

sciencemuseumoutreach

# Kitchen Science 2

Demonstrations to do at home



**The Creative Canal Project (CCP)** is part of the Science Museum's Outreach Department, which works with teachers, students, families and a huge range of community groups. CCP itself is a partnership between The Science Museum, The London Canal Museum and Beauchamp Lodge Settlement who run the largest floating classroom boat on Regent's Canal. The aim of the project is to excite people about science by making it fun and accessible. We work with groups close to Regents Canal in order to give them a different perspective of their local environment and encourage them to use it. CCP helps to bring new audiences to the Canal Museum and the Science Museum, making people aware of the resources available to them.

Kitchen Science is a collection of demonstrations that people can do at home, with everyday ingredients available from the supermarket or the chemist. We want to show that demonstrations do not have to be done in a laboratory, by people in white coats. Instead, science is involved in all aspects of people's lives.

**Please try this at home!**



## Milk Magic

### Props

- 1 pint whole milk
- Flat plate
- 4 different colours of food colouring
- Washing-up liquid
- Cotton buds
- Pipette

### Demonstration

- 1) Pour enough milk in the plate to cover the bottom.
- 2) Using the pipette, add one drop of each food colouring near the middle of the milk.
- 3) Dip a cotton bud in the washing-up liquid.
- 4) Place the bud in the centre of the milk.
- 5) Watch the colours swirl!

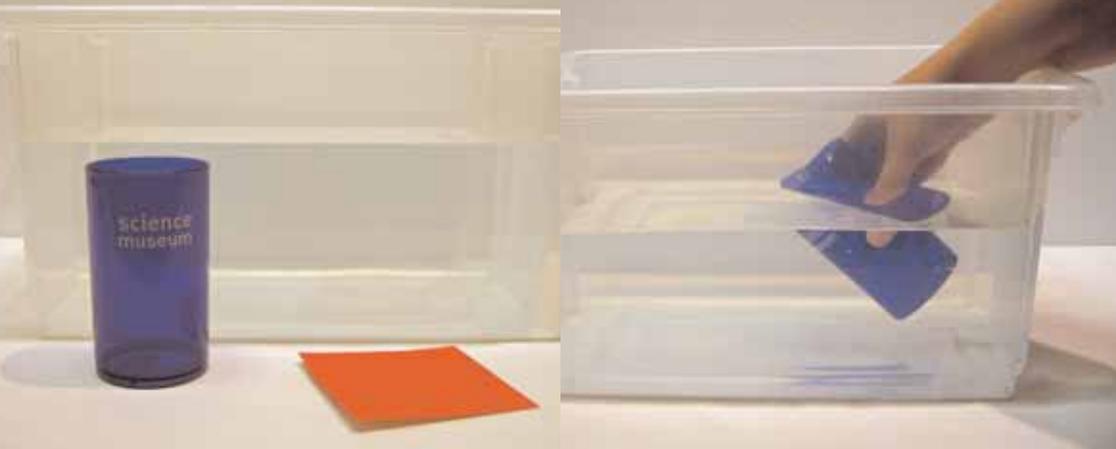


## Science

- Milk is made of water, vitamins, minerals, proteins and fats.
- When the washing-up liquid is added, it makes the fats and proteins in the milk spread out.
- This happens very quickly causing the liquid to swirl.
- The food colouring molecules bump together, letting us see the usually invisible activity.
- This is why we use soap for washing up.

## Tips

- Don't stir the milk, just touch it with the tip of the cotton bud,
- Try placing cotton buds at different places in the milk.
- Repeat the demonstration using water instead of milk. Will you get the same reaction of colour?



## Gravity Defying Water

### Props

- Bucket of Water
- A glass
- Thick card

### Demonstration

- 1) Dip the glass into a bucket of water; bring it out, full to the brim.
- 2) Place the card on the top of the glass and rub.
- 3) Turn the glass over, while holding onto the card.
- 4) When the glass is upside-down let go of the card and the water and card should stay in place.



## Science

- In order for the water to fall out of the glass, air has to replace it.
- This cannot happen, as the water on the rim of the glass has formed a seal with the card.
- As well as this the air pressure in the room is pushing up on the card.
- Although the water seal is relatively sticky, it will not last forever.
- In time gravity will break the seal by pulling the card and the water down.

## Tips

- Always keep the card flat.
- A piece of laminated card will also work.



## Fizzy Fountain

### Props

- 1 roll of Mentos (mint sweets)
- Piece of paper
- 2 Two litre bottles of lemonade (preferably diet)
- Plastic box

### Demonstration

1. Put the bottle of lemonade into the plastic container.
2. Slowly open the lid.
3. Open the packets of Mentos.
4. Fold the paper to make a funnel.
5. Put the funnel into the bottle opening.
6. Pour the Mentos into the funnel and lemonade.
7. Stand back and watch!



## Science

- Lemonade has a gas in it called carbon dioxide or CO<sub>2</sub>.
- The gas is put in the lemonade at the bottling factory under pressure.
- The surface tension of the lemonade holds the carbon dioxide (CO<sub>2</sub>) in.
- Mentos contain gum arabic; whose proteins break down the surface tension, releasing the gas.
- When the gas is released quickly, it takes the lemonade with it.

