



# STUDENT ACTIVITY PACK

KEY STAGE 3: AGES 11-14



## WHO ARE WE?

Murphy – or J. Murphy & Sons Limited, to give us our full name – was founded in 1951 by construction entrepreneur John Murphy. Almost 70 years later, Murphy is a leading engineering and construction company, working in the UK, Ireland and Canada, to deliver world-class infrastructure that improves lives.

Find out more about us: [www.murphygroup.com](http://www.murphygroup.com)

## WHY CONSTRUCTION?

**You get to build the stuff people depend on.** Can you imagine...

- lifting a bridge into place at midnight, so there is step free access to help hundreds of thousands of people with a disability use our public transport?
- finishing your day knowing you helped millions of people get gas, water and electricity?
- helping to bring green energy to 800,000 homes?
- creating inspiring spaces for people to live, socialise and work in?

Whether your passion is carpentry, engineering, welding, electrician, the environment or IT, there's a place for you in construction.

We have great apprentice and graduate programmes: [www.murphyearlycareers.com](http://www.murphyearlycareers.com)

---

## CONTENTS

- Bug Hotel 3
- Tallest Freestanding Tower 4
- Health & Safety Poster 5
- Wind Turbine 6
- Solar Ovens 7
- Wind Cars 8
- Word search 9
- Murphy Early Careers 10
- Crossword 11
- Paper Challenge 12
- Cup Challenge 13



## ACTIVITY:

## BUILD A BUG HOTEL

## GATSBY BENCHMARKING:

4. Linking curriculum to careers

## ACTIVITY TIME:

2 hours

## MATERIALS:

Toilet roll tubes, sticks, grass, sand, stones

Create a safe hideaway to shelter anything from hedgehogs to bees to ladybirds.

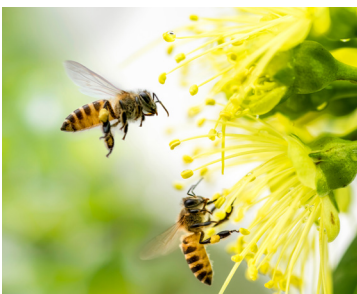
Collect natural materials such as sticks, wood, grass, sand, soil, bamboo etc from your garden or on your daily walk.

Build them into a structure that has lots of layers as spaces for bugs and insects to crawl in.

You can find out more detailed instructions on the [RSPB website](#):

Our teams love building bug hotels. Its a great way to use spare materials for good. Read more on our website:

- [Planting trees for newt](#)
- [Bug hotel Uffington Bridge](#)



**ACTIVITY:**

**TALLEST TOWER**

**KEY STAGE:**

1, 2 & 3

**GATSBY BENCHMARKING:**

4. Linking curriculum to careers

**ACTIVITY TIME:**

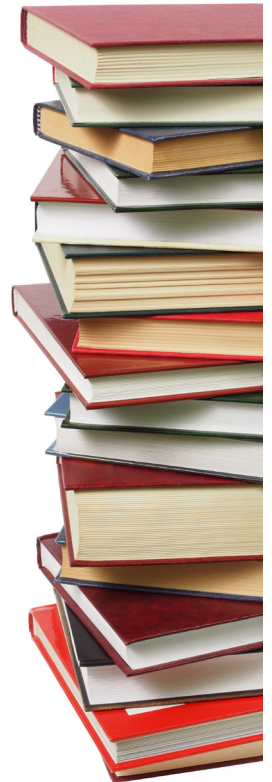
1 hour

How high can you build a tower using household objects?

Every building needs a strong foundation, so think about what shapes will help make a strong base.

