

Maker Challenge!

By designer Ella Doran



Calling all Little Inventors!

Take the Maker Challenge set by designer Ella Doran and try five different activities along the way to get your creativity flowing and help you build up to designing an ingenious woollen invention.

Ella wants to invite you to explore and learn about the amazing and magical properties of wool! To inspire you to make your own weave, then to invent something **spectacular** and **unusual** using wool. You can spin it, weave it, knit it, felt it, dye it, create tassels with it, keep warm with it, use it as a stuffing or as bedding... you could even wrap yourself up in a roll of felt!

Ella's invention challenge



What spectacular invention can you think of using wool?

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

- 1. Explore!** Wool is used in lots of different things. How many things can you find in your home that have wool in them?
- 2. Sheep to Seat, Fleece to Floor:** watch a short film all about wool and how it gets from sheep to products we use and buy.
- 3. Colour is good!** What colours are there around you? Make your own colour palette from your local environment.
- 4. Lets get making!** Make your own tapestry loom out of wood or cardboard, so you can make your own fabric.
- 5. Let's get creative!** Learn how to weave your own tapestry using wool and other materials

INVENTION SHEET.

What spectacular invention can you think of using wool?



Ella Doran is a designer who loves to work with materials to create objects and textiles. She has always been fascinated by the process of making things, and loves being in workshops and factories; seeing the magic of making in action!

Her curiosity has led her down many paths, designing lots of different prints and patterns! Ella creates designs for her own collections of wallpapers and roller blinds and also loves to give old furniture a new life. She uses her textile designs in collaboration with friends who are expert upholsterers.

Here are some pictures of her work!



"Geo" and "Peeling Paint" photographic wallpapers



Stones tray, one of Ella's first products



Award winning stationery range for John Lewis



Tray and mug designs for TATE Modern



Chairs found on the street redesigned by Ella and reupholstered by Urban Upholstery

Waterlake jacquard cloth woven by Camira Fabrics, Bradford



What can we make from wool?

Here are some of the objects Ella has designed and made using wool, in collaboration with manufacturers.

Wool is so versatile! You can spin it, weave it, knit it, felt it, dye it, create tassels with it, keep warm with it, use it as a stuffing or as bedding... you could even wrap yourself up in a roll of felt! And did you know you can electric charge wool dust and get it to stick to wallpaper? It is known as flocking,

The Wool industry is known for a brilliant saying **'Where there is muck there is brass'** because nothing goes to waste, even wool dust gets used!



Cushions made from the jacquard wool cloth in different colours



Waterlake design woven into a wool carpet floor runner 3 meters long

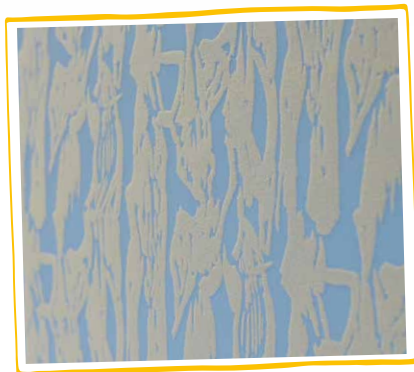
This table is made using wool! The top surface uses the wool and a resin. If you look closely you can see the sheep hairs set in the resin.



These two seats were designed using the woven cloth designed by Ella



This is an example of wool flocking onto paper using electrically charged wool dust



The properties and benefits of Wool

How many things can you find in your home that are made of wool, or have wool in them?

