

SCIENCES								
INTEGRATED SCIENCES								
pMYP - Year 1								
Unit title	Key concept	Related concepts	Global contexts	Inquiry statement	MYP Subject groups Objectives	ATL Skills	Content	Nr. of lessons (voluntary)
Unit 1 - What do scientist do?	Relationships	Evidence	Identities and relationships	To be a scientist means to gather evidence about similarity and difference in nature to understand how things are related.	A, B, C, D	Collaboration skills, Critical thinking skills, Information literacy skills	Knowing the world and work of scientists. Asking the right questions, making inquiries. What is an experiment? Laboratory, safety rules . Laboratory equipment Making up the rules - environment impact evaluation of our experiments	
Unit 2 - What changes?	Change	Form, Transformation	Fairness and development	Science enables us to change the form of matter into useful materials that can make the world a better place.	A, B, C, D,	Information Literacy skills, Critical thinking skills, Creative thinking skills, Transfer skills	- natural and artificial materials - states of matter - purity of substances - physical changes - changes of states - dissolving - suspension and solution, solvent and solute - crystals - chemical changes - separating methods - filtration, distillation, chromatography	
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.	A, B, C	Communication skills, Information literacy skills, Media literacy skills, Critical thinking skills	Characteristics and needs all living things share; relationship between specialized forms and functions of living things and where and how they live	
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	A, B, C, D	Communication skills, Collaboration skills, Critical thinking skills, Creative thinking skills	different types of energy how we can measure energy temperature, thermometers conduction, convection, radiation conductors, insulators energy saving in the house	

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.	A, B, C, D	Communication skills, Collaboration skills, Organization skills, Information literacy skills, Critical thinking skills, Creative thinking skills	ecosystem, sustainability in ecosystem, biomes, mesocosm in a bottle, what makes a healthy ecosystem
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.		Communication skills, Collaboration skills, Organization skills, Information literacy skills, Critical thinking skills, Creative thinking skills	Solar system, planets and other orbiting objects Earth layers, tectonic plates, formation of rocks Layers of the Earth's atmosphere

MYP1 - Year 2

Unit title	Key concept	Related concepts	Global contexts	Inquiry statement	MYP Subject groups Objectives	ATL Skills	Content
UNIT 1 - Where are we now and where might we be going	Relationship	Models, Movement	Orientation in space and time	Through making models of the world we have understood how place and time relate to motion and we have made the world seem a smaller place.	A - i, ii, iii B- i, iii, iv C - i, ii, iii, iv, v D - ii, iii, iv	Collaboration skills, Information literacy skills, Media literacy skills, Critical thinking skills, Creative thinking skills	Chemical energetics Transporting energy; food energy, fuels. Energy transfer and energy conservation.
UNIT 2 - How do we map matter?	Change	Models, Patterns	Scientific and technical innovation	By changing matter we can identify patterns in properties that help us to make models and the models help us invent new kinds of material.	A, B, C, D	Information literacy skills, Critical thinking skills, Creative thinking skills, Transfer skills	Periodic tables Atoms, molecules, elements, compounds Old and new materials: stone; wood; metals; plastics. Chemical symbols and formulae for elements and compounds
UNIT 3 - Who are we?	Relationship	Evidence, Patterns	Identities and relationships	Because scientists understand the relationships between genes and inherited characteristics, we can use genetic patterns as evidence for identification and decision-making.	A, D	Reflection skills, Information literacy skills, Critical thinking skills, Creative thinking skills	Function and inheritance of genes, unique and common traits, DNA

Unit 4 - What does the wave tell us?	Relationship	Energy, Form	Personal and cultural expression	Understanding the relationships between different forms of wave energy helps us better communicate and express our thoughts.	A, B, C, D	Communication skills, Collaboration skills, Information literacy skills, Critical thinking skills, Creative thinking skills	Waves/the eye and optical instruments Oscillation Electromagnetic radiation.
UNIT 5 - How do our planet work?	Systems	Models, Patterns	Globalization and sustainability	Modelling interactions between Earth's systems allows us to understand patterns that we can use to secure or improve human experiences.	A, B, C, D	Organization skills, Information literacy skills, Critical thinking skills, Creative thinking skills	Ecospheres Cycles of matter.
UNIT 6 - How do we respond to our world?	Change	Consequences	Scientific and technical innovation	Scientific innovations designed to enhance our ability to perceive and respond to change in our surroundings have consequences on our survival.	A, D	Critical thinking skills, Creative thinking skills	Systems and mechanism that allow organisms to respond to their surroundings Senses Natural selection Evolution

MYP2 - Year 3

Unit title	Key concept	Related concepts	Global contexts	Inquiry statement	MYP Subject groups Objectives	ATL Skills	Content
UNIT 1 - How do we make it work?	Change	Energy, Movement	Scientific and technical innovation	Machines have revolutionized life by making it easier to change energy from stored forms to movement and back again.	A - i, ii, iii B - ii, iv C - i, ii, iii, iv, v D - i, ii, iii	Communication skills, Collaboration skills, Organization skills, Information literacy skills, Media literacy skills, Critical thinking skills, Creative thinking skills	Chemical energetics Transporting energy; food energy, fuels. Energy transfer and energy conservation.
UNIT 2 - How do humans impact the natural world?	Change	Consequences, Environment	Fairness and development	The environment changes as a consequences of how we develop and manage natural resources around the world.	A - i, ii, iii C - i, ii D - i, ii, iii, iv	Communication skills, Reflection skills, Critical thinking skills, Creative thinking skills	Energy resources, production and distribution

UNIT 3 - What should I eat?	Relationship	Consequences, Function	Scientific and technical innovation	Because what we consume is related to, and has consequences on how our bodies function and feel, we can choose what we eat and drink based on scientific principles and development.	A - i, ii, iii C - i, ii, iii, iv, v	B - i, ii, iv D - iii, iv	Organization skills, Information literacy skills, Critical thinking skills	Balanced and healthy diet; science of nutrition; energy.
UNIT 4 - How do we put electricity and magnetism to work?	Relationship	Transformation, Form	Orientation in space and time	Electrical and magnetic forces fill space as fields, understanding their form and relationship allows us to transfer energy in useful way.	A - i, ii, iii C - i, ii, iii, iv, v	B - i, ii, iii, iv D - ii, iii, iv	Information literacy skills, Critical thinking skills, Creative-thinking skills, Transfer skills	Electrical and magnetic fields; electric current, circuits and components.
UNIT 5 - How can we connect?	Systems	Energy, Interaction	Personal and cultural expression	People interact and express ourselves through systems that manipulate information as different form of energy.	A- i, ii, iii iv, v	C - i, ii, iii, D - i, ii	Communication skills, Collaboration skills, Information literacy skills, Critical thinking skills	Waves; information systems and communication; analogue and digital systems.
UNIT 6 - 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 - ii, iii ii,	B - i, iv, C - i,	Communication skills, Organization skills, Media literacy skills, Critical thinking skills, Creative-thinking skills	Functions of different body systems

