



The Curiosity Box



Vocal Visualiser

In your pack you have:

- 3 sticks
- A cardboard hoop
- Balloon
- A tiny mirror
- Rubber bands
- Sticky tack
- A laser pen*
- Scissors* & tape

CAUTION!
Do NOT point
the laser into eyes!
The laser pen
contains button
batteries.

Your mission: Make a machine that allows you to use your voice to make a laser light show

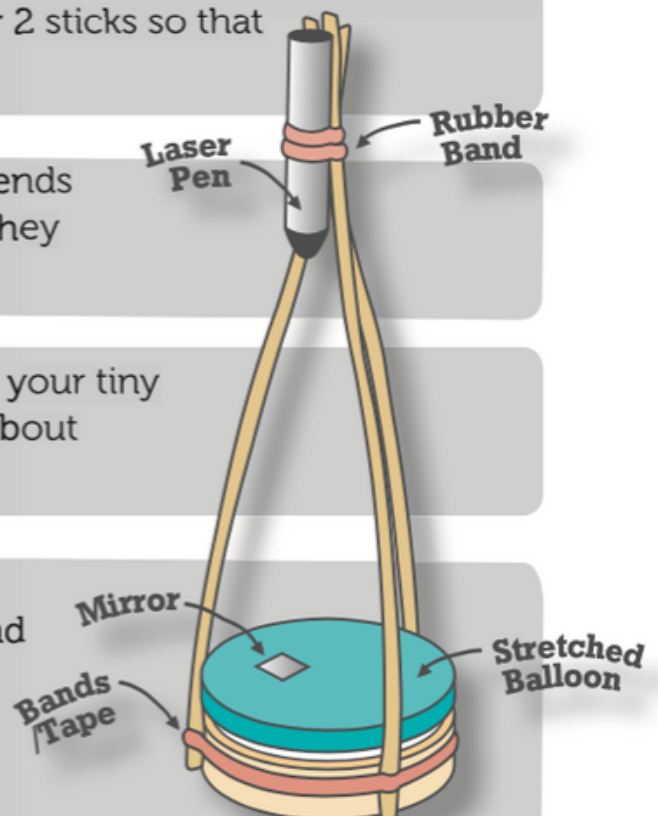
1 Cut 1cm off the neck of your balloon and stretch the remaining piece over the cardboard hoop – making sure it is very taut (tightly stretched). Secure it with some sticky tape.

2 Wrap a rubber band around the hoop. Gently poke one of the sticks under the rubber band. Be careful not to put a hole in the balloon. Then repeat with the other 2 sticks so that they are equally spaced.

3 Use another rubber band to tie the ends of the three sticks together so that they start to look a bit like a tipi tent!

4 Use a tiny dot of sticky tack to stick your tiny mirror onto the stretched balloon about 1cm from the edge.

5 Next you need to attach your laser. Firstly, wrap a rubber band around your laser pen, you will use this to keep the "on" button pressed down, so make sure you can move the band onto the "on" button.



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- 6** Now aim your laser at the little mirror and use the sticky tack to attach it to the point of your stick tipi.
- 7** Lay your visualiser on a flat surface with the mirror at the top. Making sure your laser is turned on, wiggle the laser until the red dot is reflected in the tiny mirror. This is tricky and may take a bit of time and patience to get right.
- 8** Now you are ready to see the sounds you make! Stand about 50cm away from a plain wall and hold the hoop to your mouth. You should see the little red dot of the laser reflecting from the mirror onto the wall.



Test it!

Make as many different sounds as you can and see what shapes they make! Blowing raspberries into the hoop is particularly cool. Ask your grown up to have a turn, do their sounds make the same shapes?



What's going on?

Every sound you make, whether that be singing, speaking, shouting or even burping, is actually a wave that travels through the air. Each different sound produces slightly different waves, some of them big and wide apart, some of them small and close together.

Each time one of your sound waves hits the balloon, it sends a vibration through the little mirror. The laser hitting the mirror also vibrates, creating a shape on the wall.

If you could take a slow motion film of your laser show, you would see that every different sound you make has a unique shape! Check out your **Get-Set Email** for a great video showing just that!