Foshay Learning Center – Sciences Objectives for years 1-5 of the Middle Years Program

Year 5 objectives

The sciences objectives for year 5 of the Middle Years Programme (MYP) can be found in the *Sciences guide* (February 2010). This set of **prescribed** objectives forms the basis for the **assessment criteria**, published in the guide, which must be used for final assessment of students' work during year 5.

Example interim objectives

Example interim objectives for years 1 and 3 of the MYP appear in the tables that follow. They have been developed in order to:

promote articulation between the MYP and the Primary Years Programme (PYP)

support individual schools in developing a coherent curriculum across the five years of the programme (or however many years a school is authorized to offer)

emphasize the need to introduce students to the required knowledge, understanding, skills and attitudes from the first year of the programme

provide examples of possible learning activities and assessment tasks that will allow students to work towards meeting the final objectives for year 5

support schools that are authorized to offer the first three years of the MYP in designing appropriate assessment tasks

for the end of the third year.

Unlike the objectives for year 5, the interim objectives for years 1 and 3 are not prescribed, although the IB recommends that all schools use them. Schools may choose to adopt the objectives contained in this document or develop their own.

If choosing to develop their own interim objectives, schools must start with the prescribed objectives for year 5 and modify each one by taking into account the age, prior knowledge and stage of development of students in an earlier year of the programme. Each year 5 objective will then correspond directly to a modified objective in a preceding year of the programme. **No objectives should be omitted** from an earlier year as it is vital to ensure a coherent progression of learning across all five years of the programme.

Tables of objectives

Where the objectives in the tables that follow are the same for different years of the programme, there is a natural assumption that the student will gain more knowledge, understanding and skills, and become more mature as the course progresses. The units of work are therefore likely to become more complex and the underlying concepts to become more sophisticated as the student progresses from one year to the next.

A One world

This objective refers to enabling students to gain a better understanding of the role of science in society. Students should be aware that science is a global endeavour and that its development and applications can have consequences for our lives.

One world should provide students with the opportunity to critically assess the implications of scientific developments and their applications to local and/or global issues.

Year 1	Year 2	Year 3	Year 4	Year 5
Objectives				
At the end of the first year, students should be able to:	At the end of the second year, students should be able to:	At the end of the third year, students should be able to:	At the end of the fourth year, students should be able to:	At the end of the fifth year, students should be able to:
Give examples and make comments on the ways in which science is applied and used to address specific problems or issues.	Describe and understand the ways in which science is applied and used to address specific problems or issues.	Describe the ways in which science is applied and used to address specific problems or issues.	Describe and compare the ways in which science is applied and used to address specific problems or issues.	Explain the ways in which science is applied and used to address specific problems or issues.
Make comments on the effectiveness of science and its application in solving problems or issues.	Know and comprehend the effectiveness of science and its application in solving problems or issues.	Describe the effectiveness of science and its application in solving problems or issues.	Investigate the effectiveness of science and its application in solving problems or issues.	Discuss the effectiveness of science and its application in solving problems or issues.
Make comments on how science and its application interact with life, society and the world.	Understand that science is part of the world they live in by describing and classifying the ways in which science affects life, society and the world.	Describe how science and its application interact with some of the following factors: moral, ethical, social, economic, political, cultural and environmental.	Discuss with the assistance of groups the moral, ethical, social, economic, political, cultural and environmental implications of the use of science and its application in solving specific problems or issues.	Discuss and evaluate the moral, ethical, social, economic, political, cultural and environmental implications of the use of science and its application in solving specific problems or issues.

B Communication in science

This objective refers to enabling students to become competent and confident when communicating information in science. Students should be able to use scientific language correctly and a variety of communication modes and formats as appropriate.

Students should be aware of the importance of acknowledging and appropriately referencing the work of others when communicating in science.

Year 1	Year 2	Year 3	Year 4	Year 5
Objectives				
At the end of the first year, students should be able to:	At the end of the second year, students should be able to:	At the end of the third year, students should be able to:	At the end of the fourth year, students should be able to:	At the end of the fifth year, students should be able to:
Use scientific language correctly, consistent with the level of complexity of the units of work covered.	Use scientific language correctly, consistent with the level of complexity of the units of work covered.	Use scientific language correctly, consistent with the level of complexity of the units of work covered	Use scientific language correctly.	Use scientific language correctly.
With guidance, use appropriate Communication modes, such as verbal (oral, written), visual (graphic, symbolic) and communication formats (laboratory reports, essays, presentations), consistent with the level of complexity of the units of work covered.	With some prompting the students can use appropriate communication modes, such as verbal (oral, written), visual (graphic, symbolic) and communication formats (laboratory reports, essays, presentations), consistent with the level of complexity of the units of work covered, to effectively communicate theories, ideas and findings in science	use appropriate communication modes, such as verbal (oral, written), visual (graphic, symbolic) and communication formats (laboratory reports, essays, presentations), consistent with the level of complexity of the units of work covered, to effectively communicate theories, ideas and findings in science	Use and examine the use of appropriate communication modes, such as verbal (oral, written), visual (graphic, symbolic) and communication formats (laboratory reports, essays, presentations), with limited prompting the students the students effectively communicate theories, ideas and findings in science	Use appropriate communication modes, such as verbal (oral, written), visual (graphic, symbolic) and communication formats (laboratory reports, essays, presentations) to effectively communicate theories, ideas and findings in science.
With guidance, acknowledge the work of others and the sources of information used by documenting them using a recognized referencing system.	With the support of classmates the students are able to acknowledge the work of others and the sources of information used by documenting them using a recognized referencing system.	Acknowledge the work of others and the sources of information used by documenting them using a recognized referencing system.	Acknowledge the work of others and the sources of information used by documenting them using a recognized referencing system.	Acknowledge the work of others and the sources of information used by appropriately documenting them using a recognized referencing system.

