Name:_____
Date:_____

great
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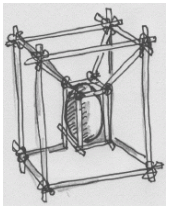
THE EGG DROP CHALLENGE

OBJECTIVE Students will investigate and observe gravity, forces and the laws of motion.

QUESTION How can you protect a raw egg when dropped onto a hard surface? How does the size of the egg, the height from which it is dropped and the characteristics of the surface affect the safety of the egg?



THE CHALLENGE Design a device that will protect a raw egg from breaking when dropped from 10 feet onto a hard surface.

THE RULES

1) You can only use the materials from the list
2) You can only select 6 things from the supply list
3) You cannot use glue on the egg itself
4) All members of the group must participate to receive credit
5) Only your teacher may drop devices loaded with eggs

SUPPLIES Pick 6 of the following materials for your team to use. Mark an X in the box next to your choices.

- ☐ 1 sheet of newspaper
- ☐ 2 sheets of notebook paper
- ☐ Tape (2 feet or less)
- ☐ String (4 - 10 inch pieces)
- ☐ 1 small Styrofoam cup
- ☐ 10 cotton balls
- ☐ 5 rubber bands
- ☐ 2 small paper plates
- ☐ Plastic spoons/forks/knives (limit 2 total!)
- ☐ Glue (for gluing things together only)
- ☐ 10 popsicle/stirring sticks **or** 10 toothpicks
- ☐ 2 feet of toilet paper

PREDICT Which materials will provide the best protection for the egg? My hypothesis is:

_____

_____

PLAN & TEST

Step 1: Plan and draw your device ➔➔➔➔
Step 2: Build your device
Step 3: Present your device to the class. Explain your design.
Step 4: Insert your egg and make sure it's ready to be dropped!
Step 5: Wait for your teacher to begin the competition. Be careful with your egg – if you break it before the competition, you will **NOT** get another one!

REFLECT

1. What happened to your egg when it was dropped from the ladder?

_____
_____
_____
_____

2. What would happen if you dropped your egg and device from a tall building? Do you think your egg would survive?

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_____
_____
_____
_____

3. What causes some objects to fall faster than others? _____

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_____
_____

4. When dropped from the same height, would reach the ground first--- a plastic bag or a gallon of milk? _____ Why? _____

_____
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5. What could you do to improve your results next time?

_____
_____
_____
_____
_____
_____

OPERATION: EGG DROP ◊ MISSION: ACCOMPLISHED

Teacher's Guide

Topics: Gravity, Force, Laws of Motion, resistance/drag, aerodynamics

- Ask why some objects fall faster than others.
  - Discuss downward acceleration, resistance/drag
  - Example:

- Ask why it takes more force to move a full shopping cart than an empty one (or an empty dresser compared to one that is full of clothes)
  - Discuss mass and weight of objects, and the forces needed to move objects
  - Example:

- Ask what would happen to an egg that rolls off a counter.
- Ask students how they can use their knowledge of forces to protect an egg from breaking when dropped from a ladder, onto a hard surface.

Teacher Tip: Set up the ladder *outside*. Use a tarp or cheap table cloth as a "landing pad". Tape it to the concrete if necessary. Mark an "X" for fun. ☺

YouTube Video – Bowling ball/Feather Drop in a Vacuum
https://youtu.be/E43-CfukEgs