

Subject-group Overview Vertical/Horizontal Planner
Subject Area: Science MYP Level: MYP2

Unit title	Key concept	Related concepts	Global context	Statement of inquiry	Objective	Summative assessment task	ATL skills	Content: knowledge
Where we are and might we be going?	Relationships	Energy Movement Transformation	Orientation in space and time	Observing changes in movement allows scientists to detect and understand the transformation of energy.	D	Imagine you are a physical education trainer. Reflect on the Newton's 3 laws of motion that you have learnt and explain at least three ways these laws can improve performance in sports. Thereafter explain three ways these laws can deteriorate performance in sports. You can connect using one game for all the laws or using different games for different laws.	Research Skills: Information literacy skills Thinking skills: Critical thinking skills Creative thinking skills	How did human beings travel? What were the push and pull factors for the same? Exploring the vocabulary words: Cubit , Foot, Inches, Reliable Measurement, Accuracy & Precision , SI Unit of measurement , Metric System, Coordinates, Distance , Displacement Difference between distance & displacement Difference between Scalar & Vector Understanding and calculating speed, distance & time Speed time graphs Understanding the term speed, velocity & acceleration Speed-time graph for constant speed and variable speed Exploring what is force and which forces exist around us Using pictures to recognize what kinds of forces exist around us balanced and unbalanced forces Types of forces gravity, inertia, motion, friction Newton's third law of motion Using science lab to explore various experiments on Newton's Lab Newtons first and second law of motion Exploring newton's laws in lab Comparing few objects to see which

								one falls first when dropped from the same point and at the same time. Finding weight on earth and other planets Finding jumps on earth and other planets
How do we map matter?	Change	Evidences Pattern	Orientation in space & time	Models are developed, challenged and modified based on new ideas formed by experimental evidence.	A	Students will be assessed on their knowledge and understanding about mapping the matter.	<p>Research: Information literacy Thinking: Critical thinking Creative thinking Transfer skills</p>	<p>Matter is made up of atoms. - Different models of the atom timeline (Dalton, Thompson, Rutherford and Bohr models) - Sub atomic particles: protons, neutrons and electrons Define, and compare and contrast, atoms, molecules, elements and compounds - Define atomic number and mass number - introduction to the periodic table - Patterns in the following in the groups and periods of the periodic table: atomic number and mass, physical states, acid/base nature, metals, non-metals and metalloids, and general reactivity with air and water Patterns in the following in the groups and periods of the periodic table: atomic number and mass, physical states, acid/base nature, metals, non-metals and metalloids, and general reactivity with air and water - Symbols of the elements Family names of and uses for the elements in the main groups</p>

<p>What does a wave tell us?</p>	<p>Relationships</p>	<p>Form Energy</p>	<p>Personal and cultural expression</p>	<p>Understanding the relationship between different forms of wave energy helps us better communicate and express our thoughts</p>	<p>B C</p>		<p>Communication: Communication skills Social skills: Collaboration skills Research skills: Information literacy skills Thinking skills: Critical thinking skills: Critical thinking skills</p>	<p>Introduction to light and sound. Where does light come from? How does light travel? How is sound produced? Can sound be produced without a vibration? What are the differences between how sound travels? How is the sound affected when using different materials? Can sound be heard in space? How is light reflected? Can light bend? What happens when light travels through different materials (mediums)? Laws of reflection Application of sound waves, specially where the timing of sound waves is crucial to the performance of the task Reflection of light by the plane mirror and curved mirror Refraction of light through liquids and gases How are shadows formed? Which materials allow shadows to form? How can the size of shadows be changed?</p>
<p>Who are we?</p>	<p>Relationships</p>	<p>Evidence Patterns</p>	<p>Identities and relationships</p>	<p>Because scientists understand relationship between underlying characteristics, we can use the</p>	<p>A</p>	<p>Students will be assessed on their knowledge and understanding about who we are in terms of genetic information.</p>	<p>Self management- reflection skills Thinking skills: Critical thinking skills and creative thinking skills</p>	<p>What is DNA, Structure of DNA, Outline that DNA is composed of double helix Describe that each helix is made up of units called nucleotides. State that there are four different nucleotides. State that the order of the nucleotides varies between species and between organisms within species. State that DNA profiling or fingerprinting produces a pattern unique to</p>

