

Maker Challenge!

By illustrator and maker Siôn Ap Tomos

Calling all Little Inventors!

Take the Maker Challenge set by illustrator and maker Siôn Ap Tomos and try five different activities along the way to get your creativity flowing and help you build up to designing an ingenious invention.

Do try this at home, take care with sharp objects and get some adult help. There are how-to guides included to help you with your project – happy making!

Siôn's invention challenge



- 1. Draw an avatar version of yourself!** Avatars are characters usually used to represent us in the digital world. What would an avatar version of yourself be like?
- 2. Practice drawing different emotions.** Your avatar can help communicate how you are feeling by showing faces with different emotions.
- 3. Build your avatar assistant!** Follow the How to Guide to make a 3D cardboard version of your avatar.
- 4. Get your avatar assistant communicate!** Come up with messages and statements that your avatar could display on its body.
- 5. Complete your avatar assistant!**

INVENTION SHEET.

Inventing time! Create a helping machine that could help you and others!



Siôn Ap Tomos is an illustrator and maker from Anglesey, Wales, UK.

Siôn draws and paints to create illustrations that get used in lots of different ways. He also likes to imagine and create unusual objects and contraptions.

He loves drawing so much that he always asks for pencils for his birthday!

Here are some pictures of his work.



Illustrations of wildlife

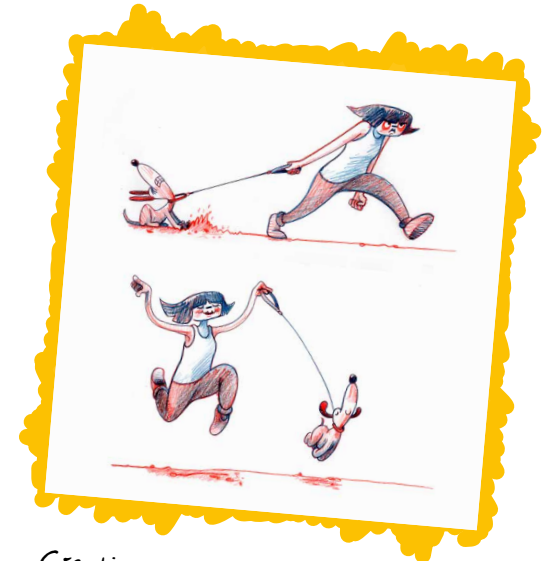
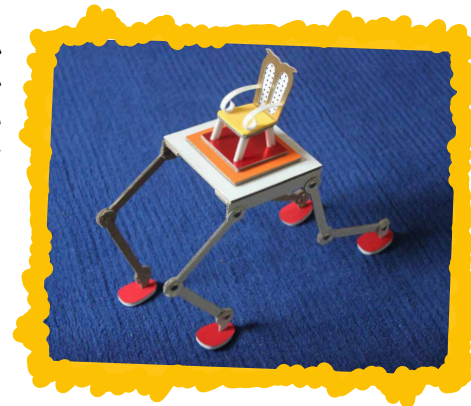


A scientific illustration for a museum



A design for a temporary tattoo

An idea for a walking throne



Creating characters and illustrating different emotions

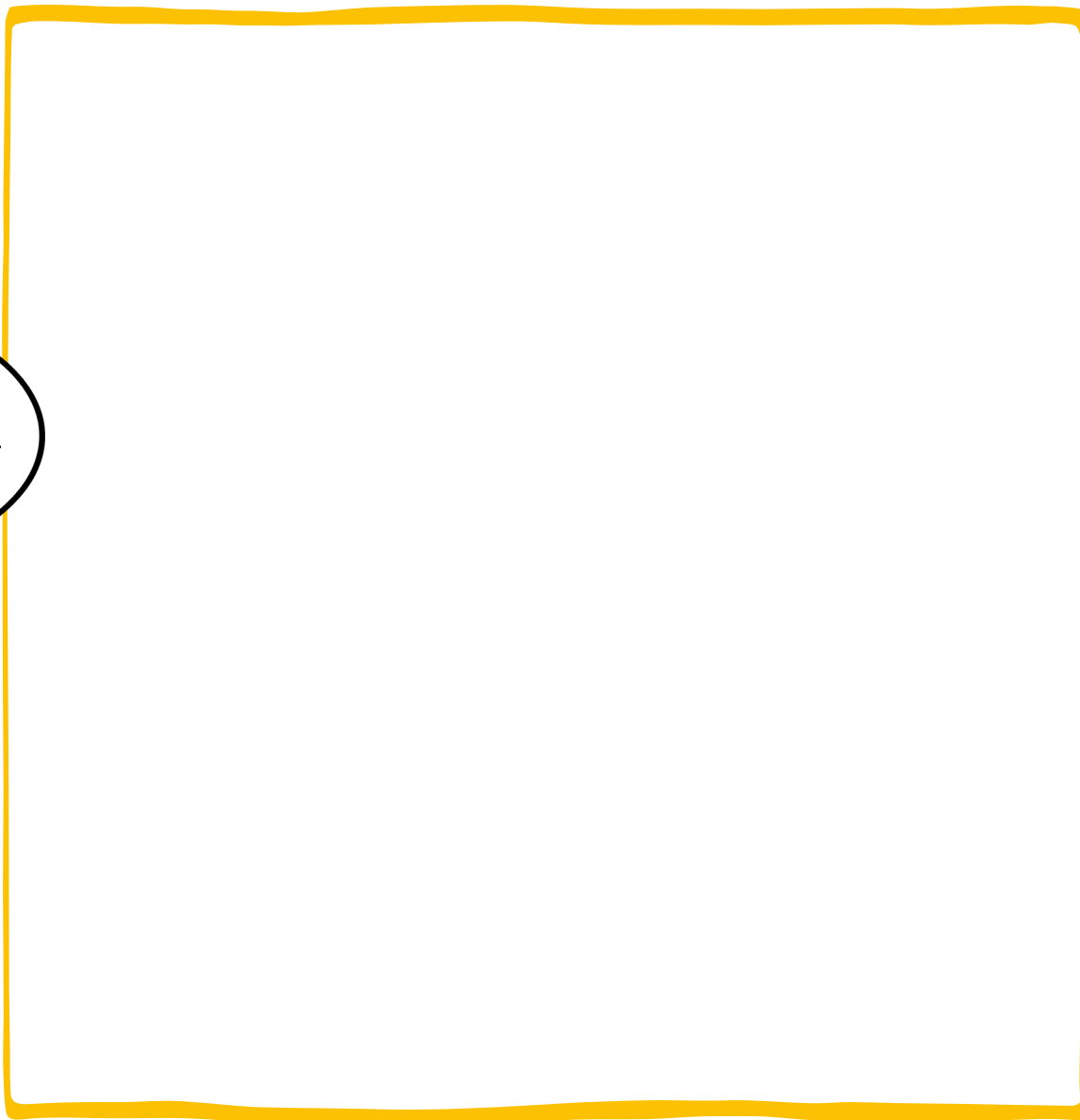
Draw an avatar version of yourself!

We're often creating digital versions of ourselves for video games, apps and social media. Usually we create these digital avatars using parts and costumes provided for us, or we have to earn them as rewards and sometimes we even have to buy the parts we want.

What if you created your avatar of yourself, all by yourself?

If you drew your avatar to look exactly how you wanted it to look, what would it be like?

Have a go at drawing some avatar ideas on this sheet.



To get you started, think about:

- What kind of look will your avatar have? Will it be looking excited, determined, grumpy?
- What would you like the avatar version of you to be wearing? Could it be a favourite outfit or a special costume of some kind?
- Could your avatar be doing something? What kind of things could your avatar assistant assist you with?
- Perhaps it could be doing something you'd like to do but haven't had the chance to yet.

