

# Suzy's World

## What are crystals?

### Fact

- A crystal is a solid substance that has its particles arranged in regular patterns.
- Different substances make a crystal that has its particles arranged in its own special way. Salt has a cubic shape, alum makes long thin crystals and copper sulphate has a distinctive kite shape.
- Because of the geometric structure of their particles crystals most often have flat surfaces and straight edges
- There are many different types of crystals. They can be made of metals like silver or non-metals like carbon.
- Crystals found in rocks are made when the liquid rock mixture has cooled down slowly and allowed the particles to get into a pattern. This is the same way that sugar or salt crystals are made



### Do you know

- You eat crystals whenever you eat salt or sugar.
- A diamond is a very valuable crystal. It is made of carbon in a special pattern that makes it very hard and very strong so that is sometimes used in cutting equipment.
- The carbon in charcoal or the lead of a pencil is not in a special pattern so it doesn't have the same properties.
- The graphite that is used in pencils is sometimes found occurring naturally as crystals.
- A snowflake is a crystal that forms from water vapour gas. Each snowflake has a different pattern.
- Scientists can make artificial crystals.
- Frost forms crystals – they're easy to see on a windowpane.

### Experiments you can do

Frozen Juice Crystals

#### What you need:

Fruit juice concentrate

Water

Ice cube tray

Straight straws

#### What you do:

Make the juice up following the instructions on the back of the bottle. Carefully pour the fruit juice into the ice tray. Cut each straw into three pieces and place a piece of straw in each juice cube. Carefully put the tray of juice into the freezer.

When the juice cubes are frozen you will be able to eat them, holding onto the piece of straw as a ice block stick.



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## Continued... What are crystals?

Suck the juice out of the cube so you are left with the clear crystals. Look at how the juice crystals have formed. Compare yours to the juice crystals of your friends, quickly before they melt.

### Other Investigations

#### What you need:

1 cup boiling water  
2 cups of sugar  
A clean jar  
Cotton thread  
A little extra cold water  
A little extra sugar in a saucer  
Pencil  
Paperclip  
Plastic wrap

#### What you do:

Mix the sugar with the boiling water in the clean jar until the sugar has dissolved. While the sugar and water cool tie one end of the thread to the pencil and the other end to the pencil clip. Wet the string with water and roll it in the extra sugar and leave it to dry. Then lower the thread gently into the sugar solution so the pencil rests across the top of the jar and the paper clip sits on the bottom of the jar. Cover the jar with plastic wrap and leave it where it won't be disturbed or bumped for at least 5 days. What happens?  
The sugar in the liquid comes out of the solution to form big crystals of sugar.

Compare sugar crystals to salt crystals.

Use a microscope or magnifying glass or even your eyes to look at a few grains of sugar and salt. They are both crystals – do they look the same? That's because they both have a different structure their particles are arranged differently.

Try different varieties of sugar. See if there is much difference between the sugar called Coffee Crystals and plain white sugar.

The limestone caves at Waitomo have crystals growing down from the ceiling called stalactites and ones that extend up from the floor called stalagmites. Try mixing some washing soda in enough very hot water to fill two jars. Put the jars in a warm place where they won't be disturbed and place a clean saucer between them. Cut a piece of wool long enough so that the ends drop into the solution in the jars and the wool hangs between the jars. After a few days you'll notice that the mixture will drop off the wool onto the saucer to make stalactites and stalagmites.