



Grade 5 Science

Short Constructed Response Scoring Guide

Spring 2023

General Information

Beginning with the 2022–2023 school year, science assessments include short constructed responses at every assessed grade level. Students are asked to provide a short response to a question. Responses are scored using a prompt-specific, two-point rubric.

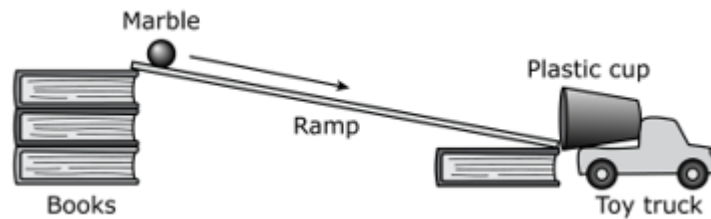
This State of Texas Assessments of Academic Readiness (STAAR®) constructed-response scoring guide provides student exemplars at all score points for a short constructed-response question from the STAAR grade 5 science operational test. The question is presented as it appeared on the test, and responses were scored based on the two-point rubric that was developed with the input of Texas educators. A response earns a specific score point based on the completeness of the response provided as measured against the rubric.

The responses in this guide are actual student responses submitted online during the testing window. To protect the privacy of individual students, all names and other references of a personal nature have been altered or removed. Otherwise, the responses appear as the students wrote them and have not been modified.

Grade 5 Short Constructed Response

A class is using the setup shown to test this hypothesis.

The shorter the stack of books becomes,
the shorter the distance the toy truck will roll.



What is **ONE** more piece of equipment needed to test the hypothesis **AND** how can the hypothesis be tested?

Look at the diagram carefully. Then enter your answer and explanation in the box provided.

Item-Specific Rubric

Score: 2

The student needs to identify at least one more piece of equipment such as:

- a ruler
- a measuring tape
- a meter stick

AND

Include at least one idea for how the hypothesis can be tested:

- varying the size of the book stack
- measuring distance traveled
- repeated trials

Score: 1

The student answers half of the question correctly.

Score: 0

The response is incorrect or irrelevant.

Sample Student Responses

Score Point 0

Response 1

The shorter the books are the shorter the truck will go.

The response does not demonstrate understanding of experimental design for scientific investigations testing one variable with a given hypothesis.

No attempt is made to identify a piece of equipment needed to test the hypothesis and no attempt is made to identify an idea for how the hypothesis can be tested as the response is only a restatement of the hypothesis (“The shorter the books are the shorter the truck will go”). The student does not attempt to add some minimal analysis beyond what has been provided in the prompt. The response is irrelevant as it does not address either element of the prompt/rubric.

Response 2

A stopwatch to see how long it takes for each book it takes the marble to see how far it goes.

The response demonstrates no understanding of experimental design for scientific investigations testing one variable with a given hypothesis.

An incorrect piece of equipment needed to test the hypothesis is provided (“A stopwatch to see how long it takes . . .”). Timekeeping devices are incorrect as the hypothesis is related to measuring distance, not time or speed, unless the student clearly explains how to use such an item to measure distance. Additionally, the response does not sufficiently explain how the hypothesis may be tested. The student’s explanation indicates a misconception that speed and distance are equivalent when in reality, one (distance) is a component of the other (speed). This indicates the student does not have the fundamental understanding of how distance functions as the outcome variable in the investigation. Because the student suggests using an incorrect tool to measure distance, in this case a stopwatch, it is not clear from the response provided that the student understands how the manipulated variable (the height of the book stack), affects the outcome variable, (the distance the truck will travel). Without further indication the marble has moved into the cup or travels with the truck, the student is not testing the provided hypothesis. Therefore, the student does not receive credit for the second element for any ideas on how the hypothesis given in the prompt can be tested.

Response 3

Maybe add one more book to the beginning of the ramp, and basically how the hypothesis can be tested is that you place the marble and it will go down the ramp, then it goes into the plastic cup.

The response does not demonstrate understanding of experimental design for scientific investigations testing one variable with a given hypothesis.

An incorrect piece of equipment needed to test the hypothesis is provided (“add one more book to the beginning of the ramp . . .”). Within the context of this response, the student is identifying an additional piece of equipment that is not needed, as enough books are provided in the diagram to test the hypothesis. The description also falls short of describing the action of varying the size of the book stack. There is an incorrect attempt to identify an answer for the second element as the explanation simply explains how the experimental setup shown works (“you place the marble and it will go down the ramp, then it goes into the plastic cup”) rather than providing an idea for how the hypothesis can be tested using the experiment.

Response 4

If you remove a book the speed of the marble will decrease and make the car not go as fast the more height the more speed with friction getting overpowered by the speed.

The response does not demonstrate understanding of experimental design for scientific investigations testing one variable with a given hypothesis.

No attempt is made to identify a piece of equipment needed to test the hypothesis, and there is an incorrect attempt to identify an idea for how the hypothesis can be tested. A brief description for varying the size of the book stack is included (“If you remove a book”), but the student ties this action to the speed of the toy truck and does not further explain the effect on truck movement in terms of distance (“the speed of the marble will decrease and make the car not go as fast”). The student’s response does not accurately address the hypothesis in the prompt, which asks about the distance the truck will travel and not its speed; therefore, the student does not receive credit for the second element for ideas on how the hypothesis given in the prompt can be tested. Additional incorrect explanation of the experiment is included (“with friction getting overpowered by the speed”), which also prevents credit for the second element.

