Exclusive to

Hamleys

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The Finest Toy Shop in the World

Super Lab Crystals

WARNING

Not suitable for children under 8 years. For use under adult supervision. Contains small parts that could be ingested and also sharp edges. Handle with care. 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 old. Eye protection for supervising adults is not included. Image shown is for illustrative purposes only, parts or colours may differ. Save all information for future reference.

Super Lab Crystals

AVAILABLE ONLINE: FI DK NO SE CZ

www.hamleys.com/explore-SuperSciencelabkits.irs

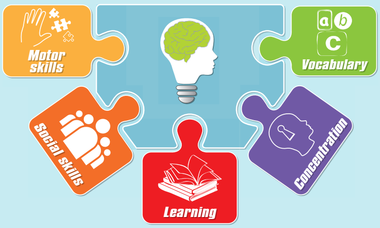
Dear parents and guardians

Through play, children develop different cognitive skills. Scientific studies show that when we are having fun or making discoveries during an experiment, a neurotransmitter called Dopamine is released.

Dopamine is known to be responsible for feelings like motivation, reward and learning and that's why experiences are related to positive feelings. So, if learning is a positive experience, it will stimulate the brain to develop various skills.

Therefore, Science4you aims to develop educational toys that combine fun with education by fostering curiosity and experimentation.

Find out below which skills can be developed with the help of this educational toy!



The educational feature is one of the key strenghts of our toys. We aim to provide toys which enable children's development of physical, emotional and social skills.

Find out more about the Brain Activator in Science4you toys at:

www.science4youtoys.co.uk/brain-activator

Science4you
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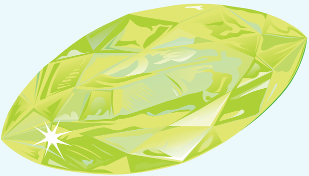
This book was produced in accordance with the following key stages and curriculum goals of subjects:
- Science - Key stage1 and 2;
- Chemistry - Key stage 3 and 4.



Super Lab Crystals

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SAFETY RULES

- Read these instructions before use, follow them and keep them for reference.
- Keep young children, animals and those not wearing eye protection away from the experimental area.
- Always wear eye protection.
- Store this experimental set and the final crystal(s) out of reach of children under 8 years of age.
- Clean all equipment after use.
- Make sure that all containers are fully closed and properly stored after use.
- Wash hands after carrying out experiments.
- Do not eat, drink or smoke in the experimental area.
- Do not allow chemicals to come into contact with the eyes or mouth.
- Do not apply any substances or solutions to the body.
- Do not grow crystals where food or drink is handled or in bedrooms.
- Do not use any equipment which has not been supplied with the set or recommended in the instructions for use.
- Take care while handling with hot water and hot solutions.
- Ensure that during growing of the crystal the container with the liquid is out of reach of children under 8 years of age.
- Make sure that all containers are fully closed and properly stored after use.

Warning. This set contains gypsum powder.

- Do not place the material in the mouth.
- Do not inhale dust or powder.
- Do not apply to the body.

GENERAL FIRST AID INFORMATION

- **In case of eye contact:** Wash out eye with plenty of water. Seek immediate medical advice if necessary.
- **If swallowed:** Wash out mouth with water and 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/or product together with the container with you.
- In case of injury always seek medical advice.

Write on the provided blank space the telephone number of national poison information centre or local hospital. They may provide you with information about measures to take in case of intoxication.

In case of emergency dial:
USA 911 | UK 999 | Australia 000 | Europe 112

LIST OF CHEMICALS SUPPLIED

Copper (II) sulfate (CAS # 7758-99-8)

__Hazard Statements:__
H302: Harmful if swallowed.
H315: Causes skin irritation.
H319: Causes serious eye irritation.
H410: Very toxic to aquatic life with long lasting effects.
__Precautionary Statements:__
P280: Wear protective gloves and eye protection.
P301 + P312: IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell.
P302+P352: IF ON SKIN: Wash with plenty of soap and water.
P273: Avoid release to the environment.
P270: Do no eat, drink or smoke when using this product.
P305+P351+P338: IF IN EYES: Rinse cautiously with water for several minutes.
P337+P313: If eye irritation persists: Get medical advice/ attention.

Sodium silicate (CAS # 1344-09-8)

Gypsum (CAS # 7778-18-9)

Magnesium sulfate (CAS #7487-88-9)

Potassium aluminium (CAS # 7784-24-9)

DISPOSAL OF USED CHEMICALS

When you need to dispose of chemical substances, it is necessary to make reference to national and/or local regulations. In any case you sure never throw chemicals into sewers and garbage. For more details please refer to a competent authority. For disposal of packaging make use of the specif collections points.

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 only 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.
- 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.

KIT CONTENT

Description:	Quantity:
1. Protective goggles	1
2. Mould for geode	1
3. Potassium aluminium	1
4. Gypsum	1
5. Sodium silicate	1
6. Whelk shaped mould	1
7. Plastic spatula	1
8. Woollen yarn	1
9. Red food colouring	1
10. Yellow food colouring	1
11. Plastic container with lid	1
12. Star shaped mould	1
13. Modelling metal wires	2
14. Protective gloves	2
15. Small measuring cups	2
16. Large measuring cups	2
17. Wooden spatulas	2
18. Copper (II) sulfate	1
19. Magnesium sulfate	1
20. Pasteur pipettes	2
21. Petri dish	1

Curiosities

Do you want to know more about the crystals?

Become a real scientist and discover the curiosities we have for you at the following link:

www.science4youtoys.co.uk/super-lab-crystals

1. Fundamental concepts to produce crystals!

Before you start producing crystals, we need to talk about a fundamental concept: the **solutions**!

1.1. What is a solution?

A **solution** is an homogeneous mixture of two or more substances in which:

- The substance dissolved is called **solute** and normally is in small amounts.
- The substance that dissolves is called **solvent** and normally is presented in larger quantities than the solute.

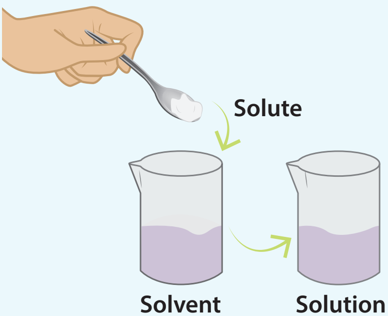


Image 1. A solution is a mixture of a solute (e.g. sugar) in a solvent (e.g. water).

1.2. Classification of solutions

Considering their composition, solutions can also be defined as:

Unsaturated solutions	Saturated solutions	Supersaturated solutions
A solution in which there are less particles of solute than of solvent.	A solution in which no more solute can be dissolved, having the proper equilibrium, at room temperature.	A solution that contains more of the dissolved material than could be dissolved by the solvent under normal circumstances. However, if we heat this solution, it's possible to dissolve all the solute.

Table 1. Types of solutions.

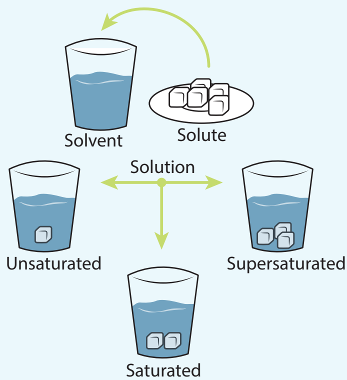


Image 2. Types of solutions.

In saturated and supersaturated solutions the probability of two solute molecules finding each other is very high. As so, in order to create crystals, you will always need to make this type of solutions.

1.3. Solubility

The **solubility** of a substance is the maximum amount of a substance that will dissolve in a given amount of solvent and at a specific temperature.

Several factors influence the solubility. A rise in temperature, for example, benefits the molecules agitation which helps in dissolution. In other words, it's easier to dissolve a solute in a hot solvent than in a cold one.

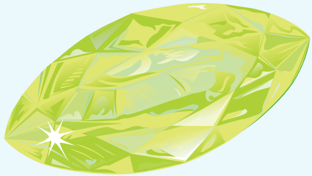
DID YOU KNOW…
That not all solutions are liquid?
Solutions can be:
- **Liquid** (example: milk with chocolate powder);
- **Solid** (example: bronze is made of copper and zinc);
- **Gaseous** (example: atmospheric air).

