

# Maker Challenge!

## By producer-maker Jilly Hargreaves



### Calling all Little Inventors!

Take the Maker Challenge set by producer and maker Jilly Hargreaves. Have a go at seven different activities along the way to get you in the creative mood and to help you build up to designing an ingenious invention.

Make sure to take care with sharp objects and get some adult help where you need it. There are how-to-guides included to help you with your project. Put your own stamp on the inventions and let your creativity out! We can't take a peep at your fantastic inventions, so roll up those sleeves, wiggle those fingers and prepare to invent! 3...2...1...GO!

### Jilly's invention challenge



Invent your own super play backpack!

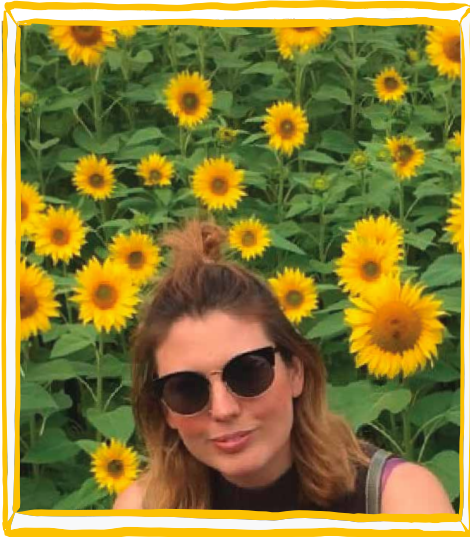
Give these seven activities a go to help guide you through the challenge!

- 1. Explore!** Think about how you can make your every day life more fun and playful.
- 2. Let's think!** Can we put play into a backpack?
- 3. Fascinating fastenings!** Let's explore fastenings
- 4. Get your thinking caps!**  
Explore your play backpack ideas and accessories.
- 5. Investigate!** Colour, shape and design.

### INVENTION SHEET.

Drawing time! Draw your very own play backpack!

- 6. Make a play backpack.** Using cardboard other recycled materials found around your home, create your own backpack.
- 7. Get creative!** Create something that allows you play anywhere you go!



Jilly Hargreaves is a producer and maker who lives in Gateshead, UK.

Jilly works under the name of Chalk. Through her company, Chalk, she produces, designs and delivers pop-up events which focus on the areas of art, music, film and science. At the heart of all these immersive family events is a strong focus on making, creating and inventing but most of all, playing together!

Here are some pictures of her work!



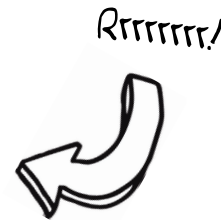
Special gigs with live interactive visuals.



Giant musical instruments made from every day objects.



Shadow puppets.



Everyone needs a paper wig!

Think about how you move around your street, town, school or city.



How could this be more fun, playful or exciting?

Write down or draw as many fun changes you could make to an everyday journey.

Would you change stairs into slides?

Would pavements be replaced by trampolines?

A large, empty rectangular box with a thick yellow border, intended for drawing or writing ideas.

**To get you started you could think about:**

- Could you change a lamp post into a helter skelter?
- Could a postbox become a den?
- Could a fence flip over and make a see-saw?
- What would be the most fun way to get from one end of your street to the other?

Let's play all day!

# How can you put 'play' into a backpack?



Draw what will go inside your backpack here

Write down all the things you would like to pop inside a backpack that would make your day more fun!

Think about the things you wanted to change in your street, town or school on the previous page. Could you take any of these things inside your backpack or modify a backpack to make them fit?

**Make a list of your top 4 things you would put inside your play backpack and why.**

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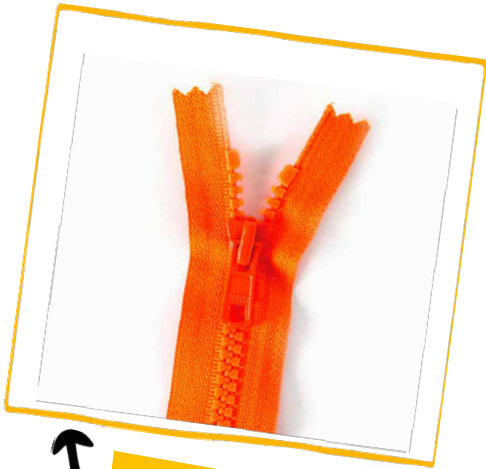
# Fascinating fastenings!

Let's have a think about the use of fastenings on our play backpack. The ultimate purpose of the fastening is to keep the bag together, but we can think about this in a number of different ways.

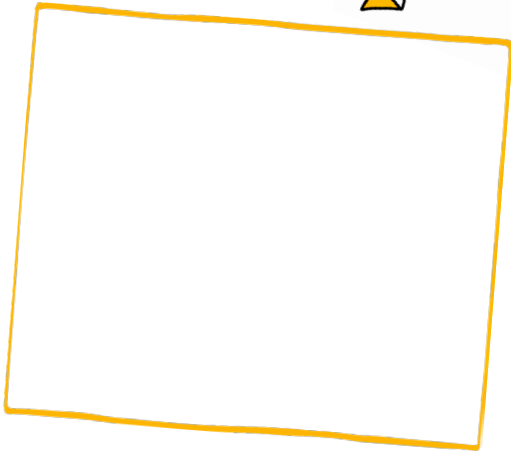
We need to consider how the fastening could change the function of the backpack. If the fastening is too fiddly it might make opening or closing the bag frustrating and awkward. If the fastening is too loose everything could fall out!

