

MISSION MISSION POSSIBLE

IMAGINE. DESIGN. CREATE.



MISSION : Egg Drop Challenge

Your mission is to invent something that will protect an egg from cracking when it is dropped!

WHAT YOU'LL NEED

- Egg(s) (from the grocery store)
- Alternative: Water balloon(s)
- Materials from around your house (paper, plastic straws, packing material, plastic bags, dishcloths or anything else you think might protect your egg!)
- Tape, yarn and/or rubber bands
- Ruler, yardstick or tape measure
- An area with hard ground surface where you can drop your egg from at least three feet above the ground (Example: the kitchen, outside porch, driveway, etc.)
- Drop cloth or newspaper (to protect the surface you drop the egg on and for easy clean-up)
- Optional: pencil, pen, crayon, marker
- Optional: paper to draw on



LET'S READ

Find a comfortable spot and read! Here are some ideas to get you started:

- Gravity by Chris Woodford
- DK Eyewitness: Force & Motion by DK Publishing
- Physics by Dan Green
- Egg-Drop Blues by Jacqueline Turner Banks

You can download digital copies of these books for free from openlibrary.org. Here is how!

1. Go to openlibrary.org.
2. Click the blue "sign up" button on the top right to create a free account. You will be sent a confirmation email.
3. Sign in.
4. Type the book title and author into the search bar.
5. Find your book and click the blue "borrow" button.
6. Don't forget to return your book when you are finished reading it!



Sam Noble Home



Activities

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Get Started:

1. Pick the area where you will drop your egg (in the kitchen, on the driveway, etc.).
2. Spread drop cloth or newspaper over the area for easy clean-up
3. Gather your egg and supplies from around the house.
4. Look at the supplies, egg and area where you will drop the egg:

THINK!

- What kind of surface will you drop your egg on?
 - How high up from the ground will you drop your egg?
 - What would happen to your egg if you dropped it without anything to protect it?
 - How can you use the materials you collected to help protect your egg?
 - Will you need any other materials?
 - Optional: Draw what you want your invention to look like!
5. Build it!
 6. Once you have built your invention around the egg, bring it to the drop area.
 7. Use a ruler or yardstick to measure at least three feet up from the ground.
 8. Hold your invention at least three feet high and drop it!

WHAT HAPPENED?

- Did your egg splatter?
 - Did your egg crack but not splatter?
 - Did your invention stay together when you dropped it or did it break?
 - Did your invention break when you dropped it, but the egg didn't crack or splatter?
9. Try Again! Just because your idea didn't work the first time, doesn't mean you should give up. Think about how you can change your idea to build your invention in a different way so it will protect your egg. Be creative and try as many times as you want. Ask for ideas from an adult or buddy if you've tried all of yours. (If you need some hints, check out the next page.)
 10. Make sure to clean up after, if the egg breaks.



When you're done, share what you did with someone!

TELL THEM

- Did your invention work on the first try?
- How did you change your idea to better protect your egg?
- How many ideas did you try?
- Which one worked best?
- What was hard about the challenge?
- If they wanted to try the egg drop challenge, what should they do?

BONUS CHALLENGE

Now that you've mastered the egg drop challenge, see if you can:

- Drop your egg from a higher height
- Build an invention that also slows your egg's fall when it lands (like a parachute)
- Challenge an adult or buddy to make an invention using the same materials (example: give everyone 5 minutes to plan, 30 minutes to build, then drop your eggs!)

What is an Engineer? Engineers try to find solutions to problems – in the egg drop challenge, you are an engineer trying to find a way to keep your egg from breaking when it drops. Gravity is the force that pulls objects towards the Earth and why your egg would fall on the ground and break if not protected. While you can't stop gravity, you can find ways to change what happens when your egg hits the ground. You can design something to protect or cushion your egg on impact (when the egg hits the ground), or you can design something that softens the impact by slowing how fast your egg falls, like a parachute! You might even be able to design an invention that does both.

HELPFUL WORDS

Crack: when a surface (like a shell) splits but doesn't break into separate pieces

Cushion: something that softens the effect of impact

Descent: the action of moving, dropping or falling downward

Drag: a force that acts opposite of an object in motion

Gravity: a force that pulls objects towards Earth

Impact: when an object comes into contact with another object

Momentum: a measurement of mass in motion

Parachute: a device that slows the descent of an object through the air

Shell: the hard, protective outer layer of an egg

Splatter: when a liquid splashes

Talk like an egg drop challenge engineer!

1. My invention did/did not provide cushion for my egg.
2. My invention protected my egg shell from cracking or splattering upon impact.
3. When I dropped my egg, gravity caused it to fall to the ground.
4. If I dropped my egg from a higher height, it would have greater momentum.
5. A parachute would slow my egg's descent when I dropped it by providing drag.

For more activities visit samnoblemuseum.ou.edu/samnoblehome



TIPS

- Make sure your invention holds your egg in, so your egg doesn't pop out when it lands
- Your invention doesn't have to be complicated – think about using materials that can cushion the fall of the egg or keep it from hitting the ground.
- Your invention can come in many shapes and sizes – there is no right or wrong design! For your contraption you could:
 - o Fill a plastic baggie with something to provide cushion.
 - o Use food containers or cardboard boxes.
 - o Tape plastic straws together to make a structure around your egg.
 - o Use plastic bags or napkins to make a parachute.

**Want to learn more about how gravity effect objects,
like an egg? Check out the links below:**

Defining Gravity (video)

<https://www.youtube.com/watch?v=ljRIB6TuMOU>

PBS Forces and Motion

<https://oeta.pbslearningmedia.org/subjects/science/physical-science/forces-and-motion/>



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