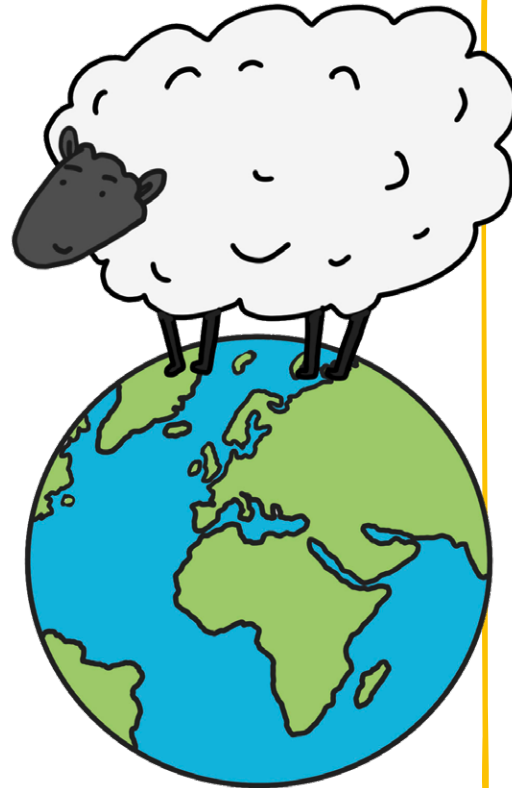
List them here

1. Wool is biodegradable, and renewable: as long as we look after our sheep we will have wool.

2. Wool is a material you can use for many things. It reacts to changes in the atmosphere, for instance in clothing it will help keep you cool in the heat of the day, and warm in the cool of the night.

Astronauts wear wool for comfort in their Spacecraft, and scientists at the North Pole wear wool to protect them from the cold.

3. Wool is stretchable and doesn't break easily, it can be woven, knitted, crocheted, felted, and spun



A large yellow-bordered box containing ten horizontal dotted lines for writing.

The properties and benefits of wool cont.

4. Wool is naturally fire-resistant, this is because it has a lot of nitrogen and water in it. It is used to keep houses warm and in furniture like my re-upholstered chair below, it acts as a fire retardant, which prevents the material from going up in flames if there were a fire.



Can you imagine wrapping a whole building in Felt to protect it from a fire?



Ella at the wool dying factory with huge bales of cleaned wool that are waiting to be dyed into different colours

This wool has been cleaned and scoured, heated and compressed allowing the fibres to come together naturally. It's called Felt.



Can you imagine a fantastical invention using these huge bales of wool?



From Sheep to Seat, Fleece to Floor

In 2019 I had an exhibition at Yorkshire Sculpture Park all about wool. I worked with the fleeces from the sheep that graze there. You can watch a short film on YouTube **"From Sheep to Seat, Fleece to Floor"** to learn about what wool has to go through in order to be made into something.

I also wanted to show the importance of reducing waste and supporting farmers, producers and renewable materials.



Click here to watch the short film or search for **From Sheep to Seat, Fleece to Floor**, on Youtube.



These are the sheep who produced the wool!



I created a large selection of colours (known as a palette) inspired by lots of elements from the park, the lake, the grass, the trees, and the buildings. I then painted swatches using watercolour inks on paper.



I then had to select the colours and find a matching Pantone colour so that we could dye the wool to match the chosen colours from my palette



The wool before it is cleaned and scoured



Examples of the first tests of wool colours from the factory...

Make your own colour palette

Create a colour palette of your local environment!

It could be your bedroom, or your street, or your local park!

Spot the colours you want to use and re-create them by mixing paints, or use coloured paper, or cuttings from magazines.

Why not give each colour it's own unique name?

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Can you find wool and other materials in these colours to use for your next challenge...