BIOLOGY

MYP3 - Year 4

Unit title	Key concept	Related concepts	Global contexts	Inquiry statement	MYP Subject groups Objectives	ATL Skills	Content
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<p>1How is life organized?</p>	<p>Relationships</p>	<p>Function, Patterns</p>	<p>Identity and relationships</p>	<p>Your identity is determined by the relationship between different levels on organization in your body which,although differing in complexity, share patterns and functions with all life on Earth.</p>	<p>Year 3 Objectives</p> <ul style="list-style-type: none"> • Objective A: Knowing and understanding <ul style="list-style-type: none"> — describe scientific knowledge — apply scientific knowledge and understanding to solve problems set in familiar and unfamiliar situations — analyse information to make scientifically supported judgments. <p>Year 5 Objectives</p> <ul style="list-style-type: none"> • Objective A: Knowing and understanding <ul style="list-style-type: none"> — explain scientific knowledge — apply scientific knowledge and understanding to solve problems set in familiar and unfamiliar situations — analyse and evaluate information to make scientifically supported judgments. 	<p>Communication skills</p> <ul style="list-style-type: none"> • Exchanging thoughts, messages and information effectively through interaction <ul style="list-style-type: none"> — Collaborate with peers and experts using a variety of digital environments and media. • Reading, writing and using language to gather and communicate information <ul style="list-style-type: none"> — Read critically and for comprehension 	<p>All students should:</p> <p>State the characteristics that determine whether something is alive or not</p> <p>Describe the characteristics that determine whether something is alive or not</p> <p>Interpret information about viruses to make scientifically supported judgements about whether something is alive or not</p> <p>Explain the relationships between the structure of a cell and its function</p> <p>Draw and label diagrams of cells</p> <p>Describe and explain the function of different organelles</p> <p>Describe the differences between cells, tissues, organs and organ systems</p> <p>Explain the implications of only using physical characteristics to classify organisms</p> <p>Explain why it is important to use the same method of classification throughout the scientific community</p> <p>Explain Linnaeus binomial classification system</p>	
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<p>2 What chemical processes support life?</p>	<p>Systems</p>	<p>Energy, Transformation</p>	<p>Scientific and tec</p>	<p>The systems of life are supported by biochemical reactions and transformations of energy that occur within cells. Innovations in science could lead to these reactions being utilized to meet growing energy and food needs.</p>	<p>Year 3 Objectives</p> <ul style="list-style-type: none"> • Objective A: Knowing and understanding <ul style="list-style-type: none"> — describe scientific knowledge — apply scientific knowledge and understanding to solve problems set in familiar and unfamiliar situations — analyse information to make scientifically supported judgments. <p>Year 5 Objectives</p> <ul style="list-style-type: none"> • Objective A: Knowing and understanding <ul style="list-style-type: none"> — explain scientific knowledge — apply scientific knowledge and understanding to solve problems set in familiar and unfamiliar situations — analyse and evaluate information to make scientifically supported judgments. 	<p>Communication skills</p> <ul style="list-style-type: none"> • Reading, writing and using language to gather and communicate information <ul style="list-style-type: none"> — Make effective summary notes for studying — Organize and depict information logically • Organization skills • Managing time and tasks effectively <ul style="list-style-type: none"> — Plan short- and long-term assignments; meet deadlines • Critical-thinking skills <ul style="list-style-type: none"> — Analysing and evaluating issues and ideas — Gather and organize relevant information to formulate an argument — Interpret data — Draw reasonable conclusions and generalizations 	<p>All students should: state the word and chemical equations for aerobic and anaerobic respiration, photosynthesis. Outline the differences between respiration and combustion Explain how substances required for photosynthesis enter the leaf Outline the role of limiting factors Describe and explain an experiment that shows how light intensity affects the rate of photosynthesis. Describe and explain an experiment that shows that plants carry out both photosynthesis and cellular respiration Outline the role of chemoautotrophs in food chains</p>
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3 How do organisms sustain themselves?	Systems	Balance, Energy, Environment	Personal and cultural expression	Systems in living organisms transfer energy and nutrients from their environment to cells, where they are used to maintain the balance of life. Diet can be affected by personal and cultural choices.	Year 3 Objectives	Communication skills	What is meant by a "balanced diet"? State the components of a balanced diet. How can process of digestion be modelled? How does gas exchange support the body? How are substances transported around an organism? What is structure and function of the heart? What processes are involved in movement and transport? Why do the conditions within organisms need to be kept in balance? How do elements essential for life cycle between the environment and organisms? Are there any dangers in using drugs to control weight?
					<ul style="list-style-type: none"> • Objective A: Knowing and understanding — describe scientific knowledge — apply scientific knowledge and understanding to solve problems set in familiar and unfamiliar situations — analyse information to make scientifically supported judgments. 	<ul style="list-style-type: none"> • Exchanging thoughts, messages and information effectively through interaction — Use a variety of media to communicate with a range of audiences — Negotiate ideas and knowledge with peers and teachers 	
					<ul style="list-style-type: none"> • Objective B: Inquiring and designing — describe a problem or question to be tested by a scientific investigation — outline a testable hypothesis and explain it using scientific reasoning — describe how to manipulate the variables, and describe how data will be collected 	<ul style="list-style-type: none"> • Collaboration skills • Working effectively with others — Help others to succeed — Encourage others to contribute 	
					<ul style="list-style-type: none"> • Objective C: Processing and evaluating — present collected and transformed data — interpret data and describe results using scientific reasoning — discuss the validity of a hypothesis based on the outcome of the scientific investigation 	<ul style="list-style-type: none"> • Information literacy skills • Finding, interpreting, judging and creating information — Access information to be informed and inform others — Make connections between various sources of information 	
					<ul style="list-style-type: none"> • Objective D: Reflecting on the impact of science — describe the ways in which science is applied and used to address a specific problem or issue — apply scientific language 	<ul style="list-style-type: none"> • Creative-thinking skills • Generating novel ideas and considering new perspectives — Use brainstorming and visual diagrams to generate new ideas and inquiries — Make unexpected or unusual connections between objects and/or ideas — Apply existing knowledge to generate new ideas, products or processes 	

