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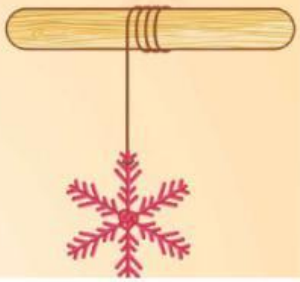
Read the 'Make a Crystal Star' instructions. Then answer questions 1–5.

Make a Crystal Star

Materials

borax powder*	hot water	large glass jar
ice-cream stick	pipe cleaners	food colouring



* Borax (or sodium borate – a type of salt) is a **non-edible** natural mineral used in various products to clean or preserve. You can find it in the laundry section in the supermarket. It can be substituted with alum, bicarbonate of soda or sugar.

Safety tips:

Ask an adult to help you when pouring hot water.

Wash your hands after touching borax.

Steps

1 Use three pipe cleaners.
2 Twist them together to form a six-point star shape.
3 Tie a length of string to one 'point' of the star.
4 Fasten the other end around the middle of an ice-cream stick.
5 Dissolve the borax powder in hot water. Use about three heaped tablespoons of borax per standard cup (250 ml) of water. Keep adding until no more will dissolve.
6 Half fill the jar with the borax **solution**.
7 Add a few drops of food colouring.
8 Place the stick across the top of the jar so the star dangles in the solution.
9 Place the jar in a warm, dry, safe place and don't disturb it.
10 Watch the crystals grow over the next few days.
11 Remove the star when all the solution has **evaporated** Hang up the star using the string.
12 Use different food colourings to make different coloured stars and hang them inside your window.

What happens

Borax dissolves in hot water.

When the water evaporates, the borax stays behind.

Crystals form as the borax attaches to the pipe cleaner.

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1 Why must you wash your hands after touching borax powder? [1 mark]

_____

2 Identify two command verbs that mean the same thing. [1 mark]

_____

3 Why must you place the glass jar in a safe place? [1 mark]

_____

4 Do you add food colouring before or after you dissolve the borax powder? [1 mark]

_____

5 Should you observe what happens at the beginning or at the end? [1 mark]

_____

Read 'The Giant Crystal Cave' text. Then answer questions 6–10.

The Giant Crystal Cave

What is the Giant Crystal Cave?

The Giant Crystal Cave is an underground cave with the largest **selenite** crystals ever found. Until recently, nobody knew it existed. The cave is the size of a football field and as high as a two-storey building. Some of the crystals are over 11 m long, 4 m in diameter and weigh about 50 000 kg. Since the extreme heat and humidity are **lethal**, it is closed to the public. Equally dangerous are the sharp, slippery crystals.

The discovery

The cave was discovered in the year 2000 by miners. They were pumping water out of a mine when they stumbled upon this natural cave 300 m underground. Because the crystals **deteriorate** in air, scientists are working on ways to preserve them.

The location

The Giant Crystal Cave is one of a cluster of natural cavities in the limestone rock near the Naica silver mine in the Chihuahua Desert, Mexico. Other caves in the cluster include:

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- **The chamber:** located below the Giant Crystal Cave. It contains hot magma which heats the water in the Giant Crystal Cave.
- **The Cave of Swords:** discovered in 1910, located 120 m above the Giant Crystal Cave. The cave is 70 m in diameter and has crystals up to 2 m in length.
- **The Queen's Eye Cave:** discovered in 2000 at a depth of 300 m. The narrow opening of the cave resembles an eye, hence its name.
- **The Candles Cave:** discovered in 2000 at a depth of 300 m. The crystals have long, delicate structures resembling candles.
- **The Ice Palace:** 150 m below the surface. It was not flooded with water, so it has smaller crystals.

Conditions inside the cave

It is deadly hot in the cave, around 58° C (136° F) – hot enough to cook an egg. A person can survive for only 10 minutes unless they wear protective clothing. When you wear an insulated suit and cold breathing system, you have 45 minutes to explore. Furthermore, the crystals are extremely dangerous because they are sharp and slippery.

How did the crystals form?

According to scientists, there is a simple explanation for how these crystals formed.

Firstly, the ground water heated up in a chamber below the cave. The hot water became saturated with minerals, mainly gypsum.

Over time, this mineral-rich hot water filled the cave.

For thousands of years, the conditions in the cave remained constant.

As a result, the crystals grew to immense sizes.

While submerged, the crystals continued to grow.

Glossary

selenite: the crystallised form of the mineral gypsum, also known as moonstone because of its colour, brilliance and transparency

lethal: harmful, destructive; causing death

deteriorate: get into a worse condition

6 What type of crystals are found in The Giant Crystal Cave? [1 mark]

_____

7 Which nearby cave was discovered first – long before The Giant Crystal Cave? [1 mark]

_____

8 Why did nobody know about The Giant Crystal Cave? [1 mark]

_____

9 Find a synonym for the word *dangerous*. [1 mark]

_____

10 Name one difference between an instruction and an explanation. [1 mark]

_____

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