If you enjoyed this activity you may want to consider a career in [engineering](#)

Sometimes the best bit is demolishing your structure! In construction we need to think about protecting the environment and reusing. Watch this [short video](#) to find out more





## ACTIVITY:

## HEALTH & SAFETY POSTERS

### GATSBY BENCHMARKING:

4. Linking curriculum to careers

### ACTIVITY TIME:

30 mins/1 hour

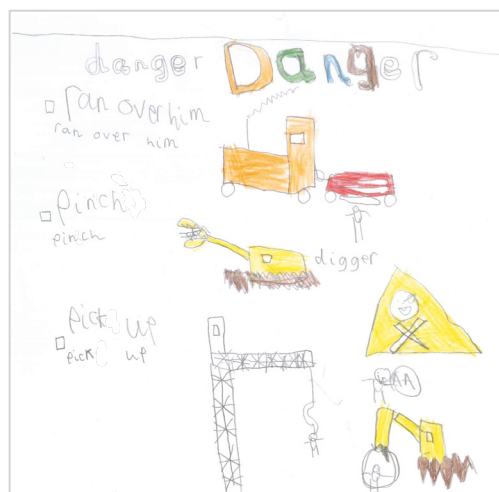
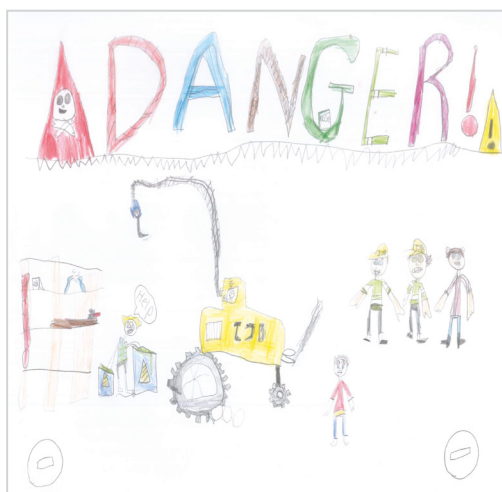
### MATERIALS:

Paper, pens, colouring pencils, computer

Safety always comes first. Have you seen any health and safety signs on your walk? Design a poster for health and safety on site.

### What do a health and safety team do?

These teams are often called SHES – Safety, Health, Environment and Sustainability. A construction site can be a very busy place with big diggers and trucks and lots of people. A SHES team not only help to make sure we don't have any slips, trips, falls and accidents, but they also look at making sure we protect the environment – so are we getting rid of waste in the right way, can we reuse that waste, can build spaces for badgers to cross roads or building at the right time of year to protect bird's nests and babies.