2. Important notes before you start

- It's very important that you wash all the materials before and after performing an experiment. By doing this you avoid contaminations. During the same experiment, never use the same material to diferent reagents without washing it first.

- You must be careful and use the quantities indicated in each experiment, so you can perform as many experiences as possible.

- If you want to perfom some experiment, but the materials indicated are being used in another experiment, you may use some similar materials you have at home, like cups.



1. Experiments

Material included in the kit.

Don't forget to put your protective gloves every time they are showned in the material list.

Experiment 1
The science of the Pasteur pipette

What you will need:

- Large measuring cup
- Water
- Pasteur pipette
- Small measuring cup

Steps:

1. Start by filling the large measuring cup with water.

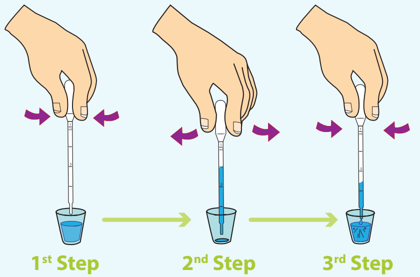
2. Now you will use the Pasteur pipette. Observe that it is squidgy and softer on the upper part - knob, and thinner on the other end - tip.

3. So that you can use it correctly you must squeeze the knob of the Pasteur pipette. This way, all the air inside will come out.

4. Now, with the knob squeezed, place the tip of the Pasteur pipette into the water and slowly release the knob. Did you notice how the water started filling up the Pasteur pipette's tube?

5. Now you can transport the liquid in the Pasteur pipette, without it dropping.

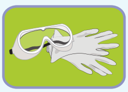
6. Pour 10 drops of water into the small measuring cup. Press the knob lightly and you will see the drops coming out of the Pasteur pipette one by one.



Note: it is very important that you follow these steps and carefully pour drops one by one, making sure you control the quantities you need.

Experiment 2
Crystalline garden

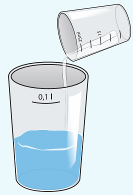
What you will need:



- Large measuring cup
- Small measuring cup
- Water
- Sodium silicate
- Plastic spatula
- Magnesium sulfate
- Copper (II) sulfate
- Wooden spatula

Steps:

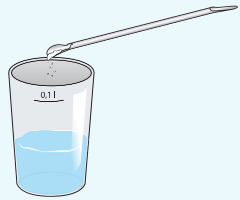
1. Start by measuring 50 millilitres (ml) of water in the small measuring cup and then add it to the large measuring cup. For that, you must perform two measurements of 25 ml each.



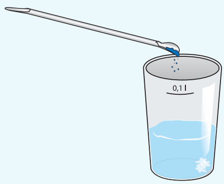
2. Measure 10 ml of sodium silicate in the small measuring cup and add it to the water.

3. Use the wooden spatula to stir the solution.

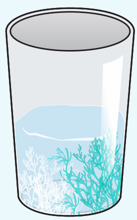
4. Now, with the plastic spatula, add carefully 1 spoon of magnesium sulfate to the cup.



5. Finally, with the plastic spatula, add 1 spoon of copper (II) sulfate to the opposite side of the cup where you've added the magnesium sulfate.



6. Wait a few hours and observe the results!



Explanation:

Sodium silicate, such as all silicates, is made of silicon (Si) and oxygen (O). Apart from this, it also includes sodium (Na^+), an alkaline metal.

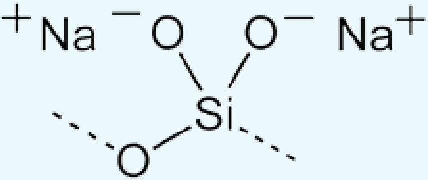


Image 3. Chemical structure of sodium silicate.

DID YOU KNOW...

That the silicates are the most common minerals of Earth's crust?

More than 90% of the minerals of Earth's crust are silicates, such as quartz and calcite!

In this experiment, two salts were added to a solution of sodium silicate: magnesium sulfate and copper (II) sulfate.

When these salts are added to the solution of sodium silicate, insoluble silicates are created due to the formation of a semi-permeable membrane around the salt inside the upper membrane.

This makes the water enter the membrane in order to reduce the concentration of salt in that place.

This process is called **osmosis**.

This phenomenon can be defined as the passage of water from a less concentrated area to a more concentrated one. The force that moves the water is called **osmotic pressure.**

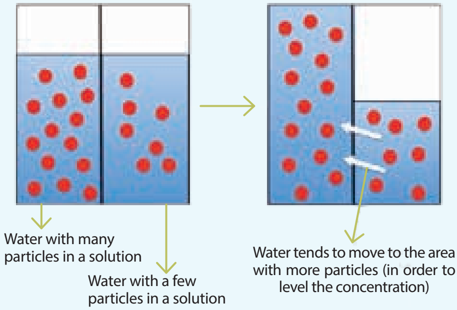


Image 4. Osmosis.

Osmosis isn't influenced by the type of solute but by the number of particles in a solution. This is to say that, through this process, water goes from the solution with less particles to the one that has more, until a balance is reached.

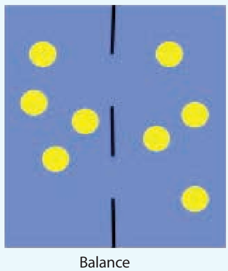


Image 5. Balance of solutions.

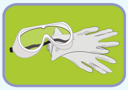
Balance is when two different solutions have the same number of dissolved particles. This phenomenon is related to **concentration.**

Concentration can be calculated using the following formula:

$$\text{Concentration} = \frac{\text{Mass (g)}}{\text{Volume (ml)}}$$

This way, a solution with 100 ml of water and 200 grams (g) of sugar will have a concentration of 2 g of sugar per each ml of water.

Experiment 3
Bright crystals



What you will need:
- Potassium aluminium
- Water
- Food colouring
- Pasteur pipette
- Small saucepan or bowl proper for micro-wave
- Large measuring cup
- Small measuring cup
- Wooden spatula
- Petri dish

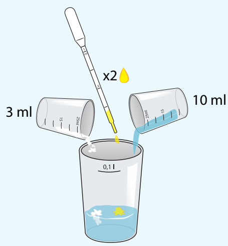
ATTENTION: ask an adult for help.

Steps:

1. Start by asking an adult to heat some water. Use a stove or a microwave.

2. Now, measure 10 ml of hot water in the small measuring cup and then pour it into the large measuring cup. Be careful not to get burnt.

3. Carefully add 3 ml of potassium aluminium to the water and stir well with the wooden spatula.



4. With the Pasteur pipette add 2 drops of a food colouring you like and stir the solution again.

5. Finally, pour the solution into the Petri dish and wait for about 24 hours or until beautiful bright crystals form!

Store the excess of the solution that did not evaporate in a flask, so that you can use it later in other experiments.

ATTENTION: keep this liquid away from small children, animals, food and also beverages.

Note: save the crystals as you will need them later!

Super scientist:
Try leaving the solution in a small measuring cup and see if the crystals that form are different!

Explanation:

In a solution with hot water, it is possible to dissolve more salts than if the water was cold.

As the solution cools, the salts that are in excess, for being a supersaturated solution, start settling.

In this experiment, the salts settle at the bottom of the Petri dish, growing as the water of the solution cools.

This phenomenon is called **precipitation**.

Scientists call precipitation to the phenomenon that originates the formation of a solid in a solution. This solid is called precipitate and happens when, in a saturated or supersaturated solution, the dissolved substances 'appear' again.

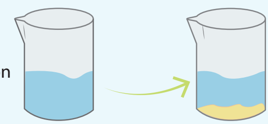


Image 6. The precipitation of a salt in a solution.

The time of precipitation varies regarding the concentration of the solution.

