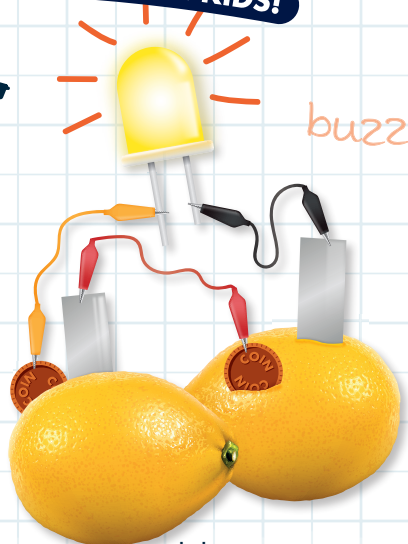
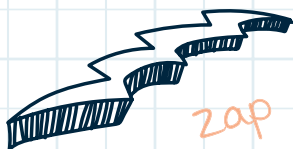


SCIENTISTS = FUN!  
KIDS

# EXPERImake

CREATED BY SCIENTISTS. FUN FOR KIDS!



## WARNING

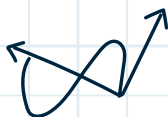
Not suitable for children under 8 years. For use under adult supervision. Contains some chemicals which present a hazard to health. Read the instructions before use, follow them and keep them for reference. Do not allow chemicals to come into contact with any part of the body, particularly the mouth and eyes. Keep small children and animals away from experiments. Keep the experimental set out of reach of children under 8 years. **Warning.** Children under eight years can choke or suffocate on uninflated or broken balloons. Adult supervision required. Keep uninflated balloons from children. Discard broken balloons at once. It is advisable to wash the balloons before using them and to use an air pump to fill them. Warning. Balloons are made of natural rubber latex.

EXPERIMENTS IN  
THE KITCHEN

FUN  
FACTS  
INSIDE

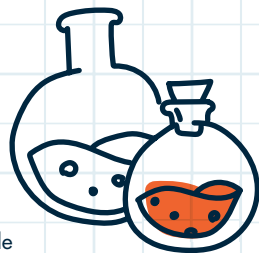
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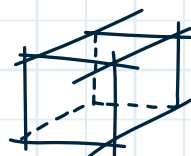
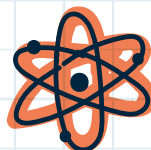
## Advice for Supervising Adults

- Read and follow these instructions, the safety rules and the first aid information, and keep them for reference.
- The incorrect use of chemicals can cause injury and damage to health. Only carry out those experiments which are listed in the instructions.
- This experimental set is for use by children over 8 years.
- Because children's abilities vary so much, even within age groups, supervising adults should exercise discretion as to which experiments are suitable and safe for them. The instructions should enable supervisors to assess any experiment to establish its suitability for a particular child.
- The supervising adult should discuss the warnings and safety information with the child or children before commencing the experiments. Particular attention should be paid to the safe handling of acids, alkalis and flammable liquids.
- The area surrounding the experiment should be kept clear of any obstructions and away from the storage of food. It should be well lit and ventilated and close to a water supply. A solid table with a heat resistant top should be provided.
- Substances in non-reclosable packaging should be used up (completely) during the course of one experiment i.e. after opening the package.
- This set contains colourings which can stain. Keep away from objects and delicate fabrics.



# Safety Rules

- Read these instructions before use, follow them and keep them for reference.
- Keep young children and animals away from the experimental area.
- Store this experimental set out of reach of children under 8 years.
- Clean all equipment and surfaces before and after use.
- Ensure that all empty containers and/or non-reclosable packaging are disposed of properly.
- Wash hands before and after carrying out experiments.
- Do not use any equipment which has not been supplied with the set or recommended in the instructions for use.
- Do not eat or drink in the experimental area.
- Do not allow chemicals to come into contact with the eyes or mouth.
- Make sure that all containers are fully closed and properly stored after use.
- Do not replace foodstuffs in the original containers. Dispose of immediately.
- Take care handling hot water and hot solutions.
- Contains glass that could break.
- Discard all food used in carrying out experiments.



