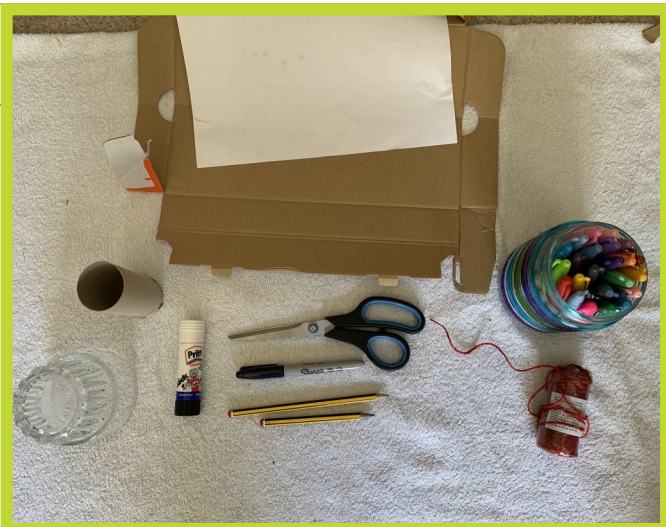


# How to make a Bike Chain

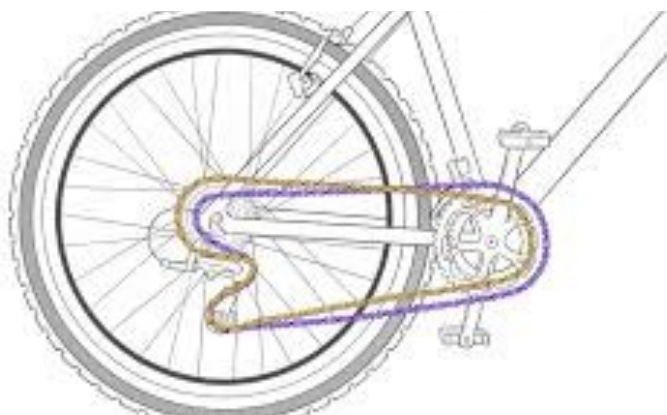
A step-to-step guide of how to make your own working bike chain out of cardboard.



# You will need



## How does a Bike Work?



## Equipment:

Cardboard box—You can use any cardboard e.g. cereal box, shoe box or packaging boxes.

Scissors - Always make sure an adult helps you when using scissors.

String or thread.

2 circular objects to draw around—One large and one small e.g. a large glass and a toilet/kitchen roll tube.

Pen—Felt tip markers work best but you can use any pen you have handy.

2 pencils—This is to poke through the cardboard, you can also use pens.

Paper

Things to decorate—Pens, colouring pencils, scrap cardboard or anything else you may have lying around the house.

You are going to make your own working bike chain out of cardboard. You will learn how to make a wheel, pedals and a cog, and a string chain. To do this you will need all the equipment above.

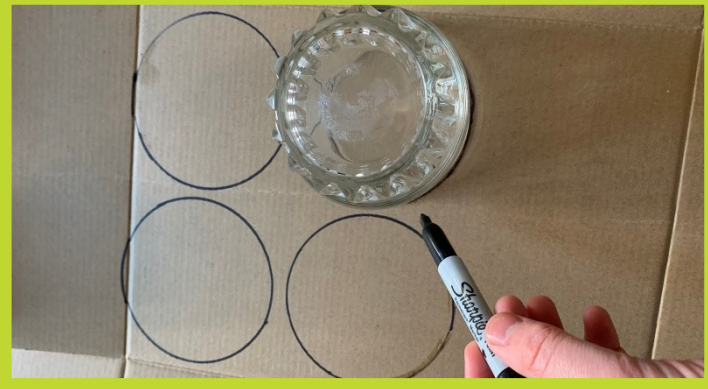
Whilst you are making your bike parts think about how they look on a real bike. Think about how a chain works and what happens when your chain move. Maybe you will be able to fix your own chain after completing this activity?





# Step 1: Drawing

## Instructions:



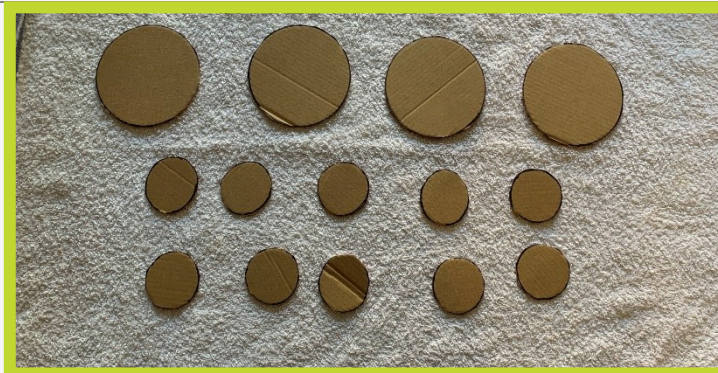
1. Firstly, draw four circles on your cardboard around your larger circular object. For this example a large glass was used.



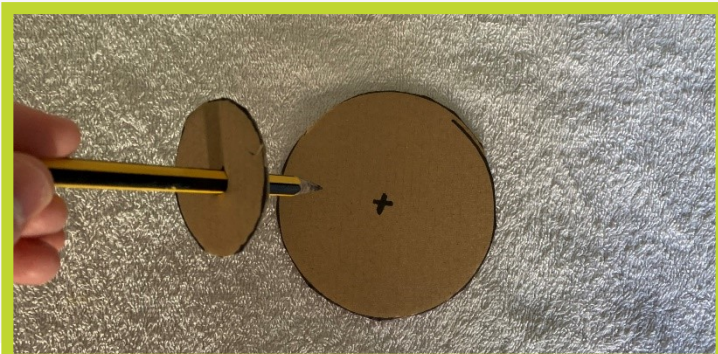
2. After this, draw around your smaller circular object, you will need about 10 of these smaller circles.

