

MYP Mathematics 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 Maths these are **Form, Logic and Relationships**.



© International Baccalaureate Organization 2018

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 phase of language acquisition.

Related concepts in mathematics		
Change	Equivalence	Generalization
Justification	Measurement	Models
Patterns	Quantity	Representation
Simplification	Space	Systems

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

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.

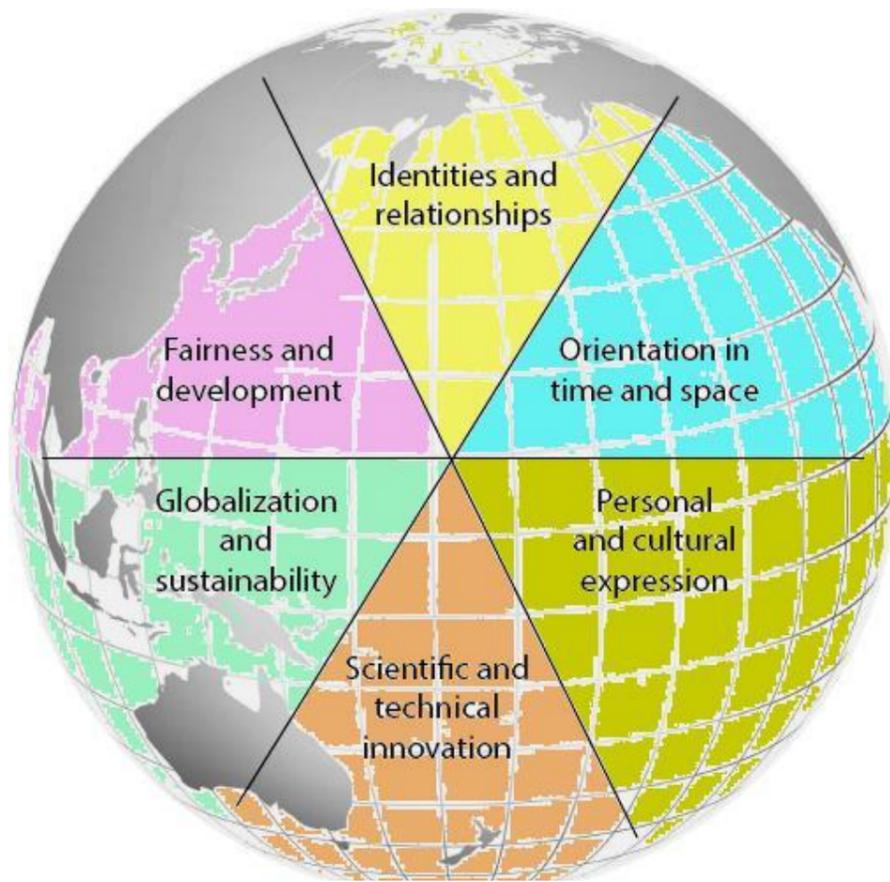
Global Concepts

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



© International Baccalaureate Organization 2018

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 and the MYP

The study of mathematics is a fundamental part of a balanced education. It promotes a powerful universal language, analytical reasoning and problem-solving skills that contribute to the development of logical, abstract and critical thinking. Mathematics can help make sense of the world and allows phenomena to be described in precise terms. It also promotes careful analysis and the search for patterns and relationships, skills necessary for success both inside and outside the classroom. Mathematics, then, should be accessible to and studied by all students. Studying mathematics, however, should be more than simply learning formulae or rules. Students should not have the impression that all of the answers to mathematics can be found in a book but, rather, that they can be active participants in the search for concepts and relationships. In that light, mathematics becomes a subject that is alive with the thrill of exploration and the rewards of discovery. At the same time, that new knowledge may then be applied to other situations, opening up even more doors for students. MYP mathematics promotes both inquiry and application, helping students to develop problem-solving techniques that transcend the discipline and that are useful in the world outside school. An MYP mathematics programme should be tailored to the needs of students, seeking to intrigue and motivate them to want to learn its principles. Students should see authentic examples of how mathematics is useful and relevant to their lives and be encouraged to apply it to new situations. Mathematics provides the foundation for the study of sciences, engineering and technology. However, it is also evident in the arts and is increasingly important in economics, the social sciences and the structure of language. Students in the MYP are encouraged to use ICT tools to represent information, to explore and model situations, and to find solutions to various problems. These are skills that are useful in a wide range of arenas. MYP mathematics aims to equip all students with the knowledge, understanding and intellectual capabilities to address further courses in mathematics, as well as to prepare those students who will use mathematics in their studies, workplaces and lives in general.