4What issues do larger organisms face?	Relationships	<ul style="list-style-type: none"> • Environment • Function 	Orientation in space and time	The size of organisms determines their distribution in space and time, and the form and function of specialized structures in larger organisms develop from their relationships with their environment.	<p>Year 3 Objectives</p> <ul style="list-style-type: none"> • Objective A: Knowing and understanding <ul style="list-style-type: none"> — apply scientific knowledge and understanding to solve problems set in familiar and unfamiliar situations • Objective B: Inquiring and designing <ul style="list-style-type: none"> — outline a testable hypothesis and explain it using scientific reasoning — design scientific investigations. • Objective C: Processing and evaluating <ul style="list-style-type: none"> — present collected and transformed data — interpret data and describe results using scientific reasoning — discuss the validity of a hypothesis based on the outcome of the scientific investigation — discuss the validity of the method • Objective D: Reflecting on the impact of science <ul style="list-style-type: none"> — describe the ways in which science is applied and used to address a specific problem or issue — discuss and analyse the various implications of the use of science and its application in solving a specific problem or issue — apply scientific language effectively — document the work of others 	<p>Critical-thinking skills</p> <ul style="list-style-type: none"> • Analysing and evaluating issues and ideas <ul style="list-style-type: none"> — Evaluate evidence and arguments — Draw reasonable conclusions and generalizations • Creative-thinking skills <ul style="list-style-type: none"> • Generating novel ideas and considering new perspectives — Make unexpected or unusual connections between objects and/or ideas 	<ul style="list-style-type: none"> - how the size of an organism plays an important role in its relationship with the environment, and issues they face as they get bigger - how different animals and plants are adapted to the environment they live in. - how endangered large animals, such as oelephants, tigers, can be protected in the wild or in zoos, so as to meet their needs and support survival.
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MYP4 - Year 5

MYP4 - Year 5								
Unit title	Key concept	Related concepts	Global contexts	Inquiry statement	MYP Subject groups Objectives	ATL Skills	Content	

1 What factors affect human health?	Relationships	Consequences Interaction	Fairness and development	Human health is a consequence of the relationships and interactions between biological processes in our bodies, our lifestyles and the conditions we live in.	<p>Year 5 Objectives</p> <ul style="list-style-type: none"> • Objective C: Processing and evaluating <ul style="list-style-type: none"> — present collected and transformed data — interpret data and explain results using scientific reasoning — evaluate the validity of a hypothesis based on the outcome of the scientific investigation — evaluate the validity of the method • Objective D: Reflecting on the impact of science <ul style="list-style-type: none"> — explain the ways in which science is applied and used to address a specific problem or issue — discuss and evaluate the various implications of the use of science and its application in solving a specific problem or issue — apply scientific language effectively — document the work of others and sources of information used. 	<p>Communication skills</p> <ul style="list-style-type: none"> • Exchanging thoughts, messages and information effectively through interaction <ul style="list-style-type: none"> — Use a variety of media to communicate with a range of audiences • Reading, writing and using language to gather and communicate information <ul style="list-style-type: none"> — Read critically and for comprehension — Make inferences and draw conclusions • Organization skills <ul style="list-style-type: none"> • Managing time and tasks effectively <ul style="list-style-type: none"> — Use appropriate strategies for organizing complex information • Information literacy skills <ul style="list-style-type: none"> • Finding, interpreting, judging and creating information <ul style="list-style-type: none"> — Access information to be informed and inform others • Media literacy skills <ul style="list-style-type: none"> • Interacting with media to use and create ideas and information <ul style="list-style-type: none"> — Locate, organize, analyse, evaluate, synthesize and ethically use information from a variety of sources and media (including digital social media and online networks) • Critical-thinking skills <ul style="list-style-type: none"> • Analysing and evaluating 	<p>What is health?</p> <p>The world health organization. Is access to health care and a healthy lifestyle a right or a privilege?</p> <p>What happens inside our body for us to be healthy?</p> <p>What external conditions contribute to our health? Micro-organisms</p> <p>Pathogenic invaders</p> <p>How do diseases get transmitted?</p> <p>Life expectancy</p>
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2 How do characteristics pass from generation to another?	Relationships	2 How do characteristics pass from generation to another?	Identities and relationships	Your identity and relationships with other people are determined by genetic factors: evidence has led to models that help to understand observed patterns of inheritance.	<p>Year 5 Objectives</p> <ul style="list-style-type: none"> • Objective A: Knowing and understanding <ul style="list-style-type: none"> — apply scientific knowledge and understanding to solve problems set in familiar and unfamiliar situations — analyse and evaluate information to make scientifically supported judgments. • Objective C: Processing and evaluating <ul style="list-style-type: none"> — interpret data and explain results using scientific reasoning • Objective D: Reflecting on the impact of science <ul style="list-style-type: none"> — explain the ways in which science is applied and used to address a specific problem or issue — discuss and evaluate the various implications of the use of science and its application in solving a specific problem or issue — apply scientific language effectively — document the work of others and sources of information used. 	<p>Information literacy skills</p> <ul style="list-style-type: none"> • Finding, interpreting, judging and creating information <ul style="list-style-type: none"> — Evaluate and select information sources and digital tools based on their appropriateness to specific tasks • Critical-thinking skills <ul style="list-style-type: none"> — Analysing and evaluating issues and ideas — Interpret data — Revise understanding based on new information and evidence • Analyse complex concepts and projects into their constituent parts and synthesize them to create new understanding <ul style="list-style-type: none"> — Use models and simulations to explore complex systems and issues • Creative-thinking skills <ul style="list-style-type: none"> — Generating novel ideas and considering new perspectives — Use brainstorming and visual diagrams to generate new ideas and inquiries 	<p>Genetic information is contained in DNA. Chromosomes are structures of supercoiled DNA found within cells. Mitosis leads to the production of cells where the number of chromosomes is maintained. The relationship between mitosis and meiosis and reproduction Meiosis leads to the production of sex cells where the number of chromosomes is halved. Compare and contrast the advantages and disadvantages of mitosis and meiosis. Traits are characteristics that are passed from parent to offspring. Genes are sections of DNA that give instructions specifying the traits of an organism. Genes are inherited. Genes are located at a specific position on a chromosome called a locus. Alleles are specific forms of genes. They occur in pairs of alternative forms of genes on the same chromosome and control one trait. Alleles occur in pairs. Homozygous pairs have two identical alleles of a gene. Heterozygous pairs have two different alleles of a gene. Variation occurs in DNA and this leads to different traits. Variation may be continuous where traits fall into discrete categories (for example, blood groups). Variation may be discontinuous where there is a range of traits from one extreme to another. Human chromosomes occur in pairs. Homologous chromosomes are pairs of chromosomes with genes for the same characteristics, inherited from both parents. DNA mutations may be beneficial or harmful but most are harmless. The genotypes and phenotypes of offspring can be determined using a Punnett square. Construct and use the</p>
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<p>3 How have different forms of life arisen?</p>	<p>Change</p>	<ul style="list-style-type: none"> • Environment • Interaction 	<p>Globalization and sustainability</p>	<p>Species change over time through interactions with their environment: the evolution of humans has impacted global biodiversity in ways that may not be sustainable.</p>	<p>Year 5 Objectives</p> <ul style="list-style-type: none"> • Objective A: Knowing and understanding <ul style="list-style-type: none"> — explain scientific knowledge — analyse and evaluate information to make scientifically supported judgments. • Objective B: Inquiring and designing <ul style="list-style-type: none"> — formulate a testable hypothesis and explain it using scientific reasoning • Objective C: Processing and evaluating <ul style="list-style-type: none"> — interpret data and explain results using scientific reasoning • Objective D: Reflecting on the impact of science <ul style="list-style-type: none"> — explain the ways in which science is applied and used to address a specific problem or issue — discuss and evaluate the various implications of the use of science and its application in solving a specific problem or issue — apply scientific language effectively — document the work of others and sources of information used. 	<p>Information literacy skills</p> <ul style="list-style-type: none"> • Finding, interpreting, judging and creating information <ul style="list-style-type: none"> — Access information to be informed and inform others Media literacy skills <ul style="list-style-type: none"> • Interacting with media to use and create ideas and information <ul style="list-style-type: none"> — Seek a range of perspectives from multiple and varied sources Critical-thinking skills <ul style="list-style-type: none"> • Analysing and evaluating issues and ideas <ul style="list-style-type: none"> — Evaluate evidence and arguments — Draw reasonable conclusions and generalizations Creative-thinking skills <ul style="list-style-type: none"> • Generating novel ideas and considering new perspectives <ul style="list-style-type: none"> — Use brainstorming and visual diagrams to generate new ideas and inquiries — Make guesses, ask “what if” questions and generate testable hypotheses — Apply existing knowledge to generate new ideas, products or processes 	<p>Students should know:</p> <p>What is the evidence of evolution? The evolution of life. What examples of natural selection are there? How have changes in habitats led to the development of new species? What is meiosis? How do changes in genetic code lead to variation? How can scientists work out how closely related species are? What effects do genetic mutations have on the survival of species?</p>	
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4 How are organisms adapted to survive?	Change	<ul style="list-style-type: none"> • Environment • Interaction 	Orientation in space and time	Organisms are more likely to survive when they are adapted to interact with their surroundings and respond to changes in their environment.	<p>Year 5 Objectives</p> <ul style="list-style-type: none"> • Objective A: Knowing and understanding <ul style="list-style-type: none"> — explain scientific knowledge — apply scientific knowledge and understanding to solve problems set in familiar and unfamiliar situations — analyse and evaluate information to make scientifically supported judgments. • Objective B: Inquiring and designing <ul style="list-style-type: none"> — explain a problem or question to be tested by a scientific investigation — formulate a testable hypothesis and explain it using scientific reasoning — explain how to manipulate the variables, and explain how data will be collected — design scientific investigations. • Objective C: Processing and evaluating <ul style="list-style-type: none"> — present collected and transformed data — evaluate the validity of a hypothesis based on the outcome of the scientific investigation — evaluate the validity of the method 	<p>Communication skills</p> <ul style="list-style-type: none"> • Reading, writing and using language to gather and communicate information — Use a variety of organizers for academic writing tasks 	<p>Communication skills</p> <ul style="list-style-type: none"> • Reading, writing and using language to gather and communicate information — Use a variety of organizers for academic writing tasks Organization skills <ul style="list-style-type: none"> • Managing time and tasks effectively — Use appropriate strategies for organizing complex information Information literacy skills <ul style="list-style-type: none"> • Finding, interpreting, judging and creating information — Access information to be informed and inform others — Make connections between various sources of information Critical-thinking skills <ul style="list-style-type: none"> • Analysing and evaluating issues and ideas — Draw reasonable conclusions and generalizations Creative-thinking skills <ul style="list-style-type: none"> • Generating novel ideas and considering new perspectives — Use brainstorming and visual diagrams to generate new ideas and inquiries — Apply existing knowledge to generate new ideas, products or processes Transfer skills <ul style="list-style-type: none"> • Using skills and knowledge in multiple contexts — Apply skills and knowledge in unfamiliar situations — Combine knowledge, understanding and skills to create products or solutions
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MYP5 - Year 6