Let's have a think about how your backpack will open and close.

Have a look around your house and search for as many different types of fastenings as you can, then draw or write what you find in these empty boxes.



Zip



Press Stud



Carabiner

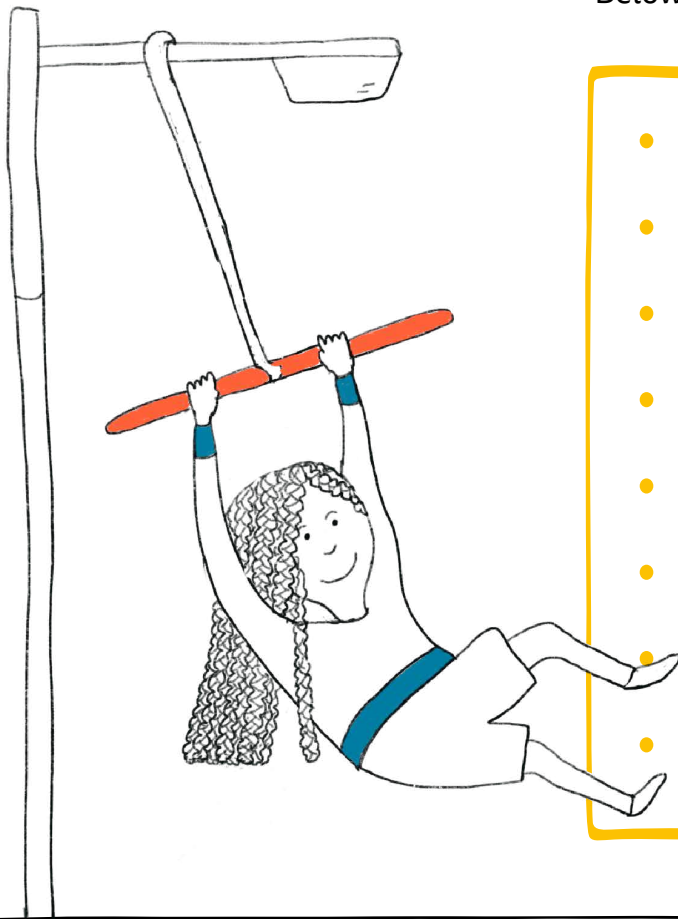
# Let's think about your play backpack and its accessories!

Grab your thinking cap and get inventive!  
Let's create something that allows you play anywhere you go!

Does your backpack transform into something unexpected or surprising? Does it make you fly? Can it extend?

Below, jot down all of your ideas for your super dooper backpack!

Could your backpack turn into a rope swing?



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Could your backpack blast you into space?



Could your backpack turn into a water slide?



# Let's explore the colours, shape and design of your backpack.

Think about how you would like your backpack to look, do you want to incorporate lots of colours, do you want to use symbols or graphics?

Are there any colours that make you feel happy or excited?

Have a play around and experiment with colour below!


What will your colour palette look like?



Are there any shapes or symbols which you'd like on your backpack?

Write them/test them out here...

Think about the shape of the backpack, you might want it to be a particular shape so you can fit specific things inside, or maybe you want it to stand out from the crowd.

Draw your different ideas here...



**HANDY HINT:** Make sure the shape of the backpack makes it easy to get it on and off your back.

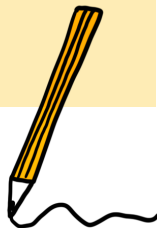
# Create your play backpack!

We all love to play, and we believe it can happen anywhere and everywhere! Let's create a play backpack, where you carry all you need for play on your back!



## To get you started you could think about:

- What would your play backpack look like? Think about the shape, the size and the colours.
- How do you store your play things inside? Do they fold out? Does the bag turn into something completely different, like a giant dance floor/ football pitch.
- Does your bag extend? Have compartments? Or extra equipment that allows you play with the things around you, for example, a rope to swing from trees/lamp posts.



Name your play backpack .....

What shape is it? .....

How big is it? .....

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Now draw it on the invention sheet included!



# My new backpack invention

Draw your invention here!

Use a black pen, add colours and labels

Name it!  
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First name .....

Age .....

School .....

Town/city .....

## Tell us more!

(who your invention is for, what it does,  
how it works!)

