**MCAS Grades 5 & 8 Science and Technology/Engineering (STE) Test Information**

This document describes the question types and test design for the STE MCAS Grades 5 and 8 tests. It also provides information about the reporting categories for the tests. The tests are aligned to the [2016 Massachusetts Science and Technology/Engineering Curriculum Framework](http://www.doe.mass.edu/frameworks/scitech/2016-04.pdf). The Grade 5 test is based on the grades 3-5 standards and the Grade 8 test is based on the grades 6-8 standards. Each test has two sessions.

**Question Types**

The following table contains information about the question types on the tests. Questions may be either selected-response or constructed-response.

|  | **Question Type** | **Total Points** |
| --- | --- | --- |
| **Selected-Response (SR) Questions1** | Multiple Choice  *Students select one correct answer from among several answer options.* | 1 or 2 |
| Multiple Select  *Students select more than one correct answer from among several answer options.* | 1 or 2 |
| Technology Enhanced  *Students taking the computer-based tests answer questions using technology such as drag-and-drop, hot spot, and drop-down menus.* | 1 or 2 |
|  | Constructed Response (CR) Questions2  *Students write a response to a multi-part question.* | 2 or 3 |

1These question types are machine-scored. Two-point questions will consist of multiple parts. Students may earn partial credit on two-point questions.  
2The written portions of the constructed-response questions are human-scored.

**Test Design**

Each test includes both common and matrix questions. Common questions count toward a student's score, while matrix questions are either field-test or equating questions and do not count toward a student's score.

Common Questions

Students complete a range of question types as described above. Information about the number of common questions by points for each test is in the table below.

**Common Questions by Grade3**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Grade** | **Number of 1-pt.**  **SR Questions** | **Number of 2-pt.**  **SR Questions** | **Number of 2-pt. CR Questions** | **Number of 3-pt. CR Questions** | **Total Points on Test** |
| 5 | 32 | 3 | 2 | 4 | 54 |
| 8 | 32 | 3 | 2 | 4 | 54 |

3The test design includes two common modules that consist of groups of questions associated with a scenario or phenomenon. Each module is worth a total of 6 points and includes three 1‑pt. selected‑response questions and one 3‑pt. constructed-response question.

Matrix Questions

In addition to common questions, students answer matrix (field-test and equating) questions that vary by test form. These matrix questions do not count toward a student’s score. Each form includes the following matrix questions across both test sessions:

* five 1-pt. selected-response questions
* one 2-pt. selected-response question or constructed-response question
* one 3-pt. constructed-response question

**Reporting Categories**

All items will be coded to at least one content standard from the [2016 Massachusetts Science and Technology/Engineering Curriculum Framework](http://www.doe.mass.edu/frameworks/scitech/2016-04.pdf). The percentage of points for each content reporting category is shown by grade in the table below.

**Content Reporting Category Percentages (+/-5%) by Grade**

|  |  |  |
| --- | --- | --- |
| **Reporting Category** | **Grade 5** | **Grade 8** |
| Earth and Space Science | 25% | 25% |
| Life Science | 25% | 25% |
| Physical Science | 25% | 25% |
| Technology/Engineering | 25% | 25% |

In addition to the content reporting categories, at least 50% of the questions are coded to an MCAS Practice Category. These questions are dually coded, meaning they are coded to both a content category and a practice category. The table lists the science and engineering practices associated with each MCAS Practice Category.

**Science and Engineering Practices Assessed on MCAS**

| **MCAS Practice Category** | **Science and Engineering Practices** |
| --- | --- |
| A. Investigations and Questioning | Asking Questions and Defining Problems  Planning and Carrying Out Investigations |
| B. Mathematics and Data | Analyzing and Interpreting Data  Using Mathematics and Computational Thinking |
| C. Evidence, Reasoning, and Modeling | Developing and Using Models  Constructing Explanations and Designing Solutions  Engaging in Argument from Evidence  Obtaining, Evaluating, and Communicating Information |

***Notes about the practices:*** Each content standard includes a reference to one science and engineering practice. For example, standard 5-ESS2-1 states:

*Use a model to describe the cycling of water through a watershed through evaporation, precipitation, absorption, surface runoff, and condensation.*

Although only a single practice is referenced within each standard, different practices may be assessed with the associated content. In the example above, items assessing standard 5-ESS2-1 may assess not only the “developing and using models” practice; they may also assess any other practice, such as constructing explanations or analyzing and interpreting data.

Each released question that assesses a practice will be coded to one of the three practice categories listed in the table. However, when reporting results by reporting category, a general “Science and Engineering Practices” reporting category will be used. Results will not be reported out on each MCAS Practice Category due to the limited number of questions.