



Grade 8 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 two short constructed-response questions from the STAAR grade 8 science operational test. The questions are presented as they appeared on the test, and responses were scored based on the two-point rubrics that were 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 8 Science Short Constructed Response

Prompt

Sodium sulfate (Na_2SO_4) is used to produce many products.

Which elements are represented in the formula **AND** how many atoms of each element are represented in the formula?

Read the question carefully. Then enter your answer in the box provided.

Item-Specific Rubric

Score: 2

The student response includes:

- There are a total of 7 atoms representing three elements in the formula
AND
- The elements are sodium (2 atoms), sulfur (1 atom), and oxygen (4 atoms)

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

Sodium and 6

The student correctly identified only one element, with no correct number of atoms identified for any elements ("Sodium and 6"). Neither of the parts for this prompt are complete, and therefore this response receives no credit.

Response 2

nutatrine and sodium

The student correctly identified one element ("sodium"), but the other named element, "nutatrine," is not an actual, real element. No attempt was made to identify the number of atoms represented in the formula for any of the elements. Neither part of the prompt is complete or correct.

Response 3

8? 2 times 4 ,

The student did not attempt to identify any elements or clearly try to provide the correct number of atoms represented in the formula for any of the elements. Only a vague and irrelevant attempt to provide a math expression is provided ("8? 2 times 4 ,"). Neither part of the prompt is complete or correct.

Response 4

13

The student did not attempt to identify any elements and only an irrelevant number is provided ("13"). Neither part of the prompt is complete or correct.

Score Point 1

Response 1

Sodium-2
Sulfur-4
Oxygen-4

The student correctly identifies all three elements but only provides the correct number of atoms in the formula for two of the three elements ("Sodium-2," "Oxygen-4"). The number of atoms for sulfur is incorrect ("Sulfur-4"). Sulfur should be one atom, not four. The first part is correct and complete with all three elements named, but only two of the elements have a correct number of atoms, so the second part of the prompt is not completely correct. This response shows partial understanding.

Response 2

sodium-11, sulfuf-16& oxygen-8.

The student correctly identifies all three elements ("sodium," "sulfuf," "oxygen"), but the number of atoms provided for each of the three elements is incorrect ("sodium-11, sulfuf-16& oxygen-8"). These are the elements' atomic numbers, not the number of atoms represented in the formula for each element. The first part is correct and complete with all three elements named, but all the elements have an incorrect number of atoms, so the second part of the prompt is incorrect. The response is only partially correct.

Response 3

(Na) sodium (46)
(S) sulfur (32)
(O) oxygen (64)

The student correctly identifies all three elements ("[Na] sodium," "[S] sulfur," "[O] oxygen"), but the number of atoms provided for each of the three elements is incorrect ("sodium [46]," "sulfur [32]," "oxygen [64]"). The first part is correct and complete with all three elements named, but all three of the elements have an incorrect number of atoms, so the second part of the prompt is incorrect, and the response is only partially correct.

Response 4

Na
S
O

The student correctly identified all three elements using the correct periodic table symbol ("Na, S, O"). No attempt was made to provide the correct number of atoms represented in the formula for each of the three elements. The response demonstrates partial understanding with only one part of the prompt complete and correct.

Score Point 2

Response 1

The elements sodium, oxygen, and sulfur are used in the formula. In this formula, sodium has two atoms, oxygen has four atoms, and sulfur has one atom.

The student correctly identifies the three elements represented in the formula ("sodium, oxygen, and sulfur") and the correct number of atoms represented in the formula for each of the three elements ("sodium has two atoms, oxygen has four atoms, and sulfur has one atom"). Both parts of the prompt are complete and correct, and this response shows complete understanding.

Response 2

sodium (Na)- 2 atoms
sulfur (S)- 1 atom
oxygen (O)- 4 atoms

The student correctly identifies the three elements represented in the formula, along with the correct number of atoms represented in the formula for each of the three elements ("sodium [Na]- 2 atoms"; "sulfur [S]- 1 atom"; "oxygen [O]- 4 atoms"). Correct periodic table symbols can be used to identify the elements instead of full element names. Both parts of the prompt are complete and correct, and this response shows complete understanding.

Response 3

sodium, sulphur, oxygen are being represented
2 sodium
1 S
4 O

The student correctly identifies the three elements represented in the formula, along with the correct number of atoms represented in the formula for each of the three elements ("2 sodium, 1 S, 4 O"). Correct periodic table symbols can be used to identify the elements instead of full element names. Both parts of the prompt are complete and correct, and this response shows complete understanding.

Response 4

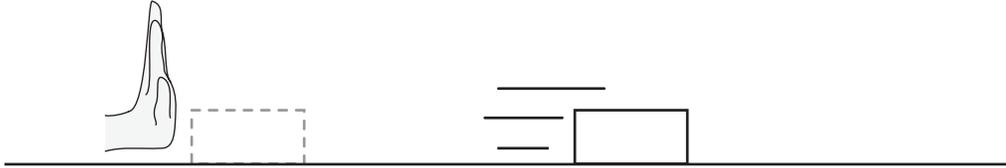
sodium-2 sulfur-1 oxygen-4

The student correctly identifies the three elements represented in the formula, along with the correct number of atoms represented in the formula for each of the three elements ("sodium-2, sulfur-1, oxygen-4"). Both parts of the prompt are complete and correct, and this response shows complete understanding.

Grade 8 Science Short Constructed Response

Prompt

A 1.5-kilogram block is pushed rapidly and released. The block continues to slide some distance until it comes to a stop. The figure shows the block after it has been released and before it comes to a stop.