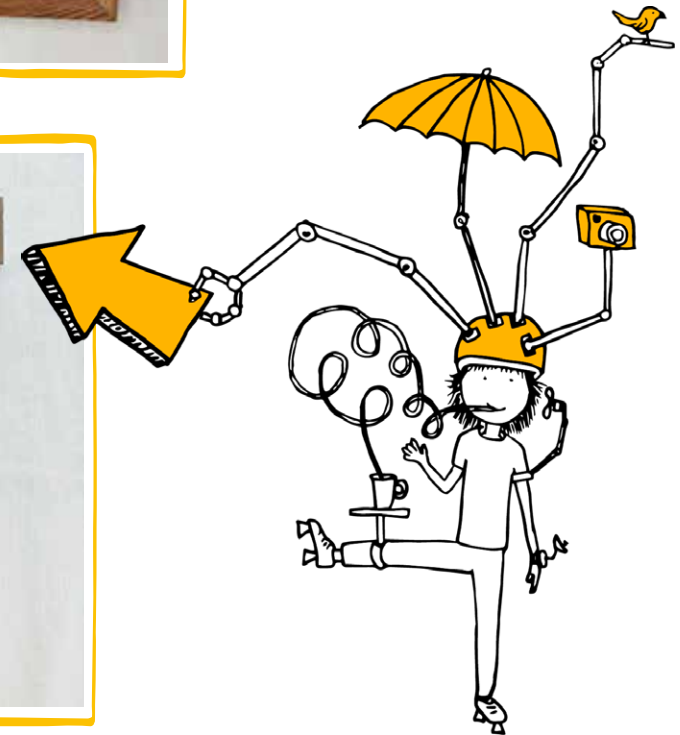
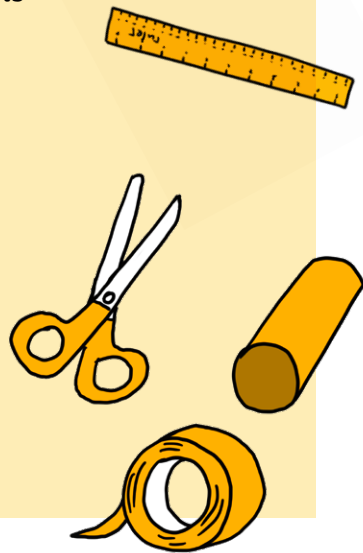


Make your own tapestry loom using wood or cardboard

To make your own tapestry frame follow the how to guide on the next page!

You will need:

- A wooden photo or picture frame (I picked this one up from Oxfam) you could also use a canvas frame by removing the old canvas, or make your own frame...
- Hammer and 1 inch nails
- Ruler
- Pencil
- Scissors
- Cardboard
- Fork
- **An adult to help!**





Collect as many types and colours of wool that you can to create your colour palette to get started with.



Make your own needle out of cardboard, with scissors



Make a mark with your pencil every 10mm across the top and bottom of your frame using your ruler and pencil. Then mark out a second line off set against the first...



1st apply a line of nails across your first line of marks 10mm apart across the top and then across the bottom of your frame....

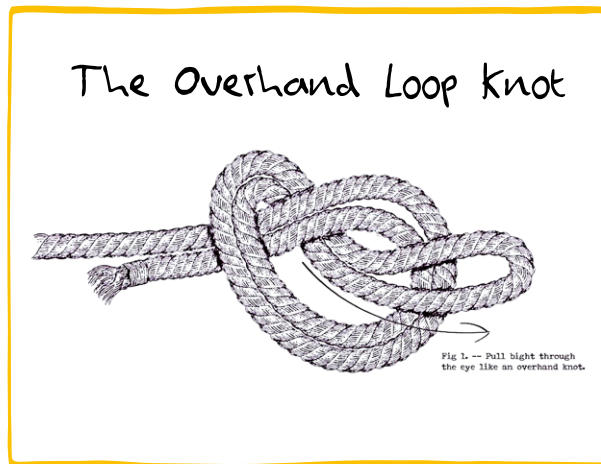




Then apply your second row of nails that are off set to the first row of nails approx 10mm beneath the 1st row, this allows for your warp to be closer together



Choose some wool to start making the warp I have chosen to do mine in yellow, what colour will you choose?



