Science Grade 11 E

Grade Level Standard: Science HS Engineering and Technology: Evaluate a solution to a real-world problem based on criteria and trade-offs that account for a range of constraints including cost, safety, reliability as well as social and environmental impacts.

Material(s) Provided for Science 11 D	Question(s)	Page Number
Science 11 D Attainment Task Questions for Student Use	1 - 5	13

Response Code:

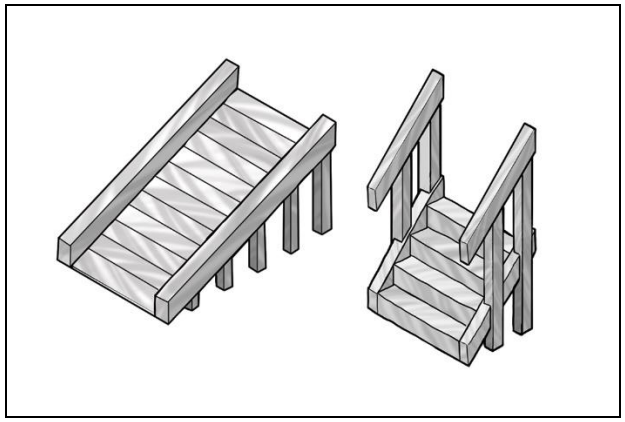
- Indicate the answer provided by the student.

Text Coding:

- "Quotation marks" indicate the script that the teacher should read to the student.
- *Italicized text* provides further direction for the test administrator.
- Words in parenthesis ( ) are optional; they may replace or be read in addition to the word(s) immediately preceding.

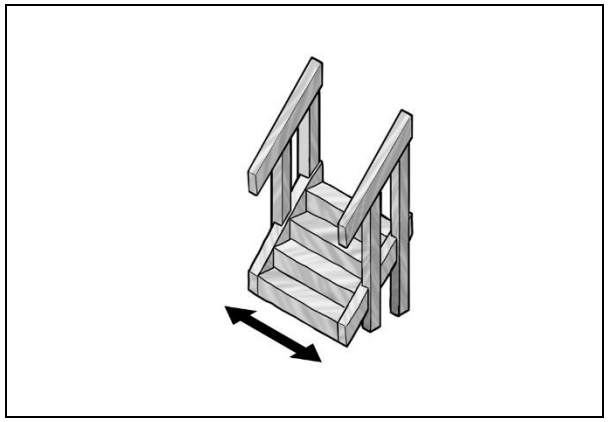
a.

Having both ramps and stairs.



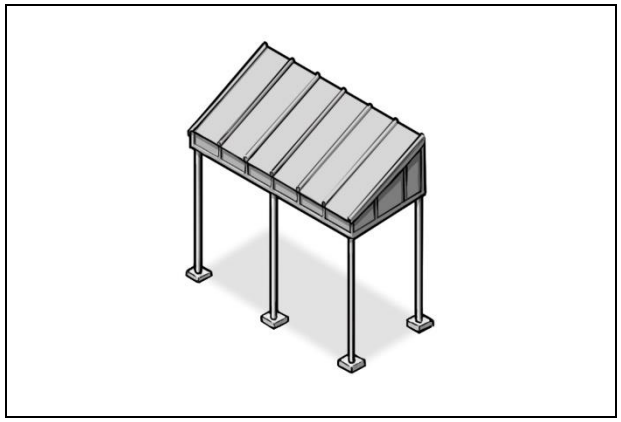
b.

Making the stairs wider and with railings.



c.

Adding cover so the students are dry and warm.



Before beginning task administration, please ensure that all conditions specified in the administration protocol (starting on page 10 of the Administration Guide Overview and Attainment Task Administration) have been met. Inform the student that the task is about to start by saying, "We are about to start the task, and I am going to ask you some questions."

All questions from this task are available for presentation to the student in the supplemental material Science 11 E Attainment Task Questions for Student Use.

