

Tools for Analysis of Student Work

We use a variety of strategies to score assessments and assessment items. No matter what your strategy, an appropriate, well-designed tool ensures your assessment provides accurate information about what students know and can do to support a meaningful response. Keep in mind effective scoring tools are predicated on quality items and tasks that elicit appropriate evidence of student learning for your purposes. For more details on eliciting quality evidence, see Module 5. For details about writing quality items, see the Minnesota Department of Education (MDE) Training Modules on Writing Quality Assessment Questions on [Testing 1, 2, 3](#).

Below are some details about different types of scoring tools.

Answer Keys

Description	When to Use	Supporting Learning
Answer keys indicate the correct answer to an assessment item.	Answer keys are useful when student responses are either correct or incorrect. They can list the correct answer to a multiple-choice item or the correct word for a fill-in-the blank item.	Because answer keys can only indicate whether students selected a correct or incorrect answer, teachers can supplement the information in the answer key by providing information to students about why an answer is correct and discuss why other answers are not. Teachers can do this during whole group, small group, and individual discussions.

Examples

These examples are from released Minnesota Comprehensive Assessment (MCA) test items. Please visit <https://public.education.mn.gov/nqt/> to see other types of scoring examples.

Grade 4, Reading Informational Text

Question ID 440091

Answer Key (Graphic Gap Match)

The Condition	The Result
Layers of salt lie in the ocean floor.	Salty water gathers and forms pools.
Sunlight does not reach the ocean floor.	Very little plant life grows.
Water in seafloor lakes is very dense.	Submarines can float easily.

Correct Responses:

- **Salty water gathers and forms pools.** => **Layers of salt lie in the ocean floor.** Paragraph 4 reads, “Layers of salt lie below the ocean floor. Over a long period of time, the salt dissolves. Then super-salty water leaks out of the ocean floor, but it does not mix with the water around it. Instead, the super-salty water gathers together and forms pools on the ocean floor.”
- **Very little plant life grows.** => **Sunlight does not reach the ocean floor.** Paragraph 6 states, “Sunlight does not reach far below the surface, so it is pitch-black. Few plants are able to grow.”
- **Submarines can float easily.** => **Water in seafloor lakes is very dense.** Paragraph 5 states, “The lake’s water is so dense that a submarine can float on the lake’s surface.”

Grade 5, Mathematics

Question ID 43833

Answer Key (Multiple Choice)

- The correct answer is: **C. 6 r5**

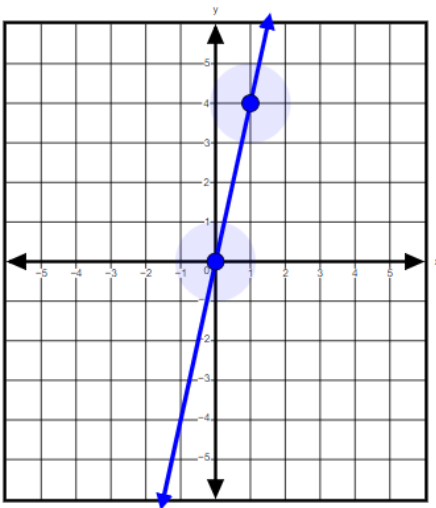
Solution:

Rationale	Solution
RATIONALE A	The student may have reversed quotient and remainder.
RATIONALE B	The student may have thought $7 \times 6 = 48$.
RATIONALE C	Correct. The student correctly solved the problem.
RATIONALE D	The student may have considered 49, which is 2 more than 47.

Grade 7, Mathematics

Question ID 274506

Answer Key (Point Graph)



Rubric:

Graphed the line $y = 4x$.