Experiment 4
Arty crystals

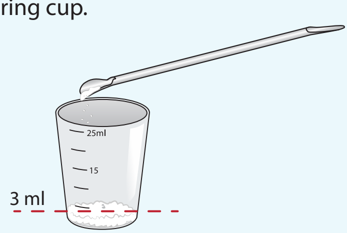
What you will need:

- Gypsum
- Whelk shaped mould
- Potassium aluminium
- Water
- Food colouring
- Porcelain mug
- 2 Large measuring cups
- 2 Small measuring cups
- Wooden spatula
- Plastic spatula
- Plastic container with lid
- Absorbent paper (kitchen paper or napkins)
- Plate
- Pasteur pipette

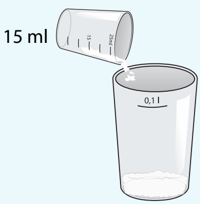
Steps:

Part 1 - Prepare the whelk!

1. Add 3 ml of potassium aluminium to the small measuring cup. Use the plastic spatula to help you. Then, transfer it into the large measuring cup.

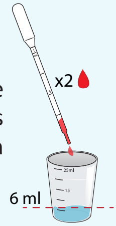


2. Now, measure 15 ml (10 g) of gypsum in the small measuring cup. Transfer it into the large measuring cup.



3. Then measure 6 ml of water in the small measuring cup.

4. If you want to give colour to the gypsum, add to the water 2 drops of colouring that you like, using a Pasteur pipette.

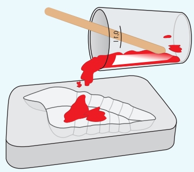


ATTENTION: you'll have to be very fast performing steps 5 and 7 so that the gypsum does not solidify in the cup. Make sure the whelk shaped mould is near you.

5. Transfer the water into the large measuring cup, where the mixture of gypsum and potassium aluminium is.

6. Mix well with the wooden spatula until you get a homogenous mixture, all in the same colour. If there is gypsum stuck on the sides of the cup, use the spatula to remove them. If the gypsum has solidified very fast, add some droplets of water with the Pasteur pipette.

7. Transfer the mixture into the whelk shaped mould.



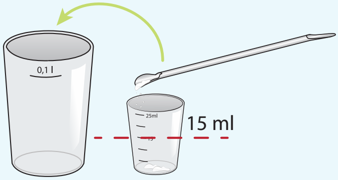
8. Leave the gypsum whelk to dry for about 2 hours.

Suggestion: after 1 hour and 30 minutes you can start preparing the next steps.

Part 2 - Conclude the artwork!

ATTENTION: ask an adult for help.

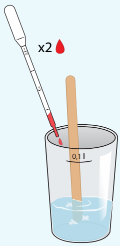
9. Add, using the plastic spatula, 15 ml of potassium aluminium to the small measuring cup and then transfer it into the large measuring cup.



10. Ask an adult to heat water in a porcelain mug. As it does not need to boil, you can heat it in a microwave or use hot water from a tap.

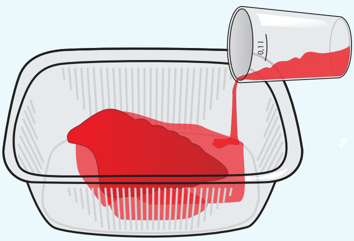
11. Carefully, so you don't get burnt, measure 35 ml of water in the small measuring cup. For that, you have to make two measurements, for example, one of 10 ml and another of 25 ml. Transfer the water into the large measuring cup.

12. Stir well with the wooden spatula until the potassium aluminium is dissolved. Then, with the Pasteur pipette, add 2 drops of food colouring, in the same colour as the whelk.



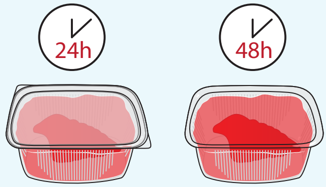
13. Let it cool-down for 10 minutes. By now, the gypsum must be dry and you can remove it from the mould. Finally, place it in the plastic container, facing down.

14. Pour the solution of potassium aluminium into the container, covering the whelk.



15. Put the lid on the container and leave your experiment to rest for about 24 hours.

16. After 24 hours remove the lid and leave it to rest for another 24 hours.



17. After this time, check if your whelk is shiny! If it is, place it on a plate with absorbent paper, in order to absorb the water in excess, if not, leave it for a while in the solution.

Store the excess of the solution that did not evaporate in a flask, so that you can use it later in other experiments.

ATTENTION: always keep this liquid out of the reach of small children, animals, food and beverages. Use within a week.

18. When the whelk is dry, you can touch it and handle it as you wish! Dazzle yourself with the glow of the fantastic crystals of potassium aluminium.

Explanation:

Just like in the previous experiment, when we heat water and dissolve potassium aluminium, we create a supersaturated solution.

As the solubility of the potassium aluminium decreases very fast due to the reduction in temperature, it starts to crystallise.

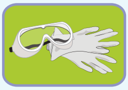
In this experiment, the crystals of potassium aluminium have a surface on which crystallisation can happen.

This way, the molecules of solute get together in molecular structures over the surface of the gypsum, allowing you to create a beautiful, sparkling and crystalline whelk.

Do you want to know more about the crystallisation process?
So perform experiments 20 and 21 which we have for you at the following link:
www.science4youtoys.co.uk/super-lab-crystals

Experiment 5
Crystalline starfish

What you will need:



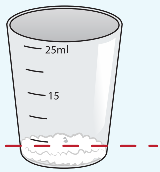
- Gypsum
- Star shaped mould
- Sea salt
- Water
- Food colouring
- Porcelain mug
- 2 Large measuring cups
- 2 Small measuring cups
- Wooden spatula
- Dessert spoon
- Plastic container with lid
- Absorbent paper (kitchen paper or napkins)
- Plate
- Pasteur pipette

Steps:

Part I - Prepare the star!

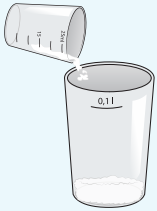
1. Use the dessert spoon and add 2 ml of sea salt to the small measuring cup. Transfer it into the large measuring cup.

2 ml



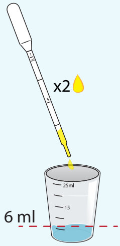
2. Now, measure 15 ml (10 g) of gypsum in the small measuring cup. Transfer it into the large measuring cup.

15 ml



3. Pour 6 ml of water into the small measuring cup.

4. If you want to give colour to the water, add 2 drops of a colouring you like to the water, using the Pasteur pipette.

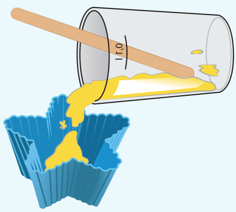


ATTENTION: you will have to be very fast performing steps 5 to 7 so that the gypsum does not solidify in the cup. Make sure you have the star shaped mould near you.

5. Transfer the water into the large measuring cup, where you have the mixture of gypsum and sea salt.

6. Mix well with the wooden spatula until you get a homogenous mixture, all in the same colour. If there is gypsum stuck on the sides of the cup, use the spatula to remove it. If the gypsum has solidified very fast, add some droplets of water with the Pasteur pipette.

7. Transfer the mixture into the star shaped mould.



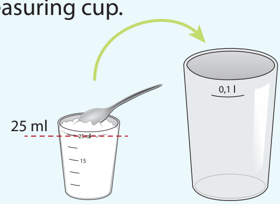
8. Leave the star to dry for about 2 hours.

Suggestion: after 1 hour and 30 minutes you can start preparing the next steps.

Part 2 - Create a starfish!

ATTENTION: ask an adult for help.

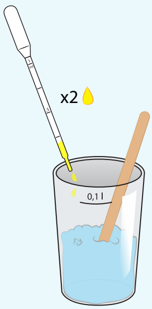
9. Measure 25 ml of sea salt in the small measuring cup and then transfer it into the large measuring cup.



10. Ask an adult to heat water in a porcelain mug. As it does not need to boil, you can heat it in a microwave or use hot water from a tap.

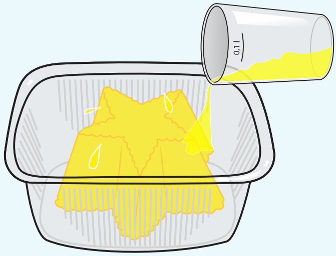
11. Carefully, so you don't get burnt, measure 50 ml of water in the small measuring cup. Transfer it into the large measuring cup.

12. Stir well the solution with the wooden spatula until the salt is completely dissolved. Now, add 2 drops of a food colouring with the Pasteur pipette, of the same colour of the star.



