

MCAS Grade 8 Science and Technology/Engineering (STE) Practice Test Answer Key

The MCAS grade 8 Science and Technology/Engineering (STE) practice test is made of performance tasks reflecting the revised test design that will become operational in spring 2027. More information about the STE performance tasks can be found on the [MCAS Grades 5 and 8 Science and Technology/Engineering \(STE\) Transition](#) page.

Practice Performance Task 1

Item Number	Reporting Category	Standard	Science Practice Category	Item Type*	Max Points	Correct Answer**
1	<i>Physical Science</i>	8.PS.2.2	B. Mathematics and Data	SR	1	<i>see page 3</i>
2	<i>Physical Science</i>	8.PS.2.2	C. Evidence, Reasoning, and Modeling	SR	1	C
3	<i>Physical Science</i>	8.PS.2.2	B. Mathematics and Data	SR	1	B
4	<i>Physical Science</i>	7.PS.3.1	B. Mathematics and Data	SR	2	Part A: <i>see page 3</i> Part B: C
5	<i>Physical Science</i>	7.PS.3.2	C. Evidence, Reasoning, and Modeling	SR	1	<i>see page 3</i>
6	<i>Technology & Engineering</i>	7.ETS.1.2	C. Evidence, Reasoning, and Modeling	SR	1	<i>see page 3</i>
7	<i>Technology & Engineering</i>	6.ETS.1.6	C. Evidence, Reasoning, and Modeling	SR	1	<i>see page 4</i>
8	<i>Physical Science</i>	7.PS.3.7	C. Evidence, Reasoning, and Modeling	CR	3	<i>see page 6</i>

Practice Performance Task 2

Item Number	Reporting Category	Standard	Science Practice Category	Item Type*	Max Points	Correct Answer**
9	<i>Life Science</i>	8.LS.3.4	None	SR	1	<i>see page 4</i>
10	<i>Life Science</i>	8.LS.3.1	None	SR	1	<i>see page 4</i>
11	<i>Life Science</i>	8.LS.3.2	None	SR	1	B
12	<i>Life Science</i>	8.LS.3.4	C. Evidence, Reasoning, and Modeling	SR	1	<i>see page 4</i>
13	<i>Life Science</i>	8.LS.3.4	B. Mathematics and Data	SR	2	Part A: <i>see page 5</i> Part B: A
14	<i>Life Science</i>	6.LS.1.3	None	SR	1	C,D
15	<i>Life Science</i>	7.LS.2.3	C. Evidence, Reasoning, and Modeling	SR	1	B
16	<i>Life Science</i>	8.LS.4.4	C. Evidence, Reasoning, and Modeling	CR	3	<i>see page 7</i>

Practice Performance Task 3

Item Number	Reporting Category	Standard	Science Practice Category	Item Type*	Max Points	Correct Answer**
17	<i>Physical Science</i>	6.PS.4.1	C. Evidence, Reasoning, and Modeling	SR	1	<i>see page 5</i>
18	<i>Physical Science</i>	6.PS.4.1	C. Evidence, Reasoning, and Modeling	SR	1	D
19	<i>Physical Science</i>	6.PS.4.2	C. Evidence, Reasoning, and Modeling	SR	1	<i>see page 5</i>
20	<i>Earth & Space Science</i>	6.ESS.1.4	C. Evidence, Reasoning, and Modeling	SR	1	A
21	<i>Earth & Space Science</i>	6.ESS.2.3	C. Evidence, Reasoning, and Modeling	SR	1	C
22	<i>Earth & Space Science</i>	6.ESS.2.3	C. Evidence, Reasoning, and Modeling	SR	1	B
23	<i>Earth & Space Science</i>	8.ESS.2.1	C. Evidence, Reasoning, and Modeling	SR	2	<i>see page 5</i>
24	<i>Earth & Space Science</i>	7.ESS.2.2	C. Evidence, Reasoning, and Modeling	CR	3	<i>see page 8</i>