Practice drawing different emotions

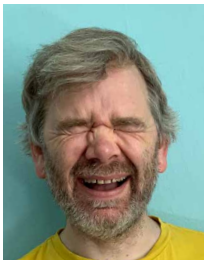
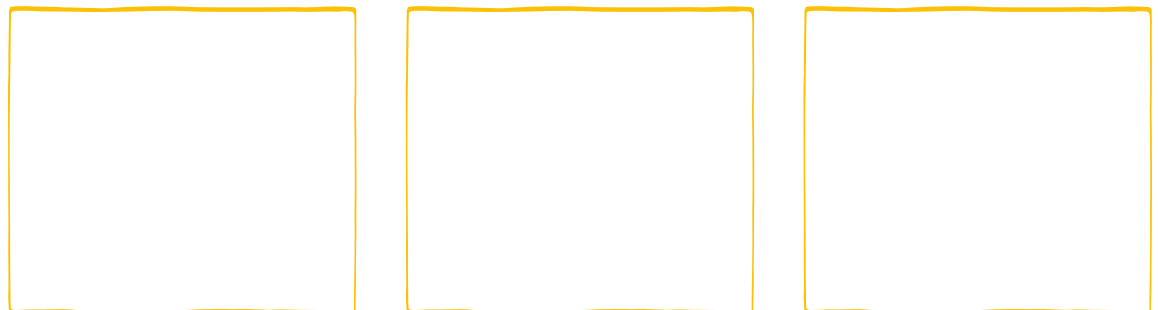
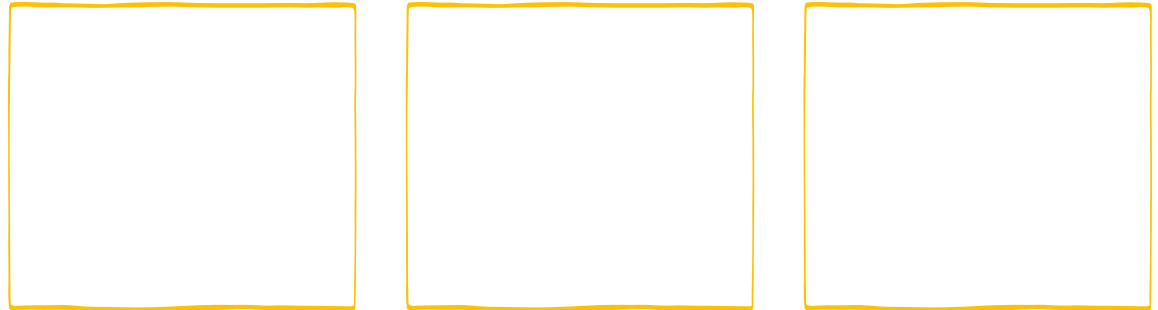
Your avatar can help communicate how you are feeling by showing faces with different emotions.

Here's how you can practice!

Ask someone to help you and using a device (with permission) get them to take photos of you. In each photo, try to create a different facial expression and show different emotions.

Write down the emotion/ expression you have depicted below each drawing.

Once you've taken the photos practice drawing simplified versions of your expressions in the square boxes on this sheet. The more you practice the more the drawings will feel like you!



Build your avatar!

This template makes a basic avatar model that you can personalise to your own design. It allows you to show different facial expressions and styles and also allows your avatar to communicate different messages.

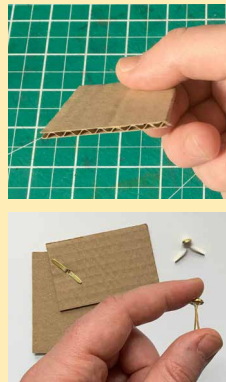
You will need:

Materials

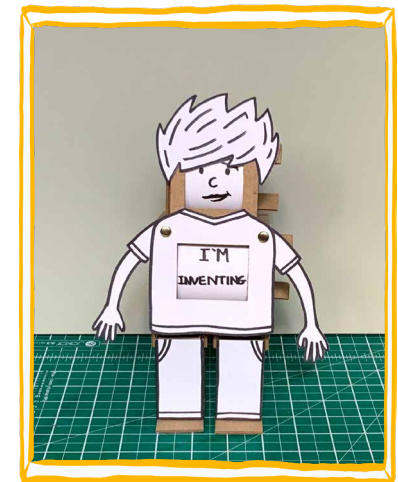
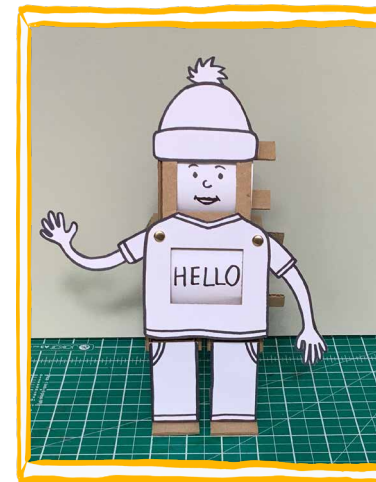
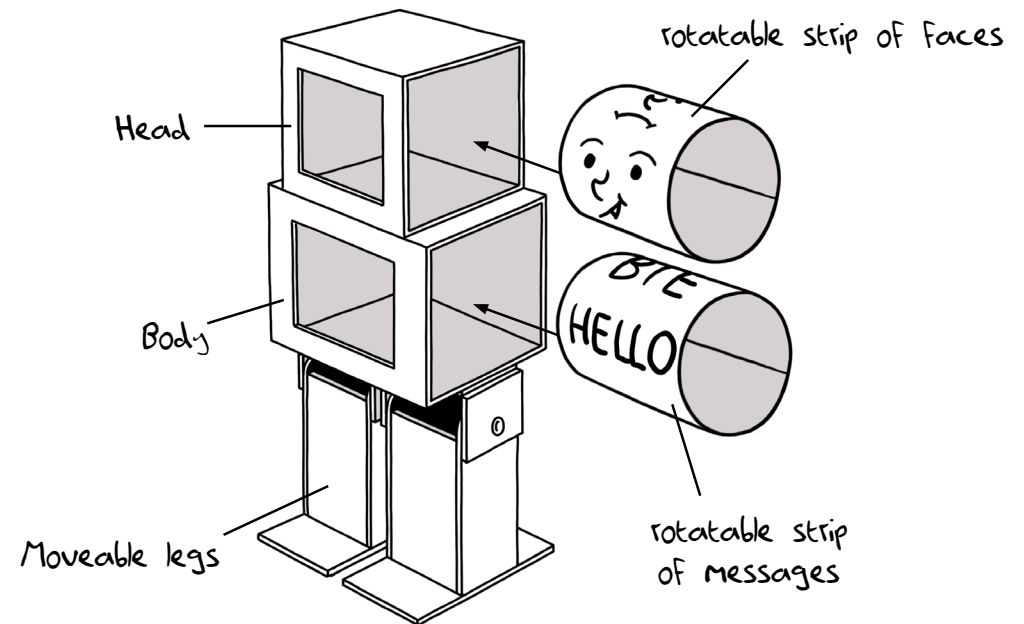
- Single wall cardboard, 2 -3 mm depth (packaging box/es)
- Thick paper (150+ GSM)
- Glue
- Split pins
- Materials to decorate your avatar
- White or blue tac

Tools

- Ruler
- A craft knife/scissors
- Pencil
- Cutting mat (or spare piece of card)
- **An adult to help!**