13. Let it cool-down for 10 minutes. By now, the gypsum must already be dry so you can remove it from the mould. Finally, place it in the plastic container.

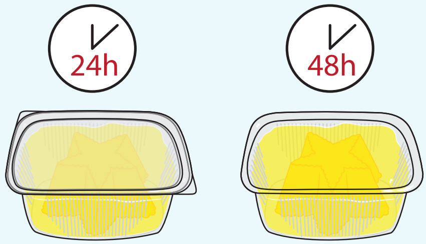
14. Pour the solution of salt into the plastic container, covering the gypsum structure.



Note: if the star floats, don't worry, it is normal.

15. Put the lid on the container and leave your experiment to rest for about 24 hours.

16. After 24 hours remove the lid and leave it to dry for another 24 hours.



17. After this time, remove the star from the plastic container and check if crystals were created. If you want, you can leave it in the solution for some time longer. When it is ready, place it on a plate with absorbent paper so that the water in excess can be absorbed.

18. When the star is dry, you can touch and handle it as you like. Surprise your friends with your starfish made of salt crystals!

ATTENTTION: when you finish the experiment throw away all used food.

Explanation:
In this experiment, the same thing happens as in the previous experiment.

However, in this case, the reagent used was sea salt.

Can you observe differences between the crystals created in this experiment and in the previous one?

Experiment 6
A large crystal!

ATTENTION: ask an adult for help.

What you will need:
- Bright crystals (experiment 3)
- Water
- Glass flask (for example a yogurt cup)
- Saucepan
- Woollen yarn
- Pencil
- Napkin

Steps:

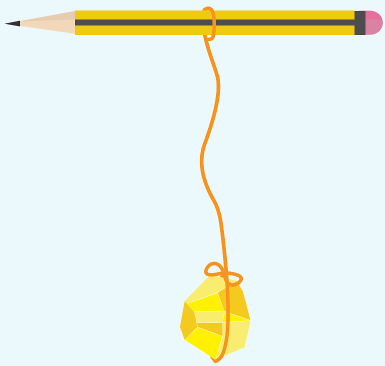
Initial note: in this experiment you will need crystals of potassium aluminium. If you don't have any, repeat experiment 3.

1. Start by looking for the largest and most beautiful crystal of potassium aluminium. You will make a larger crystal by using this one.

2. Carefully, attach the crystal to a woollen yarn. For that, start by cutting a piece of yarn, long enough for the crystal to get suspended inside the glass flask. Tie a lace knot on one of the yarn's ends to attach the crystal.

Note: if your crystal is small you can use a thread and needle to attach the thread to the crystal. **Remember to ask an adult for help to use the needle.**

3. Attach the other end of the yarn to a pencil.



4. Now, prepare a solution of potassium aluminium. You can prepare it in different ways:

- By repeating the steps of experiment 3, but using 20 ml of hot water and 6 ml of potassium aluminium.

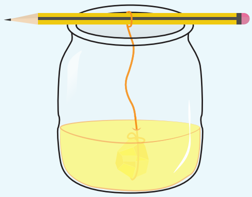
- By dissolving the crystals of potassium aluminium that you don't want/need anymore.

- By using the remains of the solutions of experiment 3 and/or 4. If these experiments have solid crystals, ask an adult to heat the solution in water-bath until they are completely dissolved.

The water-bath technique allows to apply heat in a soft and even way.
Place a container with what you want to heat in another container with water and put it to heat.

5. Pour the solution you've prepared into the glass flask and wait until it cools a little.

6. Now, place the pencil over the glass flask with the crystal suspended, in the solution, without touching the bottom or the walls of the flask.



7. Place a napkin over the flask. This will prevent dust from getting in the solution and, at the same time, allows the water to evaporate.

8. Now, wait a while, however keep checking if the potassium aluminium crystallises.

9. When you observe crystals on the bottom of the flask, remove carefully the crystal that is suspended and ask an adult to heat again, in water-bath, the solution that is still in the flask.

10. Be careful and do not let the water boil. When all crystals are dissolved again, remove the solution from the heat source, let it cool and place the crystal suspended in the flask again.

Attention scientist: it is very important that you leave the solution to cool, otherwise, your suspended crystal will also dissolve in the solution.

11. Keep repeating these steps until your suspended crystal is in the size you want or until you see that the crystals won't grow anymore!

Explanation:
In this experiment you are performing the evaporation method! Even though it is a technique that takes a while, as you have to repeat the steps several times, its result is incredible, as you can create a large and fantastic crystal!

Super scientist:
Can you draw the geometric shape that your crystals look like?

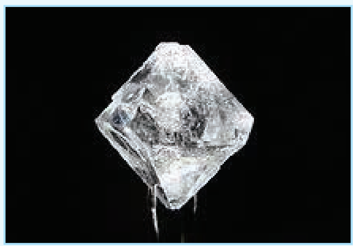


Image 7. Large crystal of potassium aluminium.

Crystals start forming through a process called nucleation. This process can occur through molecules present in a solution (such as what happens in experiment 3) or with the help of an object, like a gypsum mould (such as in experiments 5 and 6).

One by one, the molecules start bonding and creating molecular structures, from where the crystal initiates its growth.

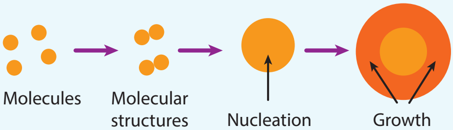


Image 8. Nucleation process and growth of a crystal.

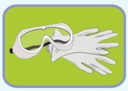
In this experiment, the crystal you have chosen will be the first molecular structure where other molecules of solute start to get together, allowing the crystal to continue growing.

The crystals' growth ends when the balance between the amount of solute molecules in the crystal and the solute molecules in the solvent is even.

Experiment 7
Crystalline mixture

ATTENTION: ask an adult for help.

What you will need:

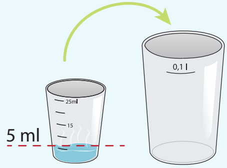


- Water
- Small measuring cup
- Large measuring cup
- Porcelain mug
- Plastic spatula
- Wooden spatula
- Potassium aluminium
- Copper (II) sulfate
- Magnesium sulfate
- Magnifying glass
- Plastic cup
- Scissors

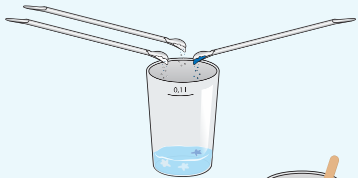
Steps:

1. Ask an adult to heat a porcelain mug of water.

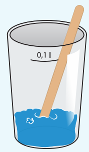
2. Carefully, with the small measuring cup, measure 5 ml of water and pour it into the large measuring cup.

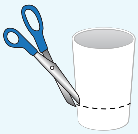


3. With the plastic spatula, add 1 spoon of each of your salts: potassium aluminium, copper (II) sulfate and magnesium sulfate.



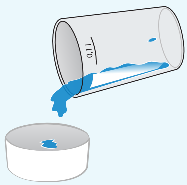
4. Stir well this solution with the wooden spatula, until all salts are dissolved.





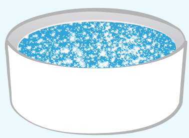
5. With a scissors and the help of an adult, cut a plastic cup so that it becomes 2 fingers high.

6. Finally, pour the solution into the base of the cup you have just cut and place it in an area with sun exposure (for example, on a window sill).



7. Wait until crystals start to form.

8. When the crystals have grown, analyse them with a magnifying glass. Can you see differences when compared to the crystals you have created only with one of the salts?



Explanation:

This experiment is very similar to previous ones, however, in this case, nucleation starts when the molecules of the salts collide against each other.

Nonetheless, you must have noticed that the final result is quite curious!

This is what happens in nature during the formation of rocks that have in their composition more than one mineral, such as granite.

Image 9. Granite is made up of 3 types of minerals: quartz, mica and feldspar.

The interaction between the different molecules of the different minerals creates different bonds between them. In turn, the final result, which is visible by us, is also different.

Super scientist:
Save these crystals in order to compare them with all the crystals you make with this kit!

Experiment 8
Create your own geode

ATTENTION: ask an adult for help.

