# Sciences assessment criteria: Year 1

## Criterion A: Knowing and understanding

**Maximum: 8**

At the end of year 1, students should be 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.

| Achievement level | Level descriptor |
|---|---|
| 0 | The student **does not** reach a standard described by any of the descriptors below. |
| 1–2 | The student is able to:<br><br>i. **select** scientific knowledge<br><br>ii. **select** scientific knowledge and understanding to **suggest solutions** to problems set in **familiar situations**<br><br>iii. **apply** information to **make judgments**, **with limited success**. |
| 3–4 | The student is able to:<br><br>i. **recall** scientific knowledge<br><br>ii. **apply** scientific knowledge and understanding to **suggest solutions** to problems set in **familiar situations**<br><br>iii. **apply** information to **make judgments**. |
| 5–6 | The student is able to:<br><br>i. **state** scientific knowledge<br><br>ii. **apply** scientific knowledge and understanding to **solve problems** set in **familiar situations**<br><br>iii. **apply** information to **make scientifically supported judgments**. |
| 7–8 | The student is able to:<br><br>i. **outline** scientific knowledge<br><br>ii. **apply** scientific knowledge and understanding to **solve problems** set in **familiar situations** and **suggest solutions** to problems set in **unfamiliar situations**<br><br>iii. **interpret** information to **make scientifically supported judgments**. |

# Criterion B: Inquiring and designing

**Maximum: 8**

At the end of year 1, students should be able to:

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.

| Achievement level | Level descriptor |
|---|---|
| 0 | The student **does not** reach a standard described by any of the descriptors below. |
| 1–2 | The student is able to: <br><br> i. **select** a problem or question to be tested by a scientific investigation <br><br> ii. **select** a testable prediction <br><br> iii. **state** a variable <br><br> iv. design a **method with limited success**. |
| 3–4 | The student is able to: <br><br> i. **state** a problem or question to be tested by a scientific investigation <br><br> ii. **state** a testable prediction <br><br> iii. **state** how to manipulate the variables, and **state** how **data** will be collected <br><br> iv. design a **safe method** in which he or she **selects materials and equipment**. |
| 5–6 | The student is able to: <br><br> i. **state** a problem or question to be tested by a scientific investigation <br><br> ii. **outline** a testable prediction <br><br> iii. **outline** how to manipulate the variables, and **state** how **relevant data** will be collected <br><br> iv. design a **complete and safe method** in which he or she **selects appropriate materials and equipment**. |
| 7–8 | The student is able to: <br><br> i. **outline** a problem or question to be tested by a scientific investigation <br><br> ii. **outline** a testable prediction **using scientific reasoning** <br><br> iii. **outline** how to manipulate the variables, and **outline** how **sufficient, relevant data** will be collected <br><br> iv. design a **logical, complete and safe method** in which he or she **selects appropriate materials and equipment**. |

# Criterion C: Processing and evaluating

**Maximum: 8**

At the end of year 1, students should be able to:

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.

| Achievement level | Level descriptor |
|---|---|
| 0 | The student **does not** reach a standard described by any of the descriptors below. |
| 1–2 | The student is able to:<br><br>i.      **collect and present** data in numerical and/or visual forms<br><br>ii.     **interpret** data<br><br>iii.    **state** the validity of a prediction based on the outcome of a scientific investigation, **with limited success**<br><br>iv.    **state** the validity of the method based on the outcome of a scientific investigation, **with limited success**<br><br>v.     **state** improvements or extensions to the method that would benefit the scientific investigation, **with limited success**. |
| 3–4 | The student is able to:<br><br>i.      **correctly collect and present** data in numerical and/or visual forms<br><br>ii.     **accurately interpret** data and **outline** results<br><br>iii.    **state** the validity of a prediction based on the outcome of a scientific investigation<br><br>iv.    **state** the validity of the method based on the outcome of a scientific investigation<br><br>v.     **state** improvements or extensions to the method that would benefit the scientific investigation. |
| 5–6 | The student is able to:<br><br>i.      **correctly collect, organize and present** data in numerical and/or visual forms<br><br>ii.     **accurately interpret** data and **outline** results **using scientific reasoning**<br><br>iii.    **outline** the validity of a prediction based on the outcome of a scientific investigation<br><br>iv.    **outline** the validity of the method based on the outcome of a scientific investigation<br><br>v.     **outline** improvements or extensions to the method that would benefit the scientific investigation. |