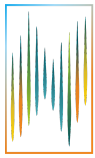
				patterns as evidence for identification and decision making.			Research: Information literacy skills	an individual that can be used for purposes of identification. Identification of individuals through inherited characteristics and genetic patterns Types of reproduction- sexual and asexual reproduction Process of Mitosis and Meiosis
How does our planet work?	Systems	Models Patterns	Globalisation and sustainability	Modelling interactions between systems allows us to understand patterns that we use to secure or improve human experience.	D	Students will reflect on and create a documentary explaining to what extent science can be used to prevent or reduce the damage from natural disasters.	Self Management: Organization skills Thinking: Critical & Creative thinking skills	Natural systems necessary to maintain life on earth Components of ecosphere Cycles of matter: Water cycle, Carbon cycle, Nitrogen cycle, Oxygen cycle Introduction to weather, climate, role of carbon dioxide, greenhouse gases Climate patterns and change Interaction between earth's systems have an influence on the living conditions Natural disasters, Using science to prevent natural disaster
Where can we fit into the living world?				Understanding the connection between health and wellness has an impact on making balanced lifestyle choices.	B C	Students will design and carry out some simple investigations to identify stimuli and responses of different organisms	Thinking: Critical & Creative thinking skills	Nervous system How living things perceive and respond to things Understanding the sense organs involved in perceiving and responding Perception pathways Process of response to stimuli Exploring response to stimuli in different kingdoms

								Outline Darwin's experiences that led to the development of the theory of natural selection. Explain that the theory of natural selection is used to account for the diversity of organisms on the planet as it is the mechanism underpinning evolution
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Subject Area: Science MYP Level: MYP3

Unit title	Key concept	Related concepts	Global context	Statement of inquiry	Objective	Summative assessment task	ATL skills	Content: knowledge
How do humans impact the natural environment?	Change	Consequences Environment	Fairness and development	The environment changes as a consequence of how we develop and manage natural resources around the world.	D	Students will identify an aspect of conservation that they would like to support with the creation of an app that people can use to help themselves make decisions that contribute positive environment change	Research Skills: Information literacy skills Thinking skills: Critical thinking skills Creative thinking skills Communication skills: Communication skills	Who is an environmental scientist and how does he work? Students will explore various environmental scientists and design a poster in the area they are interested to work biotic and abiotic factors: What are these factors and how are they connected to each other. Healthy and unhealthy environment, understanding how healthy environment promoted a healthy relationship between biotic and abiotic factors.

								<p>Differentiating natural change and man-made changes. how different species are able to cope with the natural changes.</p> <p>Tipping point: what does it mean and its impact</p> <p>reading articles to understand the meaning of a tipping point.</p> <p>Natural resources in our lives; how different natural resources are uses, how people get access to it and categorizing those into renewable and non-renewable resources</p>
Mechanics	Systems	Consequences Function	Scientific & technical innovation	Through analysing and reflecting on the underlying systems of simple components has a consequence on the functions and efficiency of the final products.	B C	Create a compound machine consisting of at least 2 simple machines based on the following GRASP model and will calculate the mechanical advantage of their machine.	<p>Research:</p> <p>Information literacy skills</p> <p>Media literacy skills</p> <p>Thinking: Critical thinking</p> <p>Creative thinking</p> <p>Communication skills</p>	<p>What is work? Defining work and understanding the relationship of energy and work, Defining power, Calculating work and power</p> <p>Simple Machines: Identify the six different simple machines; lever, wedge, inclined plane, pulley, screw, wheel. Classify the six different machines into everyday devices. Exploring and comparing the different simple machines. Recognize several examples of heavy machines that contain simple machines.</p> <p>Efficiency, Human v/s machine efficiency</p>



What should I eat?	Connection	Balance	Identities and relationships	Understanding the connection between health and wellness has an impact on making balance lifestyle choices.	A	Students will be assessed on their knowledge and understanding about food groups and importance of eating a balanced diet	Self Management: Organization skills Research: Information literacy skills Thinking: Critical thinking skills	Food groups, balanced diet What molecules do organisms need to function, micronutrients and macronutrients, energy content of food, carbohydrates and their functions, fats and their functions, proteins and their functions, Digestive system Cellular respiration,
How we put electricity and magnetism to work?	Relationships	Form Balance Transformation	Orientation in space and time	Electrical and magnetic forces fill space as fields; understanding their form and relationships allows us to transform energy in useful ways.	A		Self management: Organization skills Research- Information literacy skills Thinking: Critical thinking skills	Magnetic materials have the ability to attract some materials, and the ability to attract and repel other magnets. The meaning of the term "magnetic field" and understanding that the Earth is surrounded by one Draw the field lines around a bar magnet, label the north and south poles and show the direction that a "freemoving north pole" would move in. What causes magnetic force? What causes electric force? Relation between electrical and magnetic fields, Use and explain the terms "current" (I), "potential difference" (V) and "resistance" (R). Use and draw circuits using the recognized symbols. Working of electrical circuits