What you will need:

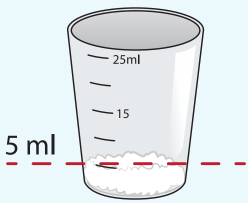
- Gypsum
- Mould for geode
- Potassium aluminium
- Water
- Food colouring
- Porcelain mug
- 2 Large measuring cups
- 2 Small measuring cups
- Wooden spatula
- Plastic spatula
- Pasteur pipette
- Newspaper sheet
- Cup
- Paintbrushes and gouaches

Steps:

Part 1 - Prepare the gypsum mould!

1. Prepare your workplace with everything you need. Start by placing a newspaper sheet on the table to protect it.

2. Measure 5 ml of potassium aluminium in the small measuring cup. Now transfer it into the large measuring cup.



3. Now, add 40 ml of gypsum to the large measuring cup. For this, use the small measuring cup and measure 2 times 20 ml.

4. Now, pour 20 ml of water into the small measuring cup.

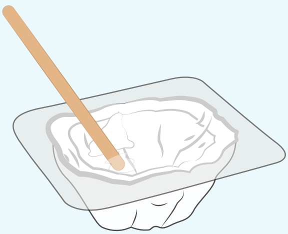
ATTENTION: you have to be really fast performing steps 7 to 9 so that the gypsum does not solidify in the cup. Make sure you have the mould for geode near you.

5. Transfer the water into the large measuring cup, where you have the gypsum and potassium aluminium mixture.

6. With the wooden spatula, mix all well until you get an homogeneous content. Remove, with the spatula the gypsum remains that got stuck to the walls of the cup.

7. Transfer all the content of the cup into the mould for geode. If the gypsum has solidified too fast in the cup, add some droplets of water using the Pasteur pipette.

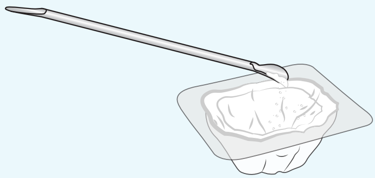
8. Now scientist, you have to be very bold! With the wooden spatula spread the gypsum on the mould's walls. Only this way you can make sure that the mould is covered with gypsum and with a space in the middle, for the crystal to grow.



Make sure the walls of the mould aren't too thin so that the geode of gypsum doesn't turn out too fragile and breaks when you remove it from the mould.

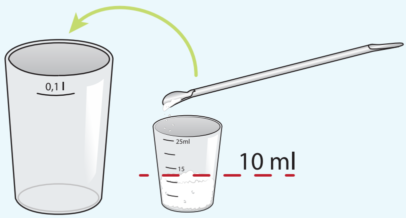
You will notice that as you spread the gypsum, it begins to solidify. However, we suggest you perform Part 2 of this experiment on the following day.

9. When you finish spreading the gypsum, sprinkle the cavity of the geode with half spoon of potassium aluminium. Use the plastic spatula to help you.



Part 2 - The formation of geode.

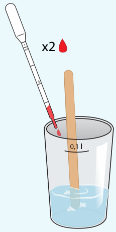
10. In a small measuring cup, add, with the help of the plastic spatula, 10 ml of potassium aluminium and then transfer it into the large measuring cup.



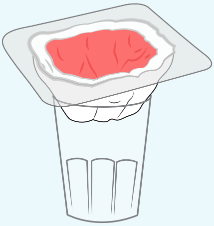
11. Ask an adult to heat water in the porcelain mug. As there is no need to boil the water, it can be heated in a microwave or you can use hot tap water.

12. Carefully, so you don't get burnt, measure 20 ml of water in the small measuring cup. Transfer it into the large measuring cup.

13. Stir well the solution with the wooden spatula, until the potassium aluminium is completely dissolved. Now, add 2 drops of food colouring that you like, using the Pasteur pipette.



14. Leave it to dry for a few minutes. By now, the gypsum must already be dry. Place the mould of geode in a safe area, where it does not fall. You can place it in a cup, such as shown in the image.



15. Pour the potassium aluminium solution into the mould, covering the gypsum structure.

16. Make sure your experiment is stored in a place with little turbulence and wait for about 24 hours. After this time you should be able to see crystals growing. If you want, you can wait for all the water to evaporate.

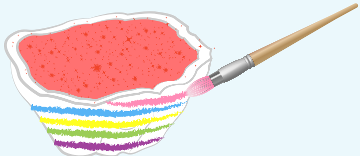
17. If you think your crystals are big enough, but there is still solution in the mould, you can pour the excess into another container.

18. After removing the excess of the solution (or after it has totally evaporated), wait 1 more day, in order to make sure the gypsum dries completely.

19. After this time, you can remove it from the mould.

Perform this step very carefully and with the help of an adult, in order to avoid breaking your gypsum structure.

20. So that your geode becomes even more incredible, paint it as you like with paintbrushes and gouaches!



Explanation:

In this experiment gypsum is used in order to create an artificial geode and we simulate its formation in only a few days!

Geodes are rocks that, when opened, show a cavity full of crystals.

Image 10. Geode with quartz crystals.

A geode is formed when an interior hollow of a rock is filled with hot water, such as what happens in volcanic rocks!

DID YOU KNOW...
That volcanic rocks are a type of igneous rocks?
Volcanic rocks are formed after the cooling and solidification of the lava expelled by volcanoes. Basalt is an example of an igneous rock!

Image 11. Giant's causeway - basalt columns, that can measure up to 12 metres high, in the northwest of Ireland. This geological formation appeared after a volcanic eruption, 60 million years ago.

How did this happen?

The formation process of a geode can take thousands of years and these can be volcanic or sedimentary.

In both cases, high temperatures and great pressures are needed, which is very common in the interior of Earth, where geodes are formed.

Volcanic geodes are formed due to the cavities created from the air bubbles that appear during the formation process of a volcanic rock.

Sedimentary geodes are created in cavities that appear after the melting or dissolution of rock parts. In other cases, they can appear due to the space left by the organic materials' degradation (for example, a coral or a fossil).
In both cases, there is a space to be filled.

This happens because the exterior part of the rock is porous, allowing the passage of fluids rich in minerals.

These minerals can set in the cavity, creating several layers of sediments over time, resulting in the crystals you can see.

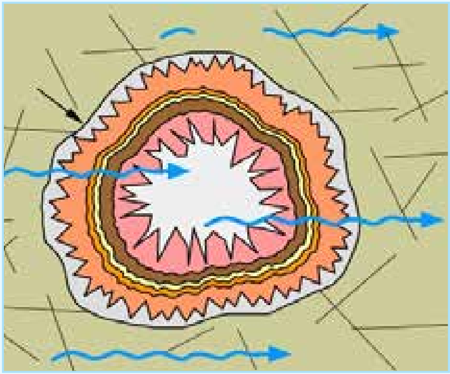
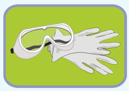


Image 12. The entry of fluids rich in minerals into a cavity in a rock, forming a geode.

In this experiment, the solution of potassium aluminium allowed that fantastic crystals could grow in your geode mould and, as so, it was possible to recreate this amazing natural process.

Experiment 9
Crystalline eggs

ATTENTION: ask an adult for help.



What you will need:
- Table salt
- 1 Egg
- Small measuring cup
- Water
- Paintbrush
- Newspaper sheet
- Scissors
- Food colouring
- Pasteur pipette

- 2 Plates
- 2 Large measuring cups
- Bowl (a little larger than the egg)

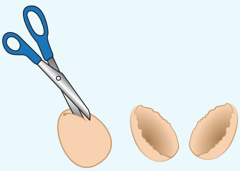
Steps:

1. Carefully, make a hole on the top and at the bottom of an egg, using a scissors. Ask an adult for help.

2. Place a plate under the egg and blow through one of the holes. This way, you will remove the content of the egg.

Note: the egg white will come out first. Save this part of the egg, as you will need it for the following steps. You will not need the yolk and, as the egg white is out, put the egg on another plate so that these two parts don't get mixed.

3. With a scissors and the help of an adult, cut the eggs from the holes, in two halves.



4. Wash both halves of the eggshells with water from a tap. Be careful not to break the eggshells.

5. Now, brush the inside of the eggshells with the egg white that you saved in step 2.

The egg white will work as glue!