**ACTIVITY:**

**WIND TURBINES**

**KEY STAGE:**

3 & 4

**GATSBY BENCHMARKING:**

4. Linking curriculum to careers

**ACTIVITY TIME:**

2 hours

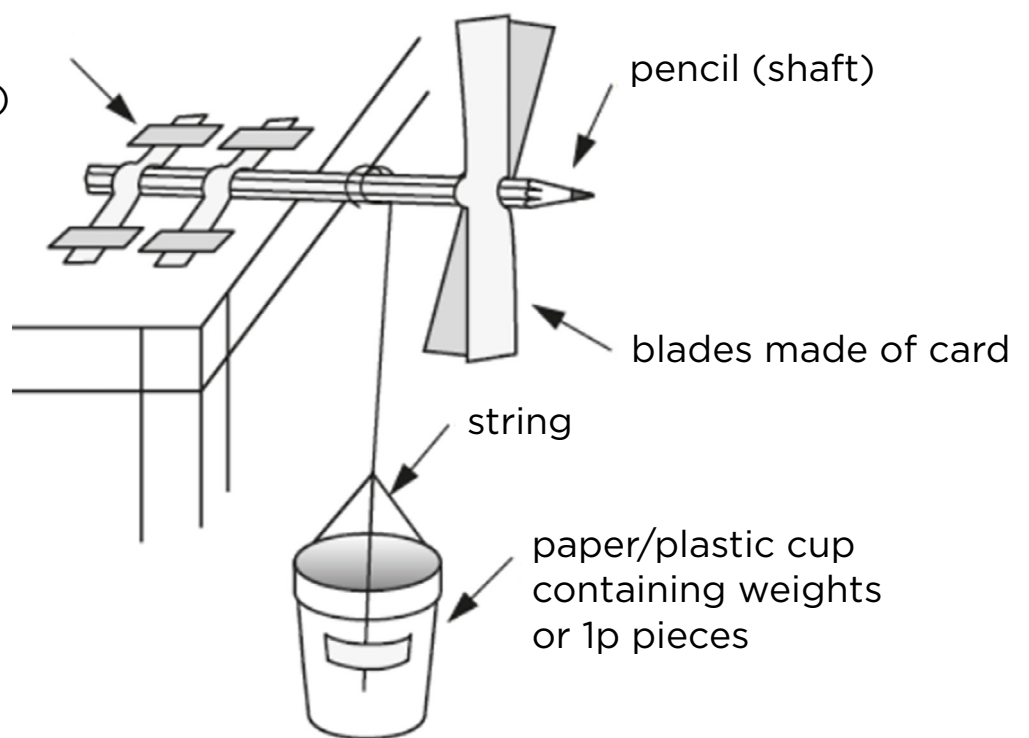
**MATERIALS:**

Scrap card, sellotape, scissors, string, paper/plastic cup, pencils, pennies/weight and a hairdryer

Using the materials listed, design a simple wind turbine capable of lifting a cup off the floor to table height. Use a hair dryer to act as the wind to spin the shaft.

**POSSIBLE DESIGN**

attachment allowing shaft to spin (made from sellotape)



The energy in the wind turns two or three propeller-like blades around a rotor. The rotor is connected to the main shaft, which spins a generator to create electricity that is sent to land.

**Disadvantages**

initial cost  
technology immaturity.

**Advantages**

Fuel is free  
Low operating costs

**ACTIVITY:****SOLAR OVENS****KEY STAGE:**

3 &amp; 4

**GATSBY BENCHMARKING:**

2. Linking curriculum to careers

**ACTIVITY TIME:**

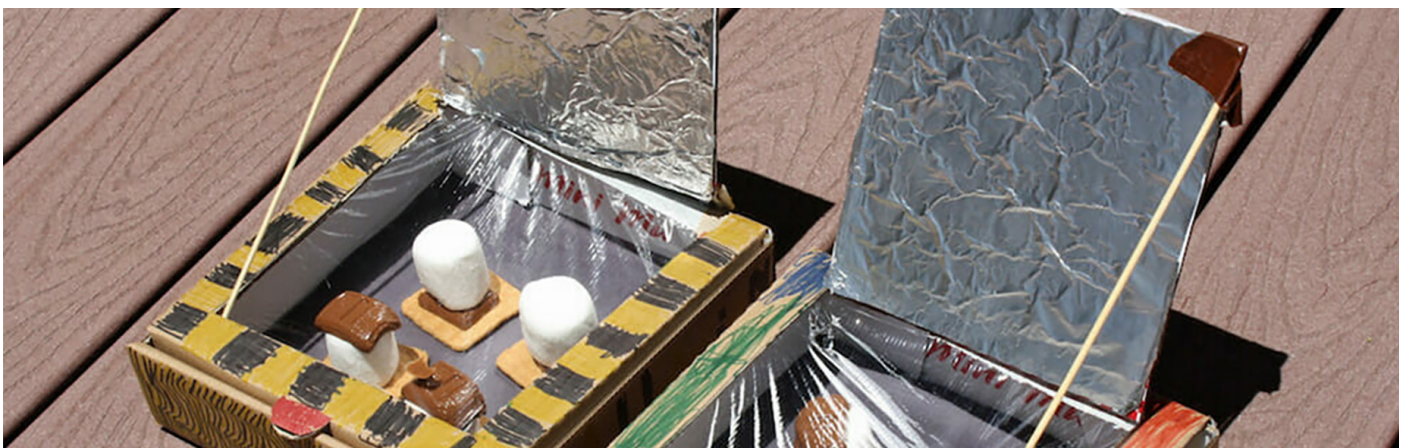
1 hour 30 mins

**MATERIALS:**

Empty pizza box, tin foil, cling film, sellotape, scissors, glue, stick or rod, black card, marshmallows, plain digestive biscuits and chocolate

**Did you enjoy this activity?** Then you should think about becoming an Environmental Advisor in our SHES teams (Safety, Health, Environment and Sustainability)