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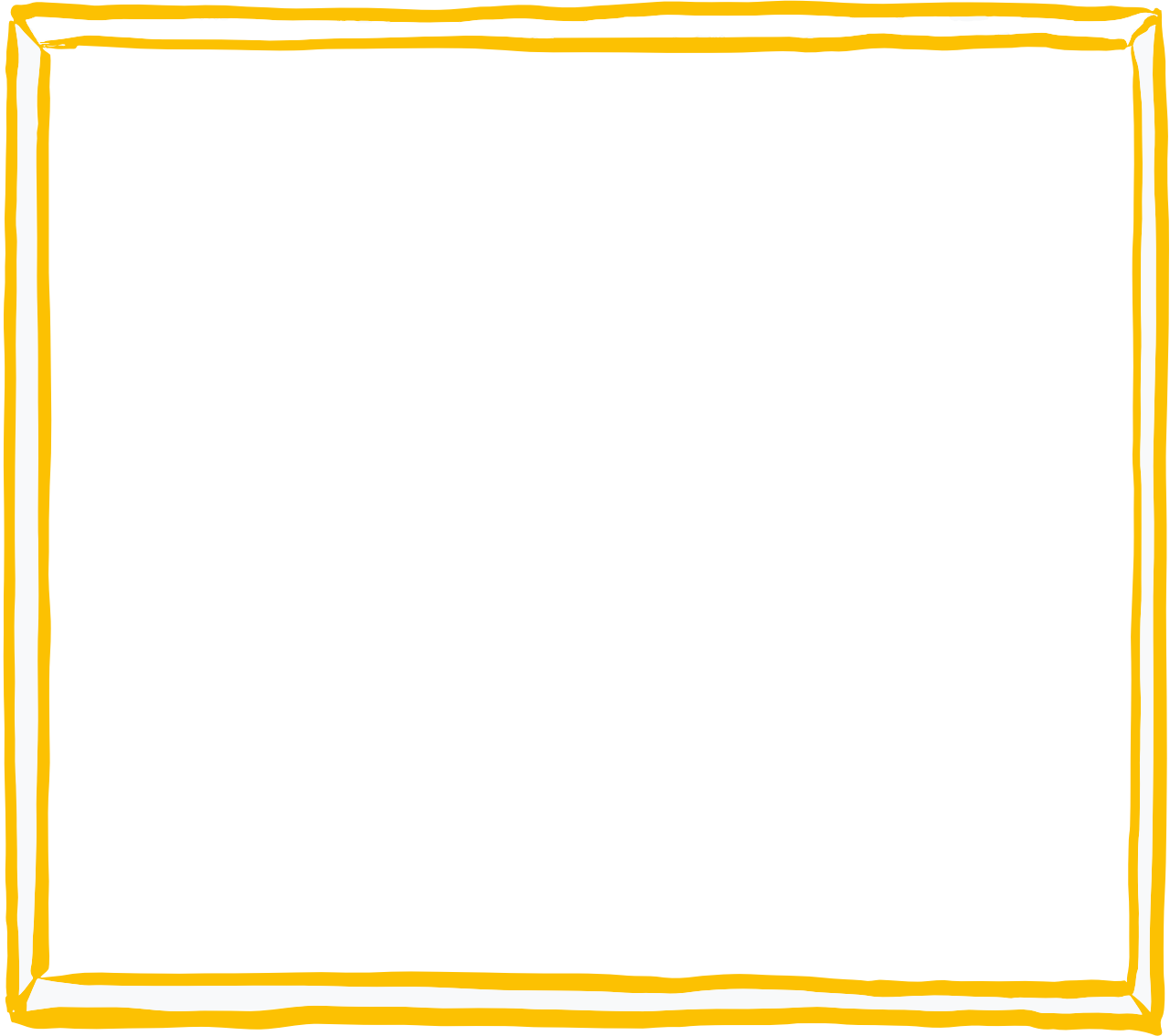
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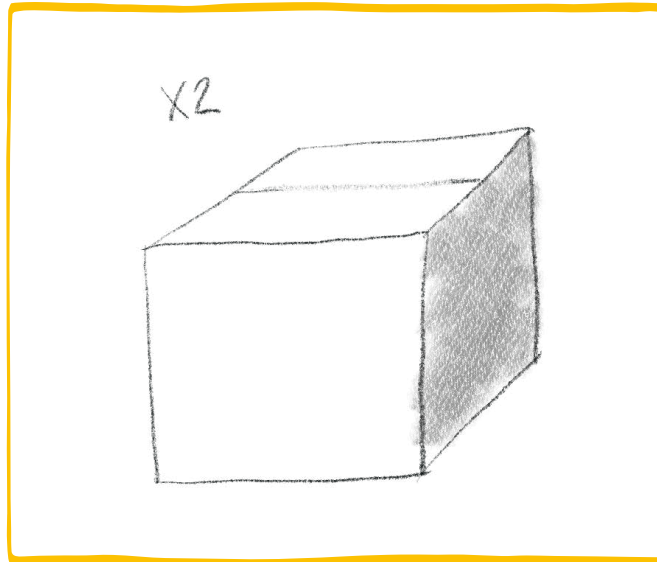
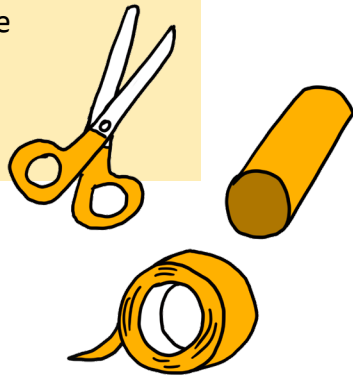
Upload your idea at [littleinventors.org](http://littleinventors.org) to get feedback and who knows, it could be chosen to be made real!

# Let's make a cardboard backpack!

With a few simple materials you can make your very own cardboard backpack. Follow these instructions and see what you can create!

