**MYP SCIENCE Course Guide**

Aims

The MYP sciences group aims to encourage and enable students to:
*understand and appreciate science and its implications
*consider science as a human endeavor with benefits and limitations
*cultivate analytical, inquiring and flexible minds that pose questions, solve problems, construct explanations and judge arguments
*develop skills to design and perform investigations, evaluate evidence and reach conclusions
*build an awareness of the need to effectively collaborate and communicate
*apply language skills and knowledge in a variety of real-life contexts
*develop sensitivity towards the living and non-living environments
*reflect on learning experiences and make informed choices.

Objectives

**Criterion A: Knowing and understanding**
i. Explain scientific knowledge
ii. Apply scientific knowledge and understanding to solve problems set in familiar and unfamiliar situations
iii. Analyze and evaluate information to make scientifically supported judgements.

**Criterion B: Inquiring and designing**
i. explain a problem or question to be tested by a scientific investigation
ii. formulate a testable hypothesis and explain it using scientific reasoning
iii.explain how to manipulate the variables, and explain how data will be collected design scientific investigations

**Criterion C: Processing and evaluating**
i. present collected and transformed data
ii. interpret data and explain results using scientific reasoning
iii. evaluate the validity of a hypothesis based on the outcome of the scientific investigation
iv. evaluate the validity of the method
v. explain improvements or extensions to the method.

**Criterion D: Reflecting on the impacts of science.**
i. explain the ways in which science is applied and used to address a specific problem or issue
ii. discuss and evaluate the various implications of using science and its application to solve a specific problem or issue
iii. apply scientific language effectively
iv. document the work of others and sources of information used.

| MYP Year | Unit | Title | Key Concepts | Related Concepts | Global Context | Statement of Inquiry | MYP Objectives | MYP Assessment Task | Atl Skills | Length of Time |
|---|---|---|---|---|---|---|---|---|---|---|
| Science 6 | 1 | Layers of the Earth & Plate Tectonics | Systems | Function, form' | Scientific and Technical Innovation | Models and data analysis are used to show the consequences of the Earth's movement | B. Inquiring & designing<br>C. Processing & evaluating<br>D. Reflecting on the impacts of science. | Plate Tectonics ADI; Earthquake Challenge | Social; Communication | 7 weeks |
| | 2 | Rocks & Fossils | Relationship | Form, interaction | Scientific & Tech innovation | Changing rocks result in observable patterns of fossils, climate, and landscape | A. Knowing & understanding | Georgia Fossils Essay | Thinking | 4 weeks |
| | 3 | Hydrology | Change | Movement | Scientific and Technical Innovation | The earth's water is always moving and changing | B. Inquiring & designing<br>C. Processing & evaluating | Cycling of Water ADI | Self-management | 7 weeks |
| | 4 | Meteorology | Systems | interaction, movement | Scientific & Technical Innovation | We use models to predict the interactoins and movement between the atmosphere and the hydrosphere. | A. Knowing & Understanding<br>D. Reflecting on the impacts of science | Winter Weather PBL; Peachtree Weather Balloon Essay | Research; Thinking | 7 weeks |
| | 5 | Science & the Universe | systems | Interaction, movement | Orientation in space and time | The interaction of the universe systems shows relationships through time and space. | B. Inquiring & designing<br>C. Processing & evaluating | Phases of the Moon ADI | Thinking | 6 weeks |
| | 6 | Natural Resources & Climate Change | Relationships | consequences | Orientation in space and time | Cause and effect relationships exist between humans and the natural world | A. Knowing & understanding | In Development | | 2 weeks |