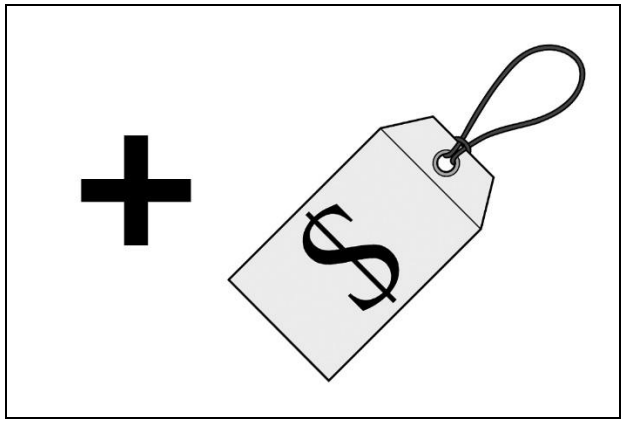
"Laticia's school is being renovated. The project will take two years and will require several design solutions to problems that come up during the construction. Two temporary classrooms outside Laticia's school can only be entered by stairs. Stairs are not accessible to students who use wheelchairs."

1. "Which change would make the temporary classrooms accessible to **all** students?"

Response Option	***Response Rationale***
a. Having both ramps and stairs. **(Correct)**	*The student evaluates the solutions and concludes that having both ramps and stairs would make the classrooms most accessible.*
b. Making the stairs wider and with railings.	*The student attempts to evaluate the solutions however does not realize that while wider steps would allow more students to pass at a given time, they would not benefit people with mobility issues.*
c. Adding cover so the students are dry and warm.	*The student attempts to evaluate the solutions however does not recognize that students staying warm and dry is a safety constraint not an accessibility constraint.*
Depth of Knowledge (DOK) 3	

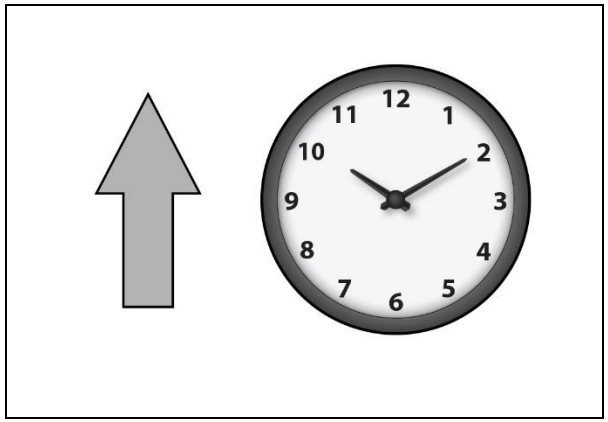
a.

The added cost of building ramps with railings.



b.

The increased time it takes to add railings to the ramps.



c.

The possible danger to students using ramps without railings.

If needed, remind the student about the task scenario by rereading, "Laticia's school is being renovated. The project will take two years and will require several design solutions to problems that come up during the construction."

"The school has decided to add ramps with railings to access the outside classrooms. The contractors do not want to add railings to the ramps because it will cost more."

3. "Which of the following would be a **safety constraint** of building ramps?"

Response Option	***Response Rationale***
a. The added cost of building ramps with railings.	*The student identifies a constraint however identifies a cost constraint rather than a safety constraint.*
b. The increased time it takes to add railings to the ramps.	*The student identifies a constraint however identifies a time constraint rather than a safety constraint.*
c. The possible danger to students using ramps without railings. **(Correct)**	*The student correctly identifies possible danger to students as a safety constraint.*
Depth of Knowledge (DOK) 1	

Science 11 E Attainment Task Questions for Student Use

1. Which change would make the temporary classrooms accessible to **all** students?

3. Which of the following would be a **safety constraint** of building ramps?

Kentucky Academic Standard: Evaluate a solution to a complex real-world problem based on prioritized criteria and trade-offs that account for a range of constraints, including cost, safety, reliability, and aesthetics, as well as possible social, cultural and environmental impacts. HS-ETS1-3

Alternate Assessment Target: *Evaluate a solution to a real-world problem based on criteria and trade-offs that account for a range of constraints including cost, safety, reliability, as well as social and environmental impacts.*

Student Group	Number of Students	Percent Correct #1	Percent Correct #3
All Students	533	62.48%	56.47%
Gender			
Female	192	66.67%	59.38%
Male	341	60.12%	54.84%
Ethnicity			
African American	57	52.63%	56.14%
American Indian or Alaska Native	<10	Not Reported	Not Reported
Asian	16	37.50%	62.50%
Hispanic or Latino	<10	Not Reported	Not Reported
Native Hawaiian or Pacific Islander	<10	Not Reported	Not Reported
White (Non-Hispanic)	401	65.34%	56.86%
Two or More Races	61	55.74%	49.18%
English Learner	20	35.00%	40.00%
Economically Disadvantaged	407	62.90%	56.76%

*Number of students that attempted the item