How can we connect? (Light & Sound)	Systems	Energy Interaction	Personal and cultural expression	We interact and express ourselves through systems that manipulate information in different forms.	B C	Communication: Communication skills Self management: Collaboration skills Research: Information literacy skills Thinking: Critical thinking skills	Students will design an investigation to investigate the way different spectacle lenses affect incident light Or They will design an experiment to investigate the effect of lens curvature on strength.	Sources of light, Colour, Shadows, Refraction and dispersion Ray diagrams Ability of the eye to 'see' Light as a form of energy How sound travels Sound as a form of energy How the ear 'hears' How is information carried through waves
How do our bodies work?	Systems	Balance Function	Personal and cultural expression	By understanding how our body systems function, people can learn to make decisions for balanced and healthy lifestyles.	A D	Students will create a platform to help teens understand the anatomy of physiology of their bodies and then use this understanding to make decisions for more balanced and healthy lifestyle.	Communication: Communication skills Self management: Organization skills Research: Media literacy skills Thinking: Critical thinking and creative thinking skills	Understand that there are systems in the body that allow the body to fulfill the requisites of life. Outline the role of the nervous system, including sense organs, neurons and the central nervous system (spinal cord and the brain). Describe the relationship between muscle and bone to explain movement using a hinge joint such as the elbow or the knee. Outline the structure of the f reproductive systems and explain their function in terms of

								production of gametes, fertilization and gestation. Impact of the understanding of the body systems on balanced and healthy lifestyle
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Subject Area: Science MYP Level: MYP4

Unit title	Key concept	Related concepts	Global context	Statement of inquiry	Objective	Summative assessment task	ATL skills	Content: knowledge
What chemical processes support life? Photosynthesis and	Systems	Transformation Energy	Scientific and technical innovation	The systems of life are supported by biochemical reactions and the transformation of energy that	A	The students will be assessed on their knowledge and understanding about chemical processes	Thinking skills: Critical thinking skills Self management skills: organization skills	Photosynthesis involves the conversion of light energy into chemical energy. State that light from the Sun is composed of a range of wavelengths (colours). State that chlorophyll is the main photosynthetic pigment. Outline in simple terms the structure of the leaf as an organ of photosynthesis. Explain the role of photosynthesis in

Respiration				occur within cells.			Research skills: Information literacy skills Communication skills	the ecosystem and its importance to the world's human population. Outline the effects of temperature, light intensity and carbon dioxide concentration on the rate of photosynthesis. Explain how humans can manipulate photosynthesis to their advantage.
How have different forms of life arisen?	Change	Interaction Environment	Globalisation and sustainability	Changes happen over time through interactions with the environment and has a worldwide impact on sustainability	B C	Design your own experiment to demonstrate natural selection	Thinking skills: critical thinking skills, creative thinking skills Research skills: Information literacy skills Media literacy skills	Evolution is the change in the inheritable characteristics of a population over time. When gene frequencies change within a population over time, evolution is occurring. Artificial selection (selective breeding) is the process of breeding organisms for desired characteristics.
Thermal Physics	Relationships	Patterns Change Models Evidence Movement	orientation in space and time	Patterns found in the changing macroscopic behaviour of products provides evidence for macroscopic behaviour of its constituents.	D	Students will research on the design of a stove and evaluate the design in terms of heat transfer	Research skills: Information literacy skills Transfer skills Communication skills Thinking skills: Creative thinking skills Critical thinking skills	The kinetic theory and the assumptions of the theory The gas laws Perform calculations with each of the gas laws and explain how volume, temperature and pressure are related. Use the kinetic theory to explain the relationships between the gas laws.
Free to move?	Change	Movement	Fairness and development	Movement is change and our world has been	B C	Design an investigation to model the effects of	Communication skills	Graphs of motion and transformations between different graphs

				changed by freedom of movement		drag on high speed vehicles	Thinking skills: Creative thinking skills Critical thinking skills Self management skills: collaboration skills	(distance/displacement–time, speed/velocity–time and acceleration–time graphs) Equations of motions (used to determine the stopping distance, for example, of cars speeding in a residential area. This can lead into discussions on safety, the importance of laws/rules on the road and so on) Newton's laws of motion accidents and safety get further explored through the concepts of forces, mass and acceleration Concept of impulse the change in momentum of human bodies is important when studying car safety Change in momentum Conservation of energy.
Why do electrons matter?	Relationship	Interaction Function	Identities and relationship	Protons define the identity of an element, but its relationship and interaction with other elements is a function of its outer electrons.	A	Students will be assessed on their knowledge and understanding of atom	Communication skills Self Management: collaboration, organization, affective and reflection skills	The periodic table shows the positions of metals, non-metals and metalloids. Metals tend to lose electrons and so they form cations. Non-metals tend to gain electrons so they form anions. Elements in a group have the same oxidation state and therefore similar chemical properties. Shielding is the decrease in attraction between an electron and the nucleus in any atom with more than one electron shell. The charge increases from left to right across