| Achievement level | Level descriptor |
|---|---|
| 7–8 | The student is able to: <br><br> i. **correctly collect, organize, transform and present** data in numerical and/or visual forms <br><br> ii. **accurately interpret data** and **outline** results **using correct scientific reasoning** <br><br> iii. **discuss** the validity of a prediction based on the outcome of a scientific investigation <br><br> iv. **discuss** the validity of the method based on the outcome of a scientific investigation <br><br> v. **describe** improvements or extensions to the method that would benefit the scientific investigation. |

# Criterion D: Reflecting on the impacts of science

**Maximum: 8**

At the end of year 1, students should be 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 various implications of using 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.

| Achievement level | Level descriptor |
|---|---|
| 0 | The student **does not** reach a standard described by any of the descriptors below. |
| 1–2 | The student is able to, **with limited success**: <br><br> i. **state** the ways in which science is used to address a specific problem or issue <br><br> ii. **state** the implications of using science to solve a specific problem or issue, interacting with a factor <br><br> iii. **apply** scientific language to communicate understanding <br><br> iv. document sources. |
| 3–4 | The student is able to: <br><br> i. **state** the ways in which science is used to address a specific problem or issue <br><br> ii. **state** the implications of using science to solve a specific problem or issue, interacting with a factor <br><br> iii. **sometimes apply** scientific language to communicate understanding <br><br> iv. **sometimes** document sources correctly. |
| 5–6 | The student is able to: <br><br> i. **outline** the ways in which science is used to address a specific problem or issue <br><br> ii. **outline** the implications of using science to solve a specific problem or issue, interacting with a factor <br><br> iii. **usually apply** scientific language to communicate understanding **clearly and precisely** <br><br> iv. **usually** document sources correctly. |
| 7–8 | The student is able to: <br><br> i. **summarize** the ways in which science is applied and used to address a specific problem or issue <br><br> ii. **describe and summarize** the implications of using science and its application to solve a specific problem or issue, interacting with a factor <br><br> iii. **consistently apply** scientific language to communicate understanding **clearly and precisely** <br><br> iv. document sources **completely**. |

# Sciences assessment criteria: Year 3

## Criterion A: Knowing and understanding

**Maximum: 8**

At the end of year 3, students should be 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.

| Achievement level | Level descriptor |
|---|---|
| 0 | The student **does not** reach a standard indicated by any of the descriptors below. |
| 1–2 | The student is able to:<br><br>i.    **recall** scientific knowledge<br><br>ii.   apply scientific knowledge and understanding to **suggest solutions** to problems set in **familiar situations**<br><br>iii.  **apply** information to make **judgments**. |
| 3–4 | The student is able to:<br><br>i.    **state** scientific knowledge<br><br>ii.   apply scientific knowledge and understanding to **solve problems** set in **familiar situations**<br><br>iii.  **apply** information to make **scientifically supported judgments**. |
| 5–6 | The student is able to:<br><br>i.    **outline** scientific knowledge<br><br>ii.   apply scientific knowledge and understanding to **solve problems** set in **familiar situations** and **suggest solutions** to problems set in **unfamiliar situations**<br><br>iii.  **interpret** information to make **scientifically supported judgments**. |
| 7–8 | The student is able to:<br><br>i.    **describe** scientific knowledge<br><br>ii.   apply scientific knowledge and understanding to **solve problems** set in **familiar and unfamiliar situations**<br><br>iii.  **analyse** information to make **scientifically supported judgments**. |

# Criterion B: Inquiring and designing

**Maximum: 8**

At the end of year 3, students should be able to:

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.

