

EXPERIMENT MANUAL

Make & Display

Colorful Crystals

Grow your own
colorful crystals!



Crystal
Growing Kit



 THAMES & KOSMOS

GROWING CRYSTALS

You will need

- 20 g alum packet, dye tablet, measuring cup, spatula
- Scissors, tap water, distilled water, old pot, trivet, potholders or oven mitts, paper towels, old spoon

Here's how

1. Fill your measuring cup with distilled water to the 120 ml marker.
2. Please ask an adult for help with the following steps, always use potholders, and work very carefully so you do not burn yourself. Fill the pot with about 3–4 cm (1.5 in) of tap water and bring it to a boil. Turn off the stove and set the pot carefully on the trivet at your workstation.

3. Place the measuring cup in the pot, add the dye tablet, and stir with the spatula until the tablet is mostly dissolved.

Caution: The dye is strong and can leave stains on clothing and table surfaces.

Cut the corner off the alum packet with the scissors. Do not use your teeth to open the packet under any circumstances. The text on the packet should remain readable. Pour the entire contents into the measuring cup.



4. Stir with the spatula until all of the alum has dissolved.
5. If there are still visible granules after several minutes of stirring, remove the measuring cup from the pot with the oven mitt, reheat the water in the pot on the stove, remove it from the stove, and place the measuring cup back into the water. Then continue stirring.
6. Place the labeled measuring cup with the dyed alum solution in a quiet, safe place and wait. After only a few hours, you will be able to see the first tiny crystals forming on the bottom of the measuring cup.



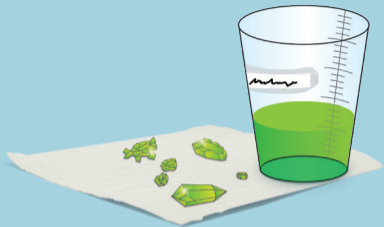
**LABEL THE MEASURING CUP LIKE THIS:
WITH A PEN, WRITE "ALUM SOLUTION"
ON A SMALL STRIP OF PAPER AND
PLACE A PIECE OF CLEAR TAPE OVER IT
TO STICK IT TO THE MEASURING CUP.**



WHAT'S HAPPENING?

Your solution heats up because of the heat from the water in the pot, which allows the small alum granules to dissolve. If the alum has formed clumps in the packet, this isn't a quality issue. It means that moisture (for example, from the air) has gotten in. The outcome won't be affected. The age of the alum is also not important.

7. Let the solution sit for one day to allow the crystals to grow bigger. Use an old spoon to take out the biggest crystals and place them on a paper towel to dry.
8. Put a lid on the measuring cup with the solution and the rest of the crystals and keep it for the next experiment. Your finished crystals can be kept in a jar with a screw-top lid, like an empty jam jar.



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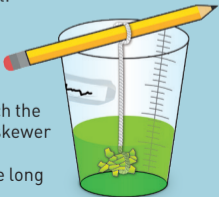
LARGE CRYSTAL

You will need

- Remaining solution and a crystal from the first experiment
- Old pot, trivet, potholders or oven mitts, thread, wooden skewer or pencil, tape

Here's how

1. Dissolve the remaining crystals in the solution by heating the solution as described in the previous experiment.
2. Allow the solution to **cool to room temperature**. In the meantime, take one of your best crystals out of the jar and tie a piece of thread securely around it. Using a piece of tape, attach the other end of the thread to a wooden skewer or a pencil laid across the top of the measuring cup. The thread should be long



enough that the crystal hangs in the solution, but does not touch the bottom.

3. Place the measuring cup back into a quiet spot and wait. The seed crystal will slowly continue to grow over the next few days. If many small crystals are forming on the bottom of the measuring cup, you can heat the solution again to dissolve them. Before you do this, take the seed crystal out and hang it in an empty jar. Then place it back in when the solution has cooled again. With enough patience, you will have a beautiful large crystal.

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.

Keep the packaging and instructions, as they contain important information.

Contents: 1 packet potassium aluminium sulfate (alum, EC-No. 233-141-3) 20g (Item No. 720616), 1 dye tablet, measuring cup, spatula

Before beginning, please read the label and check that the correct chemical, potassium aluminium sulfate (alum), is included.