Name the forces that directly affect the block's motion both before and after the block has been released. Describe the effects of each force named.

Enter your answer in the box.

Item-Specific Rubric

Score: 2

The student describes both the student's push and the surface's friction as the forces affecting the block's motion before release and describes the surface's friction as the force affecting motion.

The student also identifies acceleration (or change in velocity) as the effect both before and after release.

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

1. *gravity*
2. *push*

The response names two forces (“1. *gravity*, 2. *push*”), but no descriptions of how these forces impact the motion of the block are provided. With no description, it is not clear how the force is applied to the block; therefore, the response shows no understanding. Although a correct force is named (“*push*”), no credit is given for only naming a force.

Response 2

kinetic and pontetinal

The response is completely irrelevant. The student attempts to provide energy of the block before and after the block has been released (“kinetic and pontetinal”). Potential energy and kinetic energy are not forces that affect the block’s motion. The block is experiencing potential energy before it is in motion and kinetic energy after it starts moving, but this information is not relevant in any way to this prompt.

Response 3

one effect is that its Newton's second law which is that an object won't stop unless something stops it

The response is completely incorrect and irrelevant. The student attempts to provide Newton’s second law as an effect (“effect is . . . Newton’s second law”), but this is not a correct application of Newton’s second law and shows no understanding of what the prompt is asking. Students may attempt to apply Newton’s laws, but this is incorrect since the prompt is asking for the effect on the block’s motion from an applied force.

Response 4

force acceleration

The response is vague and irrelevant. The student provides two words with no context given (“force acceleration”). While acceleration can be an effect of an applied force, that is not provided in this response. No understanding is shown.

Score Point 1

Response 1

the hand pushing the block affect the blocks motion before it was released by appylyng enough force to the block, allowing the block to slide forwards. after the block was pushed there would not be any other force pushing it unless the hand decides to push it again.

The response names one force (“pushing”) and describes the effect of that force on the motion of the block (“hand pushing the block . . . appylyng enough force to the block, allowing the block to slide forwards”). This response describes how the push started before the block moved and then after it was released, which allowed the block to slide forward.

One correct force that acts on the block is provided, along with a description of how that force affects the block’s motion. The response answers one-half of the question and shows partial understanding.

Response 2

The force that is slowing the blocck down is friction .

The response names one force (“friction”) and describes the effect of that force on the motion of the block (“force that is slowing the blocck down is friction”). This concise response describes how friction is slowing down the motion of the block. No attempt is made to name a second force and describe how it affects the motion of the block.

One correct force that acts on the block is provided, along with a description of how that force affects the block’s motion. The response answers one-half of the question and shows partial understanding.

Response 3

force and motion, the hand pushed the block which is called force and then the block went into motion

The response names one force (“pushed”) and describes the effect of that force on the motion of the block (“then the block went into motion”). This response describes how the push from the hand moved the block.

One correct force that acts on the block is provided, along with a description of how that force affects the block’s motion. The response answers one-half of the question and shows partial understanding.

Response 4

when the boxed was pushed the force in the hand caused it to move farther way from the hand.

The response names one force (“pushed”) and describes the effect of that force on the motion of the block (“boxed was pushed . . . caused it to move farther way from the hand”). The response describes how the push from the hand moved the block away from the hand, which means it moved down the table. This response describes how the push from the hand caused the box to move further away from the hand, which indicates the box is sliding down the table away from the hand.

One correct force that acts on the block is provided, along with a description of how that force affects the block’s motion. The response answers one-half of the question and shows partial understanding.

Score Point 2

Response 1

The block is not moving until the push. The push is a force that makes the block move. The block will slide but then slow down because of the friction the block is sliding on.

The response names two forces that directly affect the block’s motion (“the push,” “friction”) and describes the effect of each force on the motion of the block (“push is a force that makes the block move . . . block will . . . slow down because of the friction”).

Two correct forces that act on the block are given, along with a description of how both forces affect the block’s motion, which shows complete understanding.

Response 2

By pushing the block is going off of the motion of the push. The greater the push the long distance it will go. But the surface that the block is sliding on has a play on how far it can go, becuae of friction. If there was no friction it could of had gone a long distance.

The response names two forces that directly affect the block’s motion (“pushing,” “friction”) and describes the effect of each force on the motion of the block (“pushing the block is going off of the motion of the push . . . greater the push the long distance it will go . . . surface that the block is sliding on has a play on how far it can go, becuae of friction”). The student explains that the push puts the block in motion and the harder you push, the further the block will slide. The student also describes how the surface the block is sliding on affects how far it can go because of friction.

Two correct forces that act on the block are given, along with a description of how both forces affect the block’s motion, which shows complete understanding.

Response 3

The box gets pushed so it moves forward until friction stops it from going any farther.

The response names two forces that directly affect the block's motion ("gets pushed," "friction") and describes the effect of each force on the motion of the block ("box gets pushed so it moves forward until friction stops it from going any farther"). This concise response clearly describes how the force of the push moves the block forward until the force of friction stops it from going any farther on the table. Moving forward and stopping are examples of motion.

Two correct forces that act on the block are given, along with a description of how both forces affect the block's motion, which shows complete understanding.

Response 4

There is a push of the block that causes acceleration of the block. The block speeds up, but then friction slows it down.

The response names two forces that directly affect the block's motion ("a push," "friction") and describes the effect of each force on the motion of the block ("push of the block that causes acceleration of the block . . . friction slows it down"). This concise response clearly describes how the push accelerates the motion of the block and how friction then slows it down.

Two correct forces that act on the block are given, along with a description of how both forces affect the block's motion, which shows complete understanding.