## Contents

Red food colouring (10ml)

2 balloons

Pipette

Large measuring cup

2 small measuring cups with lids

2 plastic test tubes with lids

Wooden spatula

Black card

Paintbrush

Wool

Wooden stick

Funnel

2 pipe cleaners

Volcano mould

4 pairs of crocodile clips



LED (Light Emitting Diode)

Paper clip

2 Zinc plates

# Chemicals Supplied and Warnings

Keep all containers tightly closed. Store in a cool, dry place.

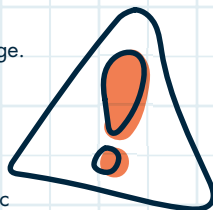
| Substance/ID                     | Hazard and Precautionary Statements       |
|----------------------------------|---|
| <b>Red Food Colouring (E129)</b> | Do not ingest. Avoid contact with eyes.   |
| CAS # 25956-17-6                 | Use only in accordance with instructions. |

## Disposal of Used Chemicals and Packaging

When you need to dispose of chemical substances, it is necessary to refer to the national and/or local regulations. Never throw chemicals into sewers and garbage. For more details please refer to a competent authority. For disposal of packaging make use of the specific collection points.

**Please recycle all packaging where possible.**

Help the environment by disposing of your product responsibly. The wheelie bin symbol indicates the product and batteries must not be disposed of in the domestic waste as they contain substances which can be damaging to the environment and health.



## General First Aid Information

- **In case of eye contact:** Wash out eye with plenty of water, holding eye open if necessary. Seek immediate medical advice.
- **If swallowed:** Wash out mouth with water, drink some fresh water. Do not induce vomiting. Seek immediate medical advice.
- **In case of inhalation:** Remove person to fresh air.
- **In case of skin contact and burns:** Wash affected area with plenty of water for at least 10 minutes.
- In case of doubt, seek medical advice without delay. Take the chemical and its container with you.
- In case of injury always seek medical advice.

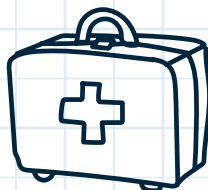
**In case of emergency dial:**

**UK 999 • Europe 112**

**USA 911 • Australia 000**

**Write the telephone number of the national poison information centre or local hospital below.**

**They may provide you with information about measures to take in case of intoxication.**



# Welcome to the Wonderful World of Science!

**EXPERIMAKE** science sets have been designed by scientists to encourage **learning** through **play**.

Science, Technology, Engineering & Maths (STEM) education is important and each set will enable the development of at least two of these skills.

The **skills** and **knowledge** gained are essential for children's learning.

**EXPERIMAKE** sets not only support education but are fun and enjoyable for parents too.

When having fun, or making discoveries, a neurotransmitter called **dopamine** is released. Dopamine helps control the brain's **reward centre**.

When we have a positive experience and dopamine is released, we are more likely to remember it.

So, if learning is a positive experience it will stimulate the brain to help develop various skills.

**EXPERIMAKE** sets are **educational toys** that combine **science** and **creativity** by fostering curiosity and experimentation.

We hope you enjoy exploring the wonderful world of science through our **EXPERIMAKE** range.

Inventive, creative and imaginative, STEM toys are educational, teaching new skills and knowledge and are (most importantly) lots of fun!



## Technology

Encouraging problem solving and methodology skills.



## Engineering

Encouraging design, building, and inventing skills.



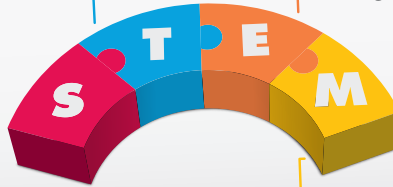
## Science

Encouraging a curiosity for the world around us.



## Maths

Exploring different ways of getting children to think about numbers.



Why not share your results with us?



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hello@addoplay.com

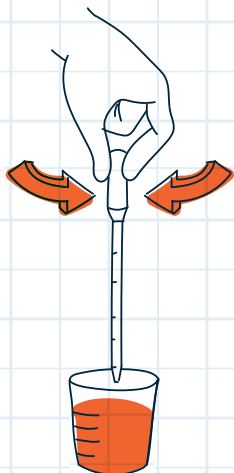
## Before You Start...

