Crash Helmets for Eggs

Name: _____

Class: _____

Date: _____

The Institute of Materials, Minerals and Mining

Prepared by
Dr Diane Aston, IOM3

Your challenge

You will be working with a partner to build the lightest possible crash protection suit that will stop an ordinary hen's egg from breaking when it is dropped from a height of about 1.5m on to a hard floor.

You will need to choose your materials carefully and think about how you can put them round your egg to give the best protection.

You will need to think about your egg and how it will behave when you drop it.

You cannot use wings or make a parachute!

You will be working like a real scientist or real engineer and so you will work through your challenge in five stages:

- Research – what have other people done before?
- Design – what do you think your crash suit should look like?
- Build – how are you going to create your crash suit?
- Test – does it do the job?
- Evaluate – how could you have made it better?

This is a competition so there are prizes! There will be a prize for the lightest design that protects the egg and a prize for the best team name. So get your thinking caps on, un-scramble your brains and get cracking!

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Our research

To help you to understand how to build your crash suit you will talk a little bit about real crash helmets.

Write a sentence to say why do you think crash helmets are important?

_____

_____

Use the space below to write some notes about crash helmets and the materials that are used to make them. There is a list of words below to help you.

Crash helmets are made from special types of _____.

They contain tiny bubbles of _____ and look a bit like Aero chocolate.

The bubbles squash when the helmet hits the _____ and this stops you getting hurt as badly.

Crash helmets need to be _____ and _____ because you wouldn't wear them if they were big and heavy!

THIN **FOAM** **LIGHT** **GROUND** **AIR**

Can you think of 10 places where you might need to wear a crash helmet?

1	6
2	7
3	8
4	9
5	10

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Our design

My partner is _____

Our team is called _____

Use the space below to draw and describe how you are going to use your materials to build a winning crash suit. Don't forget to label your diagram. Each group will be given the same amount of:

Expanded polystyrene

Bubble wrap

Sponge

Sticky tape

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Our results

Before you start building your crash suit you need to weigh your egg. Once you have built the suit you should weigh your egg again to work out how much material you have used (don't forget to use the right units!).

Our egg weighed _____

Our egg weighed _____ wearing its crash suit

So we used _____ of material

Testing our design

It is important to make sure that all the designs are tested in the same way, everyone has had the same materials to choose from, everyone has had the same amount of time and everyone's design will be dropped from the same height. We are looking at how the materials you have chosen for your design protect the egg. This is called **FAIR TESTING**.

Put a tick by the correct meaning of Fair Testing.

Fair testing is when you change everything all at once to see what happens.

Fair testing is when you keep everything the same except for the one thing that you want to investigate.

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Our prediction

Before your design is tested you should make a prediction of what you think will happen. **Complete this sentence...**

When our design is tested I think it will _____

because _____

_____

Our evaluation

This is one of the most important parts of any investigation. Evaluating your results means going back and having a look at what you did and whether it worked and then thinking about how you could have improved your design so that it worked better. **Use the space below to describe what happened when your egg was dropped and how you could have made it better...**

When our egg was dropped it **smashed** **cracked** **survived**

We could have made our design better by _____

_____

_____

_____

_____

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You can use this space to write any extra notes throughout your project

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