# Step 2: Cutting

## Instructions:



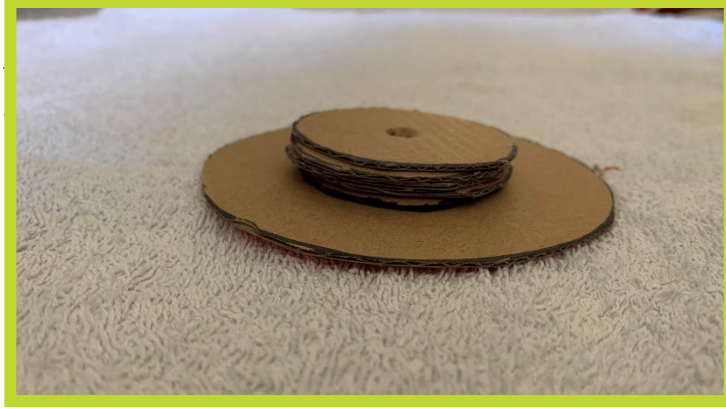
3. Next, cut out your circles. Make sure you get a grown up to help you with this! It can sometimes be tricky cutting out cardboard because it is thicker than paper.



4. Now mark an 'x' with a pen in the middle of the circle. For this next step a grown up must help you. Poke a hole using a sharp pencil or pen through your marked 'x'. You have to do this to all of your circles, trying to get as close to the middle as you can.



## Step 3: Sticking



### Instructions:

5. Stick five of the smaller circles on top of the larger circle making sure that the holes line up. Use a good amount of glue in-between each layer, if using a liquid glue then make sure the glue dries before moving onto next steps.

6. Once you have stuck all the smaller circles together then stick another larger circle on top. This will look like a sandwich. You will have to repeat instructions 5 and 6 for the other circles you have left.

## Step 4: Decorating



### Instructions:

7. Now you should have two circle sandwiches. The next step is to add some decoration. You can choose to decorate straight onto the cardboard or cut out a circle of white paper to stick on either side. If using paper then draw around your large circle and cut and stick it on. Remember to get a grown up to poke a hole through.

8. Next decorate one circle as pedals and the other as a wheel. You can use scrap bits of cardboard to make pedals. See if you can use other things to decorate too!



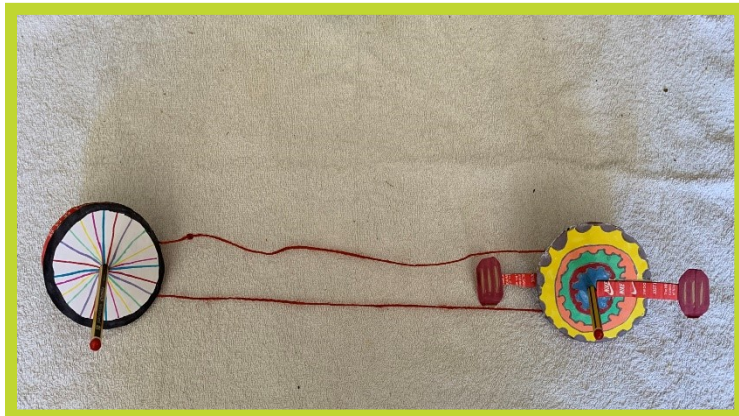


# Step 5: Putting Together



## Instructions:

9. Now that you have finished you need to measure out your string. You can do it as long or as short as you like—but make sure that your pedals and wheel don't touch each other. Tie a knot in your string to make it into a loop, this will be your chain.



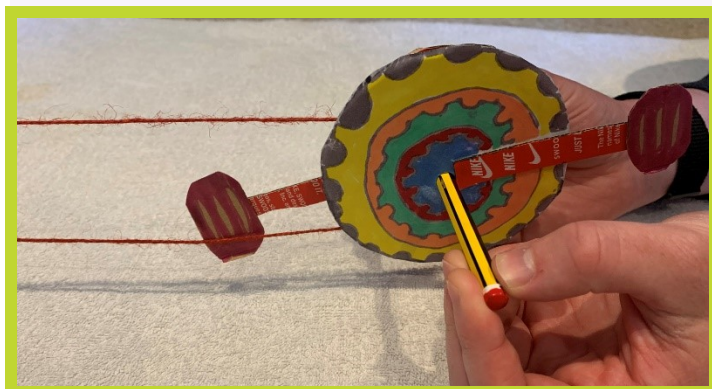
10. Now put a pencil through the middle hole on both your wheel and pedals circle. Then attach the string chain around your circles.

# Step 6: Testing



## Instructions:

11. Now that you have made your own bike chain it's time to test it out. You may need a friend or family member to help test it with you.



12. One person holds the wheel pencil loosely in the crease of your finger and thumb (picture above).

The other person spins the pencil on the pedal side. (picture below) What happens to the wheel?



# Experimenting

Now that you have made your chain can you try out these different challenges?

- What happens when your string chain is too loose?
- What happens if you use a shorter string?
- What happens if you use a longer string?
- Do you think making different sized circles will make a difference? Try it out!
- Can you make any other parts of a bike? Perhaps handlebars or a bike seat?
- Can you look on your own bike and see how your pedals and chain works?
- Why not get a grown up to tweet a picture to @SustransSW

## Examples

Here is some that have been made by others.