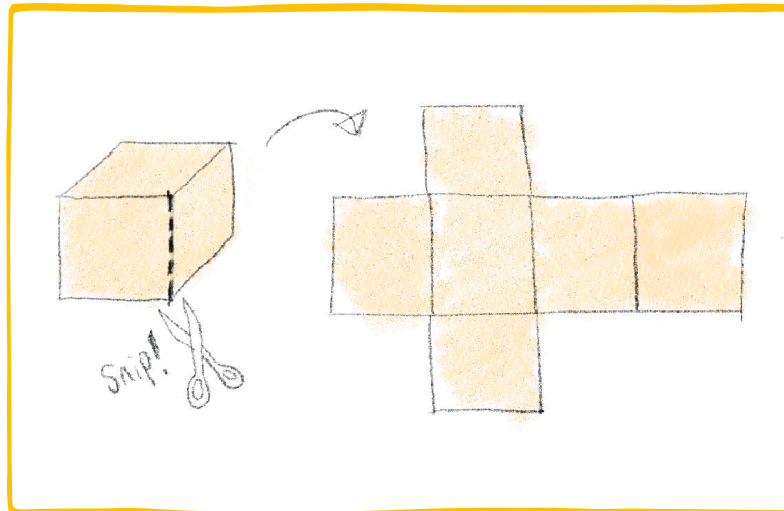
## You will need:

- Cardboard boxes
- Glue
- A brush
- A ruler
- Scissors
- A pen / pencil
- A screw / bolt (optional)
- Some rope / twine
- Tape



Start by raiding the recycling!

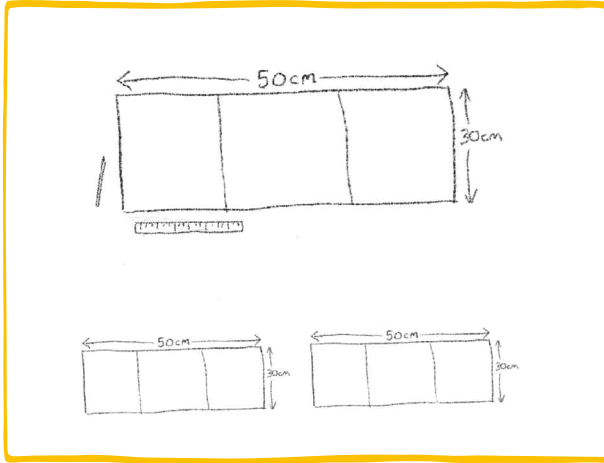
Grab two medium cardboard boxes if you have them. If not, an assortment of boxes and pieces of cardboard will do!



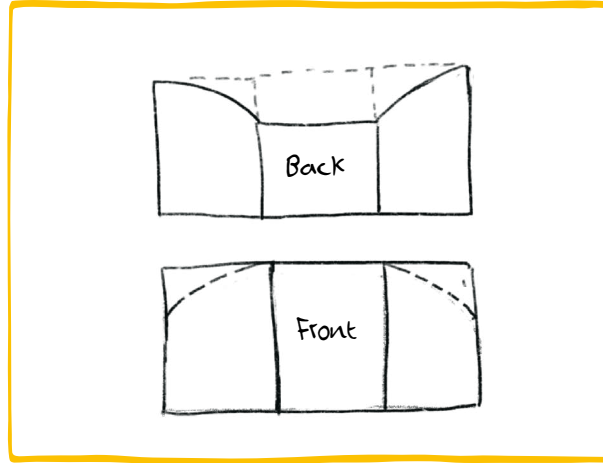
Cut open the cardboard boxes by cutting along the edge, so the box opens out like this.

You may need an adult to help start you off.

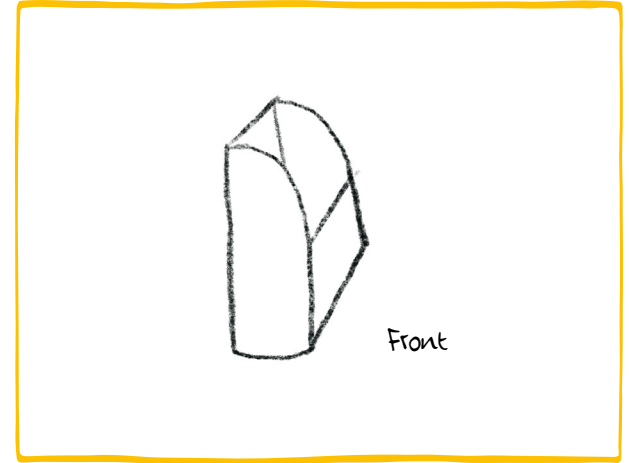




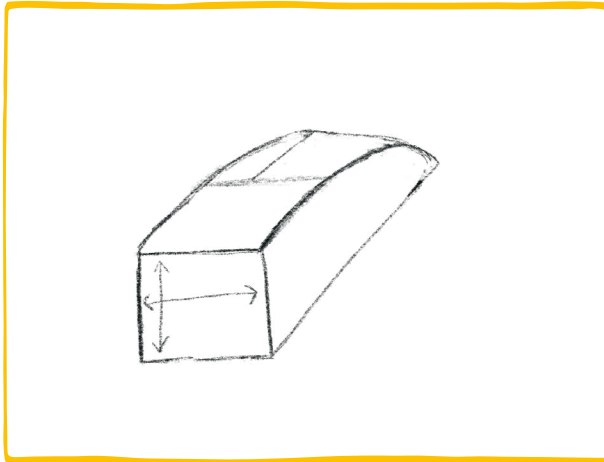
**1.** Make two pieces of cardboard. Measure 50cm x 30cm, then cut to size using scissors, get an adult to help.



