Science Grade 11 C

Grade Level Standard: Science HS Physical Science 2: Evaluate the design of a device that minimizes the force on an object during a collision and make suggestions for improvement.

Required Assessment Material(s) Provided for Science 11 C	Question(s)
Science 11 C Video Clip Egg Drop	1 - 5
Science 11 C Team B Design	2, 5
Science 11 C Attainment Task Questions for Student Use	1 - 5

Response Code:

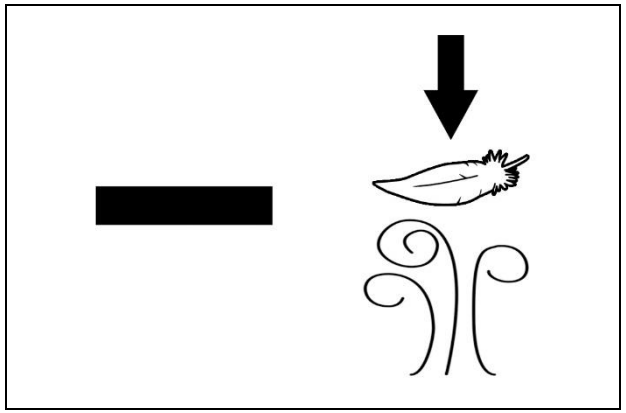
- Indicate the answer provided by the student.

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.

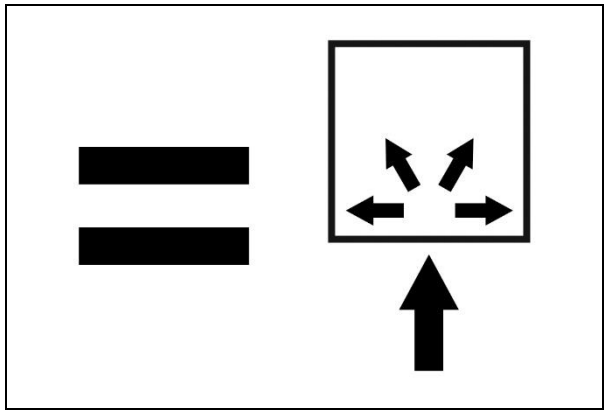
a.

There was less air resistance because air moved through the structure.



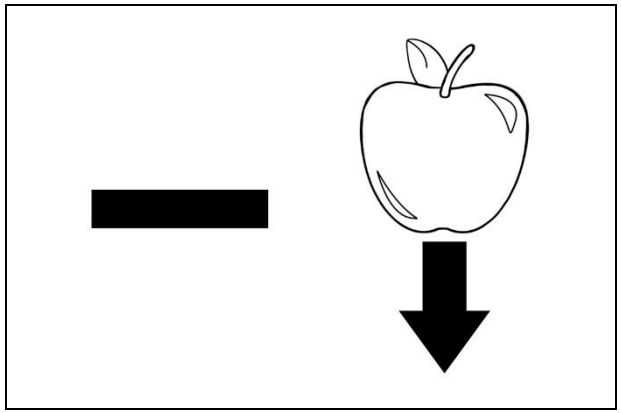
b.

The forces were distributed across the internal structure.



c.

There was less gravity acting on the egg so it hit the ground with less force.



Before beginning task administration, please ensure that all conditions specified in the administration protocol (starting on page 9 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 material Science 11 C Attainment Task Questions for Student Use.

"The science class conducts an egg drop contest. Each team is to design a system that will protect an egg from breaking when it is dropped from a height of 20 feet. The testing of each team's design is videotaped."

