GEEK & CO. SCIENCE!

PROJECT KIT

Ages 8+

HOT ICE CRYSTALS

NOTE!

Please read the safety information, the advice for supervising adults, the safety rules, the first aid information, and the information on handling the crystal salt and disposing of it in an environmentally responsible manner.

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.

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.

THAMES & KOSMOS

Franckh-Kosmos Verlags-GmbH & Co. KG, Pfizerstr. 5-7, 70184 Stuttgart, Germany | +49 (0) 711 2191-0 | www.kosmos.de
Thames & Kosmos, 301 Friendship St., Providence, RI, 02903, USA | 1-800-587-2872 | www.thamesandkosmos.com
Thames & Kosmos UK Ltd, Goudhurst, Kent, TN17 2QZ, United Kingdom | 01580 212000 | www.thamesandkosmos.co.uk

KIT CONTENTS

Please start by checking the labels on the sodium acetate packets to make sure you have the correct chemicals.

1	Packets of crystal salt, sodium acetate, approx. 30 g each, Item no. 775 017, EC no. 204-823-8 (7)	4	Seal and polar bear mold
2	Measuring cup	5	Plastic castle base
3	Wooden spatula	6	Blue dye packet, Item no. 705725
		7	Wooden stick
		8	Petri dish with lid

YOU WILL ALSO NEED: *Distilled water (from the supermarket, for example), 2 small, empty and clean jelly jars with lids, scissors, old pot and trivet, 2 pot-holders, piece of heavy cardboard (about 150 x 200 mm), aluminum foil, paper, pencil and tape, paper towels*

Hey Crystal Makers!

Are you ready to try some amazing crystal growing experiments? With this kit, you can make crystals form instantly out of a sodium acetate solution. They look like ice but they release heat upon formation. We'll use the solution to mold crystalline polar bears and seals, and create an elegant crystal castle with shimmering spires. You can learn about the chemical reaction that makes this happen. Let's get started! Krystal the Geeker will be your guide!

3. Making sparkling crystal animals

You will need:

1 packet crystal salt (sodium acetate), crystallized solution from Experiment 2, wooden spatula, seal and polar bear mold, petri dish, *2 clean jelly jars with lids, distilled water, pot, trivet, and pot-holder, scissors, paper label, pencil and tape, paper towels, piece of cardboard (about 150 x 200 mm), aluminum foil*

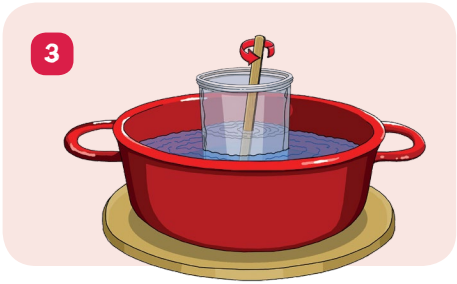
Here's how:

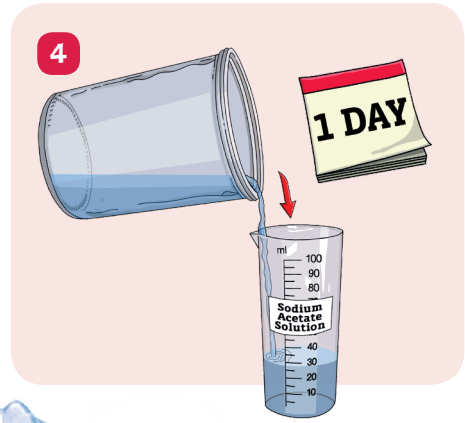
1. Pour the crystallized solution from the last experiment back into a clean jelly jar and clean the measuring cup.

2. Add **one more packet of crystal** salt to the jelly jar along with **4 mL of water.** Save a few seed crystals in the closed petri dish.

3. Heat the solution in a water bath as described in Experiment 1, and stir until the solution is completely clear and you can no longer see any crystal granules.

4. Carefully pour the warm solution into the clean, labeled measuring cup. Let it sit **overnight in an undisturbed location,** placing the jelly jar lid on top to protect it.





