

MCAS Grade 8 Science & Technology/Engineering (STE) Performance Task Practice Test Answer Key

The new practice performance task has the same format as the performance tasks that will be field tested in 2025 and 2026. More information about the new performance tasks can be found on the [MCAS Grades 5 and 8 Science and Technology/Engineering \(STE\) Transition](#) page.

The following answer key includes the reporting category, [standard alignment](#), and practice (if applicable) for each question on the practice performance task. An answer is also provided for each selected-response question. A rubric and sample student responses are included for the constructed-response question.

Item Number	Reporting Category	2016 Standard	Practice	Points	Correct Answer											
1	Physical Science	8.PS.2.2	Mathematics & Data	1	<table border="1" style="width: 100%;"> <thead> <tr> <th style="width: 30%;">Time</th> <th>Net Force</th> </tr> </thead> <tbody> <tr> <td>1–2 s</td> <td>The net force is in the same direction as the scooter's motion.</td> </tr> <tr> <td>3–4 s</td> <td>The net force equals zero.</td> </tr> </tbody> </table>		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.				
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2	Physical Science	8.PS.2.2	Evidence, Reasoning & Modeling	1	C											
3	Physical Science	8.PS.2.2	Mathematics & Data	1	B											
4	Physical Science	7.PS.3.1	Mathematics & Data	2	Part A	<p style="text-align: center;">Kinetic Energy versus Mass</p> <table border="1" style="display: none;"> <caption>Data points from the Kinetic Energy versus Mass graph</caption> <thead> <tr> <th>Mass (kg)</th> <th>Kinetic Energy (J)</th> </tr> </thead> <tbody> <tr> <td>20</td> <td>80</td> </tr> <tr> <td>40</td> <td>160</td> </tr> <tr> <td>60</td> <td>240</td> </tr> <tr> <td>80</td> <td>320</td> </tr> </tbody> </table>	Mass (kg)	Kinetic Energy (J)	20	80	40	160	60	240	80	320
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5	Physical Science	7.PS.3.2	Evidence, Reasoning & Modeling	1	The rider-scooter system that has the greatest gravitational potential energy has a mass of <input type="text" value="80 kg"/> and is on a <input type="text" value="10% incline"/> when the speed is set to 10 km/hr.															
6	Technology / Engineering	7.ETS.1.2	Evidence, Reasoning, & Modeling	1	Based on the information in the table, the best design is <input type="text" value="helmet N"/> because of the <input type="text" value="Total"/> score.															
7	Technology / Engineering	6.ETS.1.6	Evidence, Reasoning, & Modeling	1	<table border="1"> <thead> <tr> <th>Scooter Feature</th> <th>Benefit</th> <th>Limitation</th> </tr> </thead> <tbody> <tr> <td>rider can control speed</td> <td><input checked="" type="radio"/></td> <td><input type="radio"/></td> </tr> <tr> <td>deck has rough texture</td> <td><input checked="" type="radio"/></td> <td><input type="radio"/></td> </tr> <tr> <td>battery needs to be recharged frequently</td> <td><input type="radio"/></td> <td><input checked="" type="radio"/></td> </tr> <tr> <td>fender prevents water from splashing on rider</td> <td><input checked="" type="radio"/></td> <td><input type="radio"/></td> </tr> </tbody> </table>	Scooter Feature	Benefit	Limitation	rider can control speed	<input checked="" type="radio"/>	<input type="radio"/>	deck has rough texture	<input checked="" type="radio"/>	<input type="radio"/>	battery needs to be recharged frequently	<input type="radio"/>	<input checked="" type="radio"/>	fender prevents water from splashing on rider	<input checked="" type="radio"/>	<input type="radio"/>
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8	Physical Science	7.PS.3.7	Evidence, Reasoning, & Modeling	3	See scoring guide and sample student responses below. (Maximum of 3 points)															

Question 8: Scoring Guide

Score	Description
3	The response demonstrates a thorough understanding of the relationship between kinetic and potential energy. The response correctly identified 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.

Question 8: Sample Student Responses

Score	Part	Student Response
3	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.
2	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.
1	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
0	A	The scooter moves from one side to the other side
	B	the battery died
	C	wheel, motor, battery, light