Unit title	Key concept	Related concepts	Global contexts	Inquiry statement	MYP Subject groups Objectives	ATL Skills	Content	
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<p>1 How do species interact?</p>	<p>Systems</p>	<ul style="list-style-type: none"> • Balance • Function 	<p>Globalization and sustainability</p>	<p>Ecosystems can be in balance when sharing their habitat have interconnected and sustainable functions and roles.</p>	<p>Year 5 Objectives</p> <ul style="list-style-type: none"> • Objective A: Knowing and understanding <ul style="list-style-type: none"> — explain scientific knowledge — apply scientific knowledge and understanding to solve problems set in familiar and unfamiliar situations • Objective C: Processing and evaluating <ul style="list-style-type: none"> — interpret data and explain results using scientific reasoning — evaluate the validity of a hypothesis based on the outcome of the scientific investigation • Objective D: Reflecting on the impact of science <ul style="list-style-type: none"> — explain the ways in which science is applied and used to address a specific problem or issue — discuss and evaluate the various implications of the use of science and its application in solving a specific problem or issue — document the work of others and sources of information used. 	<p>Communication skills</p> <ul style="list-style-type: none"> • Reading, writing and using language to gather and communicate information <ul style="list-style-type: none"> — Make inferences and draw conclusions Reflection skills <ul style="list-style-type: none"> • (Re)considering the process of learning; choosing and using ATL skills — Consider ethical, cultural and environmental implications Information literacy skills <ul style="list-style-type: none"> • Finding, interpreting, judging and creating information — Access information to be informed and inform others Creative-thinking skills <ul style="list-style-type: none"> • Generating novel ideas and considering new perspectives — Apply existing knowledge to generate new ideas, products or processes Practise visible thinking strategies and techniques Transfer skills <ul style="list-style-type: none"> • Using skills and knowledge in multiple contexts — Combine knowledge, understanding and skills to create products or solutions 	<ul style="list-style-type: none"> - what happens to an ecosystem when the natural conditions are modified - the ways different species interact in ecosystems around the world - the interactions of species that make up the local ecosystem - identifying, advocating for, and making a small change in our daily habits that will have a positive impact on a local ecosystem. 	
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2 How do the choices people make affect the environment?	Change	<ul style="list-style-type: none"> • Balance • Environment 	Globalization and sustainability	As a result of choices that humans make, the environment has undergone and will continue to undergo change. Humans have the ability to understand the consequences of their actions and to act to restore balance in ecosystems and work towards a sustainable future.	<p>Year 5 Objectives</p> <ul style="list-style-type: none"> • Objective A: Knowing and understanding <ul style="list-style-type: none"> — explain scientific knowledge — apply scientific knowledge and understanding to solve problems set in familiar and unfamiliar situations — analyse and evaluate information to make scientifically supported judgments. • Objective B: Inquiring and designing <ul style="list-style-type: none"> — design scientific investigations. • Objective C: Processing and evaluating <ul style="list-style-type: none"> — present collected and transformed data — interpret data and explain results using scientific reasoning — evaluate the validity of a hypothesis based on the outcome of the scientific investigation — evaluate the validity of the method • Objective D: Reflecting on the impact of science <ul style="list-style-type: none"> — explain the ways in which science is applied and used to address a specific problem or issue — discuss and evaluate the various implications of the use of science and its application in solving a specific problem or issue — apply scientific language 	<p>Collaboration skills</p> <ul style="list-style-type: none"> • Working effectively with others <ul style="list-style-type: none"> — Listen actively to other perspectives and ideas — Negotiate effectively • Organization skills <ul style="list-style-type: none"> • Managing time and tasks effectively <ul style="list-style-type: none"> — Plan short- and long-term assignments; meet deadlines • Information literacy skills <ul style="list-style-type: none"> • Finding, interpreting, judging and creating information <ul style="list-style-type: none"> — Access information to be informed and inform others — Collect and analyse data to identify solutions and make informed decisions • Critical-thinking skills <ul style="list-style-type: none"> • Analysing and evaluating issues and ideas <ul style="list-style-type: none"> — Interpret data — Evaluate evidence and arguments • Creative-thinking skills <ul style="list-style-type: none"> • Generating novel ideas and considering new perspectives <ul style="list-style-type: none"> — Make unexpected or unusual connections between objects and/or ideas — Apply existing knowledge to generate new ideas, products or processes • Transfer skills 	<ul style="list-style-type: none"> - how the effects of the human disturbance can be measured - how human population growth has put increasing demands on the planet - how the choices people make affect the environment - how to make our school more sustainable.
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3 How does biotechnology create new options in industry and health?	Change	Transformation Development	Fairness and development	The development and use of biotechnology to change and transform genes helps create new options, choices and opportunities in industry and health; whether these developments are fair for all remains to be seen.	<p>Year 5 Objectives</p> <ul style="list-style-type: none"> • Objective A: Knowing and understanding <ul style="list-style-type: none"> — explain scientific knowledge — apply scientific knowledge and understanding to solve problems set in familiar and unfamiliar situations — analyse and evaluate information to make scientifically supported judgments. • Objective D: Reflecting on the impact of science <ul style="list-style-type: none"> — explain the ways in which science is applied and used to address a specific problem or issue — discuss and evaluate the various implications of the use of science and its application in solving a specific problem or issue — apply scientific language effectively — document the work of others and sources of information used. 	<p>Communication skills</p> <ul style="list-style-type: none"> • Exchanging thoughts, messages and information effectively through interaction <ul style="list-style-type: none"> — Negotiate ideas and knowledge with peers and teachers • Collaboration skills <ul style="list-style-type: none"> • Working effectively with others <ul style="list-style-type: none"> — Listen actively to other perspectives and ideas • Information literacy skills <ul style="list-style-type: none"> • Finding, interpreting, judging and creating information <ul style="list-style-type: none"> — Access information to be informed and inform others • Critical-thinking skills <ul style="list-style-type: none"> • Analysing and evaluating issues and ideas <ul style="list-style-type: none"> — Revise understanding based on new information and evidence — Consider ideas from multiple perspectives • Creative-thinking skills <ul style="list-style-type: none"> • Generating novel ideas and considering new perspectives <ul style="list-style-type: none"> — Apply existing knowledge to generate new ideas, products or processes 	<p>Biotechnology uses cellular and biomolecular processes</p> <p>Biotechnology can use organisms to make useful food products.</p> <p>Biotechnology can use organisms to produce fuels.</p> <p>Biotechnology can use enzymes</p> <p>Selective breeding is the process of breeding organisms for desired characteristics (for example, disease resistance in wheat, increasing milk yields in cattle herds).</p> <p>Genetic engineering</p> <p>Gel electrophoresis is a process to separate and analyse DNA fragments.</p> <p>A DNA profile is characterized by the banding patterns of genetic profiles produced by electrophoresis of treated samples of DNA.</p> <p>A DNA profile contains information to help identify a person.</p> <p>Artificial cloning</p> <p>Stem cells</p>
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CHEMISTRY