Scoring Guides

Description	When to Use	Supporting Learning
Scoring guides describe how students can earn different points (e.g., partial or full credit) based on their responses. This differs from rubrics, which describe different performance levels. They do not provide a measure of how well students meet different achievement levels on specified criteria like rubrics do.	Scoring guides are useful in constructed response and simple performance tasks where students can earn some of the total points (partial credit) or all of the total points (full credit). Scoring guides support analyzing student responses with more nuance than can be captured with items scored with an answer key.	Students will need help translating their scores on items that are scored with a scoring guide into a clear picture of what they did well and what they can do to advance their learning.

Examples

This scoring guide is from the National Assessment of Educational Progress (NAEP) 8th grade Civics assessment and can be accessed via the [NAEP Sample Questions web page](#).

Complete

Identifies three actions and explains how each one would impact their community.

Acceptable

Identifies two actions and explains how each one would impact their community.

Partial

Identifies two actions and explains how one would impact their community.

OR

Identifies one action and explains how it would impact their community.

OR

Identifies two or three actions but does not explain their impact on the community.

Unacceptable

Does not identify specific actions.

OR

Just repeats the wording of the prompt.

OR

Identifies one action but does not explain its impact on the community.

Sample Response

Complete

Education—They can help out in the library and cafeteria, this will lessen the cost that their community will have to pay workers in the library and cafeteria.

The Environment—They can clean up a nearby park that will make their community a better and prettier place.

Poverty and Hunger—Donate money and food or organize a food drive;, it will help out the local food banks and homeless shelters.

Rubrics

Description	When to Use	Supporting Learning
A rubric describes levels of achievement in a specified performance area. Rubrics are used to assign a performance level based on how closely student response reflects the criteria in the performance level.	Rubrics are useful for evaluating evidence of student work on multiple dimensions and when it is valuable to evaluate work along a progression. Rubrics are useful for evaluating performance tasks and portfolios.	When rubrics are used transparently with students, they are well suited to support learning because they can provide detailed information about what students did well and can provide information about how students can improve. Using rubrics to support student self- and peer-evaluation can be particularly beneficial for learning.

Types of Rubrics

There are two main types of rubrics: holistic and analytic.

Holistic Rubric

A **holistic rubric** incorporates all criteria into a single one performance level descriptor at each performance level. Students are given an overall score based on how well the student work as a whole aligns to the performance level descriptors. In a holistic rubric, all criteria are weighed together.

- **Advantages:** Holistic rubrics can be quicker to score and easier to develop.

- **Disadvantages:** Holistic rubrics are not well suited to recognize detailed information about student performance and are not set up to provide students with detailed information about their work. They can feel more subjective when scoring.

Example

This rubric is from MCA released Grade 5 Science Item 850766 available from [the Minnesota Questions Tool \(MQT\)](#).

Score	Description
3	<p>The response demonstrates a complete understanding of the question. The response thoroughly: explores phenomena/problems; utilizes evidence; develops explanations/solutions; and/or communicates information.</p> <ul style="list-style-type: none">• The response is fully cohesive and developed.• The response is solidly based on core ideas.• The response clearly and definitively connects ideas/concepts to the question.• The response is solidly based on evidence.
2	<p>The response demonstrates a partial understanding of the question. The response somewhat: explores phenomena/problems; utilizes evidence; develops explanations/solutions; and/or communicates information.</p> <ul style="list-style-type: none">• The response is somewhat cohesive and developed.• The response is based on core ideas.• The response connects ideas/concepts to the question.
1	<p>The response demonstrates a minimal understanding of the question. The response minimally: explores phenomena/problems; utilizes evidence; develops explanations/solutions; and/or communicates information.</p> <ul style="list-style-type: none">• The response lacks cohesion and development.• The response may be based on core ideas.• The response lacks connections between ideas/concepts and the question.
0	<p>The response demonstrates no understanding of the question.</p> <ul style="list-style-type: none">• The response may contain correct information, but overall the response lacks enough correct information that is connected to the question.

Analytic Rubric

An **analytic rubric** identifies and articulates performance-level descriptions for multiple criteria. Each criterion is analyzed independently and given a separate score. Analytic rubrics are useful for identifying student mastery across different skills in student work products.

