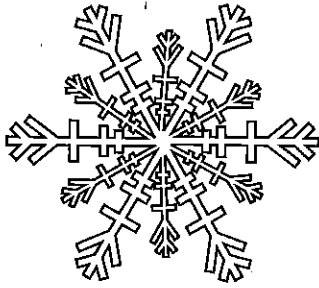


January
TK/Kindergarten
Packet





Snow, Crystals, Winter Thematic Activities

Suggested Read Aloud Books:

The Winter Book by Rotraut Susanne Berner

The Snowy Day by Ezra Jack Keats

Owl Moon by Jane Yolen

Winter Eyes by Douglas Florian

Tales for a Winter's Eve by Caitlin Matthews and Helen Cann

Memorize Jack Frost Poem by Cecily E. Pike

Look out, Look out, Jack Frost is About

Look out! Look out!

Jack Frost is about!

He's after our fingers and toes;

And, all through the night,

The happy little sprite

Is working where nobody knows.

He'll climb each tree,

So nimble is he,

His silvery powder he'll shake;

To windows he'll creep,

And while we're asleep,

Such wonderful pictures he'll make.

Across the grass

He'll merrily pass,

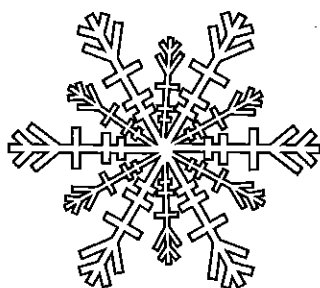
And change all its greenness to white;

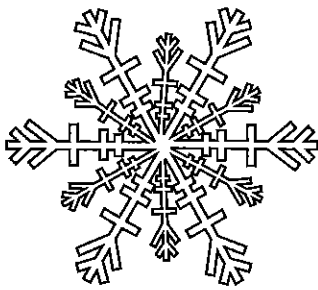
Then home he will go,

And laugh, "Ho! Ho! Ho! What fun I have had in the night!"

Other Winter activities to consider:

- ❖ Listen to *Waltz of the Snowflakes* and pretend you are a snowflake.
- ❖ Discuss how we dress in the winter compared to summer.
- ❖ Check out Geoboards and rubber bands from the Annex and create crystal shapes. Look for symmetry.
- ❖ Take a Winter drive to Calaveras Big Trees or Pinecrest.
- ❖ Try the Perceptual Motor Skills activity "The Skier". Have your child keep their arms and legs straight, step one foot forward and the opposite arm forward, then jump/switch to the other foot and the other arm. Try doing this activity 10x's.
- ❖ Make Snow Playdough by adding silver glitter, 10 drops of peppermint essential oils to the dough, and leaving out color to the dough.





Crystals and Snowflakes

"Under the microscope, I found that snowflakes were miracles of beauty; and it seemed a shame that this beauty should not be seen and appreciated by others. Every crystal was a masterpiece of design and no one design was ever repeated. When a snowflake melted, that design was forever lost. Just that much beauty was gone, without leaving any record behind."

-Wilson "Snowflake" Bentley 1925

Growing Crystals General Instructions

Crystals are easy to produce, and students like to observe the daily changes. However the crystal solutions should not be disturbed (moved, stirred, shaken, bumped...) after they have been set up in the jar.

- ❖ The two main ingredients for crystal growing are the chemical (salt, baking soda, borax...) and the water.
- ❖ A saturated solution is made by dissolving as much of the chemical as possible in boiling water. The hot water can dissolve more of the chemical than cold water.
- ❖ As the solution cools it becomes "supersaturated." Crystals are a by-product of this supersaturation. The chemical comes out of the solution and crystallizes on any surface it can attach to. The different patterns and shapes are characteristic of the way the molecules of the different chemicals like to bond and stack. Water molecules crystallize in a similar way forming snowflakes.
- ❖ The method we are using will produce many small crystals. To produce larger crystals you will need to use a two-step process by first growing a "seed crystal" then submerging the "seed" in a saturated solution. Instructions for doing this can be found at <https://www.thoughtco.com/best-crystals-for-beginners-606260>

- ❖ Be sure to observe often as some crystals form within minutes (or hours). Others will take a few days. Don't forget to use a magnifying glass as you make your observations.
- ❖ Have students record their observations in a journal.
- ❖ See the directions for **Crystal Creations**. You can use a few spoonfuls of each solution to grow crystal patterns on black construction paper. Two activities in one!!



