Sciences Aims and Objectives

Aims

The aims of MYP sciences are to encourage and enable students to:

1. understand and appreciate science and its implications
2. consider science as a human endeavour with benefits and limitations
3. cultivate analytical, inquiring and flexible minds that pose questions, solve problems, construct explanations and judge arguments
4. develop skills to design and perform investigations, evaluate evidence and reach conclusions
5. build an awareness of the need to effectively collaborate and communicate
6. apply language skills and knowledge in a variety of real-life contexts
7. develop sensitivity towards the living and non-living environments
8. reflect on learning experiences and make informed choices.

Objectives

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.

Assessment of this objective must be done using tests or exams. 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.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Year 1  In order to reach the aims of sciences, students should be able to: | | Year 3  In order to reach the aims of sciences, students should be able to: | | Year 5  In order to reach the aims of sciences, students should be able to: | |
| **Objective A: Knowing and understanding** | | | | | |
| 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. | | 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. | | 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. | |
| **Objective B: Inquiring and designing** | | | | | |
| i. outline an appropriate problem or research 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 data will be collected  iv. design scientific investigations. | | i. describe a problem or question to be tested by a scientific investigation  ii. outline a testable hypothesis and explain it using scientific reasoning  iii. describe how to manipulate the variables, and describe how data will be collected  iv. design scientific investigations. | | 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. | |
| **Objective C: Processing and evaluating** | | | | |
| i. present collected and transformed data  ii. interpret data and outline results using scientific reasoning  iii. discuss the validity of a prediction based on the outcome of the scientific investigation  iv. discuss the validity of the method  v. describe improvements or extensions to the method. | i. present collected and transformed data  ii. interpret data and describe results using scientific reasoning  iii. discuss the validity of a hypothesis based on the outcome of the scientific investigation  iv. discuss the validity of the method  v. describe improvements or extensions to the method. | | 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. | |
| **Objective D: Reflecting on the impact of science** | | | | |
| i. summarize the ways in which science is applied and used to address a specific problem or issue  ii. describe and summarize 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. | i. describe the ways in which science is applied and used to address a specific problem or issue  ii. discuss and analyse 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. | | 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. | |