Lunar Base Supply Egg Drop

Student Data Sheet

Team Name: ______________________________________________________

Team Members: ___________________________________________________

Context
Any future lunar base will be made as self-sufficient as possible, it will likely need periodic resupply from Earth. This can be achieved more cheaply and efficiently with a passive style landing of a supply payload. The lack of atmosphere on the Moon will prevent the use of devices such as parachutes or aerobrakes to slow the descent of the payload. Even in the reduced gravity of the Moon (about one-sixth that of Earth), the design of the payload package is critical to the successful resupply of the base. The design of the package must ensure that much needed supplies arrive intact.

Challenge
Package a raw egg payload in a package no larger than $20.32 \times 20.32 \times 20.32$ cms, so that it may be recovered unharmed (the shell and yolk should be intact) when dropped from a building’s second story (height of at least 9.144 m). No “drag devices” (e.g., parachutes, aerobrakes or other devices that the instructors feel have been included in the design purely to slow the descent of the payload) may be used.

Technological Design Steps
The design process can be broken down into the following steps:

1. Identify appropriate problems for technological design.
2. Design a solution or product.
3. Implement the proposed design.
4. Evaluate completed technological designs or products.
5. Communicate the process of technological design.
Design Evaluation
1. What was the problem for your team to solve? What was your product designed to do?
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2. Describe the job responsibilities of the project engineer, test engineer, facilities engineer and the developmental engineer.
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3. Draw a sketch of your design and label all key elements.
4. How did your team decide what your package would look like?
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5. Did you change your package after designing? After building? If so, what revisions did your team make?
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6. How did your team work together to solve problems?
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7. How did you approach someone on your team who had a different idea about the product?
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8. Describe how you coped with constraints such as using only the supplied materials, time and other trade offs when designing your package?
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9. Rate how well your team did in planning, organizing materials, working together and using appropriate techniques in building your product.

1  2  3  4  5
Poor Exceptional

10. Describe how you used constraints such as using only the supplied materials, time and other trade offs when designing your package?
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11. How successful was your product?

a. Shell intact: complete success = 5 points
b. Shell intact, yolk broken: partial success = 3 points
c. Shell broken, yolk intact: partial success = 3 points
d. Shell broken, yolk broken: mission failure = 1 point

Notes:
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