wave? What kind of energy travel as waves?
6 Weeks			Expressions	AOE: Fields and disciplines	Students will complete a written assessment or quiz to show their understanding of wave types, properties and behavior.	Students develop teamwork skills through group experiments and activities, with assigned roles to ensure shared responsibility.	What is light? how are we sensitive to energy that travels as waves? What other kind of electromagnetic radiations are there? Do artists and scientists have anything to say to each other? How are we sensitive to sound wave?
18 hours					Criterion B: Inquiring and Designing	Communication Skills	
					Students will design an experiment to investigate a wave-related phenomenon, such as how surface type affects sound reflection.	Students practice scientific communication using correct terminology, diagrams, and models.	
					Criterion C: Processing and Evaluating	Research Skills – Information Literacy	
					After conducting their wave experiment, students will analyze their data, present results in charts or graphs, and draw conclusions based on evidence.	Students learn how to find and evaluate credible sources on wave-related topics. They develop focused research questions, gather key information, and cite sources properly.	
					Criterion D: Reflection	Creative and Critical Thinking Skills	
					Students will research a real-world application of waves such as the use of X-rays in medicine, ultrasound in imaging, or sound engineering in music and reflect on its scientific basis and societal impact.	Critical thinking is developed through data analysis, predictions, and drawing conclusions. Creativity is encouraged through designing experiments and models	
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UNIT 4 – Who are we?	Relationship	Evidence Pattern	Identities and Relationships AOE Health and wellbeing	Because scientists understand the relationships between genes and inherited characteristics, we can use genetic patterns as evidence for identification and decision-making .	Criteria A: Knowledge and Understanding Students will complete a quiz and create a concept map to show their understanding of DNA, inheritance, and development. The task assesses their use of scientific vocabulary and ability to explain genetic processes clearly. Criterion D: Reflecting on the impacts of science Students will research a real-world application of genetics and reflect on its benefits and ethical issues. They will present their views in writing or orally, showing how science impacts society and personal life.	Research skills Information Literacy Skills Students will be explicitly taught how to locate, evaluate, and use information related to genetic inheritance, DNA structure, and real-world applications such as forensic science or genetic disorders. Creative Thinking Creative thinking will be nurtured by allowing students to represent genetic ideas in diverse formats such as building DNA models. Critical Thinking Critical thinking will be developed through problem-solving and analysis tasks that challenge students to apply concepts such as genotype and phenotype, dominant and recessive traits, and Punnett squares Reflection Skills Reflection is nurtured through structured prompts that encourage students to think about how their understanding of genetics is evolving	What is DNA? Relationship between DNA, genes, and inherited characteristics, How do we grow and develop? How are genetic patterns identified and used? How can individuals be identified through inherited characteristics and genetic patterns?
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Unit title and teaching hours	Key concept	Related concepts	Global context	Statement of inquiry	Objectives	ATL skills	Content
Unit 5- Where we are now and where we might be going 6 Weeks 18 hours	Relationship	Movement Models	Orientation in space and Time AOE: Displacement and Exchange	Through making models of the world, we have understood how place and time relates to motion and we have made the world seem a smaller place.	Criteria A: Knowledge and Understanding Students will complete a quiz or test to show their understanding of motion, speed, and forces, using scientific vocabulary and real-life examples. Criteria C: processing and evaluating Students will conduct an experiment on motion, collect and analyze data, create graphs, and evaluate the reliability of their methods and results. Criterion D: Reflecting on the Impacts of Science Students will reflect on a real-world application of motion or forces, exploring its benefits, challenges, and relevance to society and personal life.	Social Skills (Collaboration) Students will develop collaboration skills through group experiments and discussions, practicing roles, sharing responsibilities, and reflecting on teamwork to improve cooperation and conflict resolution. Research Skills (Information & Media Literacy) Students will learn to find, evaluate, and use scientific information responsibly, using credible sources, analyzing media, and applying research skills during guided inquiries on motion and forces. Self-Management Skills	Balanced and healthy diet; science of nutrition; energy.

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Unit 6- How does our planet work? 6 Weeks 18 hours	Systems	Models Patterns	Globalization and sustainability AOE: human impact on the environment	Modelling interactions between Earth's systems allows us to understand patterns that we can use to secure or improve human experiences.	criteria A: Knowledge and Understanding Objective: Demonstrate a thorough understanding of ecospheres and the cycles of matter within ecosystems. Criterion B: Inquiring and Designing Model ecosystem processes: Develop and use models to simulate and analyze the flow of matter and energy through ecospheres, and predict the impacts of changes or disturbances. Criteria C: processing and evaluating Use appropriate scientific terminology and structure to present detailed information about ecospheres, biogeochemical cycles, and ecosystem processes in written reports, presentations, or other formats.	Thinking Skills Critical Thinking: Analyze and evaluate ecological scenarios, such as the impact of human activities on biogeochemical cycles, to draw well-reasoned conclusions about ecosystem health. Research Skills Information Literacy: Identify and use credible sources to gather information on ecospheres and biogeochemical cycles. This includes understanding how to distinguish between reliable and unreliable sources. Communication Skills: Presentation Skills: Present findings about ecospheres and cycles of matter clearly and effectively, using appropriate terminology and visual aids such as diagrams and models. 4. Social Skills: Empathy and Understanding: Appreciate diverse perspectives on environmental issues and work together to address global challenges related to ecosystems and sustainability.	Ecospheres Cycles of matter.
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MYP 3:

