



**The Messy Meter**

Recommended Grades:  
**3 - 5**

Estimated Time:  
**30 minutes**

Subject:  
**Physics**

**WHAT YOU'LL NEED**

**PANTRY STAPLES:**

- 3, 7- or 9-ounce plastic or foam cups
- 9 facial tissues
- 1 plastic garbage bag
- String (lightweight)
- 3 raw eggs
- Masking tape
- Scissors
- Measuring tape or yard stick

**SPECIALTY SUPPLIES:**

- Hole punch
- Stopwatch

**Parachute Away**

If you throw an egg up into the air, it will come back down and make a big mess. In this activity kids will learn how to harness the power of physics and air resistance to develop different parachute designs and discover a safe way to deliver an egg to the ground.



**STEPS**

Use the below steps to get started, but don't forget to let kids experiment.

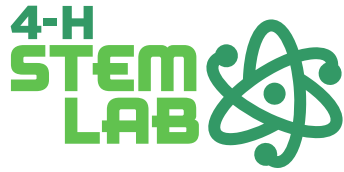
1. Prepare the egg cradle. Use a hole punch to make four holes in the top of each cup.
2. Take a few tissues and wad them up before putting them in the bottom of each cup.
3. Now make three different parachutes to test. Take the plastic garbage bag and cut a small, medium and large size square. The recommended sizes are: 10" x 10", 20" x 20", and 30" x 30" but allow kids to experiment with the sizes!
4. For each parachute cut four equal lengths of string (you will need 12 total). Tie a piece of string to each corner of the plastic garbage bag square, then attach the four loose ends of the strings to each cup, matching the parachute corners to the same corner on the cup.
5. Mark each cup with an A (10" x 10"), B (20" x 20"), and C (30" x 30") to keep track of how the different parachutes perform.
6. Place one egg in each cup, on top of the balled-up tissues, using masking tape to keep the egg in place. Then add a few more crumpled tissues and put masking tape across the top of each cup.
7. Predict which egg has the best chance of surviving a fall from 10-12 feet.
8. Test each parachute by dropping it (unfurled) as you hold it from the top center of the parachute. Time each flight and record your results. Note: If any eggs break on the landing, encourage kids to make changes to the design to prevent any breaks the next time they try.

**Bonus Fun:**

Challenge kids to compete in a Parachute race! In this race two or more kids drop their parachute at the same time and whichever one makes it to the bottom last is the winner. Before each rematch have them adjust their parachutes to try and slow them down.

**Questions to Engage Youth:**

- Why do you think some parachutes fell faster than others?
- What improvements would you make to your design with more time?



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### Explanation:

The natural force of gravity pulls objects toward Earth. When a parachute falls to Earth, or is pulled down by gravity, air resistance below the parachute pushes against it, slowing it down. When unfurled, the parachute has a lot of surface area. This means the

larger the parachute, the slower it falls. Each parachute accelerates toward the ground until the amount of force from air resistance is equal to the pulling force of gravity.

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