

Professor Brainstorm's Laughing Chickens

Safety First

Care should be taken when making a hole in the bottom of the yogurt pot. Please follow the instructions below carefully.
(An adult should do this job.)

About this Activity (Information for Parents and Teachers)

In this experiment we are going to make a sound in a rather unusual way. You will be amazed at the strange sounds you can make with just a yogurt pot and a piece of string.

This activity teaches children about:

- How sounds are made.
- How sound (pitch) changes with the size of an instrument.
- How sound (pitch) changes with the tension in the string.

What you Need

- A large yogurt pot
- A piece of string (15-20cm long)
- A jug of water
- A skewer (or other sharp pointed object) and an old chopping board



How to make your Laughing Chicken

(You can watch a video of how to make a Laughing Chicken on Professor Brainstorm's YouTube channel - search for 'Laughing Chicken')

First of all you need to make a small hole in the bottom of the yogurt pot. This is a job for an adult!

I have found the safest way to do this is as follows:

1. Drill a small hole - about 5 or 6mm diameter and just a few millimetres deep - into an old wooden chopping board*.
2. Place your yogurt pot on the chopping board with the base of the yogurt pot facing downwards - and with the centre of the yogurt pot directly above the small hole.
3. Now push the skewer down through the centre of the base of the yogurt pot.
4. Once you have made a small hole, you can lift the yogurt pot up and enlarge the hole slightly by gently wiggling the skewer. (Do not make the hole too large!)

(* Drilling a hole in the chopping board is not essential - but it does make the job a bit easier.)



How to make your Laughing Chicken (continued)

Now that you have a yogurt pot with a hole in the bottom, children can do the next few stages (with possibly a little help from an adult!):

1. Carefully thread one end of the string through the hole in the bottom of the yogurt pot. (If you have difficulty getting the string through the hole, try wrapping a short length of sticky tape round the end of the string.)
2. Tie a knot in the end of the string - so the knot is on the inside of the yogurt pot. (You may need to tie a double knot. The knot needs to be big enough so that the string does not come back through the hole when you pull it.)
3. Cut out a piece of paper which is just a bit smaller than one side of the yogurt pot. Draw a picture of a chicken on the paper - and use sticky tape to fasten the picture on to the side of the yogurt pot.)
4. Now make the string nice and wet. (One way to do this is to dunk the bottom of the yogurt pot into a jug of water - but make sure you don't get the picture wet!)

Now you are ready to make your chicken laugh. Hold the rim of the yogurt pot with one hand - and pull the string with the thumb and forefinger of the other hand. (Don't pull too hard. The idea is that your hand should slide down the string.)

How does it work? (This is the science bit)

- As you pull on string, your fingers tend to stick and slip - rather than sliding smoothly down the string.
- This means that the bottom of the yogurt pot gets pulled down a little, then springs back up, then gets pulled down again, and so on.
- So the bottom of the yogurt pot vibrates. (All of this happens very quickly, and the movements of the bottom of the yogurt pot are very small - so you can't actually see it vibrating.)
- As the bottom of the yogurt pot vibrates, it makes the air inside the yogurt pot vibrate as well.
- These vibrations travel through the air to your ears - which is how you hear the sound.

Experiments to try with your Laughing Chicken

There are several experiments that you can try to change the sound of your Laughing Chicken.

What happens if you use a different size of yogurt pot? Try making a Laughing Chicken using a small yogurt pot - or you can use a different type of container (such as a pot noodle tub, an ice cream container, etc). What do you notice about the sounds they make?

- Usually small sound sources make **high-pitched** 'squeaky' sounds, whereas large ones make a sound with a **lower pitch**. So you would expect the smallest yogurt pots to make sounds with a high pitch and larger ones to make lower sounds. (However, this isn't always the case with a Laughing Chicken - because the pitch of the sound also depends on the thickness of the base of the yogurt pot, the tension in the string, and several other factors.)
- You may also notice that the smallest yogurt pots make a quiet sound, whereas the largest ones make louder sounds. This is because the larger ones contain more air - and making more air vibrate increases the **volume** of the sound.

Experiments to try with your Laughing Chicken (continued)

What happens if you don't use a yogurt pot? Try holding up a piece of wet string. Pull down with your forefinger and thumb down the string (as you did with the Laughing Chicken). Does it make a sound?

It does - but you may have to hold the string close to your ear to hear it. In this case the sound is very quiet the string does not cause much air to vibrate. (So the yogurt pot **amplifies** the sound by making more air vibrate.)

Can you alter the sound in any other way?

- Try making a Laughing Chicken using a much longer piece of string (e.g. 40-50cm long). As you move your fingers further down the string you should notice that the pitch gets lower.
- You can also try changing the tension in the string. If you pull the string harder, the pitch should get higher. (But don't pull too hard - or you will pull the knot through the bottom of the yogurt pot!)