C Knowledge and understanding of science

This objective refers to enabling students to understand scientific knowledge (facts, ideas, concepts, processes, laws, principles, models and theories) and to apply it to construct scientific explanations, solve problems and formulate scientifically supported arguments.

Year 1	Year 2	Year 3	Year 4	Year 5
Objectives				
At the end of the first year, students should be able to:	At the end of the second year, students should be able to:	At the end of the third year, students should be able to:	At the end of the fourth year, students should be able to:	At the end of the fifth year, students should be able to:
With guidance, recall scientific knowledge and use scientific understanding to construct scientific explanations, consistent with the level of complexity of the units of work covered.	With limited guidance, recall scientific knowledge and use scientific understanding to construct scientific explanations, consistent with the level of complexity of the units of work covered.	Recall scientific knowledge and use scientific understanding to construct scientific explanations, consistent with the level of complexity of the units of work covered	Recall scientific knowledge and use scientific understanding to construct scientific explanations.	Recall scientific knowledge and use scientific understanding to construct scientific explanations.
Apply scientific knowledge and understanding to solve problems in familiar and, with guidance, in unfamiliar situations, consistent with the level of complexity of the units of work covered.	Apply scientific knowledge and understanding to solve problems in familiar and, with limited guidance in unfamiliar situations, consistent with the level of complexity of the units of work covered.	Apply scientific knowledge and understanding to solve problems in familiar and unfamiliar situations, consistent with the level of complexity of the units of work covered	Apply scientific knowledge and understanding to solve problems in familiar and increasingly unfamiliar situations.	Apply scientific knowledge and understanding to solve problems set in familiar and unfamiliar situations.
Analyze scientific information by identifying components, relationships and patterns and, with guidance, make comments on the validity and quality of the information.	Analyze scientific information by identifying components, relationships and patters and, with limited guidance, make comments on the validity and quality of the information.	Analyze and evaluate information critically and make comments on the validity and quality of the information supported by scientific understanding.	Analyze and evaluate information critically and develop strong opinions on the validity of the information supported by scientific understanding.	Analyze and evaluate information critically to make judgments supported by scientific understanding.

D Scientific inquiry

While the scientific method may take on a wide variety of approaches, it is the emphasis on experimental work that characterizes MYP scientific inquiry.

This objective refers to enabling students to develop intellectual and practical skills to design and carry out scientific investigations independently and to evaluate the experimental design (method).

Year 1	Year 2	Year 3	Year 4	Year 5
Objectives				
At the end of the first year, students should be able to:	At the end of the second year, students should be able to:	At the end of the third year, students should be able to:	At the end of the fourth year, students should be able to:	At the end of the fifth year, students should be able to:
With guidance, articulate the problem or research question to be tested by a scientific investigation, consistent with the level of complexity of the units of work covered.	With limited guidance, articulate the problem or research question to be tested by a scientific investigation, consistent with the level of complexity of the units of work covered.	State a focused problem or research question to be tested by a scientific investigation, consistent with the level of complexity of the units of work covered	State a focused problem or research question to be tested by a scientific investigation, increasingly consistent with the level of complexity of the units of work covered.	State a focused problem or research question to be tested by a scientific investigation.
Ask questions of the type: "What will happen if?", "Why does this happen when?" and make predictions ("If I do this, then this will happen … "), consistent with the level of complexity of the units of work covered.	Ask questions of the type: "What will happen if?" Why does this happen when?" and make predictions ("If I do this, then this will happen…"), with increased consistency with the level of complexity of the units of work covered.	Formulate a testable hypothesis and explain it using scientific reasoning ("If I do this, then this will happen because … "), consistent with the level of complexity of the units of work covered	With increased complexity, formulate a testable hypothesis and explain it using scientific reasoning that is consistent with the level of the units of work covered.	Formulate a testable hypothesis and explain it using scientific reasoning.
Carry out investigations, consistent with the level of complexity of the units of work covered, and, with guidance, identify the variables that can be measured (dependent variables), the variables that can be manipulated (independent variables) and those that must remain constant (control variables); identify the materials and/or equipment needed; describe a simple method	With increased complexity, carry out investigations, consistent with the level of the units of work covered, and with limited guidance, identify the variables that can be measured (dependent variables), the variables that can be manipulated (independent variables) and those that must remain constant (control variables); identify the materials and/or equipment needed; describe a simple method.	Design and carry out scientific investigations that include variables and controls, materials and/ or equipment needed, a method to be followed and the way in which the data is to be collected, consistent with the level of complexity of the units of work covered	Design and carry out scientific investigations that include variables and controls, material and/or equipment needed, a method to be followed and the way in which the data is to be collected, including a plan for processing it.	Design and carry out scientific investigations that include variables and controls, material and/ or equipment needed, a method to be followed and the way in which the data is to be collected and processed.