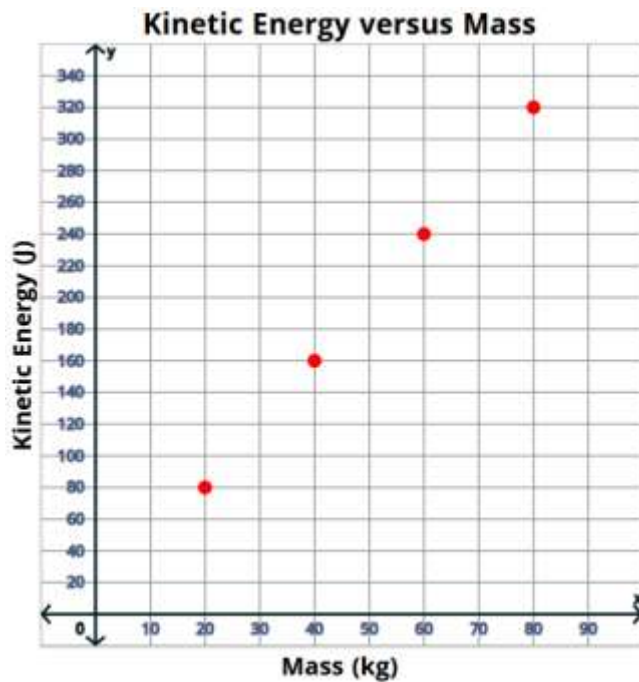
* Science item types are selected-response (SR) and constructed-response (CR).

** Pages 3–5 of this document provide correct answers for technology-enhanced items and pages 7–9 provide sample student responses to constructed-response items.

Correct Answer for Item #1

Time	Net Force
1–2 s	The net force is in the same direction as the scooter's motion.
3–4 s	The net force equals zero.

Correct Answer for Item #4 Part A



Correct Answer for Item #5

The rider-scooter system that has the **greatest** gravitational potential energy has a mass of and is on a when the speed is set to 10 km/hr.

Correct Answer for Item #6

Based on the information in the table, the best design is because of the score.

Correct Answer for Item #7

Scooter Feature	Benefit	Limitation
rider can control speed	☒	☐
deck has rough texture	☒	☐
battery needs to be recharged frequently	☐	☒
fender prevents water from splashing on rider	☒	☐

Correct Answer for Item #9

The chromosome is located in the of cells in mice.

Correct Answer for Item #10

Step	Sentence
1	Different DNA sequences are produced.
2	Different proteins are made.
3	Different traits are expressed.

Correct Answer for Item #12

**Male Mouse R
Allele Pair**

**Male Mouse S
Allele Pair**

OR

**Male Mouse R
Allele Pair**

**Male Mouse S
Allele Pair**

Correct Answer for Item #13 Part A

The genetic cross that provides the best evidence that tan fur in mice is a result of recessive alleles is the cross between female mouse L and male

This is because of the offspring have tan fur.

Correct Answer for Item #17

Wave 2 has a larger than wave 1 because wave 2 transfers energy than wave 1.

Correct Answer for Item #19

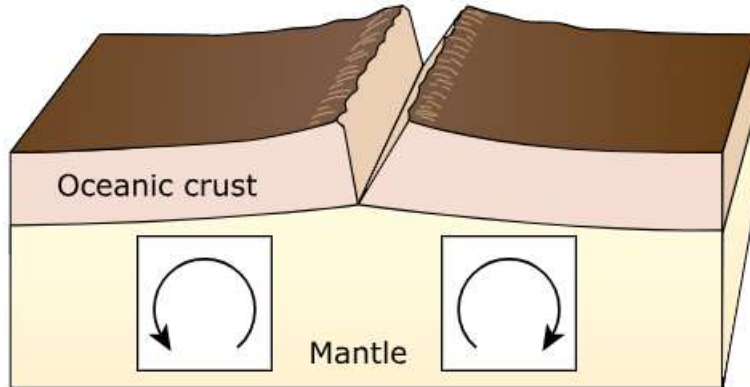
P-waves at the boundaries of Earth's layers because they are moving

Only P-waves were detected at location 2 because S-waves were by the outer core.

Correct Answer for Item #23 Part A

In Region 4, as tectonic plates move

Correct Answer for Item #23 Part B



Sample Student Responses for Constructed-Response Items

Item 8 Sample Student Work and Scoring Guide

Scoring Guide

Score	Description
3	The response demonstrates a thorough understanding of the relationship between kinetic and potential energy. The response correctly identifies that the gravitational potential energy of the rider-scooter system increases from 0 min to 20 min and clearly explains the reasoning. The response clearly explains why the two scooters have different battery levels after 20 min. The response also clearly describes one example of how energy is converted from one form in the battery to another form in a different part of the scooter.
2	The response demonstrates a partial understanding of the relationship between kinetic and potential energy.
1	The response demonstrates a minimal understanding of the relationship between kinetic and potential energy.
0	The response is incorrect or contains some correct work that is irrelevant to the skill or concept being measured.