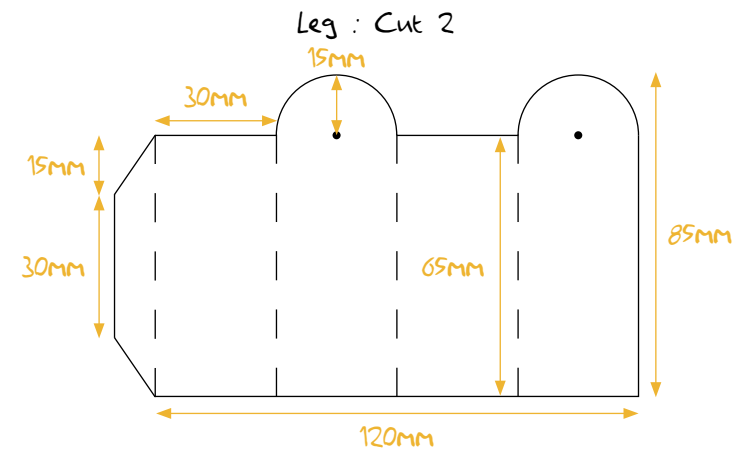
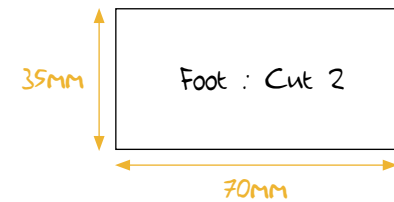
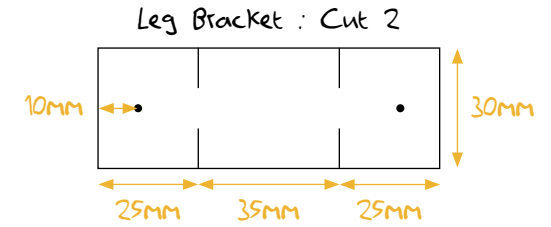
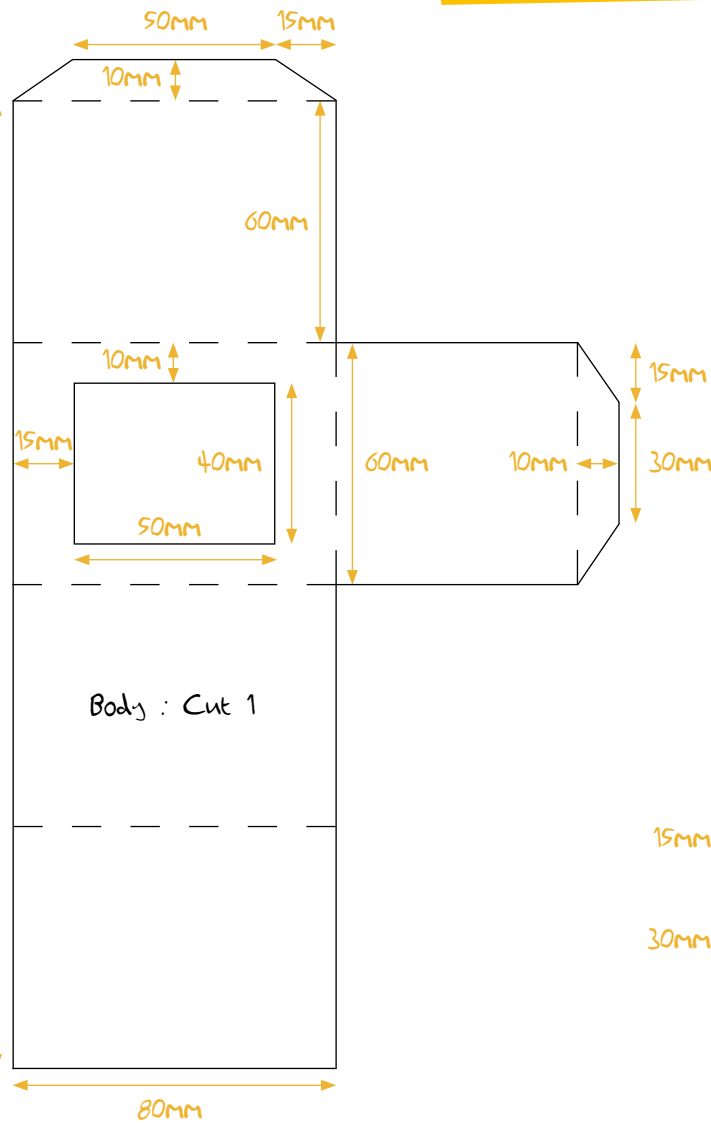
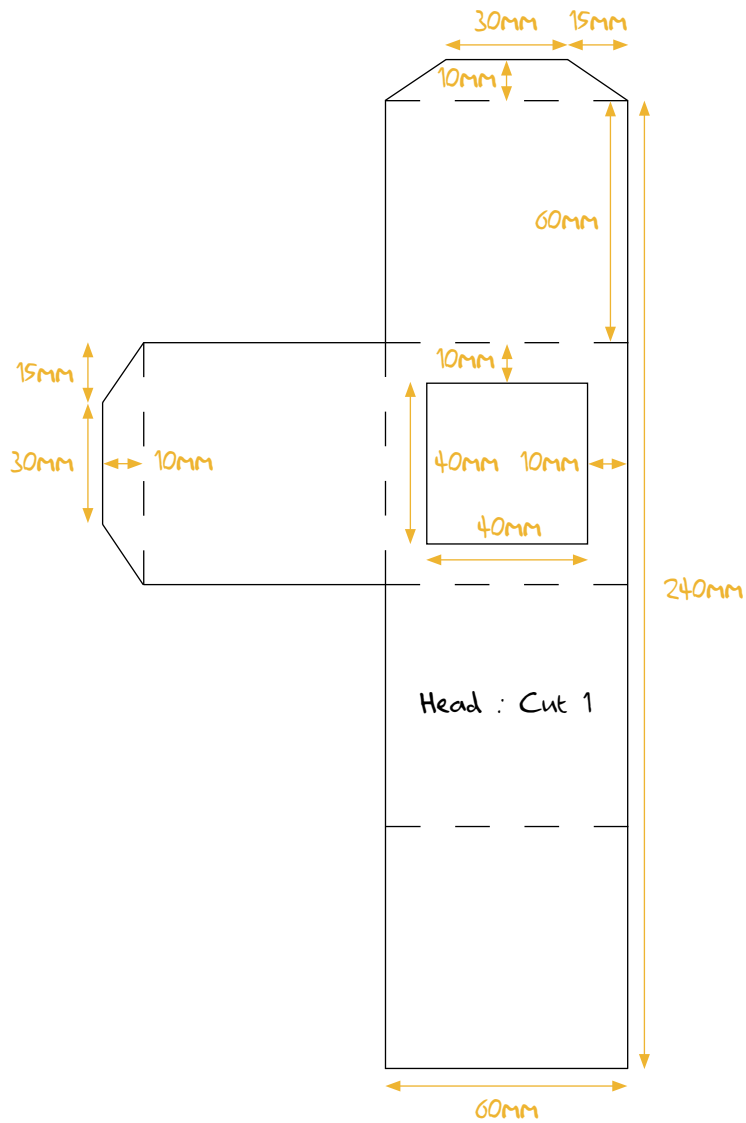


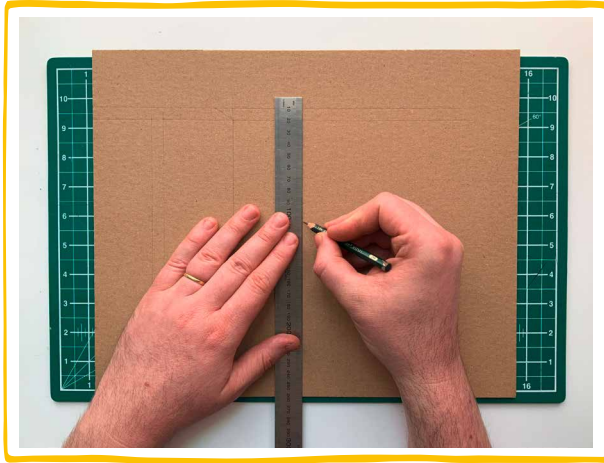
Drawing of the structure



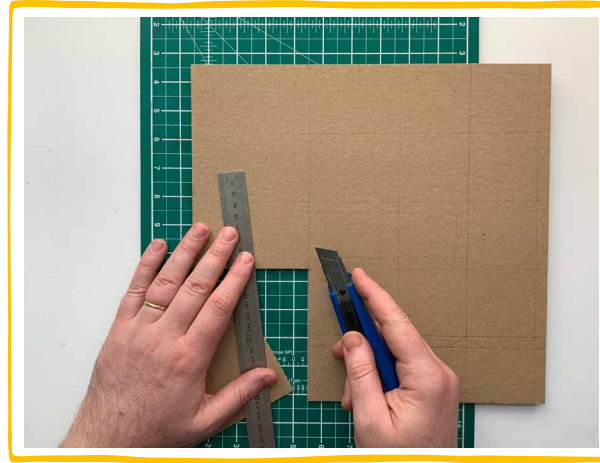
Build your avatar cont.

