

Objectives

The objectives of any MYP subject group state the specific targets that are set for learning in that subject. They define what the student will be able to accomplish as a result of studying the subject.

The objectives of MYP science courses encompass the factual, conceptual, procedural and metacognitive dimensions of knowledge.

Schools **must** use the objectives provided in this guide for years 1, 3 and 5 of the programme.

Each objective is elaborated by a number of **strands**; a strand is an aspect or indicator of the learning expectation.

Subject groups **must** address **all** strands of **all** four objectives **at least twice** in **each year** of the MYP.

These objectives relate directly to the assessment criteria found in the “Assessed curriculum” section of this guide.

Together these objectives reflect the holistic nature of science and the real-world work of scientists. They enable students to engage with all aspects of science, either through individual objectives or connected processes.

A Knowing and understanding

Students develop scientific knowledge (facts, ideas, concepts, processes, laws, principles, models and theories) and apply it to solve problems and express scientifically supported judgments.

Tests or exams must be assessed using this objective. To reach the highest level students must make scientifically supported judgments about the validity and/or quality of the information presented to them. Assessment tasks could include questions dealing with “scientific claims” presented in media articles, or the results and conclusions from experiments carried out by others, or any question that challenges students to analyse and examine the information and allows them to outline arguments about its validity and/or quality using their knowledge and understanding of science.

In order to reach the aims of sciences, students should be able to:

- i. explain scientific knowledge
- ii. apply scientific knowledge and understanding to solve problems set in familiar and unfamiliar situations
- iii. analyse and evaluate information to make scientifically supported judgments.

B Inquiring and designing

Intellectual and practical skills are developed through designing, analysing and performing scientific investigations. Although the scientific method involves a wide variety of approaches, the MYP emphasizes experimental work and scientific inquiry.

When students design a scientific investigation they should develop a method that will allow them to collect sufficient data so that the problem or question can be answered. To enable students to design scientific investigations independently, teachers must provide an open-ended problem to investigate. An open-ended problem is one that has several independent variables appropriate for the investigation and has sufficient scope to identify both independent and controlled variables. In order to achieve the highest level for the strand in which students are asked to design a logical, complete and safe method, the student would include only the relevant information, correctly sequenced.

In order to reach the aims of sciences, students should be able to:

- 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
- iv. design scientific investigations.

C Processing and evaluating

Students collect, process and interpret qualitative and/or quantitative data, and explain conclusions that have been appropriately reached. MYP sciences helps students to develop analytical thinking skills, which they can use to evaluate the method and discuss possible improvements or extensions.

In order to reach the aims of sciences, students should be able to:

- 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.

D Reflecting on the impacts of science

Students gain global understanding of science by evaluating the implications of scientific developments and their applications to a specific problem or issue. Varied scientific language will be applied in order to demonstrate understanding. Students are expected to become aware of the importance of documenting the work of others when communicating in science.

Students must reflect on the implications of using science, interacting with one of the following factors: moral, ethical, social, economic, political, cultural or environmental, as appropriate to the task. The student's chosen factor may be interrelated with other factors.

In order to reach the aims of sciences, students should be able to:

- 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 the use of science and its application in solving a specific problem or issue
- iii. apply scientific language effectively
- iv. document the work of others and sources of information used.