UNIT TILE AND TEACHING HOURS	KEY CONCEPTS	RELATED CONCEPTS	GLOBAL CONTEXTS	STATEMENT OF INQUIRY	OBJECTIVES	ATL SKILLS	CONTENT
UNIT 1: Periodic Table 18 hours	Systems	Patterns Models	Orientation in space and time Exploration: Evolution	The periodic table system reveals patterns in elemental properties, helping us understand the composition and history of African resources.	Criterion A: Knowing and Understanding Students will demonstrate knowledge and understanding of the structure of the periodic table, including the organization into groups and periods, the properties of metals, nonmetals, and metalloids, and the trends such as atomic number, reactivity, and valency. They will explain how the arrangement of elements helps predict chemical behavior and link this to real-life examples. Criterion D: Reflecting on the impacts of Science Students will reflect on how the periodic table and the discovery of elements have impacted society, the environment,	Communication Skills Students will communicate scientific ideas clearly using appropriate terminology related to the periodic table, such as atomic number, groups, periods, metals, and nonmetals. They will engage in class discussions, share findings in group work, and present information using written reports, models, or digital tools. Research Skills Students will locate, evaluate, and use relevant information about elements, their properties, and applications. They will collect data from reliable sources, including textbooks and digital media, and cite sources appropriately when investigating how elements are used in real-world contexts, especially in African industries. Thinking Skills Students will apply critical and creative	-Introduction to the Periodic table and its structure. -Exploration of periodic trends -Applications of the modern elements in African industries.

					and technological development. They will evaluate the use of specific elements in African industries, such as mining and energy, and consider sustainability, ethical sourcing, and the environmental effects of extracting and using these elements.	thinking to identify patterns in the periodic table and make predictions about elements' properties. They will analyze trends, solve problems, and design investigations or models to represent chemical behavior logically.	
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UNIT TILE AND TEACHING HOURS	KEY CONCEPTS	RELATED CONCEPTS	GLOBAL CONTEXTS	STATEMENT OF INQUIRY	OBJECTIVES	ATL SKILLS	CONTENT
UNIT 2: Forces and Energy 18 hours	Change	Energy Interaction	Scientific and technical innovation Exploration: Processes and Solutions	The interaction between forces and energy drives change, influencing technological innovations and shaping sustainable solutions to global challenges, particularly in the context of energy use and resource management within Africa.	Criterion B: Inquiring and Designing Students will design scientific investigations to explore the effects of forces and energy. They will identify a testable research question, formulate a clear hypothesis, and plan a method that allows for systematic collection of relevant data. They will consider variables, control conditions, and outline the materials and safety considerations needed for the	Thinking skills: Students will use critical and creative thinking to understand the relationships between force, motion, and energy. They will analyze cause-and-effect scenarios, interpret data, identify patterns in motion or energy transformations, and solve problems using scientific principles. Communication skills: Students will communicate scientific ideas using appropriate vocabulary related	-Introduction to forces and energy -Exploration of Energy types and transfer mechanisms. -Investigation into Renewable and Non- renewable sources.

					experiment. Criterion C: Processing and Evaluating Students will collect, organize, and analyze data from their investigations related to forces and energy. They will interpret results using tables, graphs, or calculations, evaluate the reliability of their data, identify sources of error, and suggest improvements. They will also compare their results to scientific explanations and draw conclusions based on evidence.	to forces and energy, such as "net force," "acceleration," "kinetic energy," and "work." They will express findings clearly through lab reports, diagrams, presentations, and collaborative discussions. Research Skills: Students will locate and use scientific information to support their understanding of forces and energy. They will investigate real-world energy use, technologies that involve forces (like levers or pulleys), and the environmental impacts of different energy sources, particularly in African contexts.	
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UNIT TILE AND TEACHING HOURS	KEY CONCEPTS	RELATED CONCEPTS	GLOBAL CONTEXTS	STATEMENT OF INQUIRY	OBJECTIVES	ATL SKILLS	CONTENT
UNIT 3: Interaction between organisms 18 hours	Relationships	Balance Interaction	Globalization and Sustainability	The interactions between producers, consumers, and decomposers	Criterion A: Knowing and Understanding Students will demonstrate knowledge and	Social skills: Students will develop collaboration skills by working in groups to investigate	-Trophic levels, producers, consumers, and decomposers.