1. Draw a square on pizza box that is one inch smaller than length of box
2. Glue tin foil, shiny side out, to the inside of the flap that you just made out of the box lid
3. Glue another piece of aluminum foil, shiny side out, to the inside bottom of the box
4. Tape black card over top of the foil you just glued
5. Stick clingfilm to the opening in the lid from the inside of the box. Try to make the seal as airtight as possible
6. Place plain digestive biscuits inside your pizza box on the black card
7. On half the biscuit place chocolate and on the other half marshmallows
8. Close your pizza box
9. Place your pizza box somewhere it can get sun
10. Use stick or rod to prop up your flap with tin foil on it. It should be in a position so that it is reflecting sunlight into the box up to bench height.
11. Eat the melted marshmallows! Find out more [here](#)



**ACTIVITY:****WIND CARS****KEY STAGE:**

3 &amp; 4

**GATSBY BENCHMARKING:**

2. Linking curriculum to careers

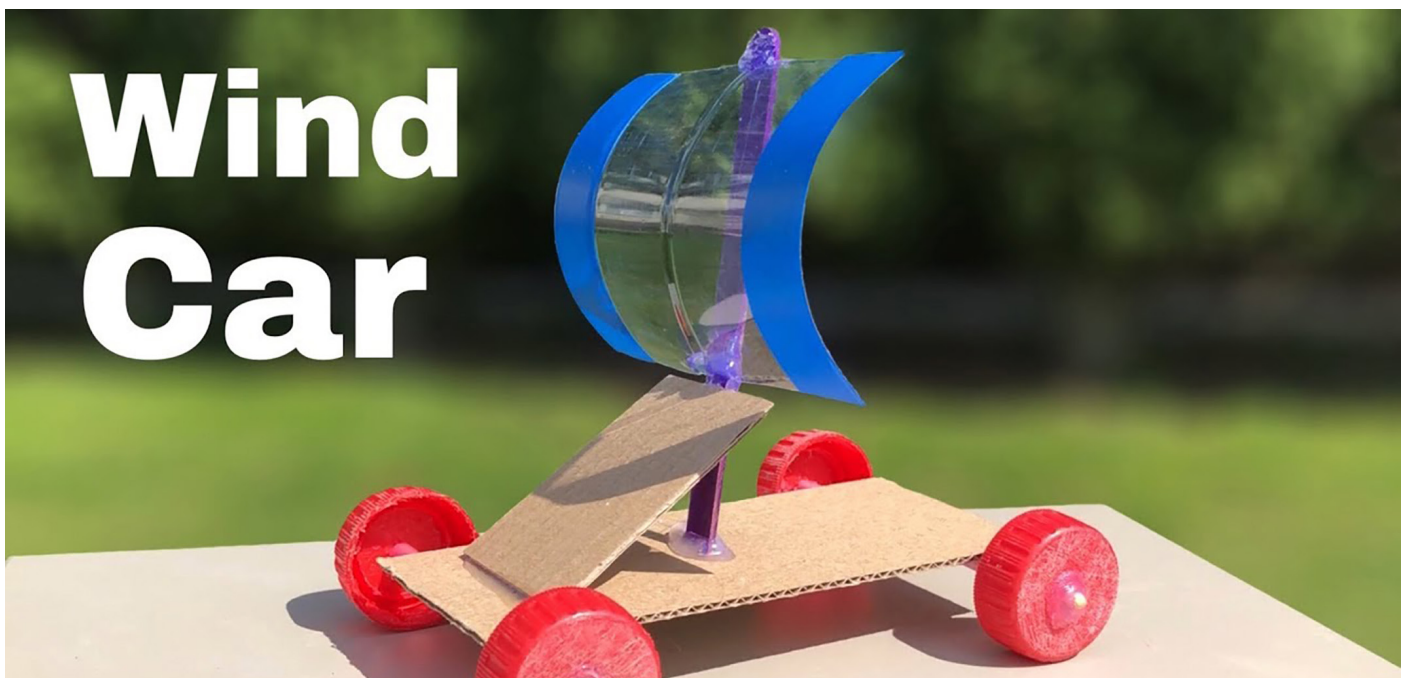
**ACTIVITY TIME:**

1 hour

**MATERIALS:**

4 Plastic bottle caps, 2 straws, cardboard, card, Sellotape, scissors

1. Cut out a piece of cardboard to form the body of your car.
2. Tape two straws to the bottom of your car, one at each end to form the axles. Make sure the straws are parallel.
3. Carefully poke a "+"-shaped hole in the centre of each bottle cap.
4. Push a wooden skewer through the hole in one of the bottle caps.
5. Thread the other end of the skewer through one of the straws.