6. Sprinkle the inside of the egg shells with table salt.

7. Leave the egg shells to dry (over newspaper sheets) for about 1 hour.

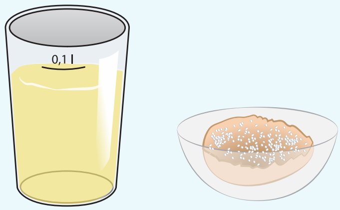
8. While you wait, you can prepare a solution of table salt. Ask an adult to heat 100 ml of water (you can use hot water from a tap). Measure 4 times 25 ml of water in the small measuring cup in order to measure that quantity. Then put the water in the large measuring cup.

9. Add table salt to the water and stir until the salt does not dissolve anymore.

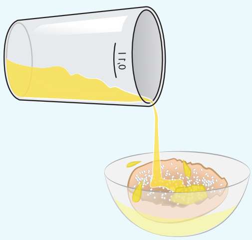
10. Transfer this solution into a new large measuring cup, making sure that the table salt that did not get dissolved doesn't pass to the new cup.

11. Add to the solution some drops of the food colouring that you like, using the Pasteur pipette.

12. Leave the solution to cool a little at room temperature. At the same time, place one of the egg shells inside the bowl, with the opening facing up.



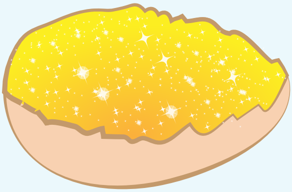
13. Pour the solution into the egg shell. The solution will overflow. Don't worry, this is expected.



14. Wait until crystals start appearing.

ATTENTTION: when you finish the experiment throw away all used food.

15. After a while, you'll have created a fantastic crystalline egg. Whenever you want, repeat steps 8 to 14 for the other half of the egg shell.



Explanation:

Once again, we have used properties of the solutions to create beautiful crystals.

In this case, we have dissolved table salt in hot water, creating a supersaturated solution that, as it cools, it solidifies in the egg shell, this is to say, a precipitation of solute (table salt) happens.

The salt that you have used to sprinkle the egg, accelerates this process, this is to say, it helps creating molecular structures and initiate the process of crystal growing.

Image 13. Crystals of sodium chloride (what we call salt).

Experiment 10
Crystalline needles

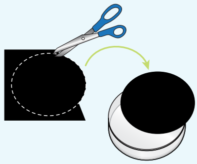
ATTENTION: ask an adult for help.

What you will need:

- Magnesium sulfate
- Large measuring cup
- Small measuring cup
- Wooden spatula
- Plastic spatula
- Water
- Porcelain mug
- Petri dish
- Black cardboard
- Scissors

Steps:

1. Start by asking an adult to help you cut circles out of a black cardboard with a scissors in order to fit the bottom of the Petri dish.

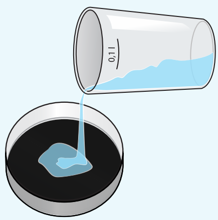


2. Ask an adult to heat a little of water in a porcelain mug or use hot water from a tap.

3. Measure 20 ml of water in the small measuring cup. Transfer it into the large measuring cup.

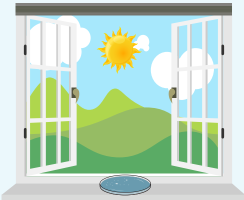
4. With the small measuring cup and the plastic spatula, measure 3 ml of magnesium sulfate and add it to the water.

5. Stir well this solution with the wooden spatula.



6. Finally, pour the solution into the Petri dish.

7. Place the Petri dish on a window sill, to catch some sunlight.



Explanation:

Magnesium sulfate, such as the name indicates, has magnesium in its composition. Once again, in this experiment, we used a solution of a salt to make crystals, however, in this case, the crystals have a different appearance comparing to the ones before. This happens due to the way the atoms of the molecules of magnesium sulfate bond and, consequently, how the molecules are organised.

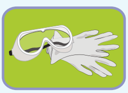
Image 14. Magnesium sulfate crystals coloured in blue.

Scientist, do you still remember how the crystalline mixture looked like? Can you observe the differences?

Experiment 11
Snowflake

ATTENTION: ask an adult for help.

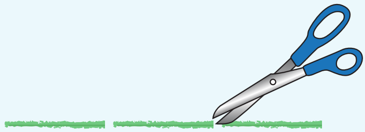
What you will need:



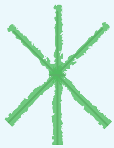
- Modelling metal wire
- Scissors
- Woollen yarn
- Porcelain mug (proper for microwave)
- Water
- Sea salt
- 2 Large measuring cups
- Small measuring cup
- Pencil
- Wooden spatula
- Plastic spatula

Steps:

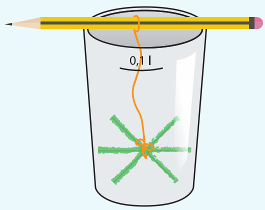
1. Ask an adult for help and cut the wire in three equal parts, using the scissors.



2. Now, attach them in order to put together the three parts, creating a six-point star.



3. Cut a piece of woollen yarn and attach it around the star so that you can hang it. Attach the other end of the woollen yarn to a pencil. Place the star in a large measuring cup, such as you can see in the image. Make sure it stays in the horizontal position.



4. Now, prepare a solution of sea salt.

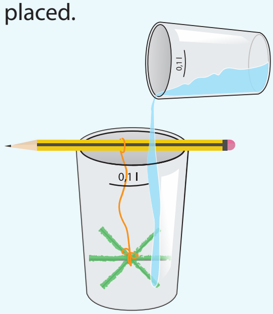
5. Ask an adult to heat a little of water in a porcelain mug or use hot water from a tap.

6. Measure 100 ml of water in the small measuring cup (make 4 measurements of 25 ml each). Transfer it into the large measuring cup.

7. In the small measuring cup and with the help of a plastic spatula, measure 50 ml of sea salt and add it to the water (make 2 measurements of 25 ml each).

8. Stir well the solution with a wooden spatula.

9. Now, pour this solution into the cup where the star is placed.



10. Finally, be patient and wait for the crystals to form.

ATTENTTION: when you finish the experiment throw away all used food.

Explanation:

In this experiment the growth of saline crystals is made around the star of wire (as they help in the nucleation process).

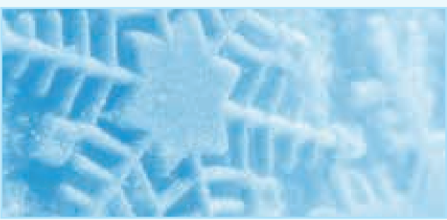


Image 15. Snowflake.

Experiment 12
Crystals of copper (II) sulfate

ATTENTION: ask an adult for help.

What you will need:

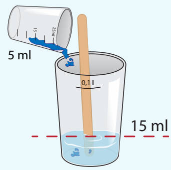
- Water
- Copper (II) sulfate
- 2 Large measuring cups
- Small measuring cup
- Wooden spatula
- Plastic spatula
- Porcelain mug

Steps:

1. The first step is to prepare a copper (II) sulfate solution: ask an adult to heat some water. It can be heated in a microwave or you can use hot water directly from a tap.

2. Measure 15 ml of water in the small measuring cup and then transfer it into the large measuring cup.

3. Add 5 ml of copper (II) sulfate to the water and stir well with the wooden spatula.



4. Pour the solution into another large measuring cup. Be careful and don´t let the solute in excess, that did not dissolve, to be transferred into the new cup.

> **Note:** save the solute in excess for experiment 14.

5. Leave the solution to rest for a day. If you want larger crystals, leave the solution to rest for 4 days.

6. After this time, remove the liquid in excess from the cup and observe what remained at the bottom.

Note: save the liquid in excess and mix it with the solute you've stored in step 4. You will need this solution in experiment 14.

ATTENTION: always keep this liquid out of the reach of small children, animals, food and beverages. Use within a week.

Explanation:

In this experiment, the explanation is exactly the same as the one in the previous experiments. From a saturated solution of copper (II) sulfate, crystals are created, and their colour comes from the salt.