You can measure out the sizes using this guide to create the different basic cardboard parts.





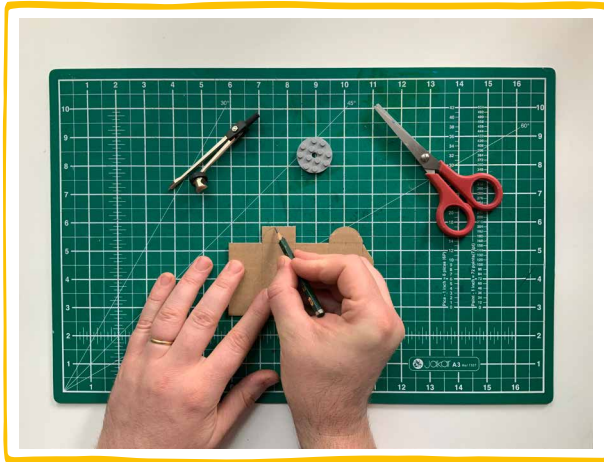
1. Measure out the pieces on your cardboard using a ruler and a pencil.



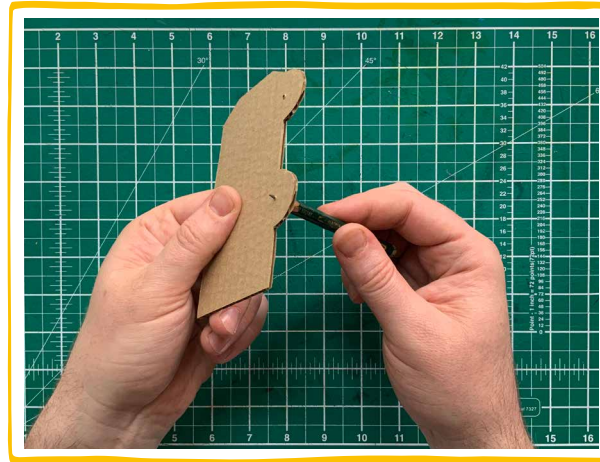
2. Cut out the pieces using scissors or a craft knife. In the guide, the dashed lines show where the card needs to bend. Score the card along these lines so it bends more easily. Ask for help with this step!



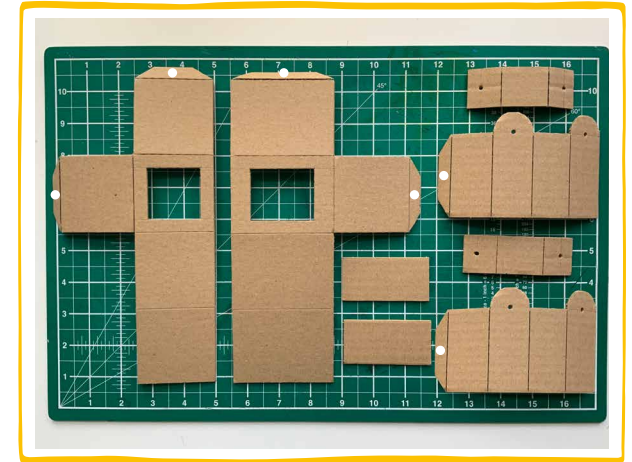
NOTE: When cutting the windows in the head and body parts, keep the pieces you cut out and label them as they will come in handy later on.



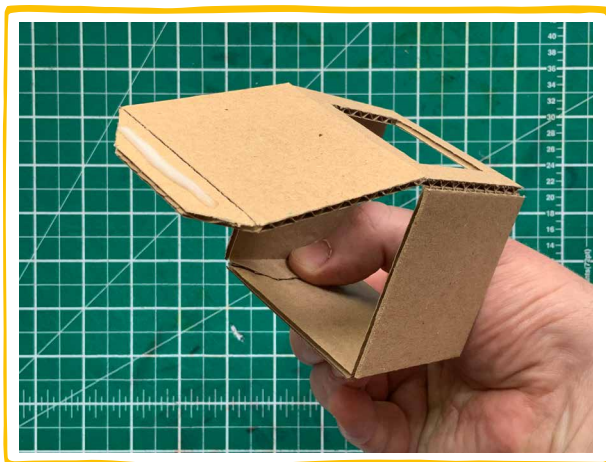
NOTE: To draw out the half circle hinge parts of the legs you can use a drawing compass if you have one. If not, you can trace around something round of the correct size or simply sketch them freehand.



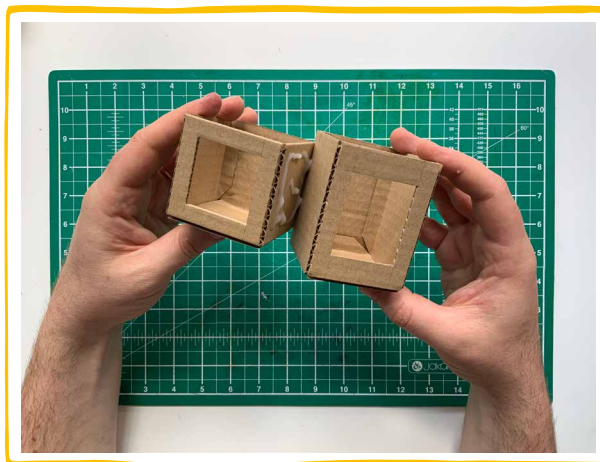
3. Carefully mark out then punch holes in the leg and leg bracket parts using a sharp pencil or drawing compass.



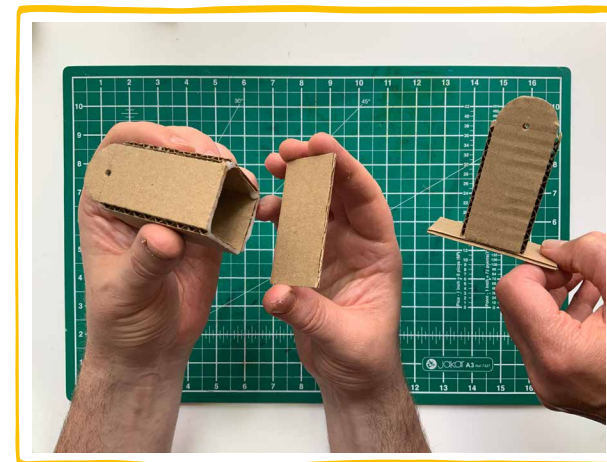
NOTE: These are all the parts you should have ready for the next stages. Use the tabs (marked here with white dots) to put the main parts (head, body legs) together.



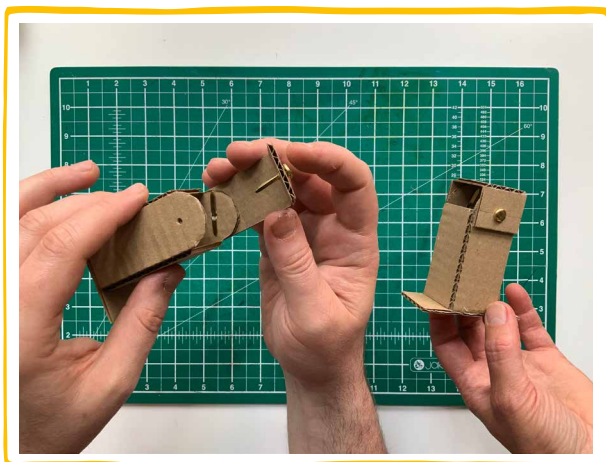
4. Put these main body parts together by placing glue onto the tabs and flattening them down hard onto the joining surface.



