Crystallisation of a Magic Crystal Tree

Instructions for demonstrators

## About this activity

‘Crystallisation of a magic crystal tree’ is an activity about crystals and crystal growth using a commercial ‘magic crystal tree’. Participants look closely at a growing magic crystal tree to see the crystals, which grow over the course of about four hours.

## Key information

Science topic(s): Crystals, crystallisation.

Age range: 5+, including adults.

Activity duration: 2 minutes – 4 hours.

Health and safety considerations: Chemicals may irritate skin – do not move or touch.

Special requirements: Stable table surface.

## 

## What’s in the box?

1. These instructions for demonstrators.
2. Risk assessment.
3. Materials for the activity:
   1. Commercial magic crystal tree kits.
   2. Nitrile gloves.
   3. Safety glasses.
4. Information to display about the activity (laminated A4 sheet).
5. Postcards about the activity to give out (A6 card).
6. Stickers for giving out to/counting participants.

## How to set up this activity

1. Assemble the tree: Unpack from its box, slot the two carboard pieces together and stand them in the small tray provided. Place it on a larger tray (e.g., lid of a plastic box) to catch any spills.
2. Position the tree: Place the tray and tree on a stable table surface, where it can be looked at but won’t get knocked. Once it starts to grow you won’t be able to move it!
3. Dispense the solution: Wearing nitrile gloves and safety glasses, carefully open the sachet of the crystal salt solution and pour over the tray. Wipe up any spills with damp paper towel and dispose of them.
4. Cover the tree with a transparent cover, e.g., plastic box, so that you can see the tree but it is protected from accidental knocks.
5. Display the magnifying glass and information sheets nearby.

## How to demonstrate this activity

1. Invite participants to look at the magic crystal tree, using the magnifying glass if necessary to see the crystals.

Potential discussion points: Crystals have smooth facets and sharp edges – this is because they are made of atoms arrange in a regular, repeating pattern. This regularity means they have facets or can be cut in specific orientations (think of the cuts of a gemstone, such as diamond).

1. You can discuss what the crystals are made of (ammonium hydrogen phosphate), and how they form (via evaporation of the water).

*The ammonium (NH4+) and hydrogen phosphate (HPO4−) ions start off dissolved in the water. As the water soaks up through the cardboard ‘branches’, the dissolved ions come with it. Where the water evaporates at the edges of the cardboard, the ammonium and hydrogen phosphate ions join up to form the crystals. As more water evaporates, more ions attach and the crystals grow!*

1. Invite the participants to come back later to see how it has changed or, later in the event, if you have taken photos of the Magic Crystal Tree, you can show them how it started and changed over the course of the event.

## Taking this activity further

You can use the activity to discuss any of these subjects:

* Crystal structures
* Factors affecting crystallisation
* Supersaturation
* Nucleation
* Crystal growth
* Crystals in nature, e.g., gem stones.

## How to pack this activity away

* Wearing safety glasses and nitrile gloves, soak up any remaining liquid solution with paper towel and carefully tip the solid magic crystal tree into a bin bag and dispose of as household waste. Do not tip down drains.
* Wipe down the tray and box with a damp paper towel and allow to dry before packing any unused kits away in the box.
* Remember to pack away the information sheets and any postcards and stickers too.

## This activity goes well with…

* Mineral Crystals
* Magnetic Tile Crystals
* The Nucleation Game
* Giant Interactive Crystal Growth

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