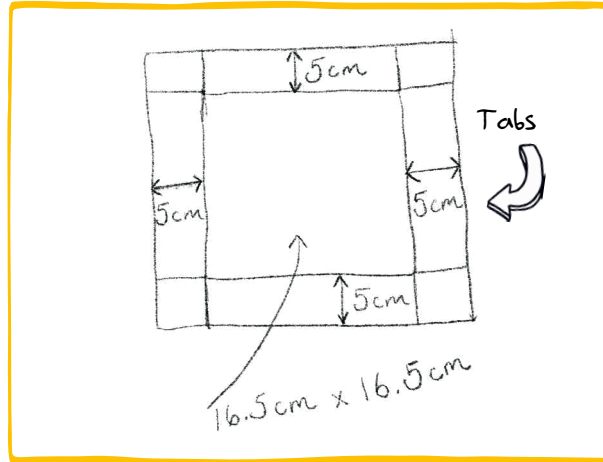
**2.** Sketch out the shapes above using a pencil. Then cut out. These pieces will form the main body of your backpack!



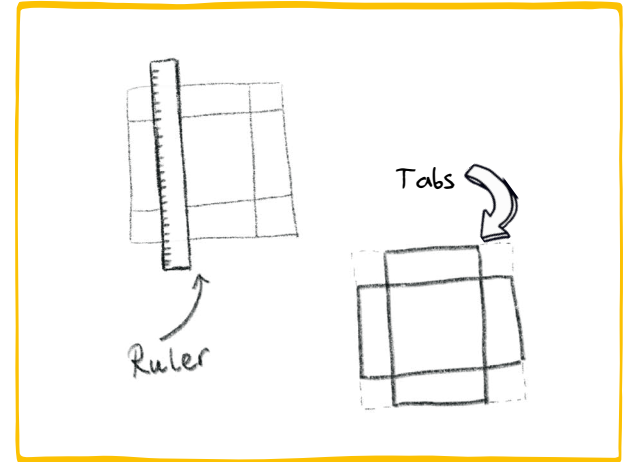
**3.** Slot the two pieces together. The curved side pieces will overlap. Then glue the side pieces together. Your bag should stand up unaided.



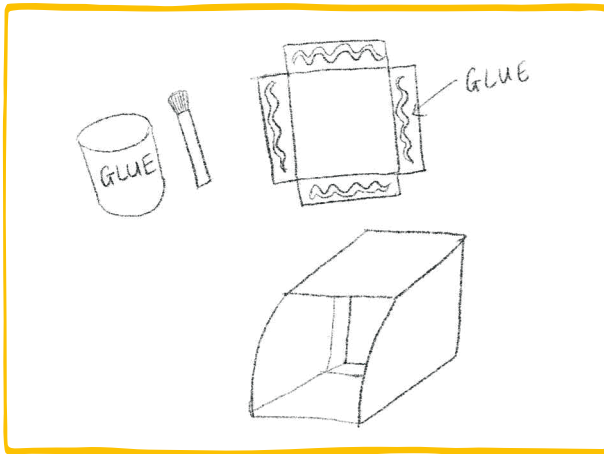
**4.** Flip the bag over onto its back, then measure the square hole in the bottom. It should measure 16.5cm x 16.5cm. Don't worry if it's not exact.



**5.** On a new piece of cardboard measure a square that fits the measurements of the bottom of your bag. Add 5cm tabs around every side. Then cut out.

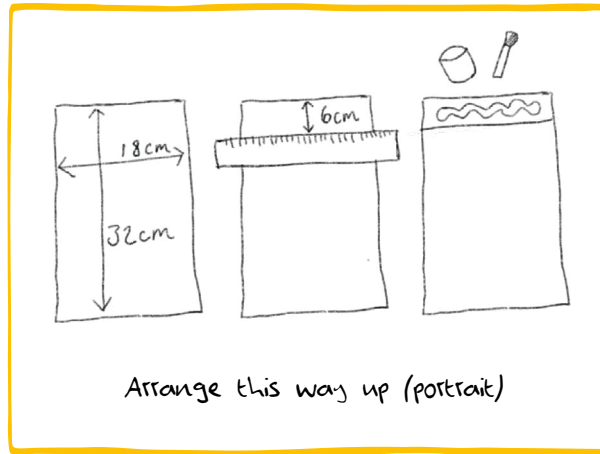


**6.** Using a ruler, fold over the tabs and cut out the corners leaving you with the shape as above.



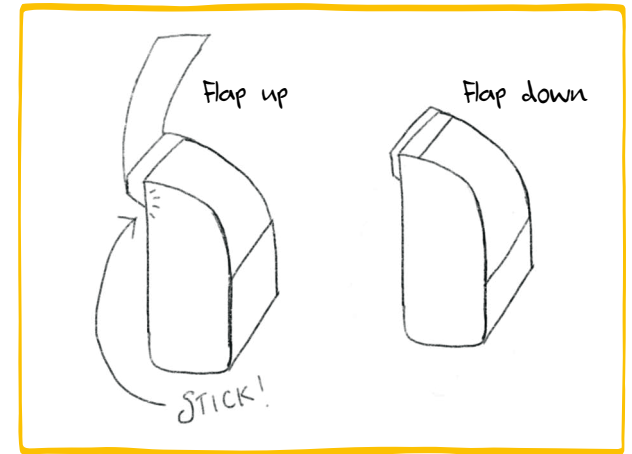
**7.** Put glue onto all four tabs and insert the piece into the bag to form the base.