Materials Needed to Grow Crystals

- ❖ String
- ❖ Weight (paper clip, nail or other small weight)
- ❖ Chemical-Borax (most grocery stores carry Borax by the laundry soap)
- ❖ Heat resistant jar(s) (jelly jars, quart sized canning jars)
- ❖ Pencil or stick to hang string from
- ❖ Other chemicals (table salt, sugar, baking soda)

Listed Below are several procedures for growing crystals. Take pictures and journal the process!

Salt Crystals

1 ½ cups water

1 cup salt

1. Heat the water to boiling.
2. Gradually add some of the salt and stir. Keep the solution boiling.
3. Add more salt and stir. Repeat until the salt will no longer dissolve.
4. Take the pan from the stove. Using hot pads pour the solution carefully into the jar.
5. Cut a piece of string longer than the height of the jar. Tie one end to a pencil or stick. Trim the string so that it will dangle slightly above the bottom of the jar. Attach a paper clip to weight down the loose end of the string.
6. Place the pencil over the top of the jar so that the string and weight dangle in the salt solution.

7. Put the jar in a place where it will not be disturbed. Soon crystals will grow on the string.

Baking Soda Crystals-beautiful on a flat surface

$\frac{1}{3}$ cup

1 cup water

Follow the salt crystal procedure using these ingredients instead. Be careful adding the baking soda to the boiling water as it will cause the water to quickly boil up. Sprinkle the baking soda instead of pouring it all at once. Just a little at a time.

- ❖ Use some of this solution to make the **Baking Soda Crystal Sun Catcher and Crystal Creations** on the next page.

Borax Crystals-these are fairly quick forming crystals

$\frac{2}{3}$ cup Borax

1 cup water

Use the salt crystals procedure using the quantities shown above.

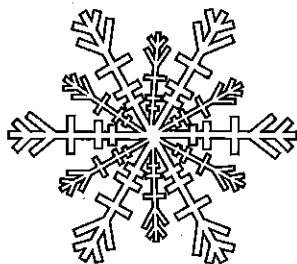
- ❖ Use some of this solution to make **Crystal Creations**. Use the extra Borax to make a **Crystal Ornament** with a pipe cleaner.

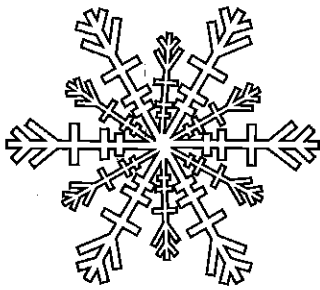
Sugar Crystals

3 cups sugar

1 cup water

Use the same directions as for salt crystals. These are the hardest to grow!!





Crystal Creations- grow spikes of crystals in the sun!

- ❖ Black construction paper
- ❖ Scissors
- ❖ Pie pan, cake pan or shallow bowl
- ❖ Warm water
- ❖ Epsom salt

1. Use your scissors to cut the black paper so that it will fit in the bottom of your pie pan.
2. Add 1 Tbls of Epsom salt to $\frac{1}{4}$ of warm water. Stir until the salt is dissolved.
3. Pour the salty water onto the black paper in the pie pan.
4. Put the pie pan out into the sun. When the water evaporates, you'll see lots of crystal spikes on the black paper!

Tips for the Home Scientist:

This activity works best on a sunny day and in a sunny window to help the water evaporate!

What's Going On?

Why does Epsom salt make crystal spikes?

When you add Epsom salt to water, the salt dissolves. When you leave the pan in the sun, the water evaporates and the salt forms crystals shaped like long needles.



If you tried this experiment with table salt instead of Epsom salt, you wouldn't get crystal spikes. That's because table salt and Epsom salt are chemically different, so the crystals that they form are very different.

The picture on the below shows part of an artwork created for the Exploratorium by Swiss artist Jörg Lenzlinger. He mixed different kinds of salts with water. As the water evaporated the salts crystallized, making beautiful shapes that kept growing and changing.

