



Egg Drop Challenge

A challenge to protect an egg from breaking after it is dropped from height

Subject(s): Design and Technology, Engineering

Approx time: 60 - 90 minutes

Key words / Topics:

- > Frame
- > Gravity
- > Protection
- > Structure
- > Triangle

Stay safe

Whether you are a scientist researching a new medicine or an engineer solving climate change, safety always comes first. An adult must always be around and supervising when doing this activity. You are responsible for:

- ensuring that any equipment used for this activity is in good working condition
- behaving sensibly and following any safety instructions so as not to hurt or injure yourself or others

Please note that in the absence of any negligence or other breach of duty by us, this activity is carried out at your own risk. It is important to take extra care at the stages marked with this symbol: ⚠

Suggested Learning Outcomes

- > To know that gravity is a pulling force.
- > To be able to make a structure to protect an egg from a drop from height.

Introduction

This is one of a series of resources designed to allow learners to use Easter themes to develop their knowledge and skills in Design & Technology and Engineering. This resource focusses on the egg drop challenge. Sheets of paper are used to make a protective structure to prevent an egg being broken when dropped from height.

Purpose of this activity

In this activity learners will use, make and assemble a protective structure to save an egg from breaking in the egg drop challenge.

This activity could be used as a main lesson activity, to teach learners about the strength of structural forms. It could also be used as one of several activities within a wider scheme of learning focussing on gravity.

Activity

Introduction (5-10 mins)

Teacher to explain that learners are going to carry out the egg drop challenge.

Making the egg protector (40-60 minutes)

Teacher to demonstrate the steps shown in the teacher presentation and listed below:

- > Step 1 – Roll paper into 6 tubes. Use pencils to get the same diameter of tube when rolling the paper. Use sticky tape to stick down the outside edge of the paper onto the roll.
- > Step 2 – Make a frame with 3 paper rolls and use sticky tape to join them together. The triangle in the middle needs to be sized so that an egg sits on it without falling out.

Teacher notes

This activity could be carried out individually or in pairs.

If using raw eggs, it is recommended that plastic covering is used on the floor and suitable hand washing facilities are available. One option is to use boiled eggs as these will reduce the mess but still crack on impact.

Step 1 – the purpose of the pencil (or pencils) is to achieve a uniform size, as differences in diameter will create zones where failure is more likely to occur. Wood dowel can be used as an alternative to pencils. If this has a slot to tuck the paper into, that can help to ensure that the roll is tight. The sticky tape works most effectively when running along the length of the tube (rather than around it).





- > Step 3 – Use the last 3 paper rolls to make the upper parts of the frame. Place the upper paper rolls at the lower paper rolls crossover points and use sticky tape to fix in place.
- > Step 4 – Place the egg in the centre of the protective frame. Bring the three loose uprights together and use sticky tape to join them, so the egg is held firmly in place.

Step 3 – don't join the upright rolls together at this step, or the egg will not fit in the structure.

If time allows, learners could improve their designs by, for example, adding extra members to the structure (such as using these to link the ends of the members in contact with the egg, resulting in what looks like the internal frame for a football), using different materials, making thicker struts, or using a shopping bag with string to make a parachute.

Teacher to hand out equipment and materials needed for the task to learners.

Learners to complete each step for themselves. The teacher presentation could be left on the whiteboard as a supporting guide as they do this.

Testing and Plenary (10-20 minutes)

Learners to test their egg protection frames. First drop from 0.5 m, then 1 m. If the egg survives, how high can it be dropped from? How would learners improve their designs to make them more effective?

Differentiation

Basic

Provide learners with pre-rolled paper tubes.

Resources

- > Projector/whiteboard
- > Raw eggs/Boiled eggs
- > Scissors
- > Glue sticks
- > Paper
- > Tissue paper
- > Sticky tape
- > String
- > Plastic bags

Additional websites

- > **BBC Bitesize** – What is Gravity? - <https://www.bbc.co.uk/bitesize/topics/z4brd2p/articles/zr3xh39>

Related activities (to build a full lesson)

Starters (Options)

- > Watch BBC Bitesize video about gravity.

Main

- > ACTIVITY: Egg drop challenge.

Extension (Options)

- > Learners to enhance their designs by adding additional features, materials or characteristics to improve performance.

Plenary

- > Testing the structures by the egg drop challenge. How would learners improve their designs to make them more effective?

Extension

Learners to enhance their designs by adding additional features, materials or characteristics to improve performance.

Required files



Egg Drop Challenge Presentation





The Engineering Context



Understanding how structures are used to protect products is an important part of the new GCSE courses in Design and Technology and Engineering. Structures are used to protect many products, ranging from eggs to supplies dropped from aircraft during emergencies.

Curriculum links

England: National Curriculum

- > Design & Technology
- KS3 2a, 2b, 3c

Scotland: Curriculum for Excellence

- Technologies
- > TCH 3-10a, TCH 4-09a

GCSE D&T

AQA D&T

- > 3.1.6.1, 3.2.2, 3.2.4, 3.2.5, 3.2.8, 3.3.9

Edexcel D&T

- > 1.9, 1.1.7, 2.7.4, 3.2.1, 3.2.2, 3.6.3, 3.7.2, 3.7.3

Eduqas D&T

- > 2.1 Core: 8
- > 2.2 Core: 1, 2, 4

OCR D&T

- 5.1a, 5.4, 7.2, 7.5

Northern Ireland Curriculum

Technology & Design

- > KS3 Knowledge, understanding and skills: Manufacturing – selecting and using materials fit for purpose; safe use of a range of tools and processes appropriate to materials, demonstrating accuracy and quality of outcome.

Wales: National Curriculum

Design and Technology

- > KS3 Skills: Making 1, 2, 3, 4

GCSE Engineering

- #### AQA Engineering
- 3.4.2, 3.6

Assessment opportunities

- > Informal teacher assessment of the produced structures.