### How to Use Your Pipette

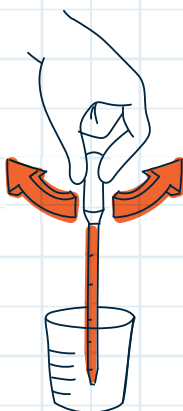
A pipette is used to collect liquid in small amounts and move from one container into another. It lets you control the amount of liquid you are adding by releasing a drop at a time. Before you begin with the experiments, you should practice using a pipette. The soft and squidgy end is called the **bulb** and the other end is called the **tip**.

1. Fill a small container with water, squeeze the bulb and place the tip into the water.
2. Slowly release the bulb until you see water filling up the tube.
3. Now that you have collected the liquid you can release it again in small drops. To do this, remove the pipette tip from the liquid and press the bulb lightly. You will see the drops come out one by one.

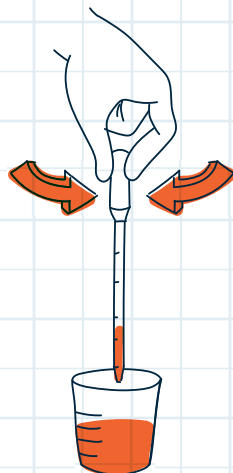
1.



2.



3.

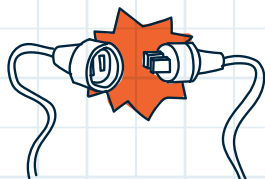


**Tip:** To avoid contamination, always use the same pipette for the same solution.

# Kitchen Safety

**There are many dangers in the kitchen, just like a laboratory. To avoid injury or fire, follow these rules and always make sure there is a supervising adult with you.**

**1.** Don't touch electrical or electronic equipment, especially if your hands are wet.



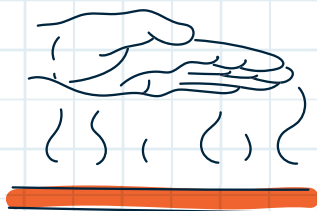
**2.** Don't leave cloths or towels near the cooker because they can catch fire.



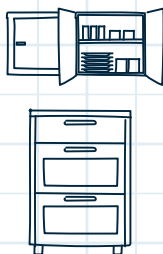
**3.** Always ask an adult for help to use the oven, hob, knives or kitchen scissors.



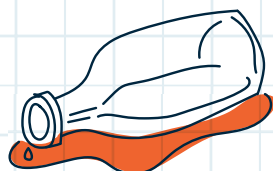
**4.** Always keep away from hot surfaces.



**5.** Ask an adult for help to reach high cupboards or shelves, and always keep doors and cupboards closed.



**6.** To avoid falls, don't leave anything on the floor. Clean up any spills immediately.



# EXPERIMENTS

## 1. Jumping Pepper

### You will need

Balloon, wooden spatula, sea salt (not included but any salt will work), pepper (not included but black pepper works best), plate (not included).

### Steps

1. Pour equal measures of salt and pepper onto the plate, and mix well with the wooden spatula.
2. Blow up and tie the end of the balloon.
3. Rub the balloon energetically on your hair for 30 seconds.
4. Hold the balloon near the mixture (about 20cm away) and slowly move the balloon closer to the plate.
5. Observe the results.

### Explanation

The pepper grains are attracted to the balloon through static electricity.

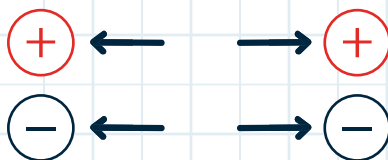
At rest, the balloon has a neutral electric charge. When it is rubbed on your hair, it becomes negatively charged.

Both salt and pepper have a positive charge at rest and are both attracted to the negatively charged balloon. The pepper "jumps" first because it is lighter than salt.

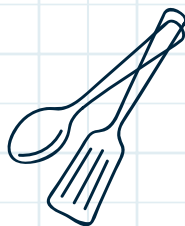
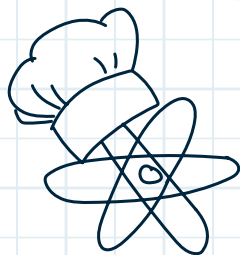
### Did You Know?

Only insulating materials such as plastic can hold static charge. Conductive materials such as metals, don't have the ability of retaining electric charges because they conduct electric current.

