2021 MCAS Sample Student Work and Scoring Guide

Grade 8 Science and Technology/Engineering
Question 14: Constructed-Response

Reporting Category: Technology/Engineering
Practice Category: Mathematics and Data
Standard: 7.ETS.1.2 - Evaluate competing solutions to a given design problem using a decision matrix to determine how well each meets the criteria and constraints of the problem. Use a model of each solution to evaluate how variations in one or more design features, including size, shape, weight, or cost, may affect the function or effectiveness of the solution.
Item Description: Use a decision matrix to determine how well different types of objects meet the criteria for building a design solution and explain the reasoning for those determinations.

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Scoring Guide

Select a score point in the table below to view the sample student response.

Score	Description
2	The response demonstrates a thorough understanding of evaluating competing solutions to a given design problem using a decision matrix. The response correctly identifies two criteria that the students used to make their choice. The response also correctly identifies the type of building block that is better than the number cubes and clearly explains the reasoning.
1	The response demonstrates a partial understanding of evaluating competing solutions to a given design problem using a decision matrix.
0	The response is incorrect or contains some correct work that is irrelevant to the skill or concept being measured.

Score Point 2

This question has two parts.

Students in an engineering class used blocks to build a model house. They first evaluated four types of blocks using the following criteria:

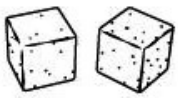
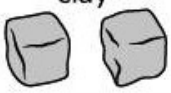
- low cost
- easy to build with
- durable
- able to stick together

The students scored each type of block from worst to best using the criteria. The results are shown in the decision matrix.

Scoring Key

Worst → Best

1	2	3	4

Type of Block	Criteria				Total Points
	Low Cost	Easy to Build With	Durable	Able to Stick Together	
Number cubes 	3	2	4	1	10
Sugar cubes 	4	1	1	1	7
Interlocking cubes 	2	3	4	4	13
Modeling clay 	2	3	2	3	10

Part A

Some students chose to use number cubes to build the model house. Identify **two** criteria from the decision matrix that the students used to make their choice.

It was durable and it was low cost.

Part B

Based on the decision matrix, the other students in the class determined there was a better type of block to use for building the model house than the number cubes.

Identify the type of block that is better for building the model house than the number cubes. Include evidence from the decision matrix to explain your reasoning.

Interlocking cubes is better for building the model house. It had the highest overall score, with 13 points.

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Score Point 1

This question has two parts.

Students in an engineering class used blocks to build a model house. They first evaluated four types of blocks using the following criteria:

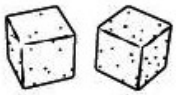
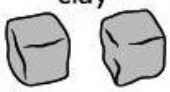
- low cost
- easy to build with
- durable
- able to stick together

The students scored each type of block from worst to best using the criteria. The results are shown in the decision matrix.

Scoring Key

Worst → Best

1	2	3	4

Type of Block	Criteria				Total Points
	Low Cost	Easy to Build With	Durable	Able to Stick Together	
Number cubes 	3	2	4	1	10
Sugar cubes 	4	1	1	1	7
Interlocking cubes 	2	3	4	4	13
Modeling clay 	2	3	2	3	10

Part A

Some students chose to use number cubes to build the model house. Identify **two** criteria from the decision matrix that the students used to make their choice.

easy to build with and able to stick together so that way in really gonna be easy so make the model house.

Part B

Based on the decision matrix, the other students in the class determined there was a better type of block to use for building the model house than the number cubes.

Identify the type of block that is better for building the model house than the number cubes. Include evidence from the decision matrix to explain your reasoning.

The better block to make a house with is the interlocking blocks. I chose these build blocks because they got the highest points on the table and beat number blocks by 3 points.

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Score Point 0

This question has two parts.

Students in an engineering class used blocks to build a model house. They first evaluated four types of blocks using the following criteria:

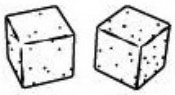
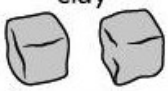
- low cost
- easy to build with
- durable
- able to stick together

The students scored each type of block from worst to best using the criteria. The results are shown in the decision matrix.

Scoring Key

Worst → Best

1	2	3	4

Type of Block	Criteria				Total Points
	Low Cost	Easy to Build With	Durable	Able to Stick Together	
Number cubes 	3	2	4	1	10
Sugar cubes 	4	1	1	1	7
Interlocking cubes 	2	3	4	4	13
Modeling clay 	2	3	2	3	10

Part A

Some students chose to use number cubes to build the model house. Identify **two** criteria from the decision matrix that the students used to make their choice.

They chose the number cubes to build a model house with because it says on the chart that it is easier to build with and it is strong enough to stay together.

Part B

Based on the decision matrix, the other students in the class determined there was a better type of block to use for building the model house than the number cubes.

Identify the type of block that is better for building the model house than the number cubes. Include evidence from the decision matrix to explain your reasoning.

I think modeling clay is also good to use besides number blocks because it says on the chart that it is at low cost and is durable.

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