With guidance, make comments on the method and the quality of the data collected; ask questions of the type: "Is the method effective/workable/feasible?", "Is the data accurate/reliable?"	With limited guidance, make comments on the method and the quality of the data collected; ask questions of the type: "Is the method effective/workable/feasible?", "Is the data accurate/reliable?"	Make comments on the method, and the accuracy and precision of the data	With some guidance, evaluate the validity and reliability of the method.	Evaluate the validity and reliability of the method.
With guidance, make comments on how the outcome of the investigation helps to answer the research question; ask questions of the type: "Is my hypothesis/research question supported by the data?", "Does the outcome of the investigation support the research question?"	With limited guidance, make comments on how the outcome of the investigation helps to answer the research question; ask questions of the type; "Is my hypothesis/research question supported by the data?", "Does the outcome of the investigation support the research question?"	Make comments on the how the hypothesis is supported or not by the data/outcome of the investigation	With some guidance, make judgments on the validity of a hypothesis based on the outcome of the investigation.	Judge the validity of a hypothesis based on the outcome of the investigation.
With guidance, suggest improvements to the method, consistent with the level of complexity of the units of work covered.	With limited guidance, suggest improvements to the method, consistent with the level of complexity of the units of work covered.	When relevant, suggest improvements to the method, consistent with the level of complexity of the units of work covered.	When relevant, and with some guidance, suggest improvements to the method or further inquiry.	When relevant, suggest improvements to the method or further inquiry.

E Processing data

This objective refers to enabling students to collect, process and interpret sufficient qualitative and/or quantitative data to draw appropriate conclusions. Students are expected to develop analytical thinking skills to interpret data and judge the reliability of the data.

Year 1	Year 2	Year 3	Year 4	Year 5
Objectives				
At the end of the first year, students should be able to:	At the end of the second year, students should be able to:	At the end of the third year, students should be able to:	At the end of the fourth year, students should be able to:	At the end of the fifth year, students should be able to:
With guidance, collect and record data using units of measurement as and when appropriate.	With limited guidance, collect and record data using units of measurement as and when appropriate.	Collect and record data using units of measurement as and when appropriate	Collect and record data using units of measurement as and when appropriate	Collect and record data using units of measurement as and when appropriate.

With guidance, organize, transform and present data using simple numerical forms (including mathematical calculations) and visual forms (tables, graphs and charts).	With limited guidance, organize transform and present data using numerical (including mathematical calculations) and visual forms (tables, graphs and charts)	Organize transform and present data using numerical (including mathematical calculations) and visual forms (tables, graphs and charts)	Organize transform and present data using numerical and visual forms.	Organize, transform and present data using numerical and visual forms.
With guidance, analyse data/information to identify trends, patterns and relationships, and use the data to convey understanding/ interpretation.	With limited guidance, analyze data/information to identify trends, patterns and relationships, and use the data to convey understanding/interpretation	Analyze data/information to identify trends, patterns and relationships, and use the data to convey understanding/ interpretation	Analyze data/information to identify trends, patterns and relationships, and use the data to convey a deeper understanding/ interpretation.	Analyze and interpret data.
With guidance, draw conclusions based on the analysis and interpretation of the data; ask questions of the type: "What might have caused….?", "How can we explain what happened using what we know about science…?".	With limited guidance, draw conclusions based on the analysis and interpretation of the data; ask questions of the type: "What might have caused…?", "How can we explain what happened using what we know about science…?".	Draw conclusions consistent with the analysis and interpretation of the data that are supported by scientific reasoning.	Draw conclusions consistent with close analysis and concise interpretation of the data that are supported by scientific reasoning.	Draw conclusions consistent with the data and supported by scientific reasoning.

F Attitudes in science

This objective refers to encouraging students to develop safe, responsible and collaborative working practices in practical science.

Year 1	Year 2	Year 3	Year 4	Year 5
Objectives				
During the course, students should:	During the course, students should:	During the course, students should:	During the course, students should:	During the course, students should:
Work safely and use material and equipment competently.	Work safely and use material and equipment competently.	Work safely and use material and equipment competently	Work safely and use material and equipment competently.	Work safely and use material and equipment competently.
Work responsibly with regard to the living and non-living environment.	Work responsibly with regard to the living and non-living environment.	Work responsibly with regard to the living and non-living environment	Work responsibly with regard to the living and non-living environment.	Work responsibly with regard to the living and non-living environment.
Work effectively as individuals and as part of a group by collaborating with others.	Work effectively as individuals and as part of a group by collaborating with others.	Work effectively as individuals and as part of a group by collaborating with others.	Work effectively as individuals and as part of a group by collaborating with others.	Work effectively as individuals and as part of a group by collaborating with others.