			Exploration: Human impact on the environment	within food chains and webs are essential for maintaining the balance and stability of ecosystems, highlighting the importance of biodiversity.	understanding of ecological concepts such as food chains, food webs, energy flow, symbiotic relationships (mutualism, parasitism, commensalism), competition, and population dynamics. They will use scientific terminology to explain how organisms interact with each other and with their environments. Criterion C: Processing and Evaluating Students will collect and organize data from ecological investigations or simulations (e.g., population changes, predator-prey dynamics). They will analyze trends, draw conclusions, and evaluate the reliability of their data and methods. Students will identify possible improvements and connect their findings to ecological principles.	ecological relationships and solve environmental problems. They will share responsibilities, listen actively to others' ideas, resolve disagreements respectfully, and contribute to group tasks effectively. Research skills: Students will develop the ability to find, evaluate, and use scientific information about ecosystems and organism interactions. They will explore topics such as endangered species, biodiversity, and the impact of human activity on habitats, using reliable sources and citing them appropriately. Thinking skills: Students will use critical and creative thinking to analyze how organisms interact in ecosystems. They will recognize patterns in population changes, evaluate the impact of changes in one part of the ecosystem on others, and propose solutions to ecological problems.	-Energy flow and ecological pyramids. Human impact on food webs (e.g., deforestation, overfishing). -Case study: The Serengeti food web.
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UNIT TILE AND TEACHING HOURS	KEY CONCEPTS	RELATED CONCEPTS	GLOBAL CONTEXTS	STATEMENT OF INQUIRY	OBJECTIVES	ATL SKILLS	CONTENT
UNIT 4: Particles and Kinetic theory 18 hours	Change	Energy Models	Scientific and technical innovation Exploration: Models	Understanding the movement of particles and the transfer of energy enables us to explain the changes in the state of matter and to innovate solutions for real-world energy challenges.	Criterion B: Inquiring and Designing Students will formulate scientific questions and design investigations to explore how particles behave in different states of matter and under varying conditions (e.g., temperature, pressure). They will plan methods to test their hypotheses, identify variables, and ensure their procedures allow for accurate and repeatable data collection. Criterion D: Reflecting on the Impacts of Science Students will evaluate how scientific understanding of particle and kinetic theory influences real-life applications and decision-making in society. They will reflect on how the behavior of particles	Research skills: Students will develop research skills to investigate how particle theory explains the properties and behavior of matter in different states (solid, liquid, gas). They will explore real-world applications such as diffusion, pressure, and temperature effects, using reliable sources and citing them appropriately. Thinking skills: Students will use critical and creative thinking to understand and apply the particle and kinetic theory. They will analyze models, make predictions, explain cause-and-effect relationships, and evaluate how particle movement relates to observable changes in matter.	-The structure of matter: atoms, molecules, and particles. -Changes of state: melting, freezing, evaporation. -Application: The role of particle theory in traditional African crafts and industries (e.g., metallurgy, pottery).

					impacts technologies such as refrigeration, aerosol sprays, and climate science, and discuss the ethical and environmental implications of their use.		
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UNIT TILE AND TEACHING HOURS	KEY CONCEPTS	RELATED CONCEPTS	GLOBAL CONTEXTS	STATEMENT OF INQUIRY	OBJECTIVES	ATL SKILLS	CONTENT
UNIT 5: Bonding (Word and chemical reactions, acids, bases and pH) 36 hours	Change	Transformation Form	Scientific and technical Innovation Exploration: Methods	The understanding of chemical bonds and reactions is essential for innovation in materials and environmental management.	Criterion A: Knowing and Understanding Students will demonstrate knowledge and understanding of atomic bonding (ionic, covalent), chemical formulas, word and symbol equations, and properties of acids and bases. They will use correct scientific terminology to explain chemical reactions, the pH scale, and neutralization processes. Criterion B: Inquiring and Designing Students will design investigations to explore chemical reactions, such as acid–base reactions or the effects of concentration on	Research skills: Students will develop the ability to locate, interpret, and evaluate scientific information about bonding, chemical reactions, and acid–base behavior. They will explore real-life applications, societal impacts, and the chemistry behind common substances, using reliable and relevant sources. Thinking skills: Students will apply critical and creative thinking to understand chemical bonding and reactions. They will analyze chemical patterns, interpret lab results, solve problems involving pH and reactions, and make predictions	-Types of chemical bonds. -Chemical reactions, including acid-base reactions. -Use of acids and bases in traditional African practices (e.g., fermentation, leather tanning).

					reaction rate. They will formulate testable questions, write hypotheses, identify variables, and plan step-by-step methods for safe and systematic data collection. Criterion C: Processing and Evaluating Students will collect, organize, and analyze data from their experiments on chemical reactions. They will identify trends, draw conclusions based on evidence, evaluate the reliability of their results, and suggest improvements to their experimental methods. Criterion D: Reflecting on the impacts of Science Students will evaluate the impact of chemical bonding and acid–base reactions on society and the environment. They will reflect on the use of acids, bases, and chemical reactions in real-life applications (e.g., agriculture, medicine, industry) and consider ethical, environmental, and safety implications.	based on chemical principles. Communication Skills: Students will communicate scientific ideas clearly using correct chemical vocabulary, symbols, and representations. They will express their understanding through written equations, diagrams, oral explanations, and presentations. Students will also collaborate effectively in lab groups and discussions.	
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