MYP3 - Year 4

Unit title	Key concept	Related concepts	Global contexts	Inquiry statement	MYP Subject groups Objectives	ATL Skills	Content
UNIT 1 - What is matter?	Change	Models	Identities and relationships	When matter changes we observe similarities and differences that help us build models to explain underlying relationships.	A, B, C, D	Communication skills, Collaboration skills, Organization skills, Affective skills, Critical-thinking skills, Creative-thinking skills	exploring matter, a brief history of ideas, testing matters and measuring, Laboratory Safety Rules, matter and temperature, state changes, SI units, density, physical and chemical properties of matter, purity of substances
UNIT 2 - How do we use matter?	Change	Function	Personal and cultural expression	Changing conditions for matter has allowed us to make attractive products that express who we are and where we are from.	A, D	Organization skills, Affective skills, Critical-thinking skills, Creative-thinking skills, Transfer skills	- differences between pure substances and mixture, Separating of mixtures, Osmosis and dialysis
UNIT 3 - How do we map matter?	Systems	Patterns	Scientific and technical innovation	Scientific and technological innovation has allowed us to identify patterns in the properties of chemical elements and so build systems to classify them.	A	Communication skills, Collaboration skills, Organization skills, Reflection skills, Creative-thinking skills	6 groups of elements <ul style="list-style-type: none"> metals alkali metals alkaline earth metals halogens (non-metals) rare earth metals noble gases (non-metals) Evidence of ions Chemical symbols Engaging with patterns: periodic trends: groups and periods <ul style="list-style-type: none"> mass of an atom The periodic table Calculating relative mass in compounds Compare properties of transition metals
UNIT 4 - How do atoms bond	Relationship	Evidence	Identities and relationships	Chemical and physical properties provide evidence of the relationships both between and within atoms.	A, B, C, D	Communication skills, Collaboration skills, Organization skills, Critical-thinking skills, Information literacy skills	Periodic trends (developing) <ul style="list-style-type: none"> Metallic bonds Ionic bonds Covalent molecular Covalent molecular network Electronegativity Van der Waals Dipole effects, H-bonds bonding (chemical formulae) Naming (IUPAC rules) Formulas valency

MYP4 - Year 5

Unit title	Key concept	Related concepts	Global contexts	Inquiry statement	MYP Subject groups Objectives	ATL Skills	Content
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UNIT 5 - What are the impacts of chemical industry?	Change	Interaction	Globalization and sustainability	Chemical industry has brought change that affects global interactions with positive and negative environmental impacts.	A, B, C, D	Communication skills, Collaboration skills, Organization skills, Affective skills, Critical-thinking skills, Transfer skills	Types of Chemical reaction <ul style="list-style-type: none"> • Solubility rules Conservation of mass; balancing equations acids and bases, • Arrhenius, Bronsted-Lowry, indicators, pH scale acid/base reactions, formation of salts, Uses of salts: (Neutralisation activities; uses in Qs) • acids + carbonates • metal oxides with acids • metals with acids • alkalis • comparing which is more corrosive (acid or base) Periodic trends (developing) Redox reactions 	
UNIT 6 - What determines change?	Change	Movement, Transfer	Orientation in space and time	Physical and chemical change requires the transfer of kinetic energy between particles of matter over time and affects the space they occupy.	A, B, C, D	Communication skills, Organization skills, Media literacy skills, Critical-thinking skills, Transfer skills	Particle/kinetic theory (introduction (about state-changes, angles of approach between molecules) <ul style="list-style-type: none"> • observing Brownian motion /diffusion- Reaction between gases Reaction between F & S (effect of heat)/ Surface area - Mentos fountains The mole concept and chemical calculations • molar mass/ molar volume • estimation/ scale/ precision Types of Chemical reaction (developing) • Mg + O (measuring mass) • Titration (acid/base reactions) 	