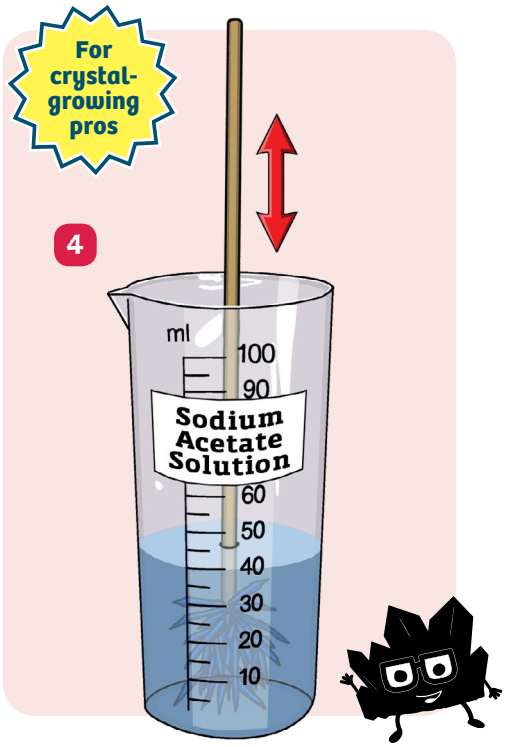
5. Growing crystal flowers in seconds

You will need:

1 packet crystal salt (sodium acetate), wooden stick, petri dish, blue dye, *clean jelly jar with lid, distilled water, pot, trivet, and pot-holder, scissors, paper label, pencil and tape*

Here's how:

1. For this experiment, you can re-dissolve the column from Experiment 4 in a water bath or you can make a colorful solution with a new packet of crystal salt, as described in Experiment 4.
2. Then pour the warm solution from the jelly jar into the clean, labeled measuring cup, cover the cup with the jelly jar lid, and leave it overnight in an undisturbed location to cool.
3. Now you will have to display a little skill. Poke the wooden stick slowly into the solution.
4. Pull the stick right out again before the needles of crystal arrive at the edge of the cup or get too heavy.
5. If the crystallization doesn't happen, repeat the last two steps.
6. Insert a paper towel into the cleaned measuring cup and set your flowers into the cup with their heads pointed up.



GEEK OUT!

WHAT'S HAPPENING?

The "disturbance" (that is, the friction) caused by the wooden stick makes the crystals grow. Before, the crystallization of the supersaturated solution was triggered by shaking or the addition of seed crystals. You can easily recognize the needle-like shape of the sodium acetate crystals in the flowers. Your animal shapes and the columns from Experiments 3 and 4, then, were also made from lots of intermeshing crystal needles rather than one big crystal.

6. Glittery crystal castles

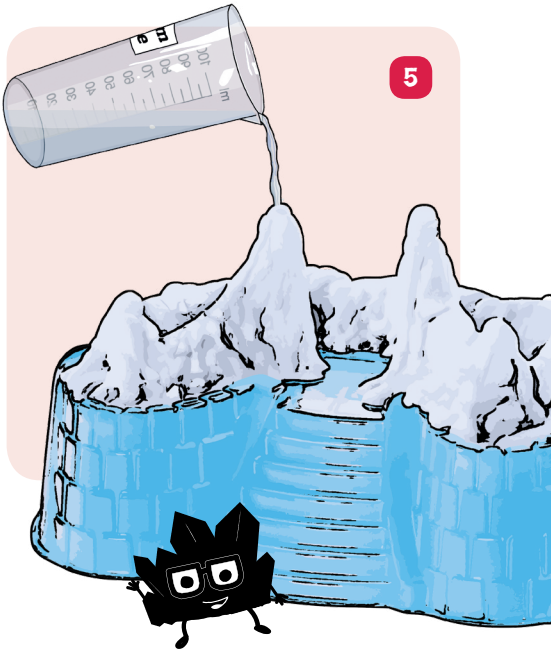
For this experiment, we recommend you use all of the crystal salt included in the kit, which includes reusing previously used crystal salts.

You will need:

Up to 7 packets of crystal salt (sodium acetate), wooden spatula, castle base, blue dye (optional), *clean jelly jar with lid, distilled water, pot, trivet, and pot-holder, scissors, paper label, pencil and tape*

Here's how:

1. Measure 4 mL of water per packet of crystal salt. You can color the water with some of the dye if you want. Then pour the colored water into an empty jelly jar.
2. Add all of the crystal salt. Save a few seed crystals on the castle base for later.
3. Make a crystal salt solution in a water bath as described in Experiment 1.
4. Pour the solution into a clean, labeled measuring cup and let the cup sit overnight in an undisturbed location with a jelly jar lid on top.
5. Carefully pour the cooled solution over the seed crystals on the castle base. Can you grow a crystal castle with a tower, gate, or turret?



GEEK OUT!

WHAT'S HAPPENING?

As in the previous experiments, when you slowly pour the liquid over the seed crystals, the solution quickly crystallizes out again. Soon you will have your own crystal castle.