Create an overhand loop knot with your warp thread



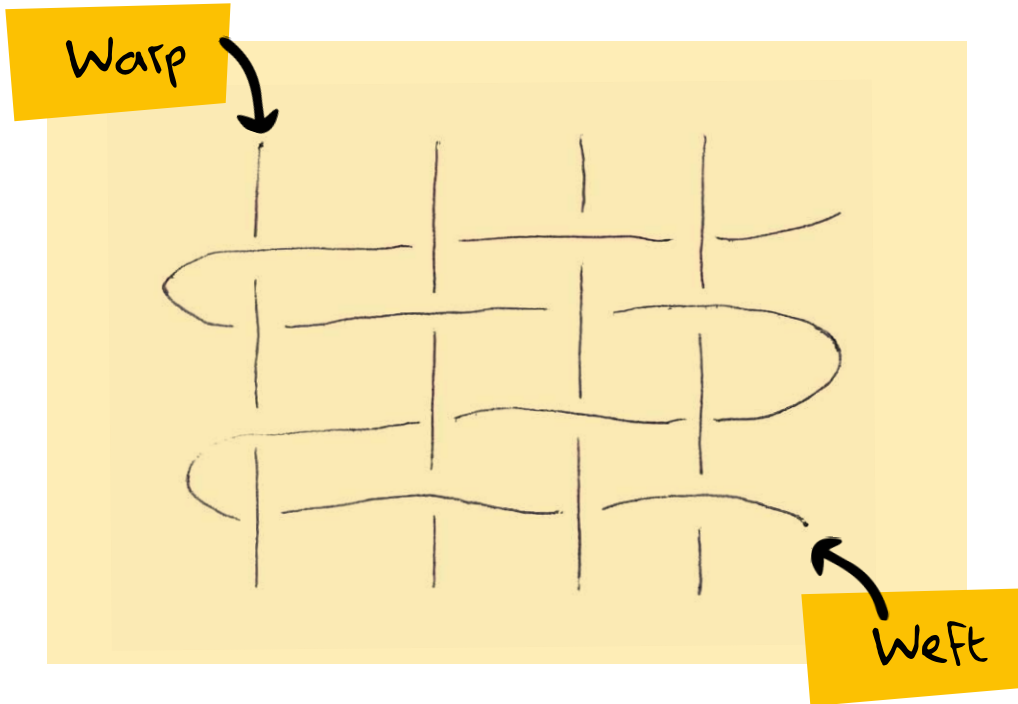
Now you can start to apply your warp.

See Ella making hers by watching the challenge film



Weave a tapestry using wool and other materials

Weaving is the criss-crossing of threads of wool to make cloth. The yarn is threaded to and fro across the vertical **warp** yarn through an over-and-under action called the **weft**.



You can also make a simple loom out of cardboard using scissors, a hole punch, cardboard and a stapler!





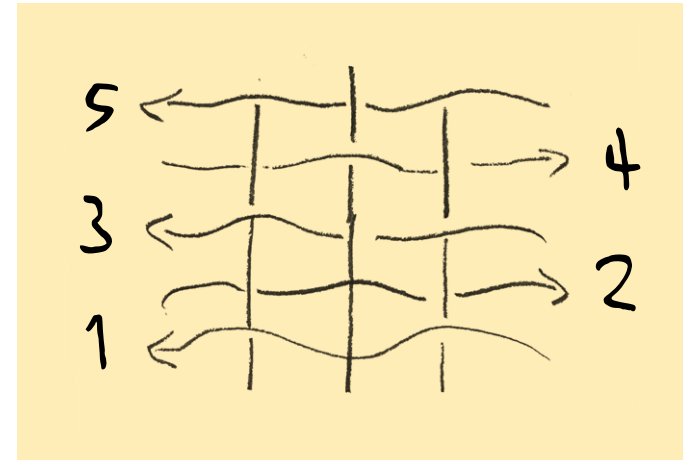
Once you have added the warp across the whole loom, you can then cut a piece of cardboard a little wider than your warp, and weave it through every thread (it's called a weft). This will help you weave quicker as explained on my video.



Use your fork to push down the warp or thread



To start you want to create a border in a plain weft, in and out one way and then back the other way about 5 times.



Using your home made cardboard needle is much easier to thread through, and change your wool colours as you wish.

Examples of materials you can use for hand weaving

Once you have started weaving you can introduce other colours and materials other than wool, here I have used:



Denim

(cut up from an old pair of jeans)

String

Ribbon



What materials and colours are you going to use for your tapestry?

