MYP Science SCWA

Key Concepts

Key concepts promote the development of a broad curriculum. They represent big ideas that are both relevant within and across disciplines and subjects. For Science these are **Change, Relationships** and **Systems.**

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Aesthetics	Change	Communication	Communities
Connections	Creativity	Culture	Development
Form	Global interactions	Identity	Logic
Perspective	Relationships	Systems	Time, place and space

Related Concepts

Related concepts Related concepts promote deep learning. They are grounded in specific disciplines and are useful for exploring key concepts in greater detail. Inquiry into related concepts helps students develop more complex and sophisticated conceptual understanding. There are 12 related concepts for each branch of Science.

Related concepts in biology		
Balance	Consequences	Energy
Environment	Evidence	Form
Function	Interaction	Models
Movement	Patterns	Transformation

Related concepts in chemistry		
Balance	Conditions	Consequences
Energy	Evidence	Form
Function	Interaction	Models
Movement	Patterns	Transfer

Related concepts in physics		
Consequences	Development	Energy
Environment	Evidence	Form
Function	Interaction	Models
Movement	Patterns	Transformation

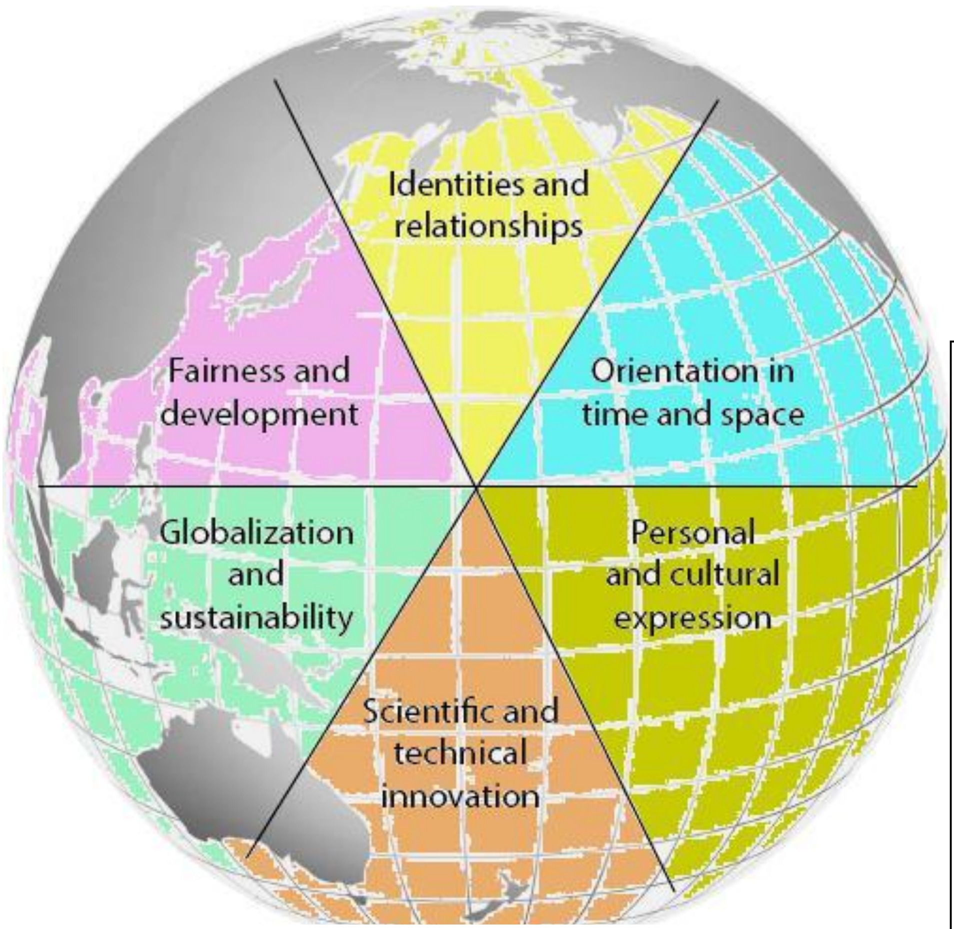
Global Concepts

Teaching and learning in the MYP involves understanding concepts in context. Global contexts provide a common language for powerful contextual learning, identifying specific settings, events or circumstances that provide more concrete perspectives for teaching and learning. When teachers select a global context for learning, they are answering the following questions.