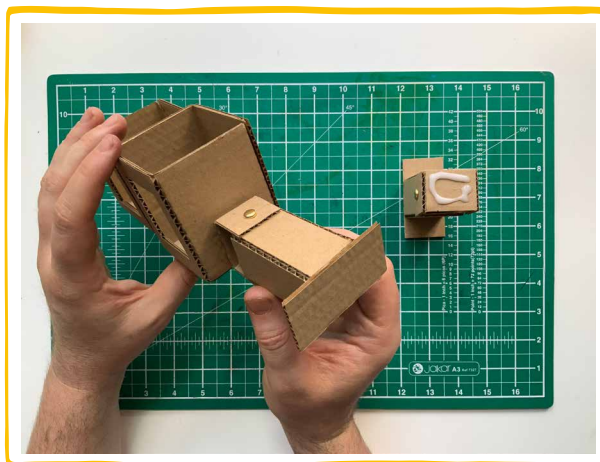
5. Allow time for the glue to dry then glue the head and body together, making sure they line up centrally. Have the open sides on whichever side is your strongest hand.



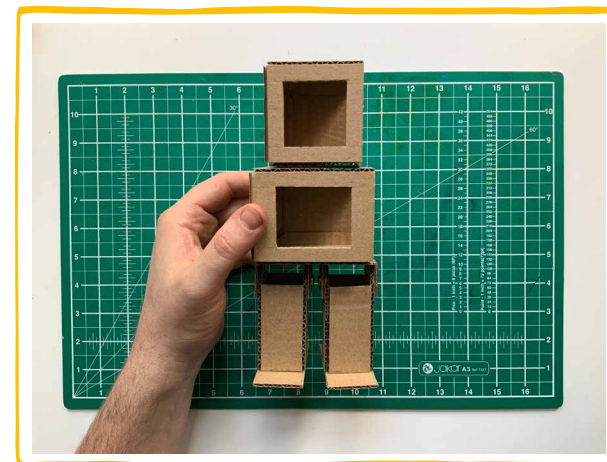
6. Attach the legs to the feet by placing glue all around the edges of the bottom of the legs and sticking them in the centre of each foot. Again, allow time for the glue to dry.



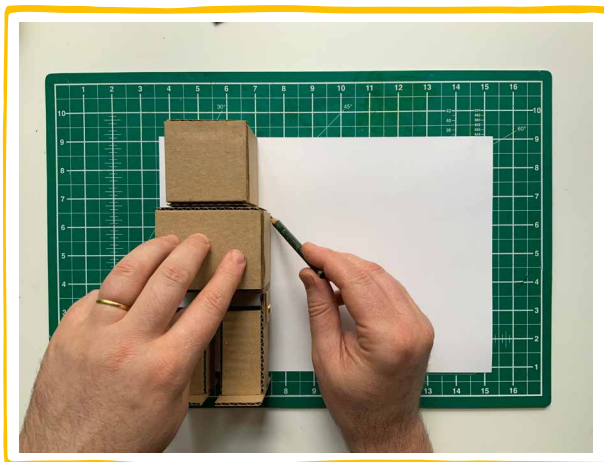
7. Attach the leg brackets to the legs using split pins. Make sure the brackets sit on the outer part of the legs and press firmly when flattening down the ends of each pin.



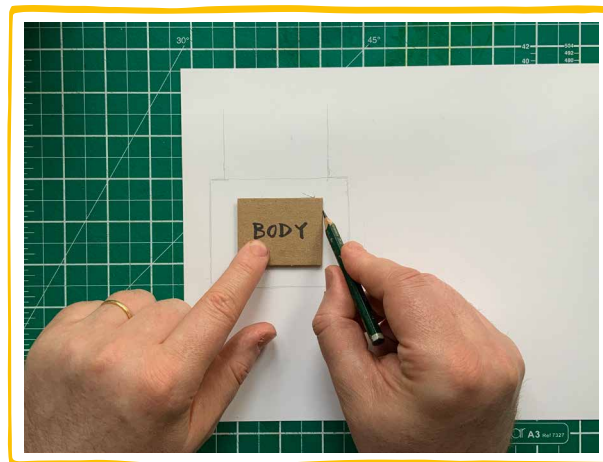
8. Then glue the legs to the body, placing them side by side in the centre with a small gap in between.



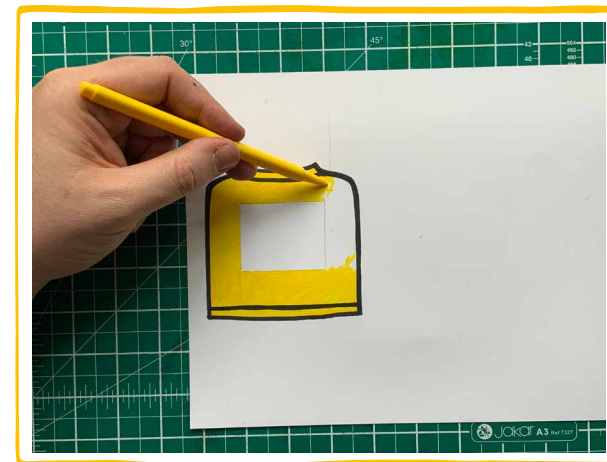
This completes the body structure of your avatar (with moveable legs!), now it's time to dress it up. What is your avatar going to wear? You could create a design based on what you drew in Activity 1!



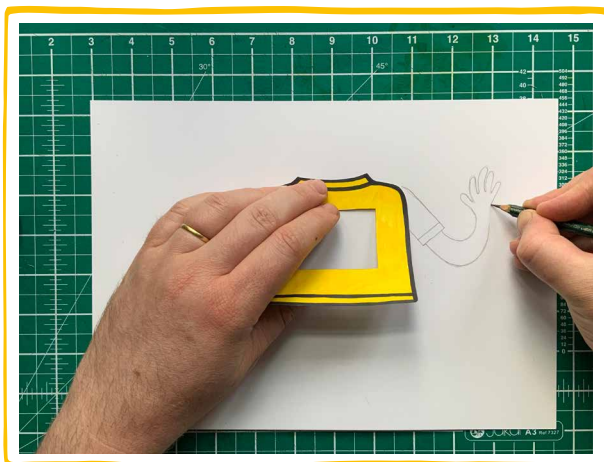
9. To create clothing for your avatar, firstly trace around the sides of the body and lower part of the head on a piece of thick paper.



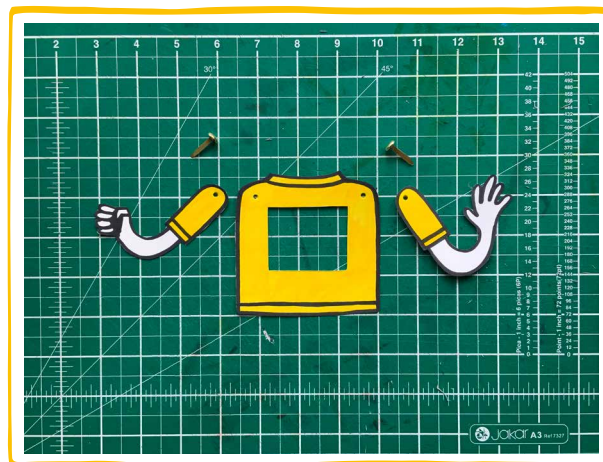
10. Trace around the body window cut out that you kept from earlier. Make sure it is placed carefully in the centre of the body area.



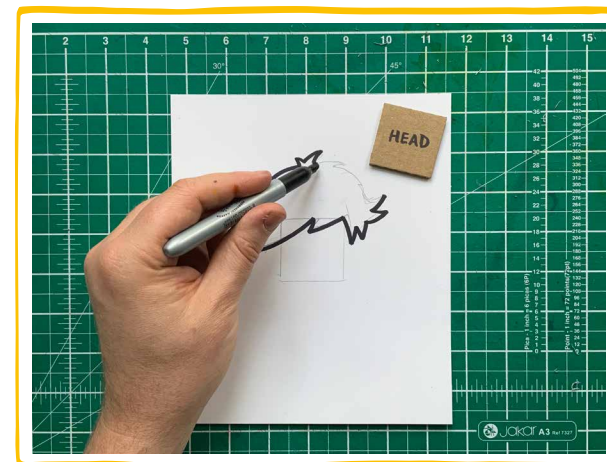
11. Draw out and decorate your outfit design (minus any sleeves). Make it the same size or a little bigger than the traced body shape.