Grow a Crystal on Pipe Cleaners

Materials

- ❖ Water
- ❖ A wide mouth jar
- ❖ A pencil
- ❖ String (decorative is fun!)
- ❖ Pipe cleaners (colors cause the crystals to have the impression of color)
- ❖ Borax
- ❖ Optional- cookie cutters

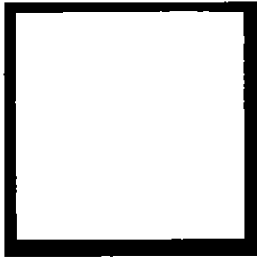


Directions

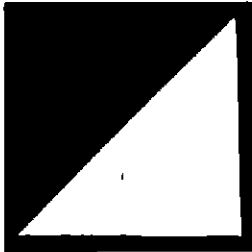
1. Twist a colored pipe cleaner into a shape (heart, cross, star, snowflake...). You can also bend the pipe cleaner around the perimeter of a cookie cutter or on the inside for a smaller shape. Make sure the pipe cleaner will be able to fit through the mouth of the jar. Keep in mind that the crystal will be larger when complete.
2. Tie a string (this can be decorative) to the top of the shape, and to a pencil. The string should not cause the shape to touch the bottom of the jar.
3. Put HOT tap water in your jar to warm it while you boil the water (pour this out when your boiling water is ready). We recommend also putting the jar on a towel to prevent the jar from cracking on a cold countertop. Pour the boiled water into the jar you have heated. Stir 3 Tbls of Borax into your jar til dissolved.
4. Lower the pipe cleaner shape into the jar with the string tied to a pencil. Make sure the water/Borax solution covers all of the pipe cleaner and the pencil rests on the rim of the jar.
5. Leave the jar undisturbed overnight.
6. The next day the pipe cleaner should be covered with crystals. If not, you can reheat the water (in the microwave) until it boils and add more Borax. Then put your pipe cleaner back into the jar.
7. Once crystals have grown, take the ornament out of the water solution and allow it to drip dry.

* You could also try adding food coloring to the water to see what happens.

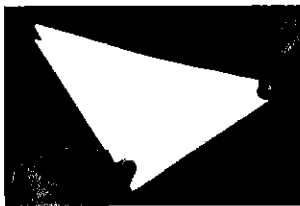
How to Cut Snowflakes



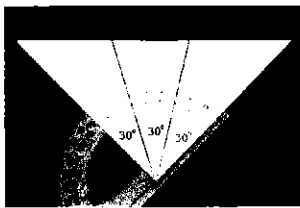
1. Make a paper square. Start out with a square piece of paper, preferably thin or lightweight paper. You can use square origami paper or follow these easy steps for making a square from any rectangular piece of paper.



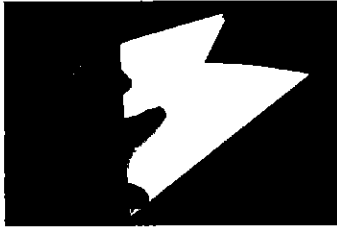
2. Fold diagonally in half. Fold the square diagonally in half to come up with a triangle.



3. Fold in half. Fold the resulting triangle in half to make a smaller triangle.



4. Divide the triangle into 3 sections. The most crucial and perhaps the trickiest step in making a paper snowflake is dividing the triangle into three equal sections. The most accurate way to do this is to use a protractor to divide the angle at the triangle's apex (the corner opposite the longest side) into three sections, each with a 30-degree angle. If you don't have a protractor, you can estimate the size of the sections as you do Steps 5 and 6.



5. Fold the left section. Once you've marked out the three equal sections, fold the left section towards the front.



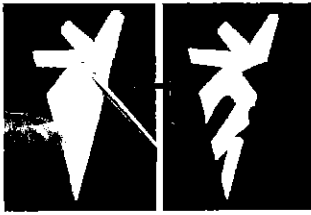
6. Fold the right section. Similarly fold the right section towards the front.



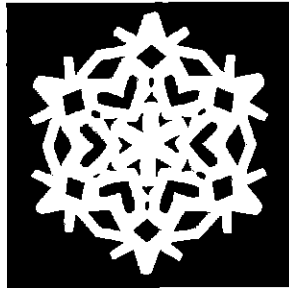
7. Flip the shape. Flip the shape over so that the side with the horizontal edge is facing front.



