

# AT HOME!

## PROJECT NO.18

### Singing Wine Glasses

As family days out are put on hold, we've been thinking how we can make your family days in as much fun as possible.

Eureka! is the UK's only hands-on museum just for children aged 0-11. Full of exhibits to explore, helpful staff to engage with, activities to do and buttons to press. Based in West Yorkshire, we have brought smiles to the faces of over 8 million visitors since 1992. As families can't come to us, we are keen to bring a sample of the Eureka! experience to you.

Our expert staff have come up with a series of experiments that can be done at home, all designed to inspire children to get hands-on, have fun, and learn about themselves and the world around them.

Get experimenting and send us or share your pictures and videos using #EurekaAtHome and we'll share on our social media feeds too.

**WE'RE ALL IN THIS TOGETHER!**

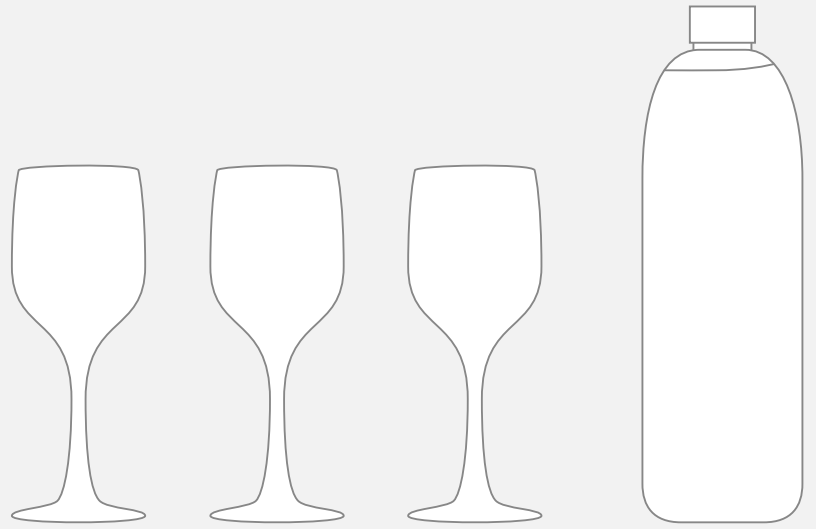


# SINGING WINE GLASSES

Get an adult to help you with the wine glass

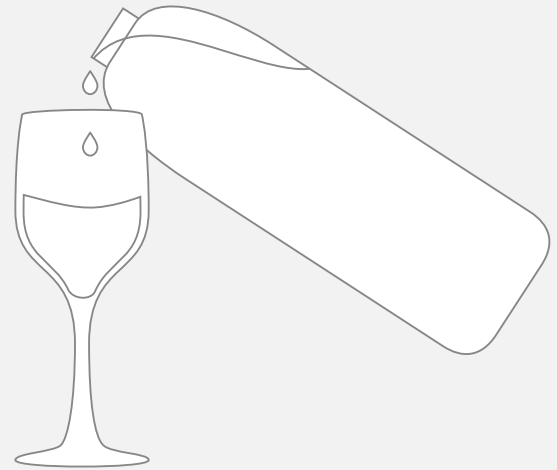
## YOU WILL NEED:

- Three identical wine glasses
- Water



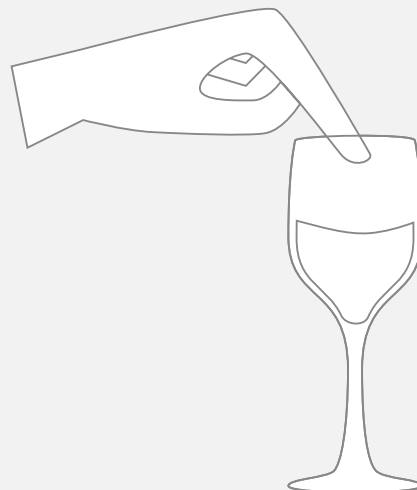
## STEP 1:

Fill your first wine glass half up with water and make sure the wine glass is placed on the middle of a table



## STEP 2:

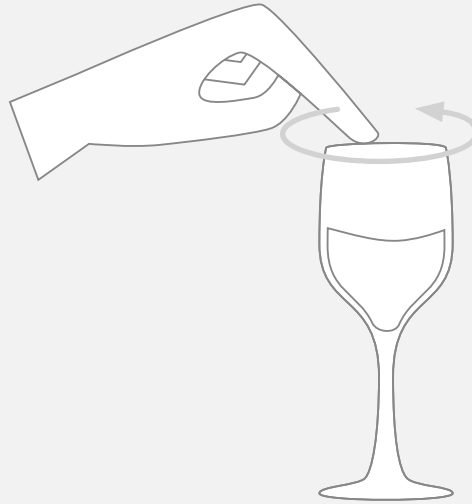
Press firmly down on the base of the wine glass to keep it in place and dip your finger in the water



# SINGING WINE GLASSES

## STEP 3:

Press down lightly on the rim of the glass and move your finger around the top of the glass. Notice the sound the wine glass makes as it "sings"



**Top Tip:**  
You might need to re-wet your finger to keep the sound going

## STEP 4:

Once you have practiced with one wine glass, pour less water into a second glass, and more water into a third glass. Run a wet finger round the rim of the other two wine glass and notice the different sounds



**Top Tip:**  
Don't press too firmly on the rim of the glass and keep your finger moving in a continuous movement. It does need a bit of practice to get it right.

# SINGING WINE GLASSES

## Why does this happen?

As your finger moves around the rim of the glass, you are making the glass vibrate. These vibrations travel through the air and make our ear drums vibrate – this is how we hear.

Every material (such as glass, steel, concrete) has a natural frequency at which it vibrates, called a resonant frequency. If you put energy into a material at its resonant frequency, you will force it to resonate (resonance = a forced vibration).

In the case of the wine glass, your finger slides and sticks along the surface of the glass as you rub the rim. The rubbing imparts energy to the glass molecules and when you find the right resonant frequency, it causes them to vibrate. The vibrating glass causes air molecules to vibrate at the same frequency. The vibrating air molecules are the sound wave that you hear (the frequency or pitch of the sound wave is the same as the resonant frequency of the glass).

So, how does the water change the pitch of the singing wine glass? When you add water to the glass the water acts as a dampener. It causes the vibrations to slow down. When things vibrate fast they produce a sound at a higher pitch, when they vibrate slower they will produce a sound with a lower pitch.

With our singing glasses, when there is more water in the glass, the pitch of the sound produced is lower because the water has caused the glass to vibrate slower. When there is a smaller amount of water in the glass the pitch is higher because the glass is vibrating faster.

## What other activities can I do?

There are few different ways to experiment further with vibrations and water. What happens when you pour water in the glass at the same time as you run your finger around the rim? What happens when you slowly lower the glass into a big bowl of water as you play it, what happens to the sound?

