



## WOW Program Lesson Plan

# Shamrock Crystals!

**Program Duration:**

15 minutes to make;  
1-2 hours to form

**Recommended Grade****Levels:**

Grades K-5

**Materials Needed:**

- Glass jar or other deep container
- Pencils
- Green pipe cleaners
- Salt
- Stove top and salt (adult use only)
- Paper towels
- Magnifying glass (optional)

**Learning Objectives**

1. To learn about crystal formation, saturation, and dissolving

**Preparation**

- Discuss the ideas of saturation vs. dissolving
- If you want to include your child in the stove top part of the experiment, discuss safety first

**Background**

Everything in the world is made up of atoms, and crystals are formed from the interactions of these atoms. Salt crystals are made up of two elements, sodium and chlorine, which are bound to each other. When they are in water, they break apart from one another. As the water evaporates, they come back together and form crystals. When creating crystals, it is helpful for the salt and water mixture to be saturated because then, there are more atoms to come together to form crystals as the water evaporates. You have to make sure the salt first dissolves into the water, so the atoms come apart. The heat from the boiled water helps to dissolve the salt into solution, so the sodium and chlorine are floating around in the water!

**Activity****Set-Up:**

1. Boil enough water (around one cup) to fill your jar/container
2. While the water boils, create shamrocks by twisting the pipe cleaners to create a 3-leaf clover
  - a. Make sure to leave a long stem that can be wrapped around the pencil in a later step.
3. Once the water is done boiling, let it cool until it can safely be poured into the jar/container
  - a. You want it to still be fairly hot, so the salt can dissolve in the water

**Experiment:**

1. Add about  $\frac{1}{4}$  cup of salt to the water in the jar/container
2. Wrap the 'stem' of the shamrock around the pencil and place the 3-leaf clover into the mixture of water and salt (the shamrock will be hanging upside down)
  - a. The shamrock should be suspended from pencil and the pencil should sit across the top of the jar/container, so the shamrock is hanging from it, into the solution
3. Let everything sit for one to two hours and keep checking on it to watch the growth of the crystals

4. Once crystals have grown, remove the shamrock from the container and gently dry it with a paper towel
5. If you have a magnifying glass, inspect the crystals up close with it

**Additional Questions**

1. What would happen to the amount of crystal growth if we added more salt to the water?
2. What would happen if the water fully cooled before the salt was added?
3. Would you be able to do this experiment with sugar? If so, would the crystal growth look any different?

**Summary**

Since the boiling water is hot, the salt dissolves in the water, and the atoms are separated. Over time, salt crystals begin to form as the atoms come back together. Today's experiment just shows one example of how atoms can interact to form new things!

**Extended Exploration**

- Try this experiment with multiple jars that have different amounts of salt added to see the differences in crystal growth!
- More experiments to look at more interactions with atoms:  
<https://www.sciencebuddies.org/science-fair-projects/project-ideas/experiment-with-atoms-and-molecules>