

STEM EXPERIMENT KIT™

EN

Manual

Crystal Geode



©2018 Franckh-Kosmos Verlags-GmbH & Co. KG,
Pfizerstrasse 5–7, 70184 Stuttgart, Germany

This work, including all its parts, is copyright protected. Any use outside the specific limits of the copyright law is prohibited and punishable by law without the consent of the publisher. This applies specifically to reproductions, translations, microfilming, and storage and processing in electronic systems and networks. We do not guarantee that all material in this work is free from other copyright or other protection.

Project manager: Linnéa Bergsträsser, Annette Büchele
Composition: sloedesign.de, M. Horn; Illustrations/

Photos: Michael Flaig, Pro-Studios; Andrea Mangold, München

1st North American Edition © 2020 Thames & Kosmos, LLC, Providence, RI, USA
Thames & Kosmos® is a registered trademark of Thames & Kosmos, LLC.

Editing: Ted McGuire; Additional Graphics and Layout: Dan Freitas

Distributed in North America by Thames & Kosmos, LLC, Providence, RI 02903
Phone: 800-587-2872; Web: www.thamesandkosmos.com

We reserve the right to make technical changes.
Printed in Taiwan

551101-02EN-280120

THAMES & KOSMOS



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

- › 2 packets of potassium aluminium sulfate (alum, EG no. 233-141-3), 20g, item no. 720616;
- › 1 packet of dye (allura red, EG no. 247-368-0), 1g, item no. 720619;
- › 1 bag of plaster (calcium sulfate, EG no. 247-368-0), 200g, item no. 720617;
- › Plastic geode mold; measuring cup; spatula



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

Advice for supervising adults

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.

- d) 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, 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 plaster, 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. The working area should be cleaned immediately after carrying out the activity.
- 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 instruments used for growing the crystals to the kitchen.

Have fun growing your crystals!

Information about the included substances

Please pay attention to the following hazard and safety information for the substances contained in the kit:

Aluminium potassium sulfate (potassium alum): Avoid breathing dust. Do not get in eyes, on skin or on clothing.

Plaster (gypsum, calcium sulfate): Avoid breathing dust. Do not get in eyes, into the mouth, or on skin. Do not place the material in the mouth. Do not inhale dust or powder. Do not apply to the body.

Dye powder: (None)

WARNING! The following applies to all chemicals: Store locked up. Keep out of reach of children. This primarily applies to young children, but also to older children who — unlike the experimenter — have not been appropriately instructed by adults.

Also follow this precautionary statement: **IF SWALLOWED:**

Get immediate medical advice/attention and have product container or label of chemical substance at hand. If any chemicals inadvertently get onto the skin, rinse off immediately under running water. Always be careful not to inhale chemical dust or powder when experimenting. Wash hands thoroughly after handling. Do not ingest. Use only as instructed

Cleaning and waste disposal: Always clean used containers and your work space immediately after experimenting. Rinse the containers thoroughly with clean water and dry them using paper towels, which you can then throw away in the household rubbish. The remaining liquid plaster can simply be dried on the newspaper and thrown away in the household rubbish with the other solid waste. As you are only working with small amounts of a harmless chemical in this experimentation kit, you can simply wash liquid waste away with plenty of water. Rinse thoroughly so that no residue remains.

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 crystal(s) (crystal geode) out of reach of children under 8 years of age.
- › Clean all equipment after use.
- › Ensure that all empty non-reclosable packaging is 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 alone. An adult should always be present.
- › Be particularly careful with hot stoves, and don't forget to turn them off after use! Do not inhale hot vapors that are released while heating!

First aid in the event of an accident

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

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. Choking hazard — small parts may be swallowed or inhaled. Keep packaging and instructions, as they contain important information.

Experiment 1: Producing seed crystals

1. You will first need some seed crystals. Add a packet of crystal powder and 90 ml of water to a glass jelly jar.

OPENING THE PACKET

Cut open a corner of the packet using scissors. Do not use your teeth.

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).

Now place your growing 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 of the crystal solution. Do not burn yourself on hot solutions or on the pan and don't forget to turn off the stove!



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



Do not inhale vapors that are produced when the crystal salt solutions are heated!

3. Leave the jar containing the crystal solution to cool somewhere it will not be disturbed. Retrieve the crystals on the bottom of the jar using a spoon and store them in a container.

Experiment 2: Filling the mold

1. Rinse a yogurt cup and fill it with half of the plaster powder together with 60 ml of water. Stir thoroughly using the spatula.
2. Place the plaster mix in the geode mold and scrape it upwards against the walls of the mold using the spatula.
3. Now scatter your seed crystals on the damp plaster so that they stick to it. Leave the mold to dry for a day.



Experiment 3: Growing the crystals

1. Place the contents of the second packet of crystal powder and 90 ml of distilled water in a clean glass jar. Heat the mixture as you have learned in experiment 1.
2. Remove the jar from the pan and add the dye powder. Stir until a nice red solution is formed.
3. Carefully pour the cooled crystal solution into your plaster mold. Fill the mold right up to the edge.
4. Place everything somewhere out of the way and wait for two days.
5. Carefully pour the solution out of the plaster mold and into a plastic cup. If you are satisfied with your crystal growth, you can wash the crystal solution down the sink with plenty of water. If not, simply pour the solution back into the plaster geode and leave it to crystallize for a few more days.
6. Leave the crystal geode to dry for another day. You can then remove it from the plastic mold. Dispose of remaining plaster and crystal pieces in the household waste.

TIP! You can also heat the solution for a second time so that all the crystals are dissolved again, and then pour them back into the geode when cooled!