How to create a tassel using wool

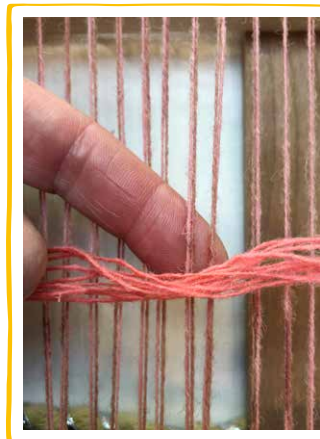
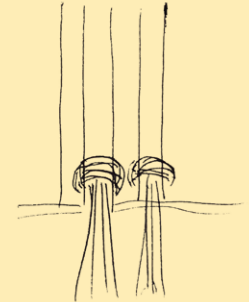
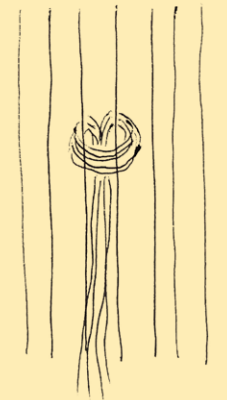
lengths of wool

loop

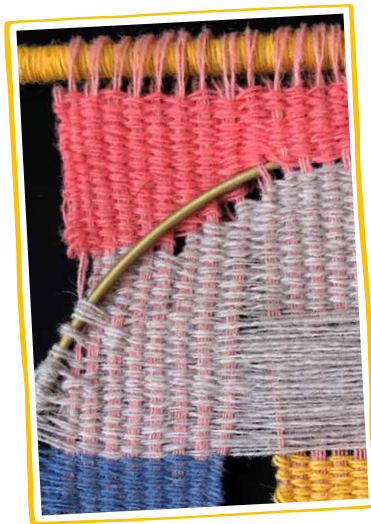
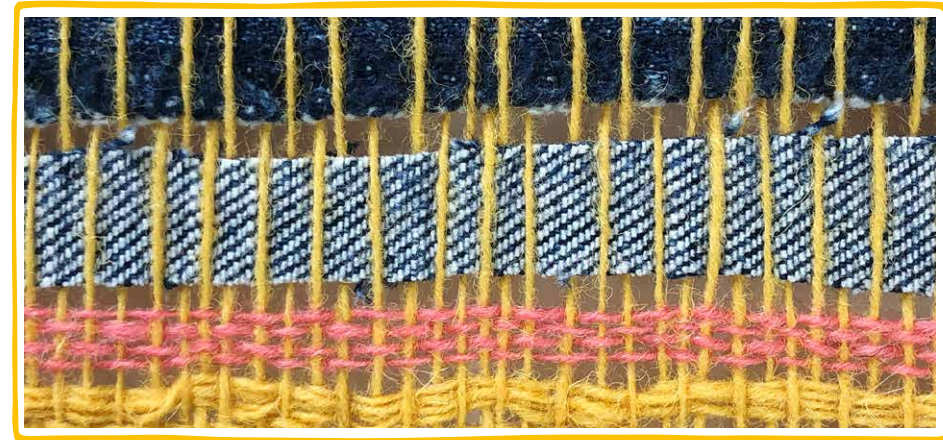
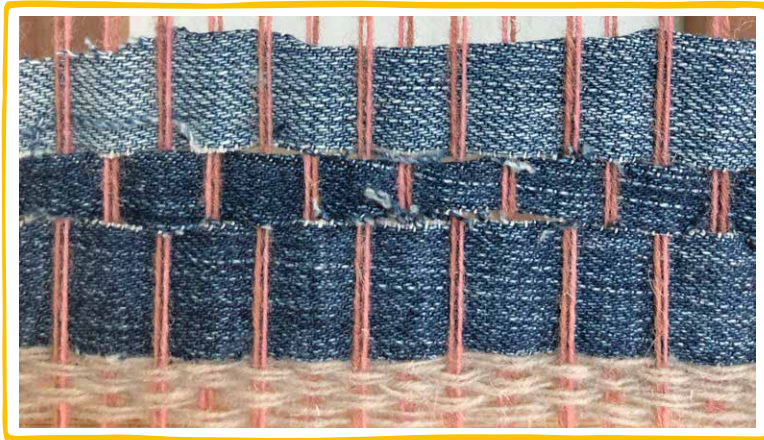


and thread through

pull down to the bottom



Experiments in weaving!



Here I have woven a metal hoop into the tapestry for decoration

This is an example of weaving and creating lots of tassels by hand on a tapestry loom

More creative techniques on a tapestry loom by weaving in objects

My wool invention

Now that you know about the genius properties of wool, and you have learnt about some of the things I have designed and made using this material, it's your turn to come up with an invention using wool...

