

A TEST OF STRENGTH

RECAP

THE TASK

Build a structure from scrap corrugated cardboard and investigate how shape affects the structural strength of materials.

WHAT WILL YOU NEED?



Some scrap corrugated cardboard.

IMPORTANT NOTES



This is a team-based project, work together to brainstorm ideas, and work out how to achieve your goal.

YOUR CHALLENGE

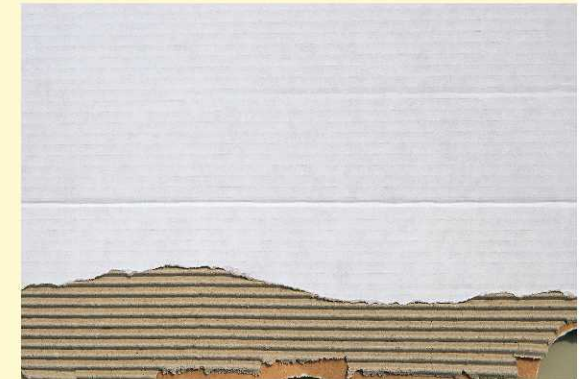


A client needs you to build a bridge to cross a river which is used by pleasure boats. In your teams build a model solution to span a 50 cm gap without obstructing the passage underneath, from scrap corrugated cardboard and investigate how shape affects the structural strength of materials.

The bridge has to be strong and use as little material as possible, and due to the location appearance is important, so remember to factor this in your design. The team with the strongest bridge wins.

FUN FACT

Have a look at your pieces of scrap corrugated cardboard, notice the layers and corrugations. These individual layers add strength to the otherwise flimsy cardboard and make it stronger.



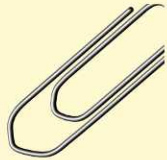
DON'T FORGET TO RECYCLE YOUR CARDBOARD WHEN YOU'RE DONE

YOUR CHALLENGE

In your teams create a dive machine with your plastic bottle, water, your pen lid, (or pipette) and bits and pieces from around your home that will initially sink to the bottom then rise after a delay without your help.

Little Hint: When baking powder is wet it slowly releases carbon dioxide.

WHAT WILL YOU NEED?



A clear plastic bottle filled with water, a pen lid, or a pipette or a test tube, a paper clip and a some blue tack.

IMPORTANT NOTES



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MAKE A CARTESIAN DIVER



A Cartesian diver is an experiment to show how buoyancy works. You only need a clear plastic bottle filled with water, something to act as your “diver” such as a pen lid (just make sure it has not got a hole in the top) and a little blue tack to act as a counterweight.

Other household items can work, so be sure to experiment with different items.

DID YOU KNOW?

Plastic pollution is a troubling issue throughout the world. In the UK alone, around 13 billion plastic bottles are disposed of each year, with nearly 6.28 billion bottles not being recycled correctly.

Did you know that an estimated 2.9 million animals are harmed in the UK due to plastic pollution? You can make a difference! Reusing your bottle then recycling it when you are finished will help stop plastic pollution.



DON'T FORGET TO EMPTY AND RECYCLE YOUR PLASTIC BOTTLE WHEN YOU'RE DONE

YOUR CHALLENGE

In your teams, take your pieces of recycling, and create a model capable of flight. It can be a kite, a balloon, or a free flight-based model such as an aeroplane.

Your challenge is to create the best flying machine that can fly between two points. Distance will be dependent on circumstances but should be suitably challenging but not impossible. Your air control officer will create the two paths and will award points for the furthest distance travelled.

IMPORTANT NOTES



This is a team-based project, work together, to brainstorm ideas, and work out how to achieve your goal.

WHAT CAN YOU BUILD YOUR FLYING MACHINE FROM?



You will need to make your flying machine only from items found in your recycling bin. It could be made from: plastic bottles, tubs or trays, paper, tins or cans, cardboard, or tinfoil.

Note: although glass can be recycled in your bin it's not safe to fly.

DID YOU KNOW?

An aluminium drink cans can be recycled and back on supermarket shelves as new drink cans in as little as 60 days but can also be recycled and turned into new parts for vehicles such as aircraft.

You can recycle yoghurt pots (as long as they are clean), many other places cannot recycle them yet.

Every tonne of paper recycled saves 17 trees.



DON'T FORGET TO RECYCLE IT WHEN YOU'RE DONE

YOUR CHALLENGE

Music and sound can be found all around us and can be made from a variety of amazing objects. Pick up a tin can and tap the side, the hollowness of the can vibrates and makes a shallow “ringing sound”.

So, your challenge is to make some musical instruments from an assorted mixture of recycled material found in your recycling bin. Then in your groups discuss and write down the kinds of sounds your instruments are making, try to describe the sound as best as you can. Then in your groups, try to make a short musical composition.

IMPORTANT NOTES



This is a team-based project, work together, to brainstorm ideas, and work out how to achieve your goal.

WHAT CAN YOU BUILD YOUR MUSICAL INSTRUMENT FROM?



You will need to make your musical instruments only from items found in your recycling bin. It could be made from: plastic bottles, tubs or trays, paper, tins or cans, cardboard, or tinfoil.

Note: glass can be recycled in your bin and can make a good musical instrument, but please handle carefully.

CAN YOU WORK IT OUT?

At UK Music festivals around 23,500 tonnes of waste is produced annually. Of that, around a third is recycled, while the rest goes into landfill. How many tonnes of this rubbish is being recycled?

USE THE SPACE BELOW FOR YOUR CALCULATIONS



WHAT IS YOUR ANSWER

DON'T FORGET TO EMPTY AND RECYCLE WHEN YOUR DONE.

TEAMS NAME:













Date: _____

Name: _____

What goes where?

Sort your rubbish! Cut out each piece below, then glue them in the correct place.

Please ask an adult for help with cutting out the pictures

					
Plastic bottle	Crisp packets	Cardboard box	Nappy	Electronics	Glass jars
					
Empty tissue roll	Plastic pouch	Drinks can	Batteries	Animal waste	Tools

Date: _____

Name: _____



Tin foil



Wood



Magazine



Tissue



Clothing



Newspaper



Polystyrene



Lightbulbs



Cigarette butt



Tin cans



Plastic bags



Yoghurt pots



Furniture



White goods



Juice cartons



Glass bottles



Plastic trays



Aerosol cans

Date: _____

Name: _____

What goes in the recycling bin?

Glue **recyclable** items here that should go in the **blue bin**.



**Blue Bin
Recycling**

Date: _____

Name: _____

What goes in the household waste bin?

Glue non-recyclable waste items here that should go in the black bin.



**Black Bin
Household Waste**

Date: _____

Name: _____

What goes to the household recycling centre

Glue items here that should go to the household recycling centre, and can not go in the blue bin.



**Household
Recycling
Centre**

Date: _____

Name: _____

What goes to the shop?

Glue items here that can be taken back to a shop to be recycled, and can not go in the blue bin.



Shop