6. Push a bottle cap onto the end of the skewer opposite the first bottle cap. You just made an axle with two wheels!
7. Repeat steps 4 through 6 to make the other axle.
8. Make sure the axles can spin and the car can roll smoothly without getting stuck. If needed, adjust the wheels so they are not too wobbly.
9. Poke a small hole in the middle of the cardboard.
10. Insert a wooden skewer upright into the hole to form a mast. Secure it at the base with plenty of tape. If it is still too wobbly, you can build a diagonal support out of a piece of cardboard.
11. Cut out a shape for a sail from a piece of paper.
12. Poke the upright skewer through both ends of the sail to hold it in place.
13. Place your car outside in the wind and watch it go!
14. Watch a video on how to make a wind car [here](#)



## ACTIVITY:

## WORD SEARCH - CONSTRUCTION

There are lots of different types of jobs you can do in construction.  
Can you find a few of them in this word search?

M G P T R J H D D H R R L H L O N Q N Q  
U P O M E X R R C P O I E E E L P Q Q Z  
R F I F E V N O E D Y F U N N A Y I Y S  
P U N W N R O R T N E Q K W G D L R L I  
H R M J I W I F L A V A B N Q I M T L T  
Y E O N G Q T L P L R I P R R G S O H E  
G R C J N Y C N E C U E R C Y X R E E S  
T Z Y R E S U G H B S Z P O A T O L D U  
P B J C L C R I M H Y E Z O N E X A F P  
R K X E I N T V D O T Q Z O T M F B L E  
O D J W K E S M G E I K C A C N E I V R  
C C G R C A N S A Z T T U I K V A N A V  
U J B T F V O I W N N D P C R E R L T I  
R H N E Y W C Q W E A P L A N N E R P S  
E V T Q F S R C M R U G W Q Q L Q N T O  
M Y A J U Q M U G T Q P E R K H L B Q R  
E T B M R V C L E V I T A R E P O V M A  
N D E J T O A P P R E N T I C E S H I P  
T X C E D R O T A R T S I N I M D A V M  
R E C E P T I O N I S T E T Z S T R V V

ADMINISTRATOR  
CONSTRUCTION  
ENGINEER  
HEALTH  
PLANNER  
PROJECT MANAGER  
SAFETY

APPRENTICESHIP  
DESIGNER  
ENVIRONMENT  
MURPHY  
PLANT OPERATOR  
QUANTITY SURVEYOR  
SITE SUPERVISOR

ARCHITECT  
DOCUMENT CONTROL  
GRADUATE  
OPERATIVE  
PROCUREMENT  
RECEPTIONIST

# MURPHY EARLY CAREERS INFORMATION

Find out more about Murphy Early Careers using the below links:

- [Student & Graduate placements](#)
- [Apprenticeships](#)



## PLACEMENTS

You might still be at university, but our placement programmes mean you can have the best of both worlds. Whether you spend a summer or a year with us, you'll explore our work, bring your studies to life, and go back to university with a better understanding of your future industry.



