

Mission Egg Possible

Are you Egg-cited for a STEAM challenge where things may get a bit scrambled?



WHAT WILL I NEED?

- 1 Egg in a sandwich bag
- Garbage bags or table cloths
- Anything else you have at home that can include – popsicle sticks, tape, paper, clean recyclable plastic containers (yogurt tubs, etc), straws, cookie boxes, etc.

WHERE SHOULD I GO?

Weather permitting: this activity should be outside.
Rainy Day Plan: Use the Bathtub with a garbage bag liner as the drop zone.

PARENTS CORNER

Campers may be handling raw eggs that have broken. They will also make amazing devices to protect a lucky egg!

WHAT DO I ALREADY KNOW?

1. Are any areas of an egg stronger than other areas? Could the top be stronger than the side?
2. Do our materials have any strengths or weaknesses that we should think about?
3. Are there other materials in my home that could be useful? How would that item be helpful?



INSTRUCTIONS

Objective: Create a safety pod for a egg to be dropped from various heights using listed items.

Take 5 minutes to answer the previous questions.

Use 5 more minutes to brainstorm your design.

The egg must be sealed in a sandwich bag at all times and should be part of the design.

You will have 20-25 minutes to create your egg pod. After your pod is finished, head to the drop zone! (outside or over a garbage bag in the shower)

Drop Height 1: 4 feet above the ground

Drop Height 2: 6 feet above the ground

Drop Height 3: Ask an adult to reach high and drop your egg from above their head.

Final Drop: Get an adult's help. How high can you drop the egg without a crack? (Share your results)



INSTRUCTIONS (continued)

If your egg cracks or breaks after one of the first 3 drops, try to make a new design if you have enough materials.

Make sure to clean up your design space and drop zone. Ask an adult for some wipes or cleaner if the egg escaped the bag. Wash your hands after cleaning up.



INSTRUCTIONS (continued)

Egg strength

The egg's unique shape gives it tremendous strength, despite its seeming fragility. Eggs are similar in shape to a three-dimensional arch, one of the strongest architectural forms. The egg is the strongest at the top and the bottom (or at the highest point of the arch). If you hold an egg in your hand and squeeze it on the top and the bottom, the egg doesn't break because you are adding pressure to the ends which are the strongest parts of the egg. The curved form of the shell also distributes pressure evenly all over the shell rather than concentrating it at any one point. If you completely surround the egg with your hand and then squeeze, the pressure you apply by squeezing is distributed evenly all over the egg. However, eggs do not stand up well to uneven forces, which is why they crack easily on the side of a bowl (or why it would crack if you just pushed on one side). This also explains how a hen can sit on an egg and not break it, but a tiny little chick can break through the eggshell. The weight of the hen is evenly distributed over the egg, while the pecking of the chick is an uneven force directed at just one spot on the egg.



WHAT DID I LEARN?

1. What part of the pod design and structure helped keep the egg safe?
2. Why are the design and testing phases of Engineering important?
3. Why are building arches strong?



GREAT JOB!

WANT TO SHARE YOUR GREAT WORK?

Have your parents upload all of your fabulous work to their Facebook or Instagram Pages and tag @GSMIDTN so all of your Girl Scout sisters can see too!

