

65. The “Egg Drop” Challenge

Classroom Activity: Design and build a device that can drop its cargo (an egg) from a plane to the survivors of a hurricane who desperately need the supplies.

Grade: 7

Strand(s): Understanding Structures and Mechanisms

This task addresses the following overall expectations:

- analyse personal, social, economic, and environmental factors that need to be considered in designing and building structures and devices;
- design and construct a variety of structures, and investigate the relationship between the design and function of these structures and the forces that act on them;
- demonstrate an understanding of the relationship between structural forms and the forces that act on and within them.

and the following specific expectations:

- evaluate the importance for individuals, society, the economy, and the environment of factors that should be considered in designing and building structures and devices to meet specific needs;
- evaluate the impact of ergonomic design on the safety and efficiency of workplaces, tools, and everyday objects and describe changes that could be made in personal spaces and activities on the basis of this information;
- follow established safety procedures for using tools and handling materials;
- use technological problem-solving skills to determine the most efficient way for a structure to support a given load;
- use appropriate science and technology vocabulary, including truss, beam, ergonomics, shear, and torsion, in oral and written communication;
- use a variety of forms (e.g., oral, written, graphic, multimedia) to communicate with different audiences and for a variety of purposes;
- describe ways in which the centre of gravity of a structure affects the structure's stability;



- identify the magnitude, direction, point of application, and plane of application of the forces applied to a structure;
- distinguish between external forces and internal forces (tension, compression, shear, and torsion) acting on a structure;
- identify and describe factors that can cause a structure to fail.

Assessment Categories:

- Knowledge and Understanding
- Thinking and Investigation
- Communication
- Applications
- Teambuilding skills

Type of Activity: Classroom

Time needed to complete activity: 1 - 2 hours

Materials/Resources for teachers:

25 straws
25 popsicle sticks
1 egg
1 pair of scissors

Glue gun

Activity Description:

To build a device that will secure the goods (represented by an egg) that when dropped from a height of at least 2

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metres will be undamaged (no breaking or cracking of the egg).

Each group will consist of 2 students.

Each group may only use supplies they receive.

Each group will only receive 1 egg.

Each group will only be permitted 1 egg drop.

All eggs will be inspected for cracks and/or damage to the shell after the drop.

All egg survival devices must be free-fall (no parachutes).

Students are not permitted to make alterations to their design once the challenge begins. Each group should be prepared to clean up their mess, if necessary.

Summary Questions:

1. Why did you choose to develop your initial design in the manner that you did? What did you think would happen when it hit the ground?
2. What could you have done initially to improve your design?
3. What materials, if any, proved to be key to your success?
4. What additional materials would you have used if you were permitted to do so? Why?
5. Looking at your final design, what improvements would you make if you were able to do another egg drop challenge? Why?