

Egg Drop Challenge

PURPOSE:

1. To learn about the concept of force and acceleration
2. To brainstorm various types of designs for protecting an egg

TALKING POINTS:

- When we fall from a high position to the ground, we feel the impact back from the ground from the fall. This is due to Newton's third law: for every action there is an equal and opposite reaction. When landing on a hard material, these falls often lead to injuries like breaking a leg or bruises. However, when we fall from a high position to soft, cushioning materials, we don't feel as much of an impact from the ground. Why is this the case?
- This is because things that cushion, like mattresses and cotton balls, absorb the impact that we should've gotten from the fall. Therefore, when we actually fall, our bodies only absorb the impact partially from the fall. Engineers take this concept to build different kinds of structures that have saved people's lives. These things include parachutes, mattresses, and trampolines, in which absorb the shock that could lead to injury.
- In this week's experiment, we are going to create a structure that will attempt to prevent an egg from cracking when dropped from a high place. A good structure will minimize the impact from hitting the ground.

MATERIALS:

- 1 egg per group of 4 (will be given during the second week)
- Plastic Ziploc bags (to put the egg in for testing)
- Paper plates
- Paper bags
- Plastic Straws
- Masking Tape
- Dixie Cups
- Cotton balls
- Scissors

PROCEDURE:

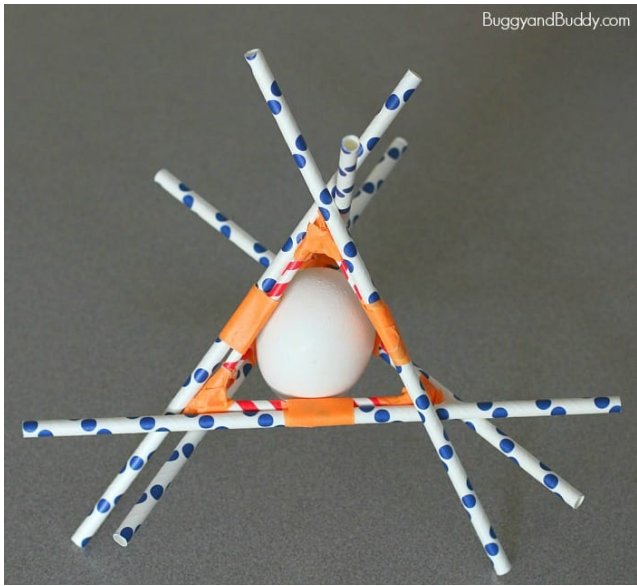
1. First start out by drawing a plan for your design on a piece of paper. Keep in mind what materials you will have available. We will be working with straws, cotton balls, paper plates, cups, and tape to hold everything together. (You can scroll to the last page for example designs).
2. Using your drawn design, start building your contraption to protect your egg.
3. Once your design is finished, place a single egg in a plastic bag. (That way if it breaks, it won't make a mess.) Then put the egg/ziplock in your contraption.
4. Start out by dropping your contraption with the egg inside from three feet off the ground. Check to see if the egg has broken or not.

5. If it is still intact, drop it from one foot higher. Keep doing this until your egg breaks. An egg is considered broken if liquid comes out of the egg.

CONCLUDING QUESTIONS:

1. How many feet did it take for your egg to break?
2. What parts of your design worked well? What parts could you improve upon?
3. Why do some materials absorb shock better than others?
 - a. Air space between the elements creates the softness in the material which will absorb shocks.
4. Why do we need rigid materials?
 - a. To build strong frames and distribute the shock throughout the structure.

EXAMPLE DESIGNS:



BuggyandBuddy.com