TIP: The easiest way to attach the piece is to hold it glue side down and push it up into the bottom of the bag.

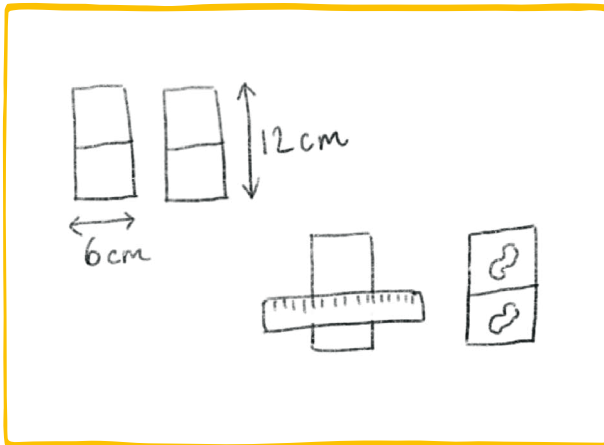


**8.** We're now going to make the top of the backpack. Take a new piece of cardboard measuring 18cm x 32cm.

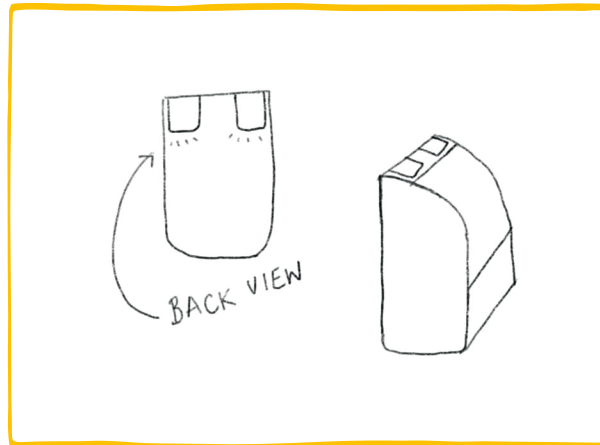
Measure 6cm from the top then fold using ruler. Add glue to this tab.



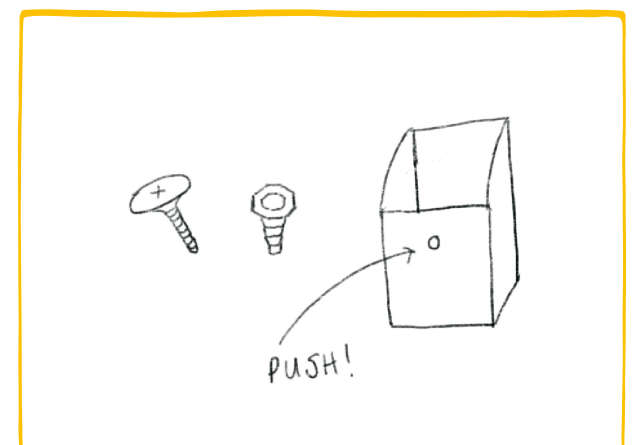
**9.** Now stick the tab to the back of the bag as shown above!



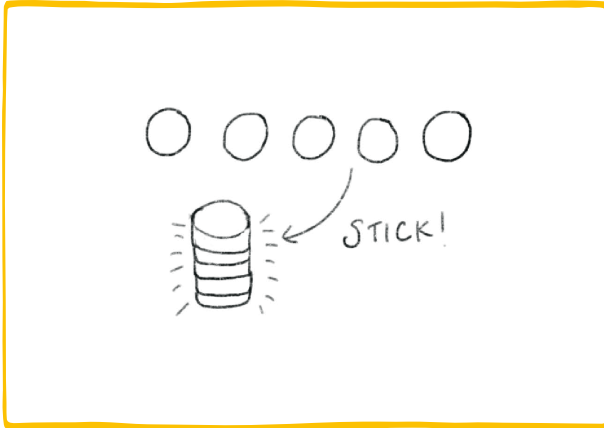
**10.** Now to make the reinforcement tabs. Take two pieces of cardboard measuring 6cm x 12cm. Then fold both tabs in half using a ruler. Add glue on both sides of the fold.