- **Advantages:** Analytic rubrics are helpful for identifying student strengths and opportunities for growth; they can provide more detailed information about student performance and can help determine where students are in a progression of learning.
- **Disadvantages:** Analytic rubrics are difficult to develop and take expertise and testing; they can take a long time to score, as each characteristic or trait should be evaluated separately.

Examples

This is the WIDA MODEL Speaking Rubric available from the [WIDA MODEL Speaking Rubric web page](#).

Task Level	Linguistic Complexity	Vocabulary Usage	Language Control
1 Entering	Single words, set phrases, or chunks of memorized oral language	Highest frequency vocabulary from school setting and content areas	When using memorized language, is generally comprehensible; communication may be significantly impeded when going beyond the highly familiar
2 Emerging	Phrases, short oral sentence	General language related to the content area; searching for vocabulary when going beyond the highly familiar is evident	When using simple discourse, is generally comprehensible and fluent; communication may be impeded by searching for language structures or by phonological, syntactic, or semantic errors when going beyond phrases and short, simple sentences

Task Level	Linguistic Complexity	Vocabulary Usage	Language Control
3 Developing	Simple and expanded oral sentences; responses show emerging complexity used to add detail	General and some specific language related to the content area; may search for needed vocabulary at times	When communicating in sentences, is generally comprehensible and fluent; communication may from time to time be impeded by searching for language structures or by phonological, syntactic, or semantic errors, especially when attempting more complex oral discourse
4 Expanding	A variety of oral sentence lengths of varying linguistic complexity; responses show emerging cohesion used to provide detail and clarity	Specific and some technical language related to the content area; searching for needed vocabulary may be occasionally evident	At all times generally comprehensible and fluent, though phonological, syntactic, or semantic errors that don't impede the overall meaning of the communication may appear at times; such errors may reflect first language interference
5 Bridging	A variety of sentence lengths of varying linguistic complexity in extended oral discourse; responses show cohesion and organization used to support main ideas	Technical language related to the content area; facility with needed vocabulary is evident	Approaching comparability to that of English proficient peers in terms of comprehensibility and fluency; errors don't impede communication and may be typical of those an English proficient peer might make

Using Rubrics

Rubrics are intended to support and interpret evidence of learning from more complex tasks than a scoring guide or answer key. Because of this, using rubrics requires some special considerations and guidelines to ensure they are used to support equitable grading practices.

Implementation

Rubrics can support fair, accurate, and consistent evaluation of student work. However, because rubrics also require educators to make judgments, it is important to invest the time to become familiar with the expectations expressed in a rubric. Using rubrics without anchor

documents (exemplar or annotated responses for each score point) and without investing in calibration leads to divergent reasoning about student learning and harms students.

Anchor Documents

An anchor document is an example of student work that is representative of a particular score level on a rubric. A collection of anchor documents, reflecting a variety of ways that students can demonstrate each of the different score levels in a rubric, is essential for applying the language of the rubric to actual student work. Educators can study and discuss anchor papers to develop an understanding of a rubric in practice. Anchor documents can be annotated to further explain reasoning for the scores they receive.

Calibration

Calibration is a process in which a group of educators work to ensure they are consistently applying a rubric to analyze student work in alignment with the expectations articulated by the rubric. This process generally involves educators examining anchor documents, scoring multiple student work samples, and discussing scores to reach a shared understanding about how to interpret and apply a rubric. Calibration can be time consuming, but this investment of time supports the consistent, coherent, and accurate analysis of student work.

Improving Analysis Tools

Scoring tools require making assumptions about how students will understand the prompt or task, how they will interpret their options, and what it will look like for students to share thinking from which you can make inferences about your claim. That being said, students are unique, creative, and surprising. Looking carefully at how students respond, searching for novel ways to share knowledge, or surfacing imitations in your scoring tool is important to ensure that your response to student work is fair and useful. Update your rubrics to reflect a broader range of student responses, including novel responses.