| Achievement level | Level descriptor |
|---|---|
| 0 | The student **does not** reach a standard identified by any of the descriptors below. |
| 1–2 | The student is able to:<br><br>i. **state** a problem or question to be tested by a scientific investigation, with **limited success**<br><br>ii. **state** a testable hypothesis<br><br>iii. **state** the variables<br><br>iv. design **a method, with limited success**. |
| 3–4 | The student is able to:<br><br>i. **state** a problem or question to be tested by a scientific investigation<br><br>ii. **outline** a testable hypothesis **using scientific reasoning**<br><br>iii. **outline** how to manipulate the variables, and **state** how **relevant data** will be collected<br><br>iv. design a **safe method** in which he or she **selects materials and equipment**. |
| 5–6 | The student is able to:<br><br>i. **outline** a problem or question to be tested by a scientific investigation<br><br>ii. **outline and explain** a testable hypothesis **using scientific reasoning**<br><br>iii. **outline** how to manipulate the variables, and **outline** how s**ufficient, relevant data** will be collected<br><br>iv. design **a complete and safe method** in which he or she **selects appropriate materials and equipment**. |
| 7–8 | The student is able to:<br><br>i. **describe** a problem or question to be tested by a scientific investigation<br><br>ii. **outline and explain** a testable hypothesis **using correct scientific reasoning**<br><br>iii. **describe** how to manipulate the variables, and **describe** how **sufficient, relevant** data will be collected<br><br>iv. design a **logical, complete and safe method** in which he or she **selects appropriate materials and equipment**. |

# Criterion C: Processing and evaluating

**Maximum: 8**

At the end of year 3, students should be able to:

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.

| Achievement level | Level descriptor |
|---|---|
| 0 | The student **does not** reach a standard identified by any of the descriptors below. |
| 1–2 | The student is able to:<br><br>i.  **collect and present** data in numerical and/or visual forms<br><br>ii.  **accurately interpret** data<br><br>iii.  **state** the validity of a hypothesis **with limited reference** to a scientific investigation<br><br>iv.  **state** the validity of the method **with limited reference** to a scientific investigation<br><br>v.  **state limited** improvements or extensions to the method. |
| 3–4 | The student is able to:<br><br>i.  **correctly collect and present** data in numerical and/or visual forms<br><br>ii.  **accurately interpret** data and **describe** results<br><br>iii.  **state** the validity of a hypothesis based on the outcome of a scientific investigation<br><br>iv.  **state** the validity of the method based on the outcome of a scientific investigation<br><br>v.  **state** improvements or extensions to the method that would benefit the scientific investigation. |
| 5–6 | The student is able to:<br><br>i.  **correctly collect, organize and present** data in numerical and/or visual forms<br><br>ii.  **accurately interpret** data and **describe** results **using scientific reasoning**<br><br>iii.  **outline** the validity of a hypothesis based on the outcome of a scientific investigation<br><br>iv.  **outline** the validity of the method based on the outcome of a scientific investigation<br><br>v.  **outline** improvements or extensions to the method that would benefit the scientific investigation. |

| Achievement level | Level descriptor |
|---|---|
| 7–8 | The student is able to: <br><br> i. **correctly collect, organize, transform and present** data in numerical and/or visual forms <br><br> ii. **accurately interpret data** and **describe** results **using correct scientific reasoning** <br><br> iii. **discuss** the validity of a hypothesis based on the outcome of a scientific investigation <br><br> iv. **discuss** the validity of the method based on the outcome of a scientific investigation <br><br> v. **describe** improvements or extensions to the method that would benefit the scientific investigation. |

# Criterion D: Reflecting on the impacts of science

**Maximum: 8**

At the end of year 3, students should be 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 various implications of using 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.

| Achievement level | Level descriptor |
|---|---|
| 0 | The student **does not** reach a standard identified by any of the descriptors below. |
| 1–2 | The student is able to:<br><br>i.   **state** the ways in which science is used to address a specific problem or issue<br><br>ii.  **state** the implications of the use of science to solve a specific problem or issue, interacting with a factor<br><br>iii. **apply** scientific language to communicate understanding but does so **with limited success**<br><br>iv.  document sources, **with limited success**. |
| 3–4 | The student is able to:<br><br>i.   **outline** the ways in which science is used to address a specific problem or issue<br><br>ii.  **outline** the implications of using science to solve a specific problem or issue, interacting with a factor<br><br>iii. **sometimes apply** scientific language to communicate understanding<br><br>iv.  **sometimes** document sources **correctly**. |
| 5–6 | The student is able to:<br><br>i.   **summarize** the ways in which science is applied and used to address a specific problem or issue<br><br>ii.  **describe** the implications of using science and its application to solve a specific problem or issue, interacting with a factor<br><br>iii. **usually apply** scientific language to communicate understanding **clearly and precisely**<br><br>iv.  **usually** document sources **correctly**. |