UNIT 7 - What's inside the nucleus?	Systems	Evidence	Orientation in space and time	Evidence from physical properties such as masses of nuclei has helped to elaborate our systems for classifying matter and explained the distribution of elements on Earth and elsewhere in the universe.	A, D	Communication skills, Collaboration skills, Organization skills, Critical-thinking skills, Creative-thinking skills	Atomic structure [including Isotopes] How does the nucleus add up? • isotopes (kinetics again) • Stable isotopes • Unstable isotopes radioactivity and decay • Modelling $\frac{1}{2}$ life • Exploring nuclides + atomic density • Modelling radiation Smoke detectors Black box experiments (Rutherford) Origin of the elements (3-level guide)
UNIT 8 - Why do electrons matter?	Relationship	Interaction, Function	Identities and relationships	Protons define the identity of an element but its relationship and interaction with other elements is a function of its outer electrons.	A, B, C, D	Communication skills, Collaboration skills, Organization skills, Affective skills, Reflection skills, Critical-thinking skills, Creative-thinking skills, Transfer skills, Information literacy skills	Flame tests Discovering atomic structure: Plum pudding/Bohr Periodic trends (detail) investigating patterns in the PT from data sheets reactivity series Octet rule/ shell models electron configuration and valency (developing) • reactivity series Lewis dot structures reactivity series of metals Types of Chemical reaction • electrolysis/ Daniell cell electrochemicals • Corrosion and corrosion protection redox reactions Preventing corrosion extraction of metals • Smelting • Activity: smelting copper (CuO) • Electrolysis • Recycling

MYP5 - Year 6

Unit title	Key concept	Related concepts	Global contexts	Inquiry statement	MYP Subject groups Objectives	ATL Skills	Content
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<p>UNIT 9 - How are environmental systems sustained by their chemistry?</p>	<p>Systems</p>	<p>Balance</p>	<p>Globalization and sustainability</p>	<p>Balancing the chemical inputs and outputs of Earth's systems is a prerequisite to sustain an environment that is hospitable to human life.</p>	<p>A, B, C, D</p>	<p>Collaboration skills, Communication skills, Organization skills, Information literacy skills, Critical-thinking skills, Transfer skills</p>	<p>Systems of the Earth the atmosphere (characteristics of gases; atmospheric composition)</p> <ul style="list-style-type: none"> • demonstrating presence of H₂O vap testing • Presence of O₂ testing • Thought-experiments - Oxygen/ Nitrogen extraction (distillation of air info) <p>cycles (nutrient, carbon, nitrogen)</p> <p>Atmosphere (Greenhouse)</p> <ul style="list-style-type: none"> • Carbon cycle • emission and environmental implications • Calculating carbon footprint <p>Interaction with the water cycle</p> <p>Value of field studies (correlation and causal effects)</p> <ul style="list-style-type: none"> • longitudinal stream study (Pre- Gp 4) testing and treatment <p>How the atmosphere interacts with nutrients:</p> <ul style="list-style-type: none"> • Nitrogen cycle • Activity: making a fertiliser • Phosphorus cycle effect of a pollutant testing and treatment 	
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<p>UNIT 10 - How can our energy resources be accessed fairly?</p>	<p>Change</p>	<p>Energy</p>	<p>Fairness and development</p>	<p>Global exploitation of energy resources relies on energetic changes in chemical reactions; global development depends on the fair and equitable exchange of those resources.</p>	<p>A, B, C, D</p>	<p>Communication skills, Collaboration skills, Organization skills, Reflection skills, Media literacy skills, Critical-thinking skills, Creative-thinking skills, Transfer skills</p>	<p>Brief history of phlogiston <ul style="list-style-type: none"> • Combustion of a candle • Carbon monoxide • Evaluating the products of combustion • Activation energy What makes a good fuel combustion of fuels Chemical energy for a sustainable future energy changes in reactions <ul style="list-style-type: none"> • exploring energy changes endo- and exothermicity • Predict-Observe-Explain (enthalpy ppt CaCO_3; displacement of Cu^{2+} with Zn^{2+}). Obtaining electricity chemically (Daniell cells) Calculation of energy produced Fruit/ vegetable 'cells' Bond energy calculations <ul style="list-style-type: none"> • measuring ΔH • Determining enthalpy of neutralisation • Intro to entropy (explanatory model) • Enthalpy of vaporisation Explosives exothermicity</p>	
<p>UNIT 11 - How can we shift the balance of a reaction?</p>	<p>Change</p>	<p>Balance</p>	<p>Orientation in space and time</p>	<p>Change in the balance called chemical equilibrium is affected by the collisions of particles in space and time.</p>	<p>A, B, C, D</p>	<p>Communication skills, Organization skills, Reflection skills, Information literacy skills, Critical-thinking skills, Transfer skills</p>	<p>Reaction kinetics [rates, and factors affecting rates/collision theory (detail)] Equilibria/reversible reactions <ul style="list-style-type: none"> • dissociation and association of hydrated compounds • Le Chatetlier's principle • Impacts of industrial chemistry on Earth's systems </p>	

UNIT 12 - Does organic chemistry mean we can make any substance we want?	Systems	Form, Function	Scientific and technical innovation	The versatile bonding of carbon atoms has allowed humanity to invent systems of molecules of various forms to fulfil different functions.	A, D	Communication skills, Organization skills, Reflection skills, Critical-thinking skills, Creative-thinking skills, Transfer skills	Organic Chemistry <ul style="list-style-type: none"> • Which substances contain C and which substances are organic? • Analysis of organic compounds classification of: alkanes, alkenes - Functional groups: alcohols - Functional groups: carboxylic acids - IUPAC naming Making esters Isomers: structural formulas Crude oil - extraction distillation of crude oil • investigating lubricants (B/C) • Cracking Creativity with polymers • Making soaps • Polymers (links given to reactions) • Classifying plastics • Alternatives to/reducing plastics 	
PHYSICS								
MYP3 - Year 4								
Unit title	Key concept	Related concepts	Global contexts	Inquiry statement	MYP Subject groups Objectives	ATL Skills	Content	