Name it! ↴
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First name

Age

School

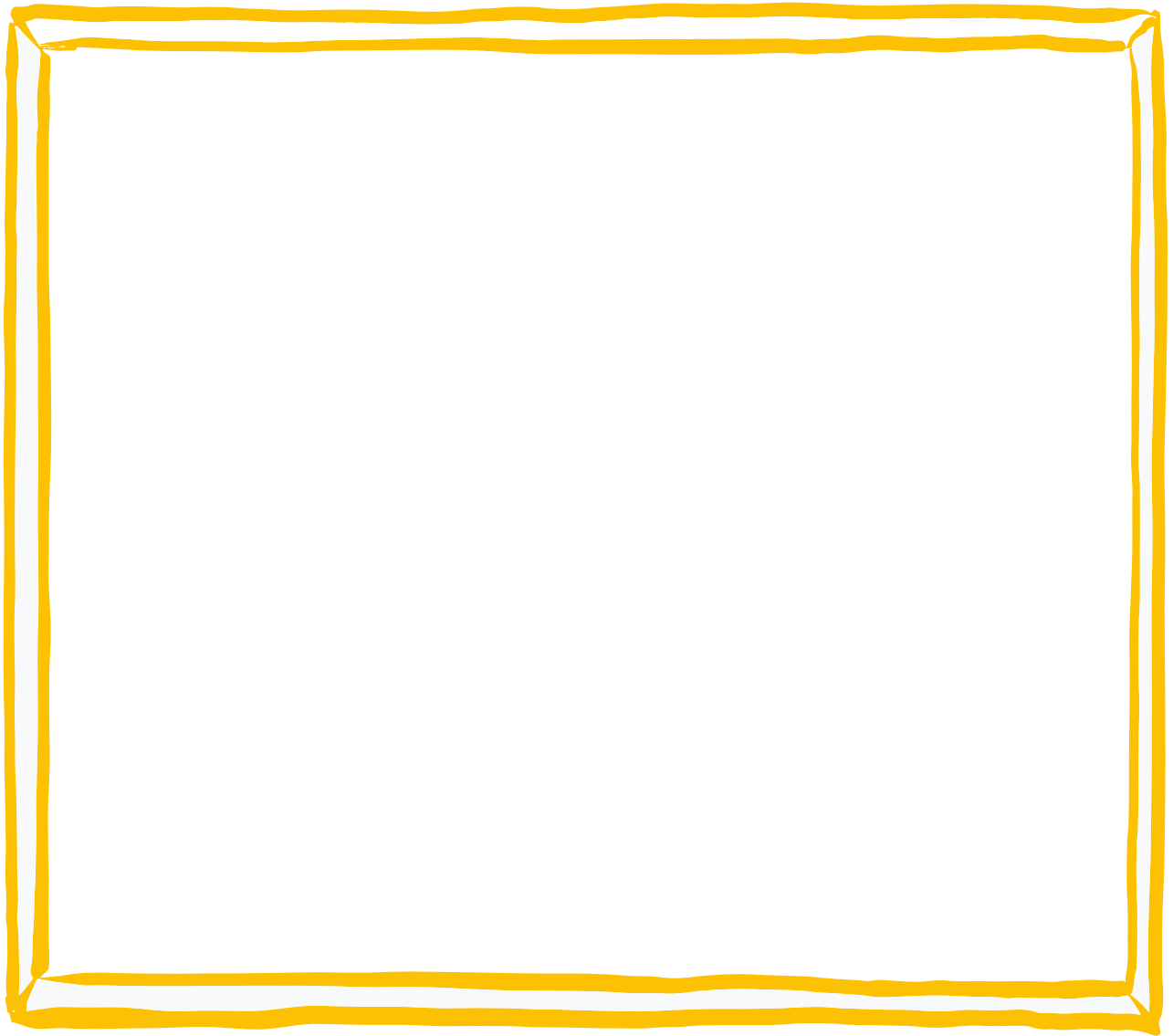
Town/city

Tell us more!

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

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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!