- Why are we engaged in this inquiry?
- Why are these concepts important?
- Why is it important for me to understand?
- Why do people care about this topic?

MYP sciences can develop meaningful explorations of:

• identities and relationships • orientation in space and time • personal and cultural expression • scientific and technical innovation • globalization and sustainability • fairness and development



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Statement of Enquiry Criteria

Statement of inquiry Teachers construct the statement of inquiry for a unit by combining a **key concept**, one or more **related concepts**, and a **global context** for the unit into a **meaningful statement** that students can understand. This statement expresses the relationship between concepts and context; it represents a transferable idea supported by factual content. Statements of inquiry facilitate synergistic thinking, synthesizing factual and conceptual levels of mental processing and creating a greater impact on cognitive development than either level of thinking by itself (Erickson 2007; Marzano 2009). The statement of inquiry:

- represents a contextualized, conceptual understanding
- describes a complex relationship that is worthy of inquiry
- explains clearly what students should understand and why that understanding is meaningful
- can be qualified (using phrases such as “often”, “may” and “can”) if it is not true in all situations, but is still an important idea
- can be formulated at different levels of specificity.

Overview of Assessment

In the MYP, subject group objectives correspond to assessment criteria. Each criterion has eight possible achievement levels (1–8), divided into four bands that generally represent limited (1–2); adequate (3–4); substantial (5–6); and excellent (7–8) performance. Each band has its own unique descriptor that teachers use to make "best-fit" judgments about students' progress and achievement. This guide provides the required assessment criteria for years 1, 3 and 5 of MYP sciences. In response to national or local requirements, schools may add criteria and use additional models of assessment. Schools must use the appropriate assessment criteria as published in this guide to report students' final achievement in the programme. Teachers clarify the expectations for each summative assessment task with direct reference to these assessment criteria. Task-specific clarifications should clearly explain what students are expected to know and do. They could be in the form of: • a task-specific version of the required assessment criteria • a face-to-face or virtual classroom discussion • a detailed task sheet or assignment.

Maths in Science

Mathematical requirements Throughout the MYP sciences students should have regular exposure to the mathematical skills developed in MYP mathematics and used by scientists. By the end of the MYP sciences course, students should be able to: • perform the basic arithmetic functions: addition, subtraction, multiplication and division • use calculations involving means, decimals, fractions, percentages, ratios, approximations and reciprocals • use standard notation (for example, 3.6 × 106) • use direct and inverse proportion • solve simple algebraic equations • solve linear simultaneous equations • plot graphs (with suitable scales and axes), including two variables that show linear and non-linear relationships • interpret graphs, including the significance of gradients, changes in gradients, intercepts and areas • draw lines (either curves or linear) of best fit on a scatter plot graph • interpret data presented in various forms (for example, bar charts, histograms and pie charts) • represent arithmetic mean using x-bar notation (for example, x)