Score Point 3

Part	Student Response
A	GPE increases because the scooter is moving uphill. When something is higher up, it has more GPE.
B	The battery levels are different because one of the scooters must have more mass. Energy from the battery is converted to kinetic energy. If a scooter has more mass it will take more energy for it to move at the same speed as the other scooter.
C	The battery has chemical potential energy which is converted into kinetic energy when the wheels spin.

Score Point 2

Part	Student Response
A	The gravitational potential energy gets bigger. The scooter is going up and potential energy has to do with how high up something is.
B	The battery is different because one scooter went faster so it had more kinetic energy.
C	the battery has potential energy that changes into light energy in the lightbulb.

Score Point 1

Part	Student Response
A	10% incline so it moves up the hill. GPE goes up.
B	energy in the battery is used up
C	kinetic energy when the scooter moves

Score Point 0

Part	Student Response
A	The scooter moves from one side to the other side
B	the battery died
C	wheel, motor, battery, light

Item 16 Sample Student Work and Scoring Guide

Scoring Guide

Score	Description
3	The response demonstrates a thorough understanding of the process of natural selection in a changing environment. The response correctly identifies whether there would have been more gray mice or more tan mice before volcanic eruptions and clearly explains the reasoning. The response clearly describes how the numbers of gray and tan mice changed in an area after volcanic eruptions and also clearly explains the reasoning using natural selection.
2	The response demonstrates a partial understanding of natural selection.
1	The response demonstrates a minimal understanding of natural selection.
0	The response is incorrect or contains some correct work that is irrelevant to the skill or concept being measured.

Score Point 3

Part	Student Response
A	There would have been more tan mice that survive 1,200 years ago because the tan mice will be camouflaged on the tan sand and be able to hide from predators.
B	The number of tan mice went down and the numbers of gray mice went up after the eruption. The gray mice were now camouflaged and the tan ones weren't. The gray ones would be more likely to survive and pass on their genes.

Score Point 2

Part	Student Response
A	1,200 years ago at Location X there would have been more tan mice. The gray mice would stick out more to the owls and more gray mice would be eaten.
B	There would be more gray mice than tan as time went by because tan mice were eaten by predators. More gray mice would live longer.

Score Point 1

Part	Student Response
A	In location 1,200 they would be more tan mouse because the surrounding color is tan. They can hide better.
B	The volcan caused more gray mouse because we gained more after the volcanos.

Score Point 0

Part	Student Response
A	there would be more grey mice in te desert 1,200 years ago
B	there would be more tan mice in the desert today

Item 24 Sample Student Work and Scoring Guide

Scoring Guide

Score	Description
3	The response demonstrates a thorough understanding of changes to Earth's surface caused by tectonic plate motion. The response clearly describes how tectonic plates move at boundary Type N. The response clearly describes how the plate boundary in Region 1 causes the land to change. The response also clearly explains why volcanoes occur in Region 3.
2	The response demonstrates a partial understanding of changes to Earth's surface.
1	The response demonstrates a minimal understanding of changes to Earth's surface.
0	The response is incorrect or contains some correct work that is irrelevant to the skill or concept being measured.

Score Point 3

Part	Student Response
A	Type N is a convergent boundary because the plates are moving toward each other.
B	In Region 1, the plates push up causing mountains to form.
C	Volcanic eruptions occur at the plate boundary in region 3 because it is a subduction zone and magma will push up through the crust.

Score Point 2

Part	Student Response
A	Tectonic Plates move toward each other
B	Continental plates collide to create very tall mountains.
C	The ocean and continental plates collide causing earthquakes, both shallow and deep.

Score Point 1

Part	Student Response
A	Slide past each other
B	All the earthquakes in region 1 will cause landslides
C	Volcano are where two plates touch

Score Point 0

Part	Student Response
A	At type 1 boundary the plates move away
B	It takes a long time for the land to change
C	Volcanoes happen when there is lava