								a period because protons are being added to the nucleus. Vertical and horizontal trends in the periodic table exist for atomic radius, ionization energy and electronegativity.
Thermoc hemistry	Change	Energy Process	Scientific and technical innovation	Physical and chemical processes involve energy changes that can be used to create a range of products and solutions.	D	Students will reflect on the researches done thermochemistry and will write an article for the school science magazine	Social: collaboration Communication Self-managem ent: organization Research: information literacy	Energy changes (transformation) Temperature and heat Temperature as the measure of the average kinetic energy of particles in a system. Units of energy Exothermic and endothermic processes Combustion as an exothermic reaction Difference between complete and incomplete combustion

Subject Area: Science MYP Level: MYP5

Unit title	Key concept	Related concepts	Global context	Statement of inquiry	Objective	Summative assessment task	ATL skills	Content: knowledge
How do characteristics pass from one generation to another? (Reproduction)	Relationship	Evidence Models Patterns	Identities and relationships	Your identity and relationship with others is determined by certain factors: scientific evidence has led to models that help to understand	A	Students will be assessed on their knowledge and understanding about reproduction	Social skills: Organization skills Thinking: Creative thinking and critical thinking skills	Describe a life cycle involving sexual reproduction using the examples of a human and a flowering plant. Describe a life cycle involving both asexual and sexual reproduction for example, an aphid or coral. Describe the structure of an insect-pollinated flower. Describe the process of pollination, fertilization, seed and

				observed patterns of these factors			Research: Information literacy skills	fruit formation and dispersal. Label a diagram of the human male and female reproductive organs. Describe the mechanism of fertilization, copulation, gestation and lactation.
How does biotechnology create new options in industry and health?	Change	Function Transformation	Scientific and technical innovation	Scientific and technological advances enable societies to use, control and transform the function of organisms and biological molecules.	D	Students will write an article on one of the techniques learnt for the school science magazine	Research skills: information literacy skills Communication skills Thinking: Creative thinking	Biotechnology uses cellular and biomolecular processes to solve problems and create products. Biotechnology can use organisms to make useful food products (for example, yeast to make bread, bacteria to make yoghurt). Biotechnology can use organisms to produce fuels and other chemicals and to treat wastes. Biotechnology can use enzymes to allow reactions to occur more quickly
Nuclear Energy	Relationships	Energy Evidence Consequences	Scientific & technical innovation	The consequences of using nuclear energy provide evidence of how the relationship between humans and nature can be affected by scientific and technological advancements.	A D	Students will be assessed on their knowledge and understanding about nuclear energy	Thinking: critical thinking Research: information literacy Communication: communication Thinking: creative thinking Self-management:	Different models of the atom and their development, including the Geiger–Marsden experiment What is meant by the term “isotope” and why some nuclei are stable and some not The nature of alpha and beta decay and the properties of alpha, beta and gamma radiation Detection of ionising radiation, including details of the GM tube Decay equations, including decay chains Fission and fusion and associated chain reactions The

							reflection Research: media literacy	nuclear processes in stars The effects of radioactivity on the living environment How a nuclear power station is constructed and labelling of a schematic diagram of the station
Why do electrons matter?	Relationships	Interactions Function	Identities and relationship	Protons define the identity of an element, but its relationship and interaction with other elements is a function of its outer electrons	B C	Students will investigate the process of rusting	Thinking: critical thinking Thinking: creative thinking Self-management: reflection	Kinetic molecular theory Conversions for temperature and pressure Dalton's law Boyle's law Charles' law Ideal gas law Graphing and calculations Standard temperature and pressure Definition of oxidation and reduction (electron transfer) Rules for assigning oxidation numbers Definition of oxidising agent and reducing agent.
Does organic chemistry mean we can make a substance we want?	systems	Form function	Scientific & technical innovation	The versatile bonding of carbon atoms has allowed humanity to invent systems of molecules of various forms to fulfill different functions.	D		Communication: communication skills Self management: Organization skills Thinking: Critical thinking skills, Creative	Understanding and Identification of the following: alkane, alkene, alkyne, alcohol, aldehyde, ketone, carboxylic acid Nomenclature for organic molecules Combustion reactions Fossil fuels Isomers To what extent we use organic materials Organic materials in daily lives