## Tips

- Tic Tacs also work instead of Mentos.
- This demonstration is best done outdoors due to the height of the eruption and the mess it creates.
- Use diet fizzy soft drinks where available.



## Table Cloth Demonstration

### Props

- Shiny tablecloth
- 2 cups
- 1 teapot
- Smooth table

### Demonstration

1. Put the shiny tablecloth on the table leaving half of the cloth hanging over the side.
2. Put the cups and teapot on the tablecloth.
3. Hold the hanging tablecloth in your hands tightly.
4. Quickly pull the tablecloth back and down.
5. The cups and teapot will stay where they are.



## Science

- The tablecloth and the table are both smooth.
- There is not much friction between the two, and when you pull the tablecloth away, it can slide out from under the crockery.
- The crockery stays on the table, because gravity is pulling them down.

## Tips

- Put the teapot and cups in a triangular formation on the cloth.



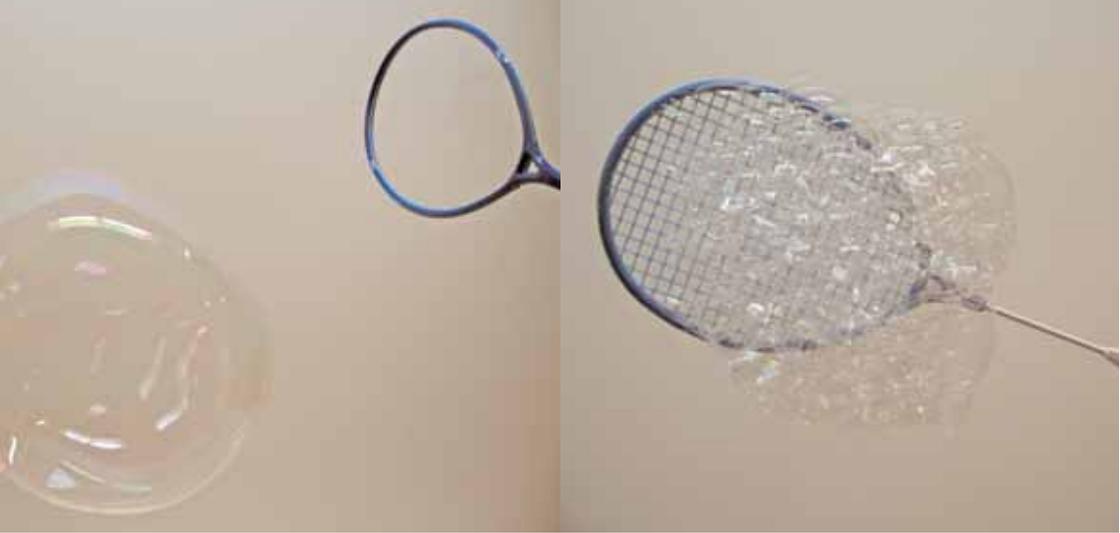
## Bubble Trouble

### Props

- 7 litre bucket of water
- 500ml washing-up liquid
- 500ml Glycerol (Glycerine)
- 1 tennis racket with strings
- 1 tennis racket without strings

### Demonstration

- 1) Add the glycerol and washing-up liquid to the water.
- 2) Stir until all the detergent is thoroughly mixed.
- 3) Make the biggest bubbles you can using the tennis rackets.



## Science

- A bubble is a thin film of liquid surrounding a pocket of air.
- Water is not flexible enough to hold the air, so soap is added to make the water more elastic (the surface doesn't burst when air is forced inside it).

## Tips

- Almost anything can be used to make a bubble wand, try a metal coat hanger.
- When making the bubble mix, use a little warm water first to dissolve the glycerol,
- Bubbles work best if dust, dirt or dry surfaces are avoided.
- Blow a few bubbles onto a plate and put them in the freezer, see what happens.

## Glossary

**air pressure** – a force made by a gas when it presses against an area.

**carbon dioxide or CO<sub>2</sub>** – a gas that is made when people and animals breathe out or when carbon is burned.

**crockery** – plates, cups, and other dishes.

**friction** – a rubbing force; when a surface rubs against something making it harder to move.

**gravity** – a natural force that makes objects fall to the ground.

**gum arabic** – a substance that comes from trees and is used in food.

**liquid** – a substance, like water, that is not a solid and can be poured easily.

**minerals** – chemicals that your body needs to stay healthy.

**molecules** – everything is made from molecules. They are the smallest part of everything.

**pressure** – the force made by a liquid or a gas when it presses against an area.

**proteins** – something found in foods like meat, cheese, fish or eggs; the body needs it to grow.

**reduce** – to make something less. e.g.: I want to reduce the amount of rubbish I throw away.

**replace** – to take the place of something else. e.g.: I will replace the broken window with a new one.

**seal** – a way to keep something closed, maybe to stop air or water getting in. e.g.: The bottle has a tight seal to stop the liquid inside coming out.

**smooth** – a regular surface that has no lumps or holes in it.

**surface tension** – a natural force in a liquid which holds its surface together.

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