Unit 1 - How big is everything?	Relationship	Evidence, Patterns	Identities and relationships	We understand our own relationship to the Universe when we identify patterns at different scales.	A, B, C, D	Colaborative skills, Information literacy skills, critical thinking skills, Transfer skills	<p>Students will develop the understanding of:</p> <ul style="list-style-type: none"> What is the smallest thing? What is the largest thing? How do we measure them? What is the Universe made from? How is the Universe structured? How are smallest and the largest things in the Universe connected? Different scales, physical properties investigation. Students will develop and explore the various ideas that humanity has held at different times about the nature of the "stuff" in the Universe and how different patterns at the smallest of scale can make the biggest differences. Errors in measurements Accuracy International system of units 	
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Unit 2 How do the matter and forces interact	Relationship	Interaction	Identities and relationships	Through identifying relationship of similarity and difference we understand how force and matter interact.	A, C, D	Colaborative skills, Information literacy skills, critical thinking skills, Transfer skills	<ul style="list-style-type: none"> - know what a force is, know effects of forces, newton meter - Recall the names of the four 'fundamental' forces. - State that force is measured in Newtons. - Interpret a range of examples for each of the four fundamental forces. - Analyse the four fundamental forces in terms of strength and distance of action. - Apply the reciprocal nature of distance–strength relationships to explain observations. - Outline that matter is both kept together and kept apart by electrostatic attraction and repulsion. - Three kinds of force will be observed closely: gravitational, electrical and magnetic. - Fields - magnetic, gravitational, electric - Measuring Earth's gravitational field strength - Analysing gravitational fields - What is the difference between weight and mass? - - How does the weight shape our identity? - Where do forces begin? Where do they end? 	
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<p>Unit 3 Amazing structures: How are we learned to use force?</p>	<p>Systems</p>	<p>Forms</p>	<p>Scientific and technical innovations</p>	<p>Forms of nature have inspired us to use systems of force and to create innovative structures.</p>	<p>A, B, C</p>	<p>Colaborative skills, Information literacy skills, critical thinking skills, Transfer skills</p>	<p>All students should: Describe force systems in terms of force arrows to show size and direction of forces. Apply vector diagrams to test whether forces are balanced or produce a resultant. Apply vector diagrams to estimate size and direction of resultant forces. - Adding forces, subtracting forces, the resultant force, balanced forces, parallelogram method, friction, air resistance, streamlined shape, turning forces, torque, lever, parts of lever, rotational motion, moment of inertia, rotational kinetic energy. Explain that unbalanced forces cause motion or deformation. Interpret force systems in terms of strong structural unit shapes: cantilevers and right-angled triangles, arches and equilateral triangles. Describe how strong structural unit shapes deform under load. Some students could: Use vector diagrams to solve multiple force problems and calculate the resultant. Explain strength of strong structural unit shapes in terms of force distribution. Outline the variables that affect the choice of design in a structure, particularly in terms of physical properties of materials.</p>	
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Unit 4 How far, how fast, how much faster?	Relationship	Movement	Scale, duration, frequency, and variability	To know where we are moving to we need to describe the relationship between space and time	A, B, C, D	Colaborative skills, Information literacy skills, critical thinking skills, Transfer skills	use appropriate scientific terms such distance travelled, speed, velocity, time taken, average speeduse with understanding formulas for s, v, t, va, $s_1 + s_2 = s$, $s_1 = s_2$ while solving examples in familiar and in unfamiliar wayidentify and describe the scientific information contained in the text of the examples, in newspapers' articles, in graphs, in encyclopediaexplain the relativity of a movement in everyday life – choose a reference systemmake graphs to solve distance – time problemslook for relationships and patterns in distance – time graph, speed – time graphcollect data – 3 different types of speed, search for speed of the chosen objects in encyclopedias, books, web pages...record data - 120 m run in a table and transforming these data into a graphwork effectively as a member of a team during lab
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MYP4 - Year 5

Unit title	Key concept	Related concepts	Global contexts	Inquiry statement	MYP Subject groups Objectives	ATL Skills	Content
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Unit 5 Free to move?	Change	Movement	Human capability and development	Movement is the change of velocity which influences how our world has been moving and developing new technologies, and applications	A, B, C, D	Communication skills, Collaboration skills, Organization skills, Critical thinking skills, Reflection skills	<ul style="list-style-type: none"> - use appropriate scientific terms such distance travelled, speed, velocity, time taken, average speed, acceleration, free fall motion, inertia, momentum - understand how momentum can be used to qualify the motion of an object - understand how Newton's law (1st, 2nd, 3rd) of motion help us understand and develop new forms of propulsion and transportation systems. - use with understanding formulas for accelerated motion while solving complex examples in familiar and in unfamiliar way - use and apply mathematics knowledge about the quadratic functions to solve accelerated/decelerated motion examples - identify and describe the scientific information contained in the text of the examples, in newspapers' articles, in graphs, in encyclopedia - explain the relativity of a movement in everyday life – choose a reference system - make the graphs to solve distance – time problems and connect it with the knowledge about the quadratic function - look for relationships and patterns in distance – time graph, speed – time graph, graphs in newspapers - identify a distance travelled as an area under the speed-time graph - understand that free fall motion is an uniformly accelerated motion and give the real life examples of such motion - collect data –about their reaction time and about an
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<p>Unit 6 How do we make live easier?</p>	<p>Change</p>	<p>Energy transformations</p>	<p>Human impact on the environment</p>	<p>The need for sustainability is changing the way in which humans have developed and used machines that are created to transform energy and do usefull work</p>	<p>A, B, C, D</p>	<p>Communication skills, Collaboration skills. Organization skills, Critical thinking skills, Reflection skills</p>	<p>The feeling of temperature – is water warm or cold? Heat – symbol, unit, state of matter, fluids $^{\circ}\text{C}$, $^{\circ}\text{F}$, K Absolute zero, freezing point, boiling point, change of freezing and boiling point in different conditions Types of thermometers – mercury, alcohol, bimetallic, liquid crystals, digital Thermal expansion of solids, liquids and gases Practical use of expansion Bimetallic strip and its use Thermostat First Law of Thermodynamics heat conductors, insulators Heat transfer: conduction, convection, radiation Evaporation, boiling Specific heat capacity Phase changes Work done, units of work Kinetic energy, gravitational potential energy + formulas ($E_k = W = F \times s$, $E_k = \frac{1}{2} mv^2$, $E_p = mgh$) Power - symbol, unit Energy as agent of a change and mechanical energy is a stored work Forms of energy/ kids of energy The Law of conservation of energy Sankey diagrams Crumple zone Energy development and transfer in everyday situations Efficiency, efficient work Renewable and non – renewable sources of energy</p> <p>Machines, work done Steam engine, windmill</p>	
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Unit 7 -How can we communicate	Relationships	Movement energy	Products, systems and institutions	New global relationships have become possible, as humanity has learned to communicate through energy transferred as wave motion		Communication skills, Collaboration skills, Organization skills, Critical thinking skills, Reflection skills	<ul style="list-style-type: none"> - aware the importance of the light for life on our Earth - use appropriate and with understanding scientific terms such angle of incidence, angle of reflection, normal, plane and concave and convex mirror, real and unreal image, laterally inverted image, total reflection, umbra, penumbra, eclipse, phases of the Moon, spectrum - draw and interpret the ray diagram - describe and explain the use of curved mirrors in everyday life – their benefits and limitations - look for relationships between angle of reflection and angle of incidence - solve optical problems in familiar and unfamiliar way - discuss and aware the importance of sight for us - discuss the limitations of blind people in our society and suggest some possibility how to help them - work effectively as a member of a team - present scientific information in a form of banner - be familiar with working with plane mirrors - use appropriate scientific terms such wave length, frequency, period, speed of light and sound, - use with understanding formula for $\lambda = v \times T$ - explain and apply scientific information to solve “sound problems” in familiar and unfamiliar situations - predict and describe what kind of image is created by lenses -design the scientific investigation – measuring the speed of sound, 	
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Unit 8 How is our climate changing	Change	Environment, Evidence	Human impact on the environment	Scientific evidence shows that human activity is leading to major changes in global environments	A, B, C, D	Communication skills, Collaboration skills, Information literacy skills, Critical thinking skills, Creative thinking skills, Reflection skills	<p>Students will inquire into how the Earth's atmosphere helps maintain the conditions that make life possible. They will explore the physics behind the processes that keep the Earth's climate in balance, and the factors that are affecting that balance.</p> <ul style="list-style-type: none"> - what is a climate, climate change - principle atmospheric layers and descriptors - balance of the Earth's energy - Absorption, infra-red energy, reflection, emission - greenhouse effect - fossil fuels - carboniferous period - specific energy - power from nature - exothermic process - climate-forcing factors - irradiance -global warming, climate response, climate sensitivity - saturation, equilibrium - global warming - evaluating consequences - thermal power station, geothermal power station, solar power station, hydroelectric power plant, tidal power station - give examples of possibilities how can my family and I save energy + argue why it is important - give examples, describe and explain ways how power plants work and discuss their positives and negative effects on the environment - describe how the building of power plants, use of energy sources, development of new ecological technologies, ... is affected by political, economical and environmental factors - present scientific information
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MYP5 - Year 6

