

Activity: Egg Drop

On SCOPE's Engineering episode, you saw Julia make different structures to protect an egg from breaking.

For this activity, use whatever you can find around the house to make the structures and then drop an egg to see how well they work. Here are three different structures that Julia tried:



What you need:

Lost of eggs!

1st Structure

Plastic container with a lid
Foam padding pieces

2nd Structure

Scissors
String
Plastic bag
Hole punch
Plastic cup
Sticky tape

3rd Structure

Big foam ball about 20cm in diameter. (You can buy one from the craft store.)
Cotton wool
Scissors

What to do:

1st Structure

1. Add the padding to the container.
2. Place an egg in the middle of the padding.
3. Put the lid on the container and make sure it is on tight!

2nd Structure

1. Cut 4 pieces of string about 30cm long.
2. Using the hole punch, make four holes in the bag around the opening, making sure they are evenly spaced.
3. Attach a piece of string to each hole.
4. Using the sticky tape, attach the end of each piece of string to the cup.
5. Place an egg in the cup.

3rd Structure

1. Cut the foam ball in half.
2. Using scissors, cut a hole in the middle of each half, so when the two halves are held together, the egg fits inside the hole.

3. Test out the structure by placing the egg in the hole and holding the two halves of the foam ball together.
4. If the egg rattles, place some cotton wool inside the hole to fill the extra space.

Once the structures are complete, find a hard surface to drop them onto.

Drop each structure from a height (standing on a chair is fine). You can also drop an egg without a structure to protect it, to act as your control for the experiment.

Then find out if your structures helped protect the egg!

What's happening?

Engineering involves designing things to achieve certain goals, and this experiment involved a lot of engineering!

The first structure used soft, light objects, with plenty of space between them, to act as padding for the egg. It was built on the same principle as the crumple zone in a car – all the energy of the crash goes into deforming the metal and so the people inside stay safe.

So for the egg, when it is dropped, the bits of padding should squash together from the force of the collision and the energy should go into squashing the padding and not squashing the egg.

Unfortunately that did not happen in the test and the egg broke! But if the container was bigger, with more padding, the result might have been different.

The aim of the egg parachute was to slow the speed of the egg's fall. Once again, in the test, the egg did break, but not as badly as the control egg. So the egg's fall did slow down, but not slow enough!

Finally, the foam ball was used to spread out the force of the impact of the egg's collision with the ground. Instead of all the force hitting the egg's shell in one spot, it hit the foam and spread evenly over the surface of the ball. It is similar to how helmets protect you when you fall off your bike. This structure was definitely the best of the three because in the test, the egg stayed nice and safe inside the ball and did not break!