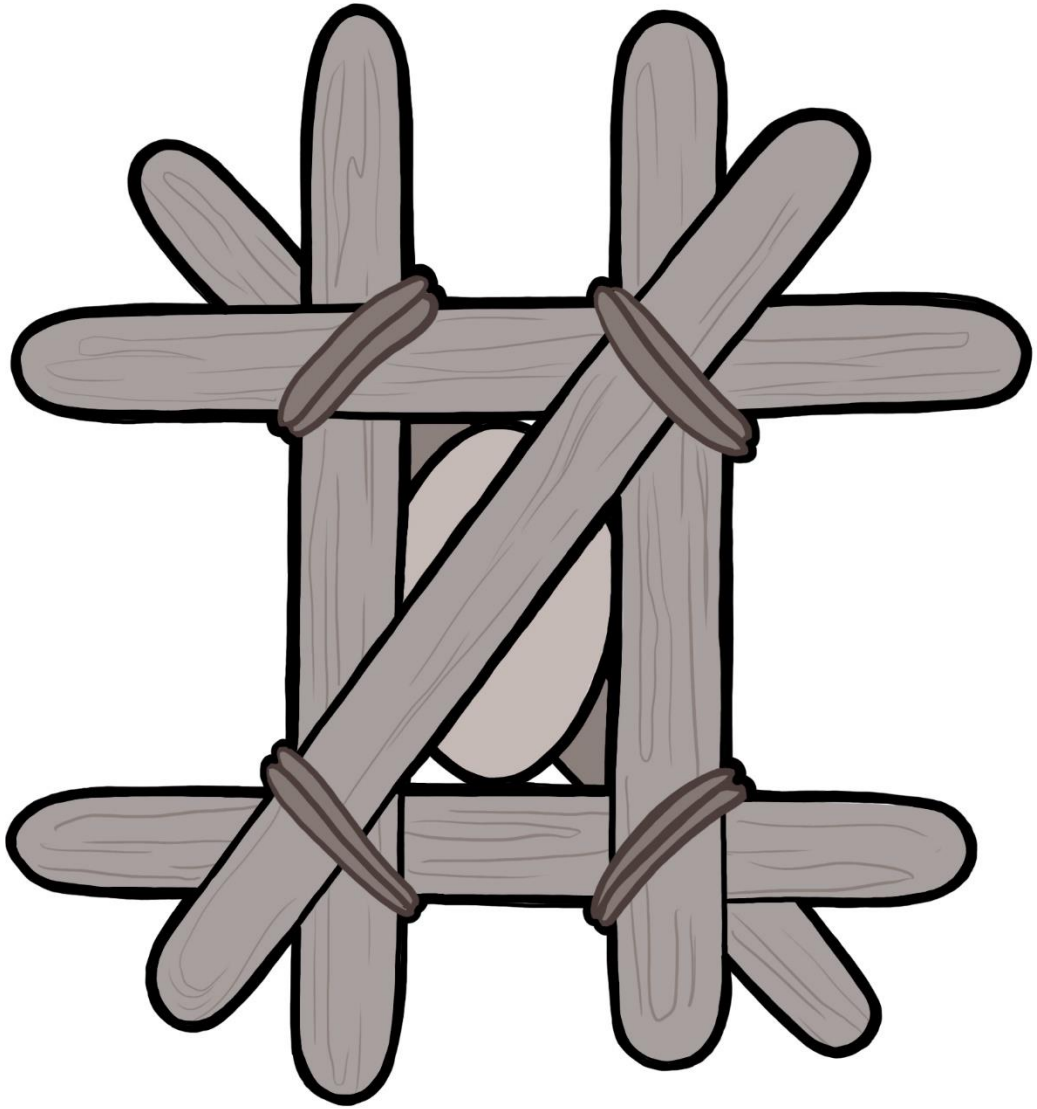
Play Science 11 C Video Clip Egg Drop for the student.

Present the student with Science 11 C Team B Design.

2. "Which statement **best** explains why Team B's design protected the egg from breaking?"

Response Option	***Response Rationale***
a. There was less air resistance because air moved through the structure.	*The student attempts to describe why the design is successful but does not understand the impact of air resistance.*
b. The forces were distributed across the internal structure. **(Correct)**	*The student effectively describes why the design is successful by explaining how the forces are distributed.*
c. There was less gravity acting on the egg so it hit the ground with less force.	*The student attempts to describe why the design is successful but does not understand the relationship between gravity and force.*
Depth of Knowledge (DOK) 3	

Science 11 C Team B Design



Science 11 C Attainment Task Questions for Student Use

2. Which statement **best** explains why Team B's design protected the egg from breaking?

Kentucky Academic Standard: Science HS Physical Science 2: Apply scientific and engineering ideas to design, evaluate, and refine a device that minimizes the force on a macroscopic object during a collision. [Clarification Statement: Examples of evaluation and refinement could include determining the success of a device at protecting an object from damage and modifying the design to improve it. Examples of a device could include a football helmet or a parachute.] HS-PS2-3

Alternate Assessment Target: Evaluate the design of a device that minimizes the force on an object during a collision and make suggestions for improvement.

Student Group	Number of Students	Percent Correct #2
All Students	553	38.16%
Gender		
Female	159	38.99%
Male	394	37.82%
Ethnicity		
African American	77	36.36%
American Indian or Alaska Native	<10	Not Reported
Asian	10	30.00%
Hispanic of Latino	44	38.64%
Native Hawaiian of Pacific Islander	<10	Not Reported
White (Non-Hispanic)	393	38.68%
Two or More Races	28	39.29%
English Learner	26	42.31%
Economically Disadvantaged	401	39.90%

*Number of students that attempted the item