DIRECTIONS FOR SUPERVISING ADULTS (SAFETY RULES)

Dear Parents and Supervising Adults,

With this crystal growing set, you will accompany your child on a journey into the fascinating world of crystals. Please read the following advice together carefully.

- 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 experiment set is intended 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, safety information and the possible hazards with the child or children before commencing the experiments. Particular attention should be paid to the safe handling of hot water, chemical solutions, and household materials, as well as use of the stove.
- 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. It should not be in the kitchen, to avoid possibility of confusion with food.
- Substances in non-reclosable packaging (potassium alum packet) should be used up completely during the course of one experiment, i.e. after opening the package.

- Hot water is used in the production of crystal salt solution. You should devote special care to handling hot water safely and assist your child when help is needed. Make sure there is no fire risk when heating water on the kitchen stove!
- While experimenting, please be careful not to let the alum come into contact with the skin, eyes, or mouth.
- The dye tablets may cause stains that can't be washed out of clothing. Keep all tablecloths, curtains, and carpets away from the experiment area. The child should wear old clothes when working.
- The alum, its solution, and the finished crystals should not get into the hands of young children, as they could mistake them for candies and put them into their mouths.

CLEAN-UP AND WASTE DISPOSAL

Cleanliness is very important in chemistry. Clean all used vessels and your workspace immediately after experimenting. Rinse the cup thoroughly with clean water and dry it with a paper towel, then dispose of the paper towel immediately. Because you will only work with a small amount of a harmless chemical in this experiment kit, you can simply rinse liquid waste down the drain with plenty of water. Solid waste can be disposed of in the household trash.

Poison Control Centers (United States)

In case of emergency, your nearest poison control center can be reached everywhere in the United States by dialing the number:

1-800-222-1222

Local Hospital or Poison Center

Record the telephone number of your local hospital or poison center here:

.....
.....
.....

Write the number down now so you do not have to search for it in an emergency.

RULES FOR SAFE EXPERIMENTATION

Stop!

Read this first before you begin.

1. Read the instructions before use, follow them, and keep them for reference.
 2. Pay special attention to the quantity specifications and the sequence of the individual steps. Only perform experiments described in these instructions.
 3. Keep young children and animals away from the experimental area.
 4. Store this experimental kit and final crystal(s) out of reach of children under 8 years of age.
 5. Clean all equipment after use.
 6. Ensure that all containers and non-reclosable packaging are disposed of properly.
 7. Wash hands after carrying out experiments, and clean the workspace.
 8. Do not eat or drink in the experimental area, and also do not smoke.
 9. Do not allow chemicals to come into contact with the eyes or mouth.
 10. Do not apply any substances or solutions to the body.
 11. Do not grow crystals where food and drink is handled, or in bedrooms.
 12. Do not use any equipment which has not been supplied with the kit or recommended in the instructions for use.
 13. Take care while handling hot water and hot solutions.
 14. Ensure that while crystals are growing, the container with the liquid is out of reach of children under 8 years of age. All filled containers should have a label marked with the container's contents.
- Pay close attention to the instructions on the alum packet and the instructions for handling the alum.**

FIRST AID INFORMATION

In case any accidents should happen during experimentation

- **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. For example, move the person into another room with open windows or outside.
- **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 and its container with you.
- **In case of injury always seek medical advice.**

DIRECTIONS FOR HANDLING THE ALUM

Please note the following safety precautions regarding the potassium aluminium sulfate (alum) contained in this experiment kit.

Potassium aluminium sulfate (alum): Avoid inhalation of the powder. Do not allow to come into contact with eyes or skin.

WARNING! The following applies to alum: Store under lock and key. Keep out of reach of children. This applies especially to young children, but also to older children who have not been instructed by a parent or supervising adult as the experimenter has.

Additional safety instructions:

IF SWALLOWED: Immediately seek medical advice/attention and have product container or label (of chemical substance) at hand.

If a chemical accidentally makes contact with your skin, immediately rinse it off under cool, running water. When experimenting, be careful not to inhale dust or powder of chemicals.