Charges of the same polarity repel each other



Charges of the opposite polarity attract each other



## 2. The Explosive Power of Lemons

### You will need

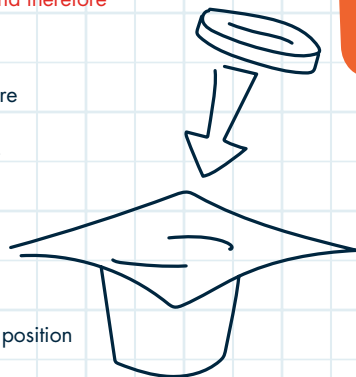
Small measuring cup with lid, bicarbonate of soda (not included), the juice of half a lemon (not included), toilet paper or thin tissue at least 5x5cm square (not included), tea spoon (not included).

**⚠ Attention!** Please note: your rocket will explode very forcefully and therefore you must take care and stand well back!

### Steps

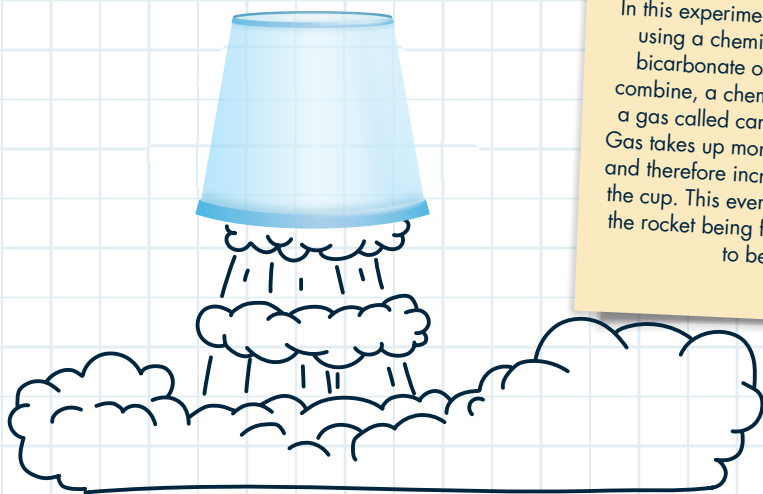
1. Protect your launch area with a waterproof cover and ensure there is a clear space above so your rocket can launch without causing damage. You might prefer to do this experiment outside.
2. Add 10ml of lemon juice into your rocket (small measuring cup).
3. Place the tissue over the end of your rocket as shown below.
4. Put a teaspoon of bicarbonate of soda on the tissue.  
Be careful that it doesn't come into contact with the lemon juice.
5. Carefully put the lid on the rocket. Make sure it is completely closed (you will hear a click) otherwise it will not launch.
6. Count to 3 and quickly place the rocket lid-side down, in launch position on the protected surface and stand well back (see diagram).
7. Observe the results.

**⚠ Attention!** When you have finished the experiment, throw away all used food.



### Explanation

In this experiment, you launched a rocket using a chemical reaction. When the bicarbonate of soda and lemon juice combine, a chemical reaction occurs and a gas called carbon dioxide is released. Gas takes up more space than solid matter and therefore increases the pressure inside the cup. This eventually results in the lid of the rocket being forced off and the rocket to be launched.



### 3. The Power of Lemons

#### You will need

LED, 4 pairs of crocodile clips, 2 zinc plates, paperclip, 1 to 3 lemons (not included), 1 to 3 copper coins (not included)

#### Steps

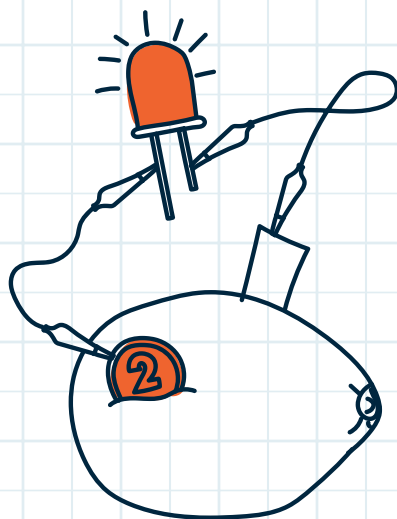
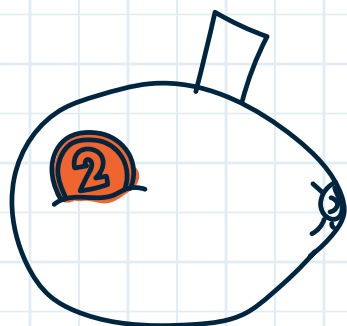
1. Insert a zinc plate and copper coin into one of the lemons, leaving some distance between the two objects.