Assessment Criteria

Achievement Level	Level Descriptor			
	Criterion A: Knowing and Understanding	Criterion B: Inquiring and designing	Criterion C: Processing and evaluating	Criterion D: Rreflecting on the impacts of Science
0	The student does not reach a standard described by any of the descriptors below	The student does not reach a standard described by any of the descriptors below	The student does not reach a standard described by any of the descriptors below	The student does not reach a standard described by any of the descriptors below
1–2	The student is able to: i. select scientific knowledge ii. select scientific knowledge and understanding to suggest solutions to problems set in familiar situations iii. apply information to make judgments, with limited success.	The student is able to: i. select a problem or question to be tested by a scientific investigation ii. select a testable prediction iii. state a variable iv. design a method with limited success.	The student is able to: i. collect and present data in numerical and/or visual forms ii. interpret data iii. state the validity of a prediction based on the outcome of a scientific investigation, with limited success iv. state the validity of the method based on the outcome of a scientific investigation, with limited success v. state improvements or extensions to the method that would benefit the scientific investigation, with limited success.	The student is able to, with limited success: i. state the ways in which science is used to address a specific problem or issue ii. state the implications of using science to solve a specific problem or issue, interacting with a factor iii. apply scientific language to communicate understanding iv. document sources.
3-4	The student is able to: i. recall scientific knowledge ii. apply scientific knowledge and understanding to suggest solutions to problems set in familiar situations iii. apply information to make judgments.	The student is able to: i. state a problem or question to be tested by a scientific investigation ii. state a testable prediction iii. state how to manipulate the variables, and state how data will be collected iv. design a safe method in which he or she selects materials and equipment.	The student is able to: i. correctly collect and present data in numerical and/or visual forms ii. accurately interpret data and outline results iii. state the validity of a prediction based on the outcome of a scientific investigation iv. state the validity of the method based on the outcome of a scientific investigation v. state improvements or extensions to the method that would benefit the scientific investigation	The student is able to: i. state the ways in which science is used to address a specific problem or issue ii. state the implications of using science to solve a specific problem or issue, interacting with a factor iii. sometimes apply scientific language to communicate understanding iv. sometimes document sources correctly
5-6	The student is able to: i. state scientific knowledge ii. apply scientific knowledge and understanding to solve problems set in familiar situations iii. apply information to make scientifically supported judgments.	The student is able to: i. state a problem or question to be tested by a scientific investigation ii. outline a testable prediction iii. outline how to manipulate the variables, and state how relevant data will be collected iv. design a complete and safe method in which he or she selects appropriate materials and equipment.	The student is able to: i. correctly collect, organize and present data in numerical and/or visual forms ii. accurately interpret data and outline results using scientific reasoning iii. outline the validity of a prediction based on the outcome of a scientific investigation iv. outline the validity of the method based on the outcome of a scientific investigation v. outline improvements or extensions to the method that would benefit the scientific investigation.	The student is able to: i. outline the ways in which science is used to address a specific problem or issue ii. outline the implications of using science to solve a specific problem or issue, interacting with a factor iii. usually apply scientific language to communicate understanding clearly and precisely iv. usually document sources correctly
7-8	The student is able to: i. outline scientific knowledge ii. apply scientific knowledge and understanding to solve problems set in familiar situations and suggest solutions to problems set in unfamiliar situations iii. interpret information to make scientifically supported judgments.	The student is able to: i. outline a problem or question to be tested by a scientific investigation ii. outline a testable prediction using scientific reasoning iii. outline how to manipulate the variables, and outline how sufficient, relevant data will be collected iv. design a logical, complete and safe method in which he or she selects appropriate materials and equipment.	The student is able to: i. correctly collect, organize, transform and present data in numerical and/ or visual forms ii. accurately interpret data and outline results using correct scientific reasoning iii. discuss the validity of a prediction based on the outcome of a scientific investigation iv. discuss the validity of the method based on the outcome of a scientific investigation v. describe improvements or extensions to the method that would benefit the scientific investigation	The student is able to: i. summarize the ways in which science is applied and used to address a specific problem or issue ii. describe and summarize the implications of using science and its application to solve a specific problem or issue, interacting with a factor iii. consistently apply scientific language to communicate understanding clearly and precisely iv. document sources completely

MYP Unit Planner Check List

Unit title	Key concept	Related concept(s)	Global context	Statement of inquiry	Inquiry Questions	Approaches to Learning