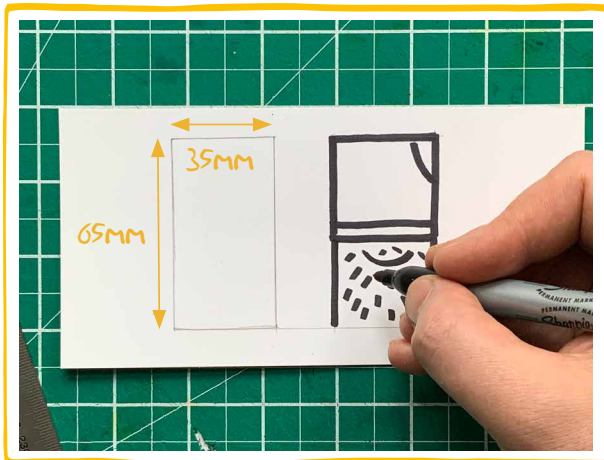
12. Cut it out (and the window part) then use it as a guide for sketching out the arms.



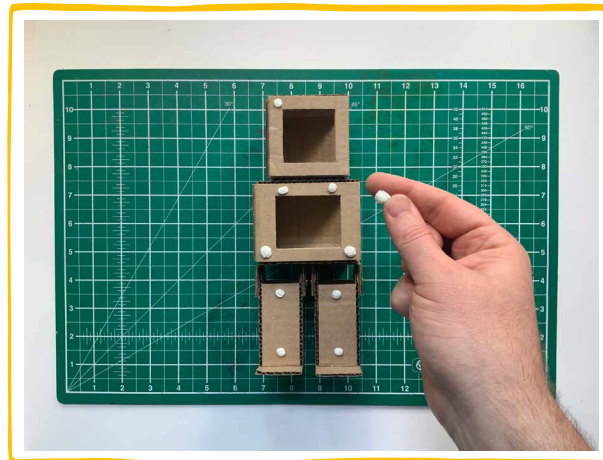
13. Decorate and cut out the arms, then punch holes in them and the shoulders of the body section and connect them using split pins. Place the arms behind the body part when doing this.



14. You can use the head window cut out as a guide for drawing out any head decoration, this could be hair, a hat or part of a costume perhaps. Decorate and cut out.



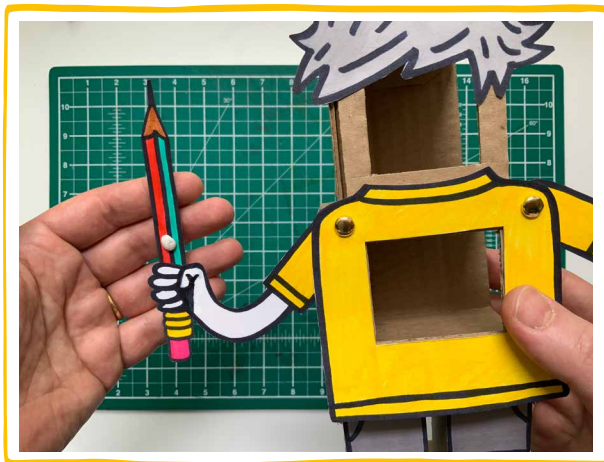
15. For the legs, draw out two rectangles to the size indicated above, decorate and cut out.



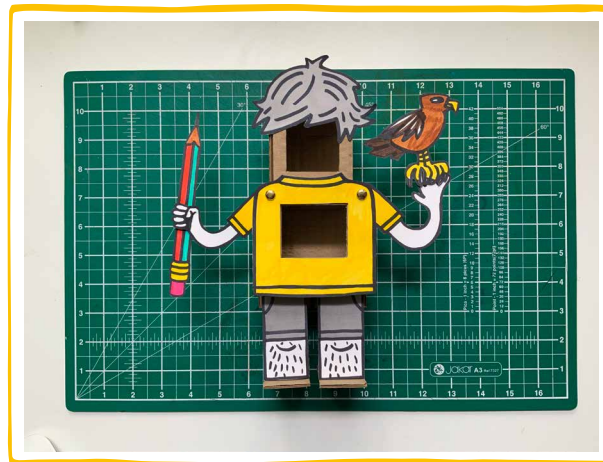
16. Attach the outfit to the body using white or blue tac. Don't glue it as you then won't be able to swap outfits. Also make sure you don't have tac near where the split pins are so the arms can be moved freely!



17. You can also create accessories for your avatar. What could you make? What would you like your avatar to have?



18. Attach these using tac also!



Now you have an outfitted, accessorised avatar!



But is one outfit enough? You could create lots of outfits, costumes and accessories for your avatar...

Get your avatar assistant to communicate!

Now you've created your 3D avatar assistant it's time to think about what things it could communicate on its body display.

Use this sheet to come up with different message ideas. Write your messages in the boxes which are the same shape as the display window on the avatar model. Feel free to experiment with different styles of writing!

To get you started, think about:

- What kind of greeting could your avatar say.
- Perhaps you get shy and your assistant could say a greeting for you, what would it be?
- Are there things that you find difficult to say that your avatar assistant could help say for you? How you're feeling for example.
- Are there favourite things you like to say or things you say a lot? Perhaps you could ask someone who knows you well what things they hear you say.
- Are there any statements you could make about things you believe in, and think are important to say!



Complete your avatar assistant!

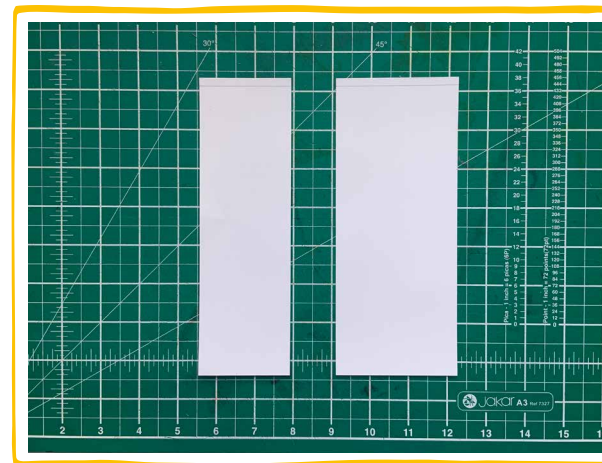
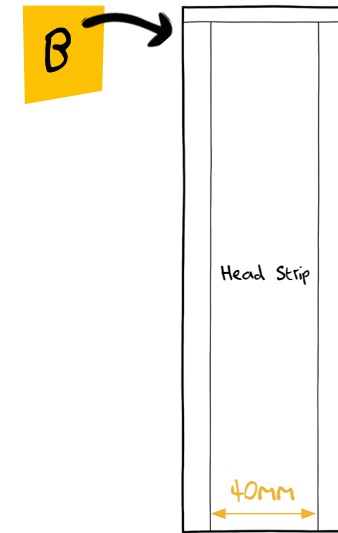
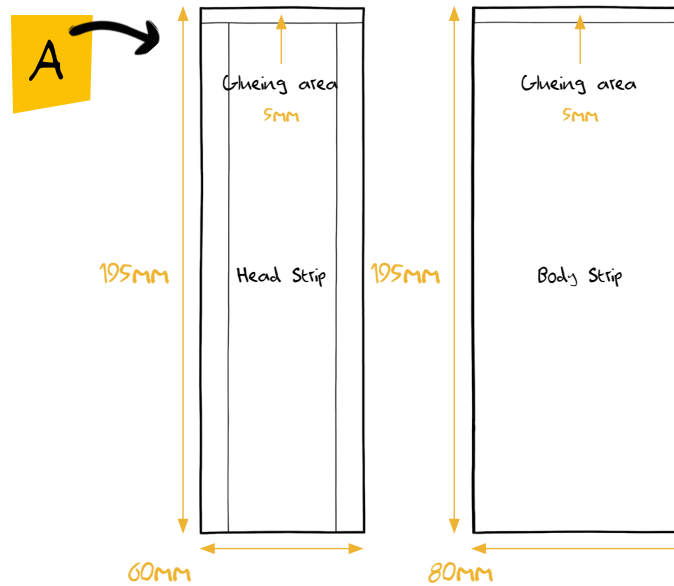
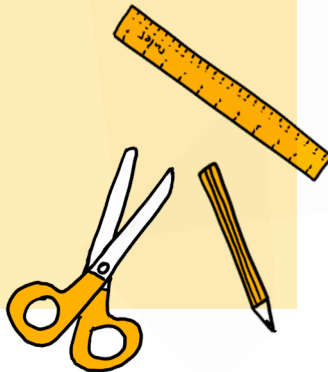
It's time to create the strips onto which you can draw faces for your avatar and write the messages you would like it to communicate by following this how-to guide!