## THE WONDERFUL WORLD OF MURPHY APPRENTICES

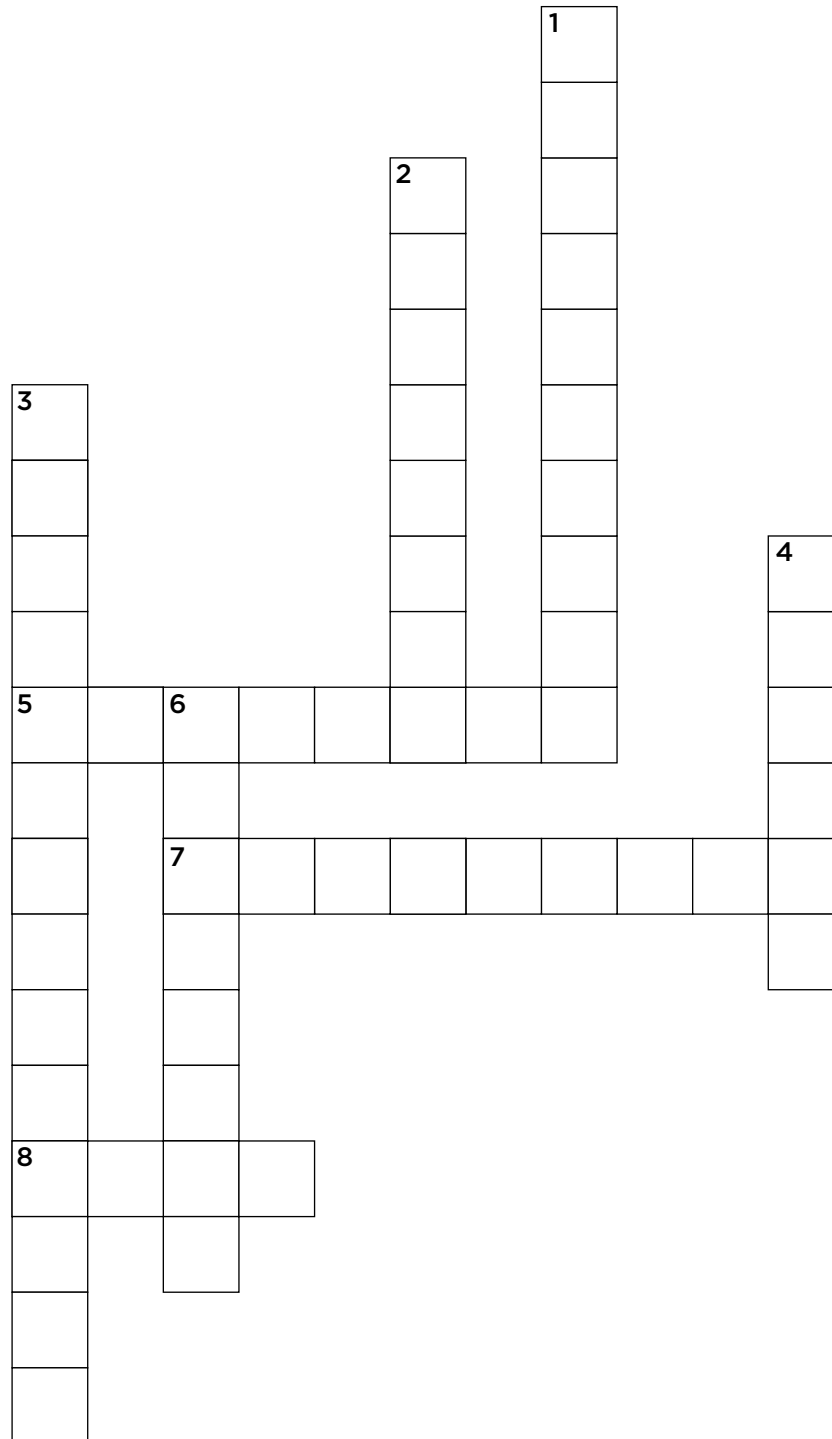
You're the future of the Murphy world: the new starters who'll one day grow to be our experts and our leaders. And because we need talent like that across our business, we run two different apprenticeship schemes: our degree apprenticeship and our trades apprenticeship.





## ACTIVITY:

## CONSTRUCTION CROSS WORD PUZZLE



### Across

5. A person who designs, builds, or maintains engines, machines, or structures.
7. A person who designs buildings or other structures.
8. An area of ground on which a town, building, or monument is constructed.

### Down

1. A person who supervises a person or activity.
2. The mixture of cement, sand, gravel, and water.
3. Type of employment where you gain a qualification whilst you work.
4. The condition of being protected from or unlikely to cause danger, risk, or injury.
6. A person who has been awarded an undergraduate or academic degree.