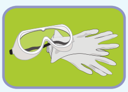
Image 16. Copper (II) sulfate.

DID YOU KNOW...
That copper sulfate can also be used with fungicide?
It is commonly used in products that intend to help the culture of some fruits!

Experiment 13
Mega crystal of copper (II) sulfate

What you will need:

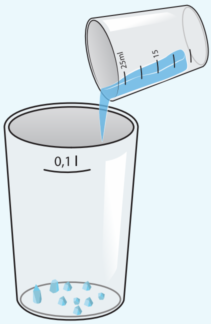
- Water
- Crystals of copper (II) sulfate (experiment 12)
- Large measuring cup
- Small measuring cup
- Wooden spatula
- Plastic spatula
- Porcelain mug
- Petri dish



Steps:

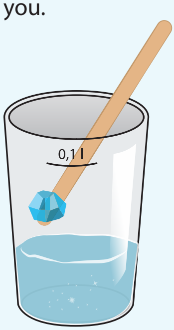
1. Observe the crystals of copper (II) sulfate you made in experiment 12. With the wooden spatula, remove them from the bottom of the cup and place them on the Petri dish. Choose one of the crystals and put it aside (for example on the Petris dish lid).

2. Now it is necessary to prepare a new copper (II) sulfate solution. For this, use the copper (II) sulfate crystals that you did not choose, and dissolve them in hot water. Place the crystals in the large measuring cup and add 20 ml of hot water (use the small measuring cup to measure the amount of water).



3. Transfer this solution into a new measuring cup and leave it to cool for 5-10 minutes.

4. Carefully, place the crystal you've chosen in the bottom of the cup. Use the wooden spatula to help you.



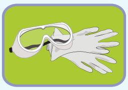
5. Leave this solution to rest, for at least one week.

6. When the water evaporates, remove your mega crystal from the cup, observe it and, if you want, save it!

Explanation:
In this experiment, you have created a mega crystal of copper (II) sulfate because, when using a crystal to start, the crystals of this new saturated solution will set and crystallise around this crystal.

Image 17. Crystal of copper (II) sulfate.

Experiment 14
Crystalline messages



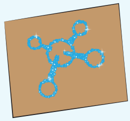
What you will need:
- Paintbrush or cotton bud
- Excess solution of copper (II) sulfate (experiment 12)
- Dark cardboard

Note: if in the excess solution of copper sulfate there are already precipitated crystals, **ask an adult to heat them**, in water-bath, so that they can dissolve again.

Steps:
1. Dip the paintbrush into the copper (II) sulfate solution and write a message or make a drawing on the dark cardboard.

2. When you finish, leave the cardboard to dry near a window.

3. After a while, observe how your message became shiny! The result is small blue crystals.



ATTENTION: ask an adult for help.

Explanation:
The paint used in this experiment was a saturated solution of copper sulfate. This way, as the water evaporates on the card, blue crystals appear on the places you painted with the solution.

Super scientist:
Perform this experiment with other solutes, for example salt or sugar.

ATTENTION: if you use salt or sugar, when you finish the experiment, throw away all food products.

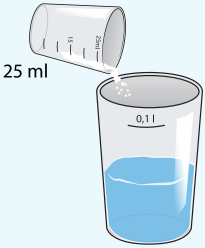
Experiment 15
Salty crystals

ATTENTION: ask an adult for help.

What you will need:
- Sea salt
- Water
- Large measuring cup
- Small measuring cup
- Wooden spatula
- Food colouring (optional)
- Pasteur pipette (optional)
- Petri dish

Steps:
1. Start by preparing a solution of sea salt. For this, ask an adult to heat 50 ml of water in a small measuring cup, by measuring 2 times 25 ml.

2. Transfer the water into the large measuring cup and add 25 ml of sea salt, using the small measuring cup.

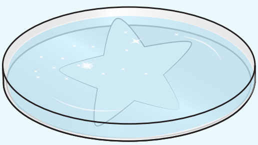


3. Stir well the solution with the wooden spatula, making sure you dissolve as much salt as you can. If you want, now it's time to add some droplets of food colouring, using the Pasteur pipette.

4. Finally, pour your solution into the Petri dish, carefully, so that the salt that did not dissolve doesn't fall into the dish.

5. Place the dish in an area with sun, for example on a window sill, and wait until the water evaporates.

Super scientist:
Cut some shapes out of kitchen paper and place them in the Petri dish with the salt solution. Wait and see what happens.



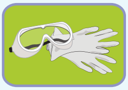
ATTENTTION: when you finish the experiment throw away all used food.

Explanation:
Such as in the previous experiments, a supersaturated solution of a salt, in this case, sea salt, allows to create crystals as the water evaporates.

Experiment 16
Stalactites and stalagmites

ATTENTION: ask an adult for help.

What you will need:



- Porcelain mug
- Sea salt
- Teaspoon
- Large measuring cups
- Woollen yarn
- Paper clips
- Petri dish
- Water
- Scissors

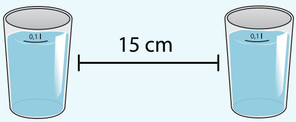
Steps:

1. Start by asking an adult to help you heat 200 ml of water in a porcelain mug.

2. Add 6 spoons of sea salt to the water. Attention, you must add spoon by spoon and keep stirring. Mix well, until you dissolve as much salt as you can.

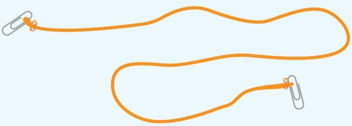
3. Now, fill each one of the measuring cups with 0.1 litres (l) of water.

4. Separate the cups in a distance of about 15 centimetres (cm).

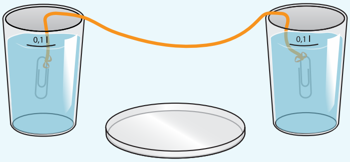


5. Ask an adult to help you cut with the scissors about 30 cm of woollen yarn.

6. Attach to each end of the woollen yarn a paper clip.



7. Press gently the yarn that stays in the middle of the cups in order to create a curve (such as shown in the image). Place the Petri dish under the curve of the woollen yarn.



8. Make sure the water falls drop by drop. If the droplets fall too fast, separate a little more the cups from one another. If the droplets take some time to fall, put the cups closer together.

9. Leave your experiment in a calm place and observe what happens. If you want, add a new solution of sea salt when the cups have only ¼ of the solution.

You will have to be patient, this experiment can take one week.

ATTENTTION: when you finish the experiment throw away all used food.

Explanation:

The saturated solution of salt climbs the woollen yarn and drops in the middle. The droplets that fall start transforming into hard pillars of sodium: one forms from bottom to top (stalagmite) and the other from top to bottom (stalactite).

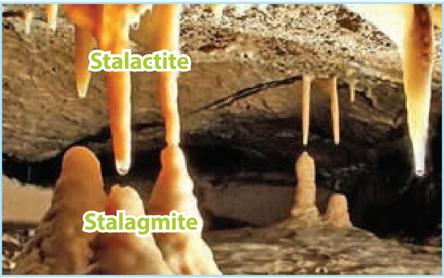


Image 18. Stalactites and stalagmites in a cave.

Stalactites and stalagmites are mineral formations quite common in caves and appear on limestone rocks, which are very soluble, through the process that you can see in the following image:

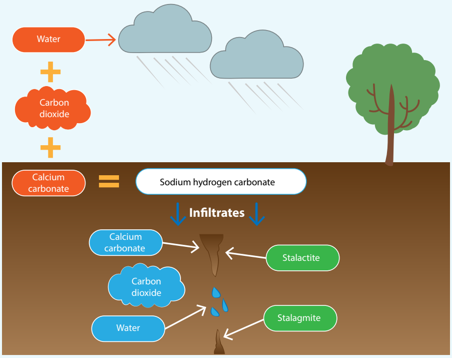


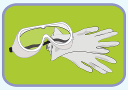
Image 19. Simplified scheme of the formation process of stalactites and stalagmites.

In this experiment, the water moves on the yarn because it fills its air spaces. This process is called **capillary action**. The sea salt is dragged with the water. When water evaporates, the sea salt cristalises and this is why it's possible to observe this effect.

Experiment 17
Salt flower

ATTENTION: ask an adult for help.