**Note:** Make sure the metal parts do not touch each other inside the lemon.

2. Attach one end of a crocodile clip to the copper coin, and the other end to the longest leg of the LED.

**Note:** This position is very important.

3. Using another crocodile clip attach the short leg of the LED to the zinc plate.

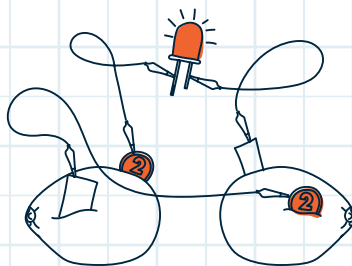


4. Observe the result.

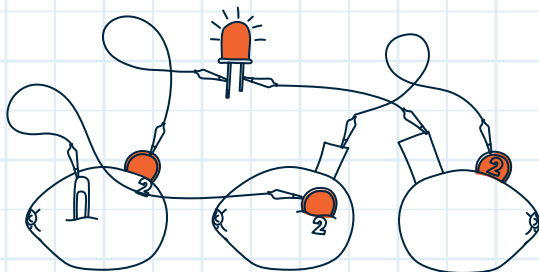
**Note:** You should look very carefully to see the result because one lemon only produces a small amount of power.

## Suggestion

Try connecting 2 lemons for additional power, and observe the results.



Then try 3 lemons for maximum effect. You will need to use the paperclip instead of another zinc plate on the third lemon. Observe the results.

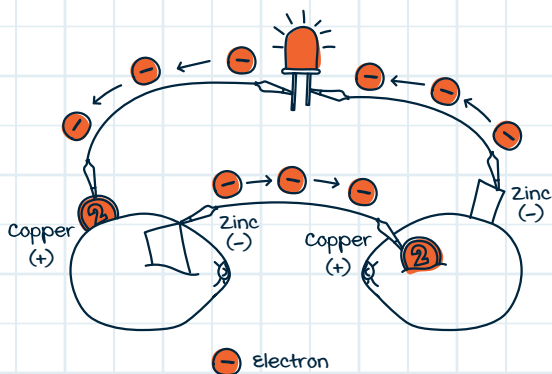


You could also try alternative fruits and vegetables, such as potatoes or oranges. Observe how using different sizes and types of fruits or vegetables affects the results.

## Explanation

You have generated electricity through lemons. When you insert both metals in the lemon, a chemical reaction occurs which is called an electrochemical reaction. The copper coins work as a positive electrode or anode, and the zinc plate works as a negative electrode or cathode.

Electrons (particles with negative energy) pass through the connecting wires from the zinc plate to the copper coins creating an electric current, and so light the LED.



**⚠ Attention!** When you have finished the experiment, throw away all used food.

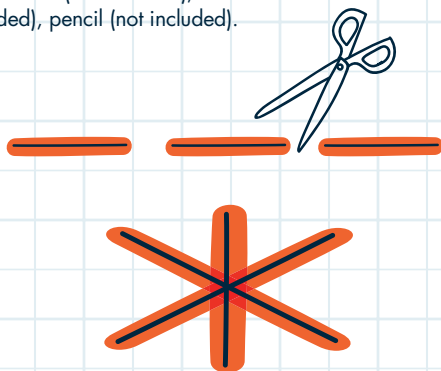
## 4. Creative Crystals

### You will need

Pipe cleaners, wool, wooden spatula, small measuring cup, sea salt (not included), scissors (not included), water (not included), 2 cups (not included), pencil (not included).

