



Egg Drop

CHALLENGE

EGG DROP CHALLENGE

INSTRUCTOR GUIDE

1. Preparation

- Review Instructor Guide
- Make any necessary adaptations based on age level
- Choose where you will be dropping the Egg from
- How long will you allow for this challenge for designing and building?
Typically in my classes students get 45min to plan and 1hr 30min to build.
- Decide what materials will be available for your kids to use
 - Can give them a limited amount of materials or unlimited amount.

2. Introduction

- For those that are not familiar with the Nursery Rhyme begin by watching this video : <https://www.youtube.com/watch?v=nrv495corBc>
- Questions following video: What happened to Humpty Dumpty? (He fell) Why? (Gravity) Could this accident have been prevented? How?
- The Challenge is to create a device to prevent Humpty Dumpty from cracking after a big DROP from _____, only by using _____ as materials.

3. Vocabulary to Know

- Gravity: the force that pulls things towards the center of the Earth.
- Drag: the force that opposes movement. This is the air pushing against Humpty as he falls.
- Impact: force applied over a short period of time when two objects collide. This would be the force between Humpty and the ground. ****the greater the speed the greater the force of impact****

4. Newtons Laws of Motion

- 1st Law of Motion: an object at rest will stay at rest and an object in motion stays in motion unless acted on by an outside force.
 - How does this Apply? The egg will be dropped and be pulled down by gravity unless a force acts on it to prevent it.
- 2nd Law of Motion: FORCE = MASS x ACCELERATION

- How does this apply? The egg will hit with a force that is determined by the size of the egg (mass) and the height of the fall (which changes the speed).
- 3rd Law of Motion: for every action there is an equal and opposite reaction
 - How does this apply? When the egg lands it will hit the ground with the force (impact) that is generated during the fall and the ground will push back on the egg with an equal force.

5. Ask

- What is the challenge?
- What do you know about Gravity, Drag and Impact that would help you with this challenge?
- What materials would work best for this challenge?

6. Imagine

- Brainstorm for 5min on the best solution for the challenge.

7. Plan

- Give child a blank piece of paper and have them sketch with 3-4 different ideas for a prototype. MAKE SURE THEY LABEL THEIR SKETCHES.
- Choose 1 of the sketches to build

8. Create

- Time limit? Or work until it is completed

9. Test/Improve

- Use lab sheets provided

10. Reflect

- Discuss and compare results

11. Options to Modify

- Try dropping the egg from increasing heights. Does it eventually stop working?
- If the initial design did not work, redesign it and try to improve it. Can you get it work the next time?
- Fill a box with a large amount of materials that could be used for this project. Then allow each child to only choose 3 items from the box to build their design.

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LAB SHEET

	Fall Time	Level of Damage
Trial One		
Trial Two		
Trial Three		

Testing Notes and Observations

Trial One	
Trial Two	
Trial Three	

1. How far is Humpty falling? (The height of the drop)
2. How much mass does Humpty have? (The weight)
3. What did I learn?
4. What worked? What didn't work?