Materials

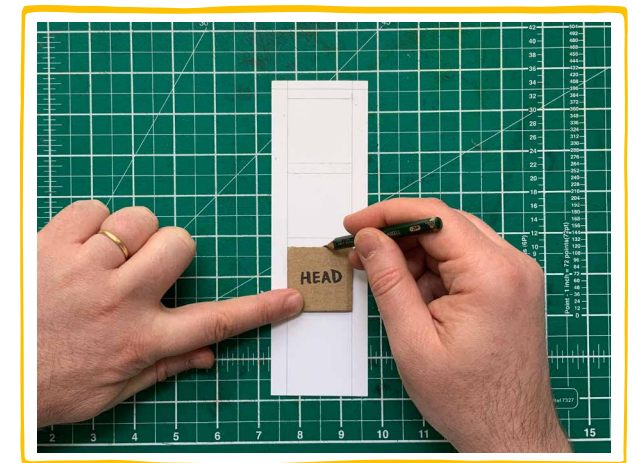
- Small amount of cardboard
- Thick paper (150+ GSM)
- Glue
- Materials for decoration

Tools

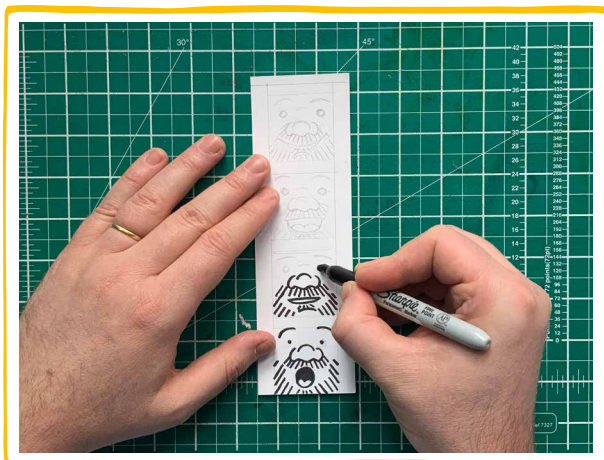
- Ruler
- Scissors
- Pencil
- **An adult to help!**



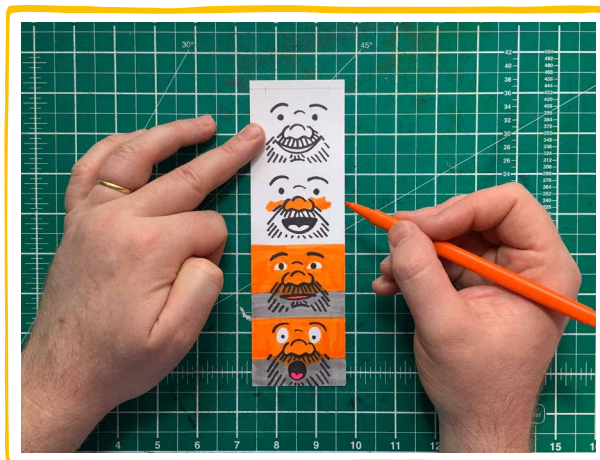
1. Draw and cut out two strips from thick paper using the measurements shown above A (make sure to include the lines indicating the gluing area). Then take the head strip and draw the additional vertical guidelines shown above B.



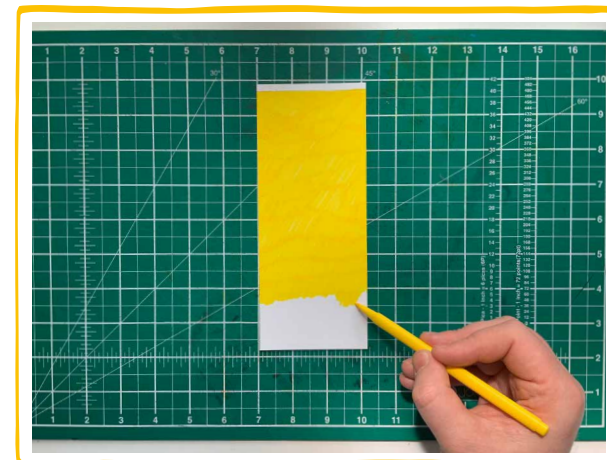
2. Use the head window cut out to mark four squares between the vertical guidelines. Leave a little gap between each square.



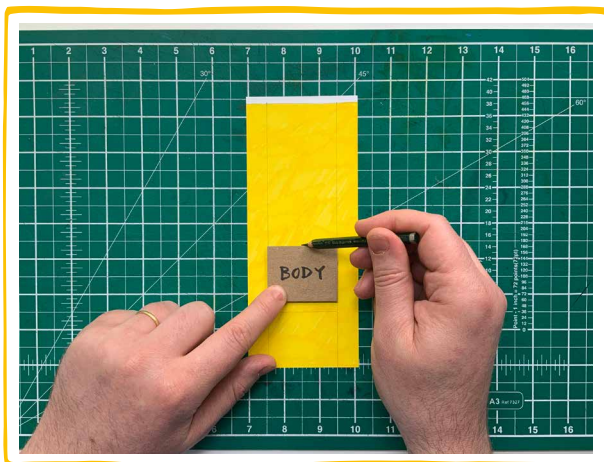
3. Choose four facial expressions you enjoyed creating during Activity 2 and draw them out again inside the boxes.



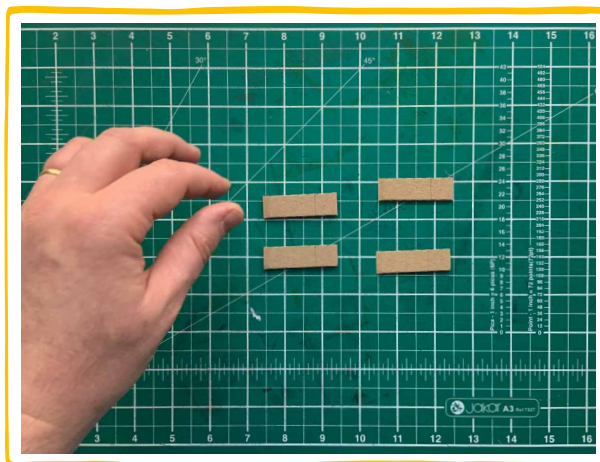
4. Colour the strip in with colouring pens or pencils making sure to cover right up to the edges.



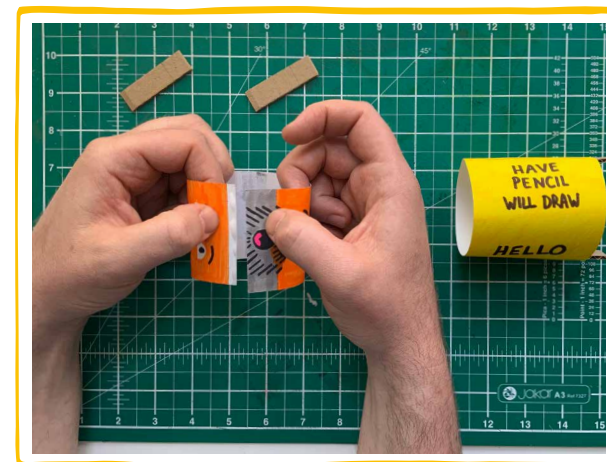
5. For the body strip, first colour it in. Be sure to choose a colour that matches one of the outfits you have created.