**ACTIVITY:****PAPER CHALLENGE****KEY STAGE:**

3, 4 &amp; 5

**ACTIVITY TIME:**

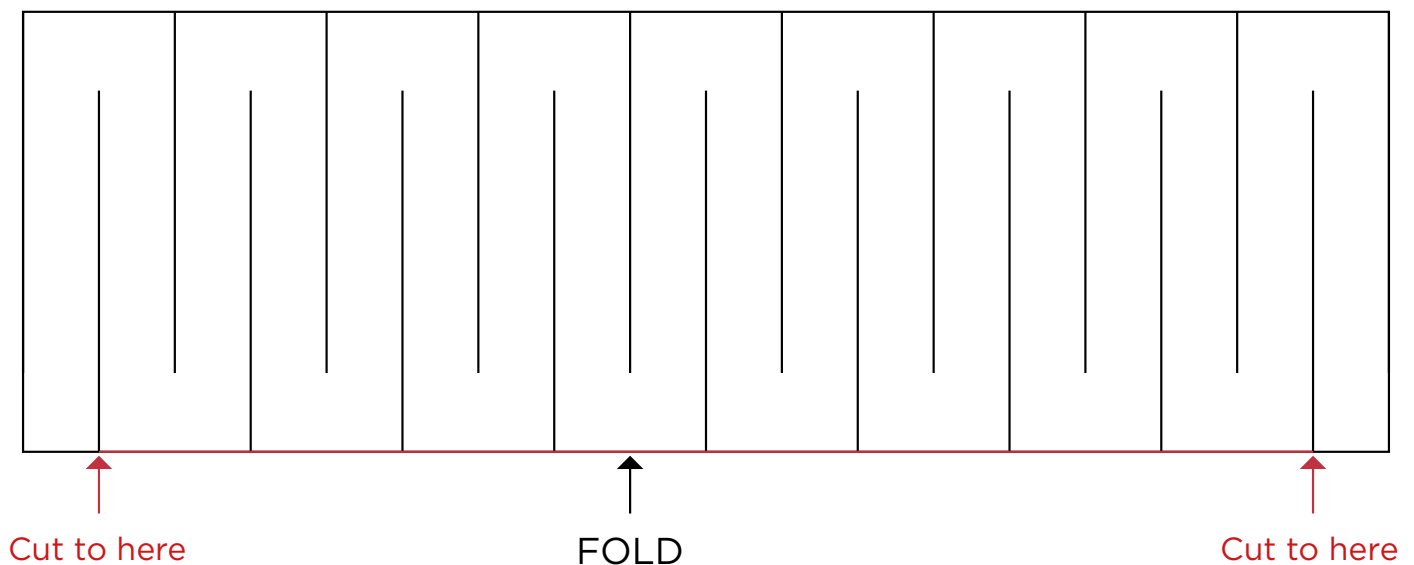
30 mins

**MATERIALS:**

Piece of A4 paper and a pair of scissors

Using one piece of A4 and a pair of scissors, cut the paper so you are able to climb through the single sheet.

1. Fold the A4 piece of paper in half
2. Starting at the folded side at the top, cut a straight horizontal line until 2cm from the edge
3. Then starting from the open side just below the previous line cut a similar line until 2cm from the folded edge
4. Repeat this until you have made slits along the whole folded paper
5. Opening the paper and cut along the folds EXCEPT the last and first
6. The paper should then open as a large loop which you can climb through
7. Get family members/friends involved and challenge them to fitting themselves through a single piece of paper!





**ACTIVITY:****CUP GROUP CHALLENGE****KEY STAGE:**

4 &amp; 5

**ACTIVITY TIME:**

30 mins

**MATERIALS:**

6 Paper cups, an elastic band and 4 pieces of string

This an activity for a group of four people. In this challenge you will learn key skills for working on a project such as listening, determination, teamwork, patience and communication.

1. Tie the four pieces of string onto the elastic band



2. Stack the cups into the set-up position below and put the elastic band around the top left-hand cup.
3. Each player takes one piece of string and together you must move the cups to the ending position without touching the cups with your hand.

**CUP SET-UP POSITION**  
Set up your cups like this before you begin the cup pyramid construction! You must move them using the tool into a pyramid formation with three cups on the bottom, two in the middle and one on top.



**CUP ENDING POSITION**  
Once finished, your cup pyramid should look like this. be sure that you never touch any of the cups directly with your hands!





[WWW.MURPHYGROUP.COM](http://WWW.MURPHYGROUP.COM)