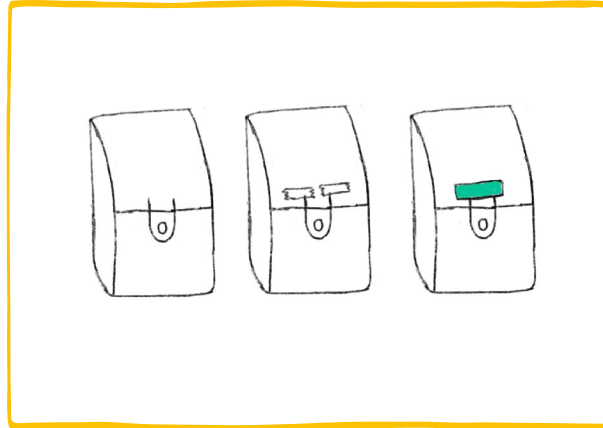
**11.** Stick both tabs onto the back and top of the backpack.



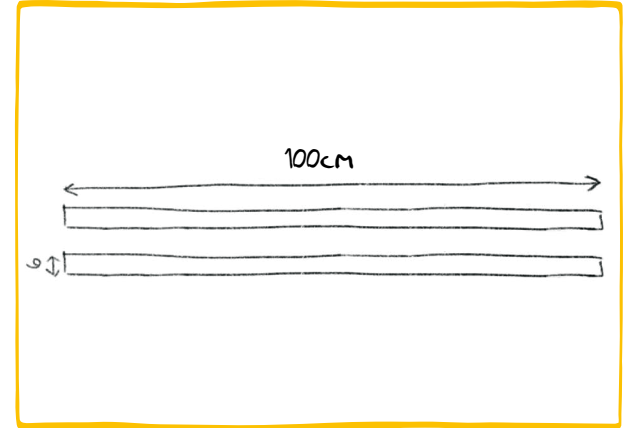
**12.** Make the fastening. Take a screw/bolt and push into the front panel of the backpack. If the screw pokes through onto the inside of your backpack, use some cardboard and tape to cover it up.



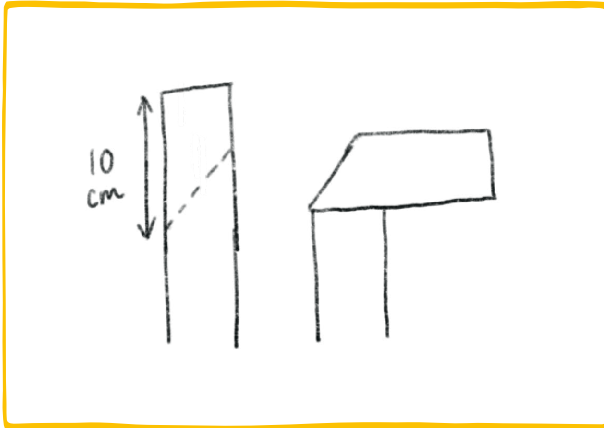
**13.** If you don't have a screw/bolt you can make your own fastening using cardboard. Cut some small circles and stick together with glue to form a column. Wait for it to dry then attach to the bag where the screw would have been placed.



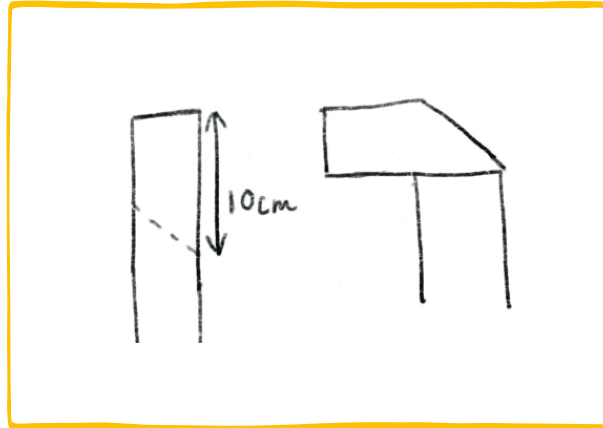
**14.** Add string to the front flap. Check the length is correct by hooking the string around the screw. Adjust if too long or short. Stick down the string with tape then cover over with a small piece of cardboard.



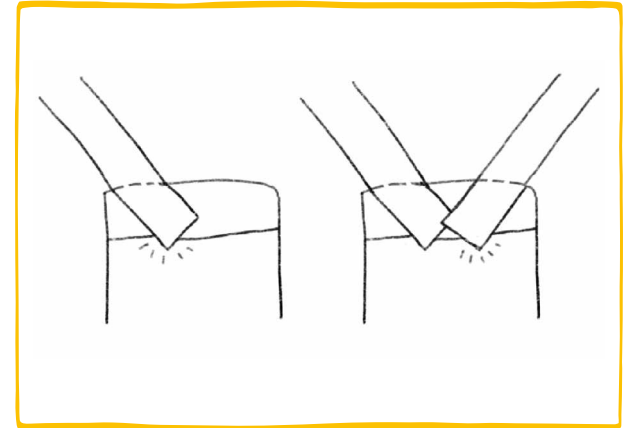
**15.** Time for the straps! You will need long strips of cardboard measuring 6cm x 100cm. You can attach multiple cardboard strips together.



**16.** Measure 10cm from the top of one strip and make a mark on the left side. Using a ruler, fold over to create the fold above.