| Achievement level | Level descriptor |
|---|---|
| 7–8 | The student is able to: <br><br> i. **describe** the ways in which science is applied and used to address a specific problem or issue <br><br> ii. **discuss and analyse** the implications of using science and its application to solve a specific problem or issue, interacting with a factor <br><br> iii. **consistently apply** scientific language to communicate understanding **clearly and precisely** <br><br> iv. document sources **completely**. |

of MYP 5 and allowing for subsequent academic development, teachers are asked to predict the outcome of eAssessment for their students with reference to the subject-specific grade descriptors. This prediction helps the IB to check the alignment between teachers' expectations and the IB's assessment outcome and, as such, forms an essential strategy for ensuring reliable results.

Subject-specific grade descriptors are also the main reference used to select grade boundaries for each discipline in each assessment session. During this process, the grade award team compares student performance against descriptors of achievement at grades 2 and 3; 3 and 4; and 6 and 7 (other boundaries are set at equal intervals between these key transitions). The grade award process is able to compensate for variations in challenge between examinations and in standards applied to marking (both between subjects and for a particular subject across sessions) by setting boundaries for each discipline and examination session, with reference to real student work.

Subject-specific grade descriptors tie eAssessment to criterion-related assessment and to MYP assessment criteria and level descriptors, which put the programme's criterion-related assessment philosophy into practice.

| Grade | Descriptor |
|---|---|
| 7 | Produces high-quality work with frequent insightful scientific discussion that is fully justified. Communicates comprehensive, nuanced understanding of concepts and contexts demonstrating proficient use of scientific and technical communication modes. Consistently demonstrates sophisticated analytical thinking and critical evaluation to make scientifically supported judgments. Frequently transfers scientific knowledge and applies scientific skills, with independence and expertise, in complex classroom and real-world situations. |
| 6 | Produces high-quality work with occasionally insightful scientific discussion and justification. Communicates extensive understanding of concepts and contexts demonstrating proficient use of scientific and technical communication modes. Demonstrates analytical thinking and critical evaluations to make scientifically supported judgments, frequently with sophistication. Transfers scientific knowledge and applies scientific skills, often with independence, in classroom and real-world situations. |
| 5 | Produces generally high-quality work with scientific discussion and justification. Communicates good understanding of concepts and contexts demonstrating proficient use of scientific and technical communication modes. Demonstrates analytical thinking and critical evaluations to make scientifically supported judgments, sometimes with sophistication. Usually transfers scientific knowledge and applies scientific skills, with some independence, in classroom and real-world situations. |
| 4 | Produces good-quality work with some evidence of scientific discussion and justification. Communicates basic understanding of most concepts and contexts with evidence of appropriate scientific and technical communication modes, with few misunderstandings and minor gaps. Often demonstrates analytical thinking to make scientifically supported judgments. Transfers some scientific knowledge and applies some scientific skills in classroom and real-world situations, but requires support in unfamiliar situations. |

| Grade | Descriptor |
|-------|-----------|
| 3 | Produces work of an acceptable quality with occasional evidence of scientific description. Communicates basic understanding of many concepts and contexts, with occasional significant misunderstandings or gaps. Begins to demonstrate some analytical thinking and begins to make scientifically supported judgments. Begins to transfer scientific knowledge and apply skills, requiring support even in familiar classroom situations. |
| 2 | Produces work of limited quality. Communicates limited understanding of some concepts and contexts with significant gaps in understanding. Demonstrates limited evidence of scientific thinking. Limited evidence of transfer of scientific knowledge and application of skills. |
| 1 | Produces work of a very limited quality. Conveys many significant misunderstandings or lacks understanding of most concepts and contexts. Very rarely demonstrates evidence of scientific thinking. Very inflexible, rarely shows evidence of knowledge or skills. |