What you will need:

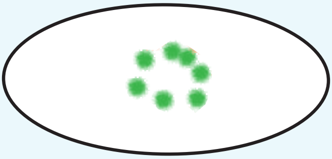


- Coffee filter paper
- Scissors
- Stapler
- Petri dish
- Water
- Small measuring cup
- Large measuring cup
- Sea salt
- Wooden spatula
- Coloured markers

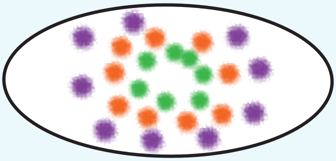
Steps:

1. With a scissors and the help of an adult, cut the coffee filter paper in a round shape.

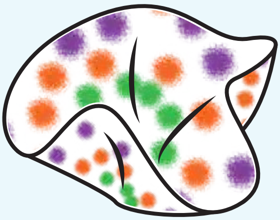
2. Choose one coloured marker and make a circle of dots in the middle of the filter paper, such as shown in the image.



3. With other coloured markers make more circles of dots, until you fill the filter paper completely.



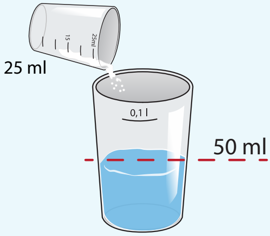
4. When you finish, transform the coffee filter paper into a flower. Hold it from the underside and make small folds, in order to get a similar effect of what you see in the following image. When it is ready, staple the bottom of the flower.



5. Place the flower on the Petri dish.

6. Now you have to create a supersaturated solution of sea salt. Measure 2 times 25 ml of water, and ask an adult to heat the 50 ml of water.

7. Transfer the water into the large measuring cup and add 25 ml of coarse salt, using the small measuring cup.



8. Stir well this solution with a wooden spatula, making sure you dissolve as much salt as possible.

9. Finally, pour the solution into the Petri dish, carefully, so that the salt that did not dissolve doesn't fall into the dish.

10. Place the Petri dish in a place with sun, for example on a window sill and wait until the water evaporates.

What happens?

ATTENTTION: when you finish the experiment throw away all used food.

Explanation:
In this experiment, once again, we have created a solution of salt that allows to make beautiful crystals. However, these grew along the filter paper.

This happens because the paper is porous, allowing that also in this case the capillary action happens, just like in the previous experiment. When the water evaporates, it is possible to observe the salt crystals forming a salt flower!

DID YOU KNOW...
That a crystal flower is a cluster of crystals that form on the water surface of saline?
These crystals are collected in specific crystallisers, are treated and then can be used in our food as they have unique minerals and nutrients. Apart from this, they do not suffer any type of industrialisation process!

Image 20. Workers collecting salt in a saline.

But what happened to the dots made with the coloured markers? Their colours were dragged and it looks like they appeared with more colours!

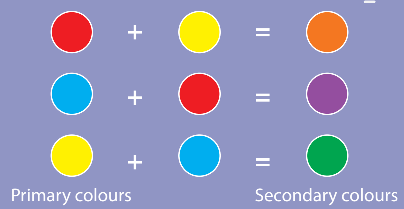
When using the filter paper and water, you made a **chromatography**.

This process is a physical-chemical method of separating homogeneous mixtures in their components by weight, mass and density.

In the case of secondary colours, chromatography decomposes them in their primary colours.

This happens because colours have different weights and, as so, they are in different positions on the paper when the water can't drag them anymore.

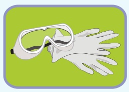
Get to know the primary and secondary colours!



Experiment 18
Crystal salad

ATTENTION: ask an adult for help.

What you will need:

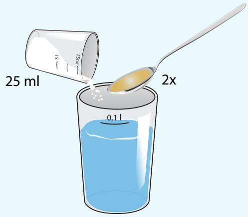


- Water
- Vinegar
- Tablespoon
- Food colouring
- Pasteur pipette
- Small measuring cup
- Piece of a kitchen sponge
- Petri dish
- Scissors
- Large measuring cup
- Sea salt

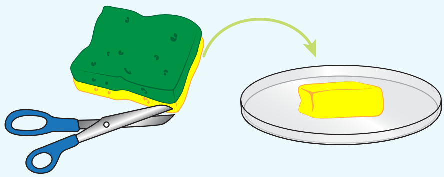
Steps:

1. You will need 100 ml of hot water. Measure 4 times 25 ml of water in the small measuring cup. Now, ask an adult to heat the water (on a stove or microwave). Then, pour the water in the large measuring cup.

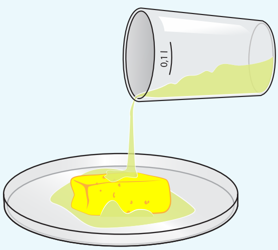
2. Add 2 tablespoons of vinegar and 25 ml of table salt to the water. Use the small measuring cup for the salt.



3. Ask an adult to help you cut a piece of the yellow part of a kitchen sponge, using a scissors. Place the piece of sponge on the Petri dish.

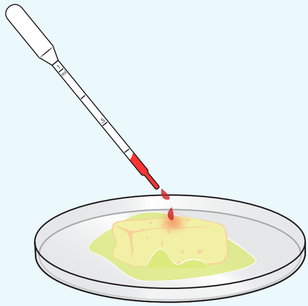


4. Over the sponge, pour the solution of water, vinegar and salt. Make sure the sponge absorbs the liquid and that the solution is covering the bottom of the Petri dish.



5. Store the solution that remains.

6. With the Pasteur pipette, add some drops of food colouring over the sponge. This way you will create coloured crystals.



7. Place the Petri dish on a window sill.

8. On the following day, add a little more of the solution.

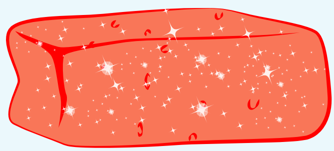
9. Leave your crystals to grow for a few days. The more time goes by, the larger the crystals will be.

ATTENTTION: when you finish the experiment throw away all used food.

Explanation:

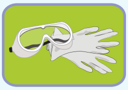
Once again, the same principles were applied: it is possible to dissolve more salt in hot water than in cold water.

In this experiment, when pouring the saturated solution over the sponge, it helps to evaporate the water of the solution. This way, the salt crystallisation is faster because the salt crystals start forming on the salts that aren't dissolved on the sponge.



Experiment 19
Shining stones

What you will need:



- Large measuring cup
- Vinegar
- Stones

Steps:

1. Start by looking for small stones in a garden or on the street. The stones should not be too big and the darker they are, the better will be the result.

2. Now that you have your stones, you can start the experiment: fill ⅓ of the large measuring cup with vinegar.

3. Add 4 or 5 stones, depending on their size, to the cup.

4. Observe if effervescence (bubbles) happens! If it does, the stones are perfect!

5. On the following day, remove the stones from the cup, leaving only one. It is on this stone that the crystals will grow.

6. Finally, you just need to be patient and wait for the vinegar to evaporate. Attention scientist, these crystals can take until 1 month to form.

7. When you can see the crystals, remove carefully the stone from the cup and observe its crystals.

ATTENTTION: when you finish the experiment throw away all used food.

Explanation:

These crystals form because the vinegar, as it is an acid, reacts with the stones, corroding them.

During the corrosion, carbon dioxide and the minerals of the stones, which then dissolve in vinegar, are released.

This way, the conditions to create a crystalline structure are gathered: while the vinegar evaporates, the crystals form around the stone that is still in the cup, by the precipitation of the minerals that were dissolved.

With this experiment you also apply one of the methods of identifying minerals: effervescence with acids. In this method we observe the release of carbon dioxide (bubbles) only when the acid of vinegar is in contact with a basic compound, such as calcium chloride.

Image 21. Crystalline stones.

Did you had fun with these experiments and want to know more about crystals?

Become a real scientist with all the explanations you need and 8 more experiments that we have for you at the following link:

www.science4youtoys.co.uk/super-lab-crystals

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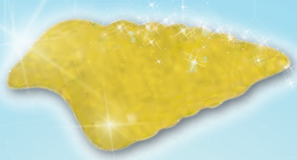

Super Lab Crystals

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