Sciences Subject Guide

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.**

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

Global Context

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

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

Together we inspire, learn and achieve

Reflective Open-Minded Caring Knowledgeable Communicators Inquirers Thinkers Principled Balanced Risk-takers

Sciences: Curriculum and Assessment overview

Criterion A	Criterion B	Criterion C	Criterion D
Knowing and understanding	**Inquiry and design**	**Processing and evaluating**	**Reflecting on the impacts of science**

Year 7

Module 1	Module 2	Module 3	Module 4	Module 5	Module 6
Topic: Cells, body systems and reproduction	Topic: Particles and elements	Topic: Forces and Motion	Topic: Chemical reactions	Topic: Chemical Reactions-Acids and alkalis	Topic: Light, sound and space
Assessments: A, B, C	Assessments: A & D	Assessments: D	Assessments: B & C	Assessments: A & D	Assessments: A, B, C

Year 8

Module 1	Module 2	Module 3	Module 4	Module 5	Module 6
Topic: Electricity, magnetism and energy	Topic: Periodic table, Metals and acids	Topic: Health and lifestyle	Topic: Separating techniques	Topic: Adaptations and Ecosystem	Topic: The Earth
Assessments: A, B, C	Assessments: A & D	Assessments: B & C	Assessments: D	Assessments: D, B, C	Assessments: A, B, C

Year 9

Module 1	Module 2	Module 3	Module 4	Module 5	Module 6
Topic: Cells and Organisation; Atomic structure	Topic: Particle model of matter, atomic structure and particle (introduction)	Topic: Atomic structure and particle model of matter	Topic: Cells and Organisation; Properties of elements in the periodic table, energy stores.	Topic: Health and Ecosystems, The Earth's atmosphere	Topic: Testing for gases, Forces and motion
Assessment: A, B, C	Assessment: A & D	Assessment: B & C	Assessment: D	Assessment: A & D	Assessments: A, B, C

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Year 7 & 8 Assessment Criteria

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.

Year 7 & 8 Grading

The scores for each of the four criteria are added together and a final Grade is awarded.

1	2	3	4	5	6	7
1-5	6-9	10-14	15-18	19-23	24-27	28-32

level	Level Descriptor			
	Criterion A: Knowing and Understanding	**Criterion B: Inquiring and designing**	**Criterion C: Processing and evaluating**	**Criterion D: Reflecting 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.

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Year 9 Assessment Criteria

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.

Year 9 Grading

The scores for each of the four criteria are added together and a final Grade is awarded.

1	2	3	4	5	6	7
1-5	6-9	10-14	15-18	19-23	24-27	28-32

level	Level Descriptor			
	Criterion A: Knowing and Understanding	**Criterion B: Inquiring and designing**	**Criterion C: Processing and evaluating**	**Criterion D: Reflecting 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. 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, with limited success ii. state a testable hypothesis iii. state the variables iv. design a method, with limited success.	The student is able to: i. collect and present data in numerical and/or visual forms ii. accurately interpret data iii. state the validity of a hypothesis with limited reference to a scientific investigation iv. state the validity of the method with limited reference to a scientific investigation v. state limited improvements or extensions to the method.	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 the use of science to solve a specific problem or issue, interacting with a factor iii. apply scientific language to communicate understanding but does so with limited success iv. document sources, with limited success.
3-4	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 hypothesis using scientific reasoning iii. outline how to manipulate the variables, and state how relevant 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 describe results iii. state the validity of a hypothesis 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. 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. sometimes apply scientific language to communicate understanding iv. sometimes document sources correctly
5-6	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 and explain a testable hypothesis using scientific reasoning iii. outline how to manipulate the variables, and outline how sufficient, 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 describe results using scientific reasoning iii. outline the validity of a hypothesis 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. summarize the ways in which science is applied and used to address a specific problem or issue ii. describe the implications of using science and its application 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. describe scientific knowledge ii. apply scientific knowledge and understanding to solve problems set in familiar and unfamiliar situations iii. analyse information to make scientifically supported judgments	The student is able to: i. describe a problem or question to be tested by a scientific investigation ii. outline and explain a testable hypothesis using correct scientific reasoning iii. describe how to manipulate the variables, and describe 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 describe results using correct scientific reasoning iii. discuss the validity of a hypothesis 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. describe the ways in which science is applied and used to address a specific problem or issue ii. discuss and analyse 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.