### Steps

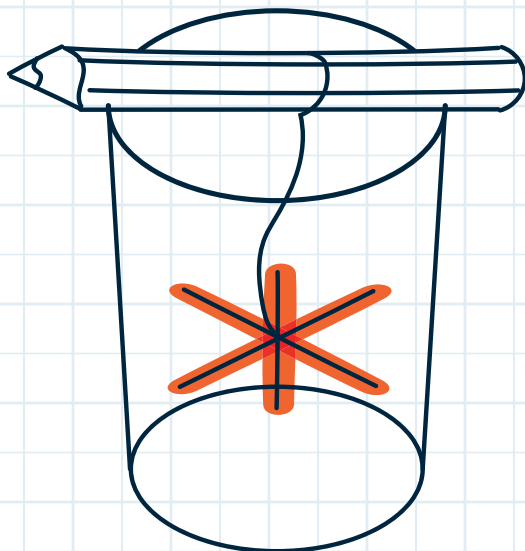
1. Ask an adult to help you use scissors to cut 1 pipe cleaner into 3 equal parts.
2. Bend the 3 parts together to make a 6 tip star as shown.
3. Cut a length of wool and tie it around the star so that you can hang it. Fix the other end to a pencil. Then put the star inside a cup as shown. Try to make the star stay in a horizontal position.
4. In the other cup prepare a solution of sea salt, mixing 50ml of sea salt with 100ml of hot water and stir well. Ask an adult for help.
5. Pour the solution into the cup with the star.
6. Be patient and wait to observe the results.



### Explanation

When you dissolve the sea salt in hot water, you are creating a supersaturated solution. The solubility of salt decreases quickly with the reduction in temperature, which causes the salt to crystallise.

In this experiment, the pipe cleaner provides a surface for the salt crystals to form, creating a beautiful crystal star.



## 5. Crystal Messages

### You will need

Red food colouring, large measuring cup, small measuring cup, pipette, wooden spatula, paint brush, black card, hot tap water (not included), sea salt (not included), cup (not included).

### Steps

1. Measure 25ml of sea salt into the large measuring cup.
2. Add 50ml of hot tap water to the large measuring cup and stir using the wooden spatula until the salt dissolves. You could also add a few drops of red food colouring.

**Note:** You might need to re-heat the solution to help it dissolve. Take care with hot water.

3. Dip the paintbrush in the solution and write or draw something on the black card.

**Note:** It is important to keep mixing the solution and to wet the paintbrush for each stroke.

4. For best results, repeat over your original design.
5. When you have finished, ask an adult to put the black card somewhere warm. Let the card rest until the water evaporates completely.
6. Observe the results.

### Explanation

Salt dissolves in water. When the water evaporates only the salt molecules remain on the card, leaving behind your crystal design.

Salt is a solute which dissolves in the water; water is a solvent.

When a solute dissolves in a solvent it creates a solution.

A solvent is a substance capable of dissolving another. Whereas a solute is a substance which dissolves in another.

## 6. Volcanic Eruption

### You will need

Red food colouring, volcano mould, small measuring cup, pipette, wooden spatula, teaspoon (not included), bicarbonate of soda (not included), flour (not included), vinegar or lemon juice (not included), deep plate (not included).

### Steps

1. Place the volcano mould in the centre of the deep plate.
2. Add 1 teaspoon of bicarbonate of soda and  $\frac{1}{2}$  a teaspoon of flour inside the volcano and mix well.
3. Measure 15ml of vinegar or lemon juice in the small measuring cup.
4. Using the pipette add 4 drops of red food colouring into the vinegar and stir with the wooden spatula.
5. Pour the solution inside the volcano and observe the results.

**⚠ Attention!** When you have finished the experiment, throw away all used food.

### Explanation

You have simulated what happens during a volcanic eruption with a chemical reaction. The chemical reaction you just observed is an acid-base reaction, in which bicarbonate of soda (a base) reacts with the acetic acid (which is present in both the vinegar and lemon juice) to release carbon dioxide ( $\text{CO}_2$ ). **Please note:** this is not what happens inside a volcano. This experiment is to show what a volcanic eruption looks like.

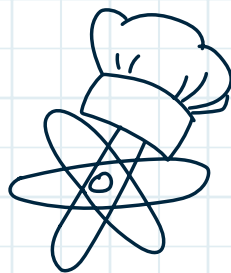
## 7. Tantalising Tomato Juice

### You will need

Test tube, funnel, wooden stick, large measuring cup, seeded fruit, for example strawberries, raspberries, or tomato, tea bag (not included), bowl (not included), fork or spoon (not included).