MYP5 - Year 6								
Unit title	Key concept	Related concepts	Global contexts	Inquiry statement	MYP Subject groups Objectives	ATL Skills	Content	

<p>UNIT 9 - Are all our futures electric?</p>	<p>System</p>	<p>Development</p>	<p>Scientific and technical innovation</p>	<p>The development of electrical systems has defined the modern world and made new futures possible</p>	<p>A, B, C, D</p>	<p>Communication skills, Collaboration skills, Affective skills, Reflection skills, Information literacy skills, Critical thinking, Creative thinking, Transfer skills</p>	<p>Electric circuits and its properties (parts of a circuit, symbols of the components, sources of el. current, switch, parallel circuit, series circuit,...) Electric current, symbol, unit direct current, real current, conventional current circuit diagram Voltage Voltmeter, ammeter electrostatic generator Van der Graaf generator Connection in series and in parallel Different types of sources (series connection of batteries) Battery from fruit and vegetable El. current in solids – what it is, real and conventional el. current Resistance Factors influencing the resistance Heat produced by el. current Filament lightbulb Short circuit and protection against it, fuse Protection against el. current Potentiometer, rheostat, resistor The Ohm's Law What is el. current + formula $I = Q/t$, what is voltage, AC, DC Resistance, resistor, rheostat + its properties ($R = \rho l/S$, $R \sim T$, thermistor) Resistance in series and parallel circuits + formulas El. Power Electric work, kWh Heating effect of el. current Efficiency Voltage graphs AC – electromagnetic induction Transformer Power transportation, power grid, fuse box controlling electricity - covalent bonds, metallic materials, semiconductors, potential difference</p>	
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Unit 10 - Power to the people	Relationship	Energy, Interaction	Fairness and development	Manipulating the relationship between interacting electric and magnetic forces make it possible to distribute plentiful energy to everyone.	A, B, C, D	Communication skills, Information literacy skills, Critical thinking, Creative thinking	Magnet and its parts Attractive and repulsive magnetic force Magnetic field lines, magnetic field and its properties Permanent and temporary magnets Magnetic domains Magnetization, demagnetization, Magnetic field of the Earth, compass Magnetic properties of matter Soft and hard magnetic materials Use of magnets Electromagnet Electricity and Magnetism Relationships electrostatic charges, stationary magnets (brief review) Oersted's experiment, 1820 forces between electric currents and moving magnets current direction determines magnetic field direction solenoids Maxwell's corkscrew rule the catapult effect Fleming's rule motors homopolar motor commutating motor commutator for d-c circuits alternating current and emf stator and rotor slip rings and brushes Ampere's experiment, forces between parallel, current- conducting wires Ampere's rule for magnetic flux, Ampere's rule for solenoids affect of core materials - permeability galvanometer - how a galvanometer works Electromagnetic Induction Michael Faraday and Joseph Henry direct current dc alternating current ac electrical grid resistive heating
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Unit 11 - What's in atom	Change	Consequences, Energy	Scientific innovation	Learning to control nuclear changes allows us to use matter in new ways and release huge quantities of energy with consequences that can be both positive and negative.	A, D	Communication skills, Collaboration skills, Affective skills, Information literacy skills, Critical thinking,	<ul style="list-style-type: none"> - Matter made up of atoms - Protons, neutrons, electrons - Periodic table is a tabular arrangement of chemical elements - How does the periodic table work? - Chemical properties - Metals; metalloids; non-metals - Pure substances and mixtures - Different models of atoms - Protons, neutrons, electrons - Define atomic number and mass number - Isotopes and their uses - Chemical formulas - Ionization - Radiations - The alpha rays - Quantum physics - Nuclear force - Quarks - Hadrons - Nuclear force - Isotopes - anti-matter - Background radiation - Mutation - Radio-carbon dating - Binding energy - Nuclear reactors - Nuclear fusion 	
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Unit 12 - Where are we in the universe?	Relationship	Evidence, Models	Orientation in space and time	As we expand the reach of our observations and evidence it, we better understand the relationships that form our models of the Universe and so our place in the cosmos.	A, B, D	Affective skills, Reflection skills, Information literacy skills, Critical-thinking skills, Transfer skills	<p>Solar system, stars, planets, galaxy, moon, Sun, Universe</p> <p>gravitation orbits perturbations inner planets, satellites, asteroid belt, comets, outer planets, oort cloud astronomical unit geocentric view heliocentric model Galileo Galilei J. Kepler and his three laws for planetary motions Newton's law of universal gravitation inertia centripetal force freefall star and its life Planck-Einstein relationship Planck's constant Sources of light, "light environments", scattering Light and its properties Light as part of electromagnetic spectrum Speed of light, light-year Pinhole camera Shadows, lunar and solar eclipse Colours of objects Primary, secondary colours – for painters and for physicists Addition and subtraction of colours Filters Rods and cones in eye</p> <p>law of reflection, law of refraction prism, focal point, images total reflection, optical fibres Plane mirror, spherical mirrors Formation of image, properties of image Use of mirrors Lenses, images created by lenses and their properties, ray diagrams Focal length of lenses Eye and its parts Defects of vision, glasses resolution</p>
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