Growing Salt Crystals

Sections

Joey Scouts | Cub Scouts | Scouts | Venturer Scouts | Rover Scouts

Scouts VICTORIA

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Challenge Areas

COMMUNITY | CREATIVE | OUTDOOR | PERSONAL GROWTH

Scout Method Elements

COMMUNITY INVOLVEMENT | LEARNING BY DOING | NATURE AND THE OUTDOORS | PROMISE AND LAW | PERSONAL PROGRESSION | PATROL SYSTEM

SYMBOLIC FRAMEWORK | YOUTH LEADING, ADULTS SUPPORTING

SPICES Growth Areas

CHARACTER | EMOTIONAL | INTELLECTUAL | PHYSICAL | SOCIAL | SPIRITUAL

The Adventure

Salt crystals occur when the atoms used to make salt – sodium and chloride ions in the case of table salt – are a particular geometric formation. You and your patrol can grow your own salt crystals in different shapes, while learning more about crystals.

Plan

1. We commonly think of salt as table salt, but did you know that the term ‘salt’ refers to a wide range of compounds. Investigate different types of salts and what makes them salts.
2. There are two main forms that you can grow salt crystals. This can either be on a string or pipe cleaner or on some cardboard. Investigate the advantages and disadvantages and choose which form of crystals you would like to make.
    a. You can also make coloured salt crystals by adding food colour. Decide what colour salt crystals you would like to make. What colours might you need to mix to get your desired colour?
3. Investigate crystals and how they look. Try looking at some salt crystals look like under a microscope using this online microscope: https://myscope-explore.org/virtualSEM_explore.html. You may require assistance from an adult to do this.
    a. Investigate if salts made from the same elements always make the same shaped crystal by looking at Celtic sea salt and table salt by loading the different samples then pressing ‘Evacuate’. Select any ‘Accelerating Voltage’, ‘Spot size’, and ‘Z height distance’ and then press ‘HV on’. For the initial values, we recommend choosing settings near the middle of each option.
4. It is not only salts that form crystals. Investigate what else forms crystals. Can you think of anything that you might regularly use that forms crystals?
5. Investigate different types of solutions and saturation.
6. Read the safety information and discuss with your leaders or another appropriate adult what safety equipment, precautions, and supervision may be required. Ensure that you have these safety measures in place before starting the ‘Do’ section. A risk assessment should also be completed.
7. Gather the equipment and ingredients you will need for this activity. You will need the following: salt, hot water, cardboard or string/pipe cleaner, food colouring, a glass (for the string method) or a tray (for the cardboard method), pencils, and paper clip (if using string).

Do

1. Make sure everyone is aware of the safety requirements of this activity and you have an adult to assist.
2. Regardless of what type of salt crystals you are making, the initial steps are the same. Firstly, get an adult to boil some water for you and pour it into a heat-proof container. It is best if this container is see-through.
3. Carefully add salt into the water while stirring. It is important to be careful to avoid splashes as the water will still be very hot and can burn. Keep adding salt until no more salt will dissolve into the solution. This creates what is known as a supersaturated solution.
4. If you are making cardboard-based salt crystals, cut out a cardboard shape that you want to grow the crystals on. If you are making string or pipe-cleaner based crystals, tie your string or pipe cleaner onto a popsicle stick, pencil, or other suitable object that is longer than the width of your glass. If you are using string, you will also want to attach a paper clip to the end of your string. If you are using pipe cleaners, you can twist them into the shape you want your crystals to grow on.
5. If you want to make cardboard-based salt crystals, have an adult carefully pour the salt solution into a bowl or tray so that it forms a thin layer. If you are making cup and string-based crystals, have an adult carefully pour the salt solution into a heat-proof jar or cup.
6. Carefully, and using a wooden paddle pop stick, mix in a few drops of food colouring if you want to grow coloured crystals.
7. Soak your cardboard in the salt solution in your bowl or hang your string/pipe cleaner in the jar.
8. Move your jar or plate to a sunny spot that will not be bumped.
9. Wait. Salt crystals can take several days to grow. Record your observations over time. If you are making cardboard-based salt crystals and are under a time pressure, you can place the saturated cardboard in the oven on a very low heat for about 20 minutes.
10. In your patrol, try making both types of salt crystals and compare how they differ or are the same.

Review

1. Did your salt crystals grow as you expected them to? Why or why not?
2. What did you enjoy most about this activity? What did you learn?
3. What would you do differently if you did this activity again? What would you do the same?

Safety

- Temperature warning: This activity uses boiling water. This should be done by an adult and care should be taken to avoid burns. Joeys and Cubs should not be allowed to touch the water until it has cooled sufficiently. This can be done by allowing time for the liquid to cool after Step 3 in ‘Do’ before providing youth members with the liquid. The water needs to be as hot as possible to allow for as much salt to dissolve.
- Sharps warning: If making cardboard-based crystals, scissors are required to cut the shapes. Care should be taken to avoid cuts or the cardboard should be pre-cut by adults.

Variations

- Salt crystals can be created with other types of common salts, such as Epsom salts (magnesium sulfate). Try growing crystals with other types of salts. How are they the same or differ?
- If you have a microscope available, look at your crystals under the microscope. What do they look like? How do they differ or are similar to the crystals you looked at in part 3 of ‘Plan’.
- Investigate how different types of water affects the crystals by using demineralised water for one and tap water for another.