Assessment Criteria

Achievement Level	Level Descriptor			
	Criterion A: Knowing and understanding	Criterion B: Investigating patterns	Criterion C: Communicating	Criterion D: Applying mathematics in real-life contexts
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 appropriate mathematics when solving simple problems in familiar situations ii. apply the selected mathematics successfully when solving these problems iii. generally solve these problems correctly in a variety of contexts.	The student is able to: i. apply, with teacher support, mathematical problem-solving techniques to recognize simple patterns ii. state predictions consistent with simple patterns.	The student is able to: i. use limited mathematical language ii. use limited forms of mathematical representation to present information iii. communicate through lines of reasoning that are difficult to understand.	The student is able to: i. identify some of the elements of the authentic real-life situation ii. apply mathematical strategies to find a solution to the authentic real-life situation, with limited success.
3-4	The student is able to: i. select appropriate mathematics when solving more complex problems in familiar situations ii. apply the selected mathematics successfully when solving these problems iii. generally solve these problems correctly in a variety of contexts.	The student is able to: i. apply mathematical problem-solving techniques to recognize patterns ii. suggest how these patterns work.	The student is able to: i. use some appropriate mathematical language ii. use different forms of mathematical representation to present information adequately iii. communicate through lines of reasoning that are able to be understood, although these are not always coherent iv. adequately organize information using a logical structure.	The student is able to: i. identify the relevant elements of the authentic real-life situation ii. apply mathematical strategies to reach a solution to the authentic real-life situation iii. state, but not always correctly, whether the solution makes sense in the context of the authentic real-life situation.
5-6	The student is able to: i. select appropriate mathematics when solving challenging problems in familiar situations ii. apply the selected mathematics successfully when solving these problems iii. generally solve these problems correctly in a variety of contexts.	The student is able to: i. apply mathematical problem-solving techniques to recognize patterns ii. suggest relationships or general rules consistent with findings iii. verify whether patterns work for another example.	The student is able to: i. usually use appropriate mathematical language ii. usually use different forms of mathematical representation to present information correctly iii. communicate through lines of reasoning that are usually coherent iv. present work that is usually organized using a logical structure.	The student is able to: i. identify the relevant elements of the authentic real-life situation ii. select adequate mathematical strategies to model the authentic real-life situation iii. apply the selected mathematical strategies to reach a valid solution to the authentic real-life situation iv. describe the degree of accuracy of the solution v. state correctly whether the solution makes sense in the context of the authentic real-life situation.
7-8	The student is able to: i. select appropriate mathematics when solving challenging problems in both familiar and unfamiliar situations ii. apply the selected mathematics successfully when solving these problems iii. generally solve these problems correctly in a variety of contexts.	The student is able to: i. select and apply mathematical problem-solving techniques to recognize correct patterns ii. describe patterns as relationships or general rules consistent with correct findings iii. verify whether patterns work for other examples.	The student is able to: i. consistently use appropriate mathematical language ii. consistently use different forms of mathematical representation to present information correctly iii. communicate clearly through coherent lines of reasoning iv. present work that is consistently organized using a logical structure.	The student is able to: i. The student is able to: i. identify the relevant elements of the authentic real-life situation ii. select adequate mathematical strategies to model the authentic real-life situation iii. apply the selected mathematical strategies to reach a correct solution to the authentic real-life situation iv. explain the degree of accuracy of the solution v. describe correctly whether the solution makes sense in the context of the authentic real-life situation.

MYP Unit Planner Check List

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