8. Cut along the horizontal edge. Cut along the horizontal edge so that you end up with a wedge.

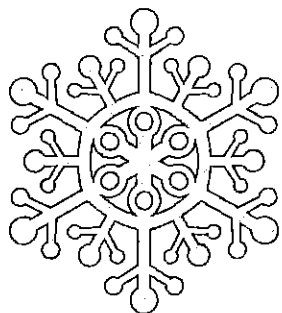


9. Cut random shapes. While keeping the wedge folded, cut out random shapes out of the edges.



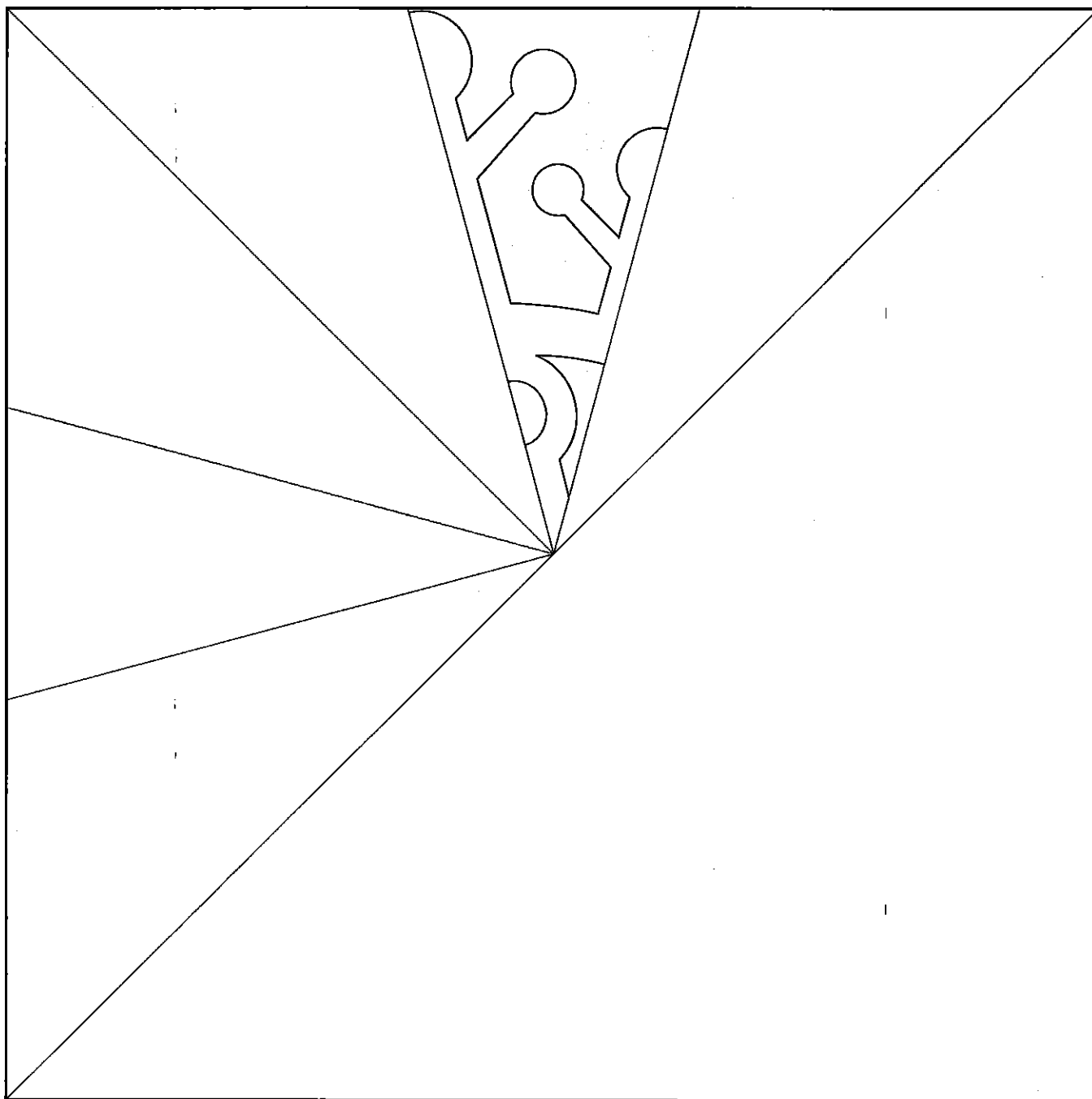
10. Unfold the paper. Carefully unfold the paper to reveal your paper snowflake. Like real snowflakes, your paper snowflake has a 6-point or six-sided symmetry.