Score Point 1

Response 1

That you have to do it more than once

The response demonstrates a partial understanding of experimental design for scientific investigations testing one variable with a given hypothesis.

No attempt is made to identify a piece of equipment needed to test the hypothesis. The response only addresses the second element to include a valid idea for how the hypothesis can be tested: a description of repeated trials of the experiment (“That you have to do it more than once”) as “it” can be seen here as referring to “testing” the hypothesis.

Response 2

I think they need to make sure every test they do they should add or take away some books. The first round they would start with one book and each test after that they would add one book at a time.

The response demonstrates a partial understanding of experimental design for scientific investigations testing one variable with a given hypothesis.

No attempt is made to identify a piece of equipment needed to test the hypothesis. The response only addresses the second element to include a valid idea for how the hypothesis can be tested: a clear description of varying the size of the book stack without any incorrect information (“every test . . . add or take away some books. The first round they would start with one book and each test after that they would add one book at a time”).

Response 3

a notepad is needed to take notes on how much less distance the truck went from alot of books too 3 books.

The response demonstrates a partial understanding of experimental design for scientific investigations testing one variable with a given hypothesis.

An incorrect identification of a piece of equipment needed to test the hypothesis is provided (“a notepad is needed to take notes”). Tangible (paper, pen, person, etc.) and intangible (chart, data table, etc.) notetaking items are not equipment unless the student clearly explains their use as a measuring tool. Partial credit can be given for the student’s explanation about how the hypothesis can be tested as evidenced by their stating “how much less distance the truck went from alot of books too 3 books.”

Response 4

Ruler so you can measure the amount of distance the ball rolled.

The response demonstrates a partial understanding of experimental design for scientific investigations testing one variable with a given hypothesis.

A correct piece of equipment needed to test the hypothesis is provided ("Ruler"), and while a description for "measuring distance traveled" is included ("measure the amount of distance the ball rolled"), the student incorrectly identifies measuring the distance of the ball/marble instead of the toy truck. Since the marble only rolls down the ramp and goes into the cup to push the truck to travel a distance, it is unclear whether the student has a fundamental understanding of the investigation. Without further indication the marble has moved into the cup or travels with the truck, the student is not testing the hypothesis and does not receive credit for answering the second element for any ideas on how to test the hypothesis given in the prompt.

Score Point 2

Response 1

A yard stick to see how far the toy truck will go.

The response demonstrates a complete understanding of experimental design for scientific investigations testing one variable with a given hypothesis.

A correct piece of equipment needed to test the hypothesis is provided ("A yard stick") and one valid idea for how the hypothesis can be tested is provided: measuring distance traveled ("to see how far the toy truck will go").

Response 2

They need a meter stick in order to measure the distance and they can repeat this experiment multiple times to get a reliable answer or conclusion.

The response demonstrates a complete understanding of experimental design for scientific investigations testing one variable with a given hypothesis.

A correct piece of equipment needed to test the hypothesis is provided ("a meter stick"), and the response includes two valid ideas for how the hypothesis can be tested (only one is needed): the first idea is a direct answer to the last question asked in the prompt "how can the hypothesis be tested?" ("measure the distance"), and the second idea indicates repeated trials of the experiment ("repeat this experiment multiple times").

Response 3

According to the diagram I have noticed that they need to use a measuring tool to see how far the toy truck could go. According to what I know, you could test it by putting less books and more books to see if the hypothesis is right.

The response demonstrates a complete understanding of experimental design for scientific investigations testing one variable with a given hypothesis.

A correct piece of equipment needed to test the hypothesis is provided (“a measuring tool to see how far the toy truck could go”). While a specific measuring tool is not identified, a description is included to indicate the tool is being used to measure (“to see how far . . . could go”) and is sufficient to indicate measuring distance. The response includes two valid ideas for how the hypothesis can be tested (only one is needed): varying the size of the book stack (“by putting less books and more books to see if the hypothesis is right”) and measuring distance traveled (“see how far the toy truck could go”).

Response 4

The last item needed in this experiment is a measuring tool. I would suggest a yard stick. Also to test the hypothesis you should roll the marble down the ramp with the same amount of force each time. After you roll the marble take away a book. Then measure the distances the car went. Remember there should be three trials to a good experiment.

The response demonstrates a complete understanding of experimental design for scientific investigations testing one variable with a given hypothesis.

A correct piece of equipment needed to test the hypothesis is provided (“a measuring tool . . . a yard stick”). “Measuring tool” alone would be insufficient as students are asked to name a specific piece of equipment needed for testing, such as a yard stick, or provide a description of how the tool is being used to measure. The response includes three valid ideas for how the hypothesis can be tested (only one is needed): varying the size of the book stack (“After you roll the marble take away a book”), measuring distance traveled (“Then measure the distances the car went”), and repeated trials of the experiment (“there should be three trials”). Identifying the need for more than one trial or multiple trials at each book stack level are both acceptable.