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| Science 7 | 1 | Classification & Identification | Identity | Evidence, patterns | Scientific & Technical Innovation | Humans use their undertanding of scientific principles to identify patterns from evidence. | A. Knowing & Understanding | Summative Assesment and Dichotomous Key Project | Communication | 3 weeks |
| | 2 | Cells & Human Body | Systems | Function, interaction | Scientific & Technical Innovation | Individual actions can influence complete systems | A. Knowing & Understanding D. Reflecting on the impacts of science | Summative Assesment, Cell Model Project, Osomisis ADI Lab, | communication, Self-management skills | 8 weeks |
| | 3 | Genetics & Heredity | Change | Models, function | Scientific & Technical Innovation | Models help us understand how the naturaland artificial patterns of inheritance change. | A. Knowing & understanding<br>B. Inquiring & designing<br>C. Processing & evaluating<br>D. Reflecting on the impacts of science. | Summative Assesment, ADI Lab - Fruit Flies & Inheritance and Pedigree Project | communication, thinking skills, Research | 6 weeks |
| | 5 | Evolution | Change | Balance and Consequences | Globalization and Sustainability (Human Impact on the Environment) | Changes in a biological system affect the balance, with consequences for the sustainability of organisms in the system. | A. Knowing & understanding<br>B. Inquiring & designing<br>C. Processing & evaluating<br>D. Reflecting on the impacts of science. | Summative Assesment, Animal Adaptation Project | communication, thinking skills | 5 weeks |
| | 4 | Ecology | Relationships | Balance, Enviroment, and Interaction | Globalization and Sustainability | The sustainability and balance of natural systems is affected by interactions within the environment. | A. Knowing & understanding<br>B. Inquiring & designing<br>C. Processing & evaluating<br>D. Reflecting on the impacts of science. | Summative Assesment, MN Food Web and invasive species Create a solution for the loss of penguin habitats | Research, communication | 10 weeks |
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| Science 8 | 1 | Matter | Change | Transformation | Identities & Relationships | Relationships change and transform under certain conditions, making new forms and identities. | A. Knowing & understanding B. Inquiring & designing | Test and periodic project | research and organization | 8 weeks |
| | 2 | Force & Motion | Relationships | Interaction | Orientation in space and time | Understanding the relationship between forces, time and space help us to better understand the relationship between variables. | C. Processing & evaluating D. Reflecting on the impacts of science | Newton's law project and test | research | 5 weeks |
| | 3 | Transformation of energy | Systems | Energy, movement | Orientation in space and time | The movement of energy changes based on the system of space and time. | B. Inquiring & designing<br>D. Reflecting on the Impacts of Science | Panther Jams project & ADI Lab (Ball Drop) | collaboration | 6 weeks |
| | 4 | Electricity & Magnetism | Relationships | Environment, Interaction | Globalization & Sustainability | The relationship between man and nature helps us to understand the challenges of resource sustainability. | A. Knowing & understanding C. Processing & Evaluating | ADI Lab (Magnetic Force) | collaboration | 5 weeks |
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| Grade 9 Physical Science (Ridgeview) | 1 | Science Fair | Logic | Cause & effect, patterns; models | Scientific & technical innovation | Patterns of cause and effect explain scientific models and the natural world | A. Knowing & understanding<br>B. Inquiring & designing<br>C. Processing & evaluating<br>D. Reflecting on the impacts of science. | Science Fair Project | Research | 10 weeks (50 hours) Written unit due May 20th |
| | 2 | Rube Goldberg | Relationships | systems, models | Scientific & technical innovation | Models of motion show systems that allow for adaptation and ingenuity. | A. Knowing & understanding<br>B. Inquiring & designing<br>C. Processing & evaluating<br>D. Reflecting on the impacts of science. | Rube Goldberg Project | Thinking | 10 weeks (50 hours) Written unit due 15th |
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| Grade 9 Earth | 1 | Structures of the Earth | Systems | Patterns, models | Orientation in space and time | Models of the earth help us to an understanding of how these sytems interact with one another | A. Knowing & understanding<br>B. Inquiring & designing<br>C. Processing & evaluating<br>D. Reflecting on the impacts of science. | short answer | Thinking | 15 hours (2.5 weeks) |