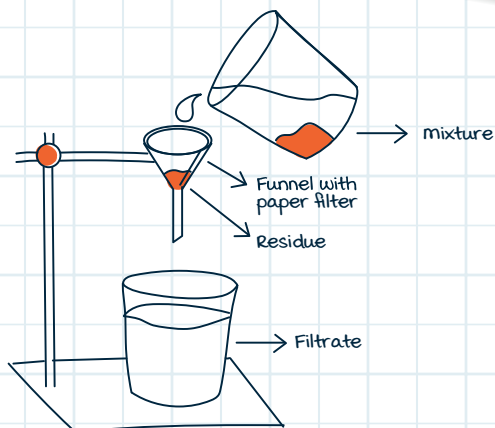
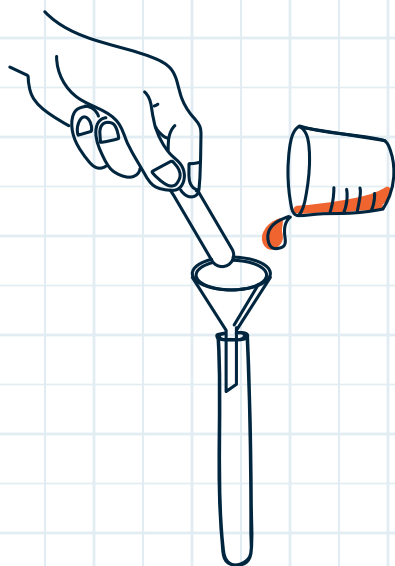
### Steps

1. Carefully empty the contents of the tea bag.
- Ask an adult for help. Put the empty tea bag in the funnel as a filter.
2. Using a fork or spoon, mash the seeded fruit in the bowl.
3. Put the funnel into the test tube and carefully spoon the mashed fruit into the funnel.
4. Use the wooden stick to swirl the liquid to help it trick through.
5. Observe the results.



### Explanation

The tea bag retains the seeds and pulp because they are bigger than the holes or pores in the tea bag. The juice passes freely into the test tube. This process of separating mixtures is called filtration and is often used by chemists in the laboratory.



**Congratulations!** You are on your way to achieving your **experimake certificate**.

To claim your certificate collect **3** of these tokens and send them to us.



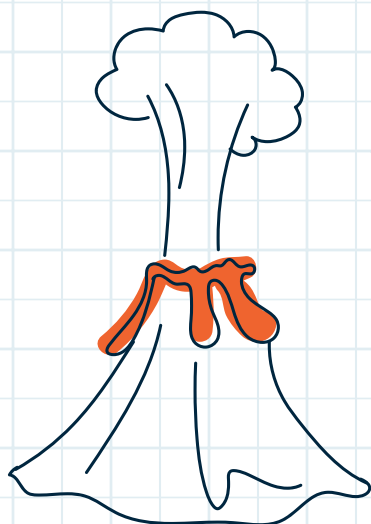
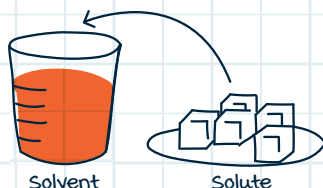
Alessandro Volta built the first electrical battery in 1800. This battery, today called voltaic pile or galvanic pile, was built with zinc (Zn) and copper (Cu) discs, alternated with pieces of cloth soaked in a salty or acid (vinegar) solution. This battery has two electrodes: one negative (zinc) and another positive (copper).

A **solution** is a mixture where one of the substances dissolves in the other. The substance that dissolves is called the **solute**. The substance that does not dissolve is called the **solvent**. A substance that dissolves is described as soluble whereas a substance that will not dissolve is insoluble.

A **saturated** solution is a solution that contains the maximum quantity of a solute at room temperature.

A **supersaturated** solution is a solution that contains more solute than can be dissolved in a solvent at room temperature. This is achieved by heating the solution.

To make a solution



A volcano is an opening on Earth's surface. Volcanic eruptions can be caused by the Earth's internal movements which cause a great accumulation of magma (molten rock) inside the magma chamber of the volcano. The build-up of pressure causes the magma to ascend to the surface and erupt as lava which flows down the volcano. Carbon dioxide is one of the gases released into the atmosphere by volcanoes.

Please ask your parent or guardian to complete:

Name \_\_\_\_\_

Age \_\_\_\_\_

**EXPERImake**

Home Address \_\_\_\_\_

Email Address \_\_\_\_\_

Please send **3** tokens to Addo to receive your **experimake** certificate

**Send to:** Addo Play Ltd. Bucks, HP10 8EG, UK

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319:10106N



## Also Available...



\*Subject to Availability

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