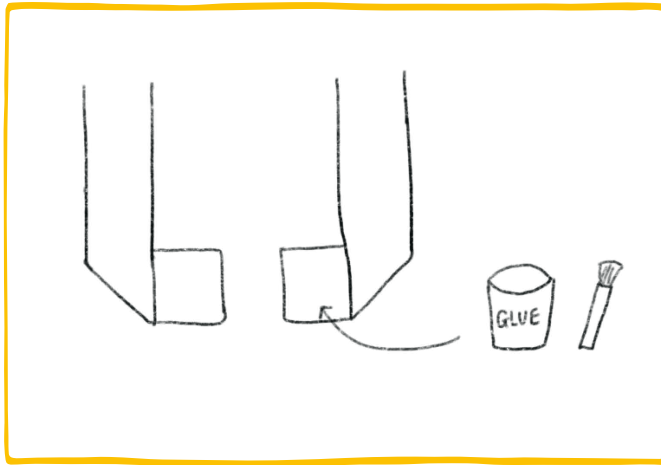


**17.** Measure 10cm on the opposite (right) side of the other strip and make a mark. Using a ruler, fold over to create the fold above.

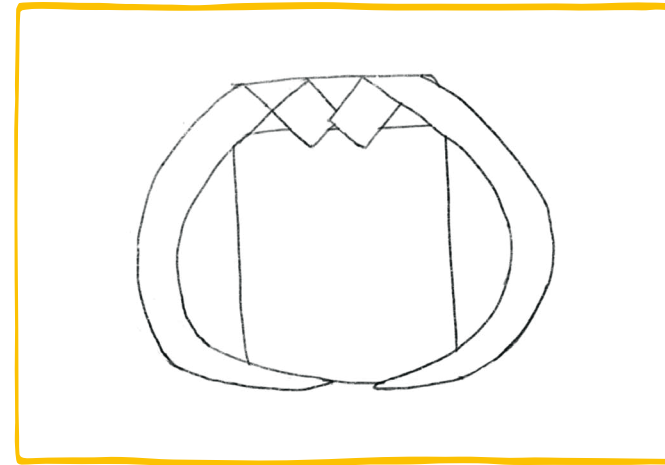


**18.** Using glue, stick down the straps to the top of the backpack. The fold will run parallel with the top edge of the back of the backpack.

Check the strap length by putting the bag on your back and popping the loose straps over your shoulders.



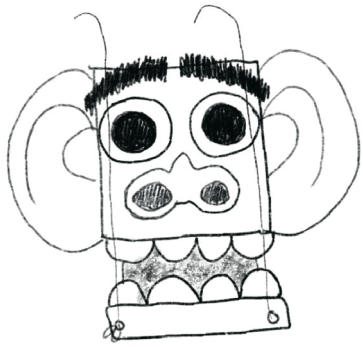
**19.** Once you are happy with the length of the straps, fold the loose ends at a rough 45 degree angle (as above) using a ruler, then add glue to the tabs.



**20.** Final step! Attach the gluey tabs underneath the bag so that the fold on the straps runs parallel with the bottom back edge of the backpack. Leave to dry then pop on your backpack and you're good to go! Woohoo!



# Let's get creative!



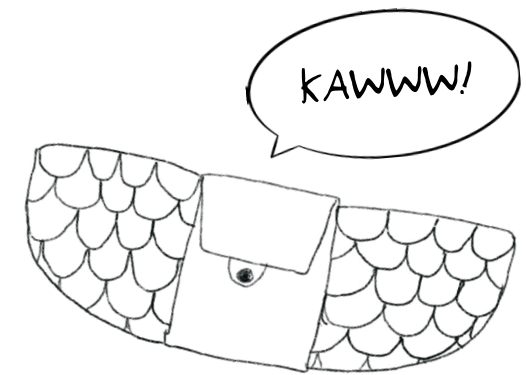
You could attach string to make a mouth open and close. To do this, you'll need to attach string to a bottom jaw which you control by pulling strings over your shoulders.

Grab your cardboard backpack and let's go wild! Now is the time to bring everything together and create your very own play backpack.

Think about the colours we explored and how you might like to use these on your cardboard design. You could use paint, crayons, you could create a collage from newspapers and magazines, or have a think about text, geometric shapes or symbols.

Think about altering the basic shape of the backpack, can you add compartments, curves or change the straps? Do you want to make a face, add wings or a create slide? Take your imagination for a walk and see where you end up!

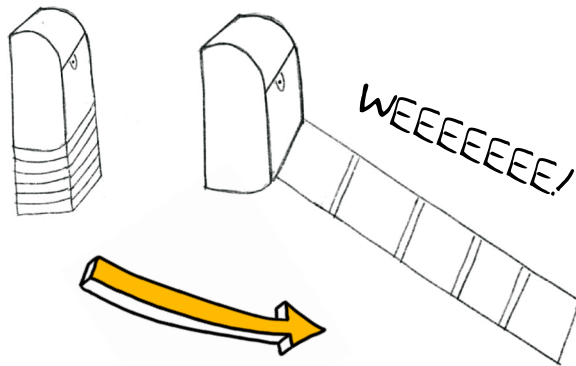
Check back to your invention sheet for some inspiration!



Soar through the sky by adding wings. You could use cardboard or create a wireframe using coat hangers.



Grab some plastic bottles and make your own rocket boosters!



Make a slide by adding cardboard panels to the base of the backpack. Tape together so they fold up concertina-style. Experiment with width and length.