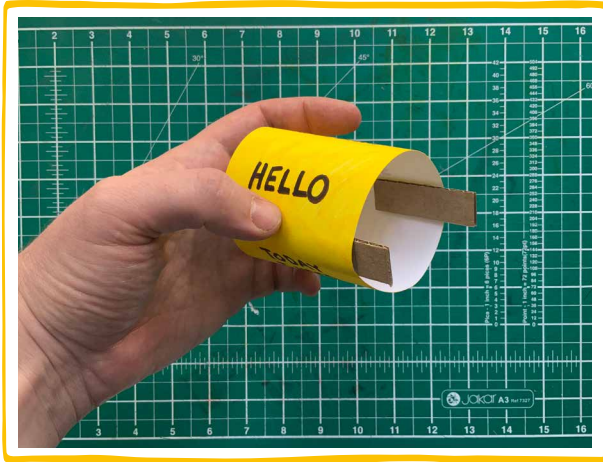
6. Draw vertical guidelines like before, this time 50mm apart and use the body window cut out to mark four rectangles on the strip. Then write four separate messages that you created during Activity 4.



7. Cut out four small pieces of cardboard roughly 50mm x 15mm in size. These will be what you use to turn the strips inside your avatar.



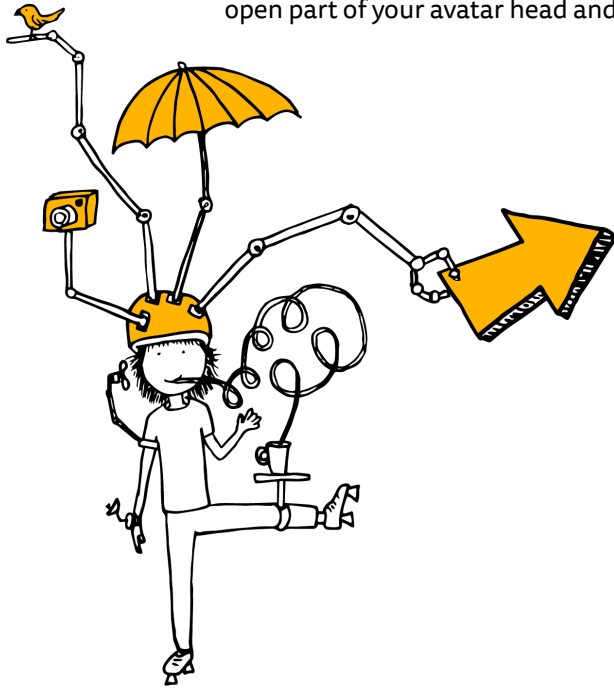
8. Glue the ends of each strip together making sure to line them up correctly.



9. Then glue two of the cardboard pieces opposite each other on the inside of both strips. Make sure the side you attach them is the same side as the open part of your avatar head and body.



10. Place the strips inside your avatar. Use your thumb and forefinger to turn them when you want to.



NOTE: You can decorate the edges of the face box to match the colour of your face strip.



There's no limit to the amount of face and message strips you could make to swap around on your avatar. You could have all sorts to match your different moods, thoughts and interests!

Invent a helping machine your avatar assistant could use to help you and others!

Now you've designed an avatar assistant how can we make it even more helpful?

By inventing a helping machine that it could use!

What could the helping machine help you with and how would it work?

Think about things you perhaps find difficult to do, what might they be and what kind of machine could help you doing them?

Could it be something that helps you physically or something that helps you to communicate more easily for example?

Perhaps your avatar could have a machine that helps other people too? Is there someone you know that you could help in some way? What kind of machine could help them?

Use this sheet to do some doodles
some ideas for a helping machine
and your avatar using it

Draw your favourite idea on the invention sheet on the next page



My helping machine

Your avatar can help you communicate your ideas and emotions. What other inventions can you think up that could help you or others with things they might find difficult?

Name it!



.....
.....

First name

Age

School

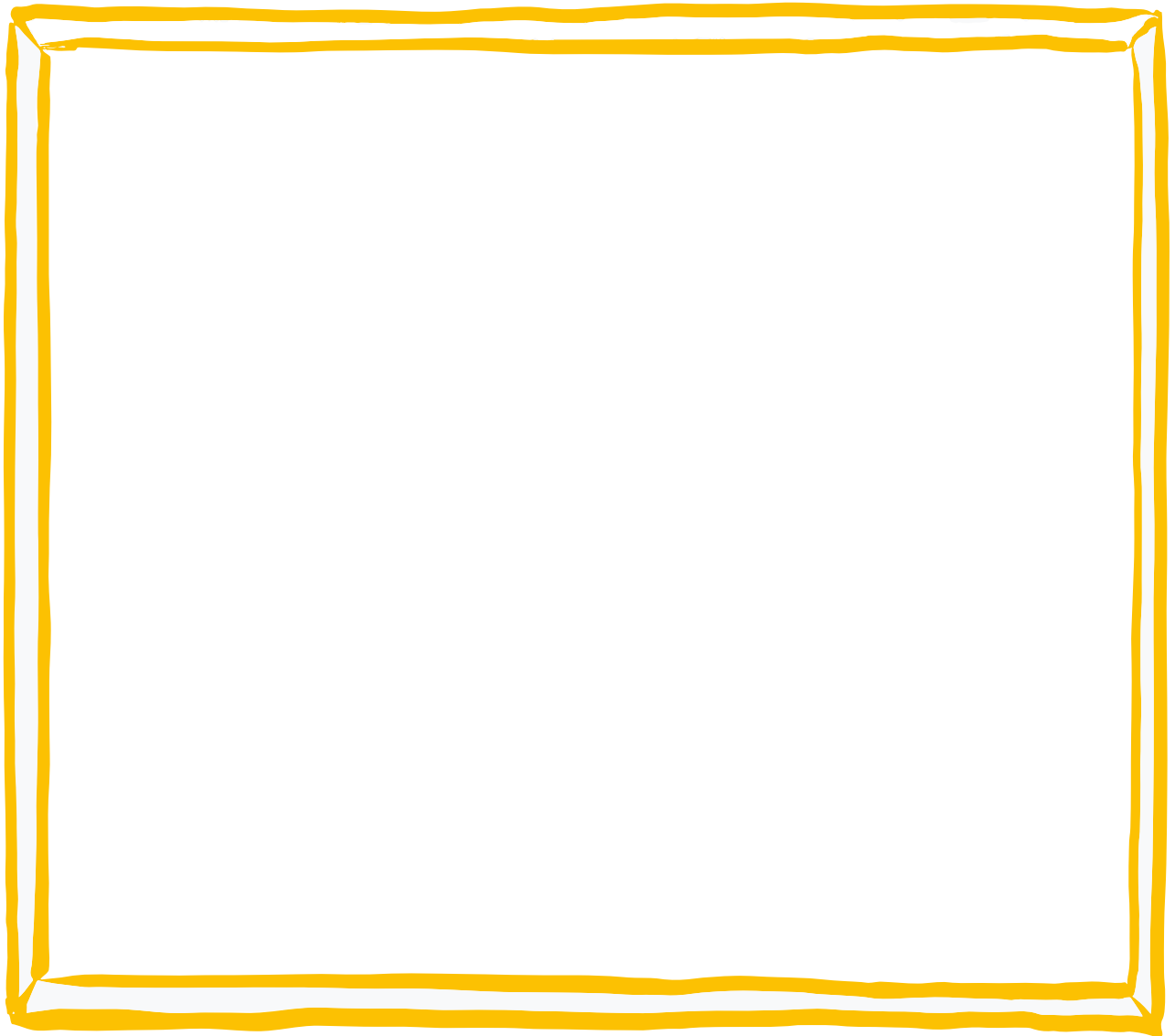
Town/city

Tell us more!

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

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Draw your invention here! Use a black pen, add colours and labels



Upload your idea at littleinventors.org to get feedback and who knows, it could be chosen to be made real!