

STEM EXPERIMENT KIT™

EN

Manual

Crystal Growing

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Safety instructions

WARNING — This set contains chemicals [and/or parts] that may be harmful if misused. Read cautions on individual containers [and in manual] carefully. Not to be used by children except under adult supervision.

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 old.

Kit contents

- > 4 packets of potassium aluminium sulfate (alum) 20g (item no. 720616)
- > red and blue dye, 1g each
- > 30ml measuring cup
- > Spatula



You will also need:

Scissors, tap water or distilled water (from a supermarket or drug store), an old pan, trivet, oven mitt, two empty and clean jelly jars, paper towels, sewing thread, a pencil, adhesive tape, and a few small rocks

Before starting, please read the labels and check that the packets contain the correct chemicals.

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 cuts, treat wound with sterile, dry adhesive bandage. Foreign bodies (for example shards of glass) may only be removed from the wound by a doctor.
 - »» In case of doubt, seek medical advice without delay. Take the chemical and its container with you.
- As a basic rule: In case of injury always seek medical advice.

Dear parents!

This experimentation kit does not contain any substances that are particularly harmful, but still provide your child with help and advice when growing the crystals.

- 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. For use under adult supervision.
- 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.

- e) 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 the crystal growing chemicals and solutions.
- f) 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.
- g) Substances in non-reclosable packaging (crystal salt packet) should be used up (completely) during the course of one experiment, i.e. after opening the package.

The dye powder has a very powerful dyeing ability and can stain clothes. For this reason, wear old clothes and remove tablecloths or rugs from the experimentation area. Take care when pouring the colorful solution down the drain as the dye can stain.

Cover the work space with newspaper. If the crystal salt is clumped together, moisture has been added to it, for example from the air. This will not impair its function. The age of the crystal salt doesn't matter either. Please prepare all equipment and chemicals required before starting the experiment.

Do not return any of the containers and equipment used for growing the crystals to the kitchen.

Have fun growing your crystals!

General rules for safe experimenting (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 and the final crystals out of reach of children under 8 years of age.
- › Clean all equipment after use.
- › Ensure that all empty containers and non-reclosable packaging are disposed of properly.
- › Wash hands after carrying out experiments.
- › Do not eat or drink 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.
- › Never work on your own. An adult should always be present.

Information for handling the crystal salt:

Please observe the following hazard and safety information for the crystal salt (potassium aluminium sulfate (alum)) contained in this experimentation kit. Potassium aluminium sulfate (alum): avoid breathing dust. Do not get in eyes or on skin.

Telephone numbers for poison control centers:

US 1-800-222-1222

Enter the telephone number of the nearest poison control center that should be available in case of emergency:

WARNING! Not suitable for children under 3 years. Choking hazard — small parts may be swallowed or inhaled. Keep packaging and instructions as they contain important information!

Opening the packet of crystal salt: Cut open a corner of the packet using scissors. Never use your teeth.

Cleaning and waste disposal: Always clean used containers and your work space immediately after experimenting. Then rinse the containers thoroughly with clean water. Since you are only working with small amounts of a harmless chemical in this experimentation kit, you can simply wash away liquid waste with lots of water. Solid waste can be thrown in the household trash.

Storing the crystals: Always store your dried crystals in a sealable container when they have finished growing!

Experiment 1

1. Pour two packets of alum into a jelly jar together with 140 ml of water and stir using the spatula.

TIP! It is best to use distilled water. The glass jar should be very clean!

2. Heat a few centimeters of tap water in an old saucepan to just below boiling point. Carefully place the pan on a table mat in your work space (it is best to let an adult help you).

Place the jar in the pan and stir using the spatula until the crystal salt dissolves. If it doesn't dissolve very well, use an oven mitt to take the growing container out of the pan and re-heat the water on the stove before trying it again in the same way.

Careful! Only heat the water under adult supervision. Be careful and do not spill any crystal solution. Do not burn yourself on hot solutions or on the pan and don't forget to turn off the stove! Do not inhale vapors that are produced when the crystal salt solutions are heated!



3. Once all the alum has dissolved, use the oven mitt to take the glass jar out the pan and add the dye powder.
4. Cover the jar with a piece of paper towel so that dust cannot enter. Place it somewhere out of the way to sit overnight.
5. Pour the remaining alum solution into a second glass jar. Do not throw it away; it is still needed! Using the spatula, lay the crystals on a paper towel and leave them to dry.
6. Store any particularly large and well-formed crystals in a sealable container. Put the smaller crystals back in the solution in the glass jar. Tightly screw the lid back onto the jar and store it.

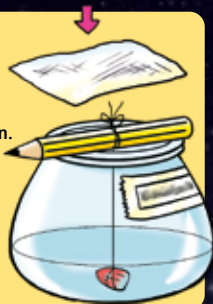


Experiment 2

1. Take the glass jar containing the solution from experiment 1 and heat it, as in step 2. Let the solution cool to room temperature!
2. Pick a nice, large crystal saved from experiment 1 and thread it onto a piece of sewing thread. Next, knot the thread on a pencil and hang the crystal in the solution so that it is in the middle of the liquid.

3. Place the jar in a secure place and cover it with a piece of paper towel. Whenever a layer of small crystals has deposited on the bottom of the jar, take the crystals out and dissolve the small crystals in the hot pan again.

Leave the solution to cool down properly each time before suspending the crystal in the solution again!



Experiment 3

1. Dissolve two packets of alum, as described in experiment 2, in 100 ml of water.
2. Carefully place a small rock in the solution.
3. Leave the jar to stand overnight. Take the rock out of the jar using the spatula and leave it to dry on a piece of paper towel.