Paper Snowflake (Template 1)

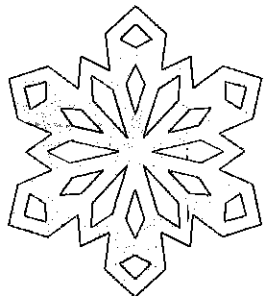


Cut out the square. Fold diagonally in half to come up with a triangle. Fold once more in half to get a smaller triangle. Fold the left section towards the back. Fold the right section towards the back as well. Cut away the gray area. Unfold the paper to reveal the snowflake.

See detailed folding and cutting instructions with illustrations plus more snowflake templates at our Paper Snowflake Patterns page.
http://www.firstpalette.com/tool_box/printables/snowflake.html

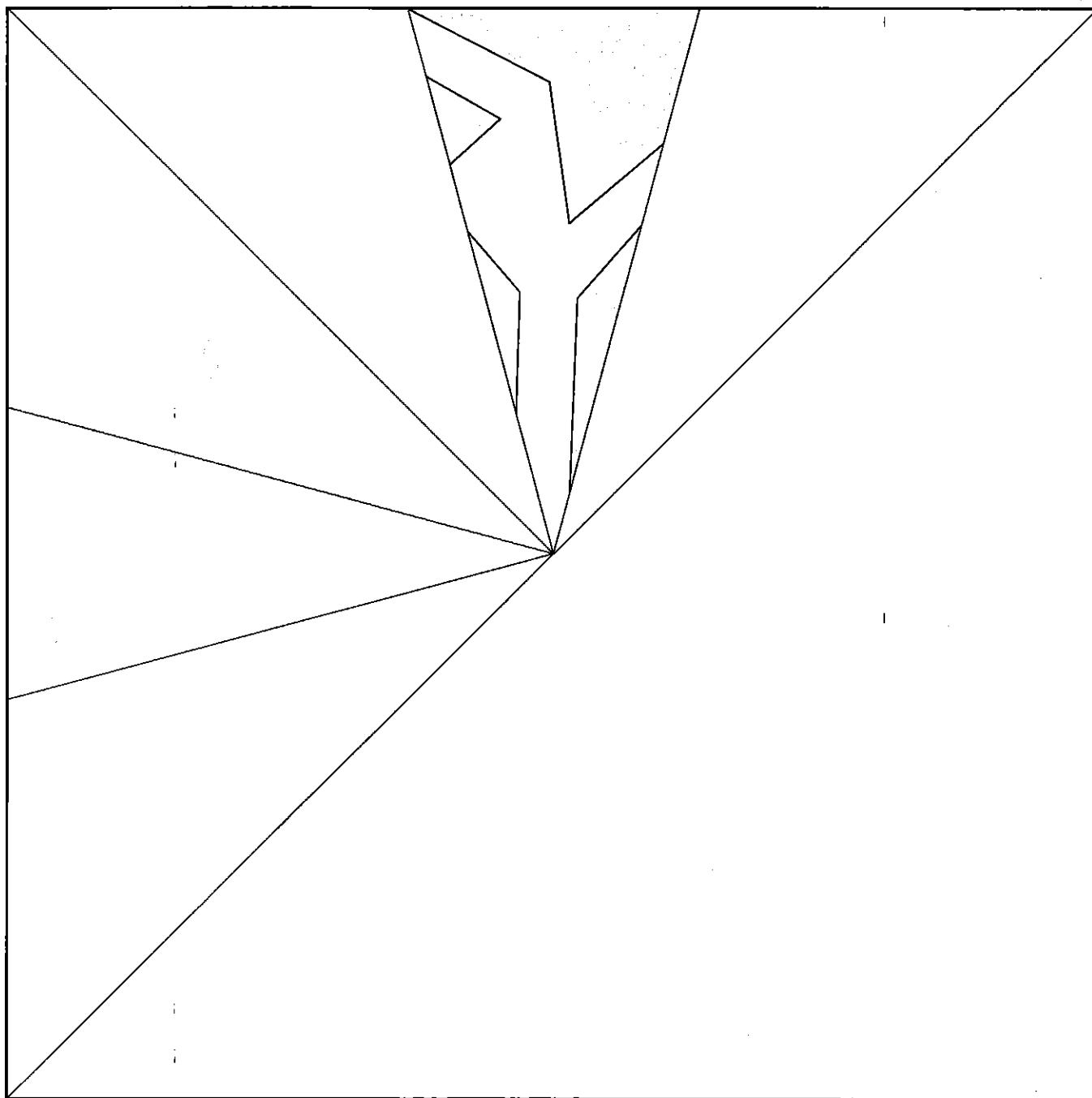


Paper Snowflake (Template 2)



Cut out the square. Fold diagonally in half to come up with a triangle. Fold once more in half to get a smaller triangle. Fold the left section towards the back. Fold the right section towards the back as well. Cut away the gray area. Unfold the paper to reveal the snowflake.

See detailed folding and cutting instructions with illustrations plus more snowflake templates at our Paper Snowflake Patterns page.
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Online Resources for Growing Crystals