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| Systems (Riverwood) | 2 | Ecology | Revise | revise | Scientific & Tech Innovation | Organisms interact with the natural environment in order to understand the interactions between environmental factors and living organisms. | A. Knowing & understanding<br>B. Inquiring & designing<br>C. Processing & evaluating<br>D. Reflecting on the impacts of science. | Human Impact Project | Communication, Social, Self-management, research. | 22.5 hours (6 weeks) |
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| Chemistry | Intro | Science Fair | Relationship | Models, forms, patterns | Students Select Global Context | Relationships are understood when scientists use models to uncover patterns | A. Knowing & understanding<br>B. Inquiring & designing<br>C. Processing & evaluating<br>D. Reflecting on the impacts of science. | Science Fair Research Project | All atl Skills | 5 months (Independent Inquiry Project) |
| | 1 | Nature and Conservation of Matter | Change | Form, Interaction | Scientific & Tech Innovation | Change evolves when the forms of substances interact through processes.. | A. Knowing & understanding<br>C. Processing & evaluating | Formative 1; Chromatography lab; Unit Test; Identification Task | Communication, thinking | 15 hours (4 weeks) |
| | 2 | Organization of Matter | Structure | Periodicity | Orientation in space and time | Particles of matter are organized at the micro and macro level | A. Knowing & understanding<br>B. Processing & Evaluating | Chapter Test; Scientific Poste | Communication | 1 week |
| | 3 | Stiochiometry | Change | interaction | Identities & Relationships | Molar ratios allow us to predict the amount of a product that will be generated in a reaction | C. Processing & evaluating | ADI Lab (Molar Relationships) | Communication, research | 30 hours (8 weeks) |
| | 4 | Motion of Atoms and Molecules | Change | Energy, movement | Globalization & Sustainability. | Properties of matter are related to the motion of atoms and molecules | C. Processing & evaluating | In Development C & D. | Self-management, Thinking | 12 hours/3 weeks |
| | 5 | Solutions and the Nature of Acids and | Relationships | Interaction; balance | Identities & Relationships | In development | A. Knowing & understanding<br>D. Reflecting on the impacts of science. | Chapter Test | self-management, thinking | 12 hours/ 3 weeks |
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| Biology | 1 | Ecology & Organisms | Change | environment; energy | Scientific & Technical Innovation | ***Change*** *occurs when* organisms **interact** with the natural environment by transferring matter and **energy.** | A. Knowing & understanding<br>B. Inquiring & designing<br>C. Processing & evaluating<br>D. Reflecting on the impacts of science. | Unit Exam; Human Impact Project | self-management; research | 22.5 hrs (6 weeks) |
| | 2 | Cells | systems | models, interaction, form, function | Identities & Relationships | Scientists understand the world by using and observing biological systems, models, methods, products, processes, & solutions. | A. Knowing & understanding<br>B. Inquiring & designing<br>C. Processing & evaluating<br>D. Reflecting on the impacts of science. | Unit Exam | self-management, thinking, | 37.5 hrs (11 weeks) |
| | 2H | Cell Structure & Function | form & function | form & function | Scientific & Technical Innovation | Molecular interactions drive the relationships between the structure and function of living things. | A. Knowing & understanding<br>B. Inquiring & designing<br>C. Processing & evaluating<br>D. Reflecting on the impacts of science. | Content Quizes; Exam; Cell Comparison Lab | self-management, thinking, research | 30 hrs (8 weeks) |
| | 3 | Genetics 1 & 2 | Transformation (Change) | function; interaction | Scientific & Technical Innovation | Scientific and technological advances enable societies to use control and **transform** the **function** of organisms. | A. Knowing & understanding<br>B. Inquiring & designing<br>C. Processing & evaluating<br>D. Reflecting on the impacts of science. | tests, SPA projects, Labs, Argument #5, Alien DNA Lab | Thinking; social | 16 hrs (3-4 weeks) |
| | 4 | Evolution | In Development | | | | | | | |
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| ACCEL Physics | In Development - Interdisciplinary Science & Design | | | | | | | | | |
| | In Development - Science Fair Research Project | | | | | | | | | |