<http://chemistry.about.com/od/growingcrystals/>

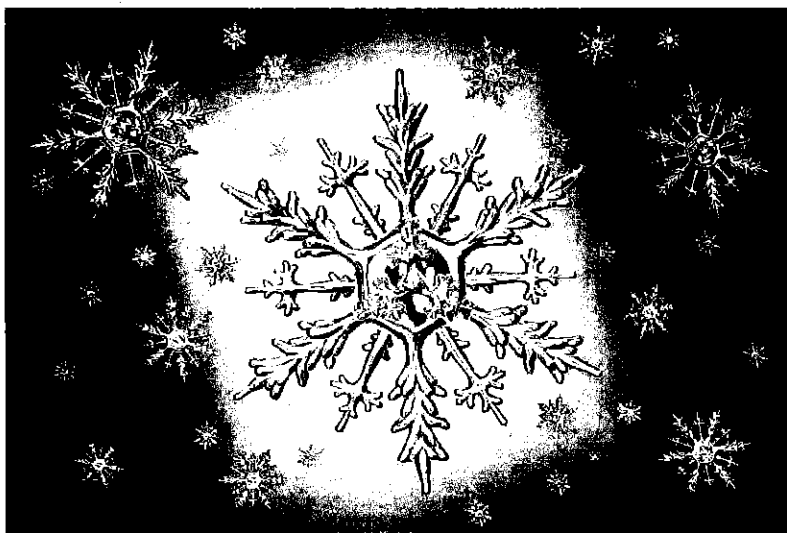
If you get the bug to grow large crystals or learn more about the process or the chemistry, this is the site for you.




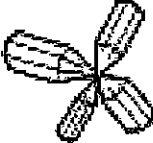



<http://www.exploratorium.edu/complexity/exhibit/saltcrystals.html>

This site has wonderful pictures of actual salt crystals.

www.snowcrystals.com

This site is for EVERYONE! It has great pictures and it is a lot of fun.



				
Simple Prisms	Solid Columns	Sheaths	Spirals on Plates	Triangular Forms
				
Hexagonal Plates	Hollow Columns	Cups	Columns on Plates	12-branched Stars
				
Stellar Plates	Bullet Rosettes	Capped Columns	Split Plates & Stars	Radiating Plates
				
Sectored Plates	Isolated Bulks	Multiply Capped Columns	Skeletal Forms	Radiating Dendrites
				
Simple Stars	Simple Needles	Capped Bullets	Twin Columns	Irregulars
				
Stellar Dendrites	Needle Clusters	Double Plates	Arrowhead Twins	Fined
				
Femlike Stellar Dendrites	Crossed Needles	Hollow Plates	Crossed Plates	Graupel

