

# 3D CRYSTAL SHAPES

**WARNING** — THIS SET CONTAINS CHEMICALS THAT MAY BE HARMFUL IF MISUSED. READ CAUTIONS ON INDIVIDUAL CONTAINERS AND IN MANUAL CAREFULLY. NOT TO BE USED BY CHILDREN EXCEPT UNDER ADULT SUPERVISION.

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# SAFETY

## Safety Rules

Read these instructions before use, follow them and keep them for reference.

Keep young children, animals and those not wearing eye protection away from the experimental area.

Always wear eye protection.

Store this experimental set out of reach of children under 7 years of age.

Clean all equipment after use.

Make sure that all containers are fully closed and properly stored after use.

Ensure that all empty containers are disposed of properly.

Wash hands after carrying out experiments.

Do not use any equipment which has not been supplied with the set or recommended in the instructions for use.

Do not eat or drink in the experimental area.

Do not allow chemicals to come into contact with the eyes or mouth.

Do not replace foodstuffs in original container. Dispose of immediately.

## First Aid

In case of eye contact: Wash out eye with plenty of water, holding eye open if necessary. Seek immediate medical advice.

If swallowed: Wash out mouth with water, drink some fresh water. Do not induce vomiting. Seek immediate medical advice.

In case of inhalation: Remove person to fresh air.

In case of skin contact and burns: Wash affected area with plenty of water for at least 10 minutes.

In case of doubt, seek medical advice without delay. Take the chemical and its container with you.

In case of injury always seek medical advice.

## CAUTION!

For the colored polyvinyl alcohol-containing powders:

May cause eye irritation.

Avoid breathing dust. Do not get in eyes.

Wash hands thoroughly after handling.

Do not ingest. Use only as instructed.

## WARNING!

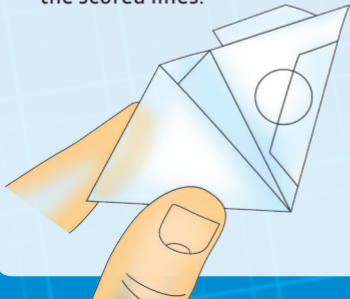
Not suitable for children under 3 years. There is a risk of choking due to small parts that can be swallowed or inhaled. There is a risk of strangulation if long strings or cords are placed around the neck. Keep the packaging and instructions, as they contain important information.

## EXPERIMENT: 3D CRYSTAL SHAPES

1. Locate one of the flat, clear, die-cut plastic pieces that will eventually become your crystal shape.

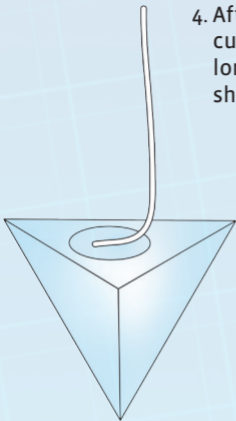


2. Fold the plastic along the scored lines.

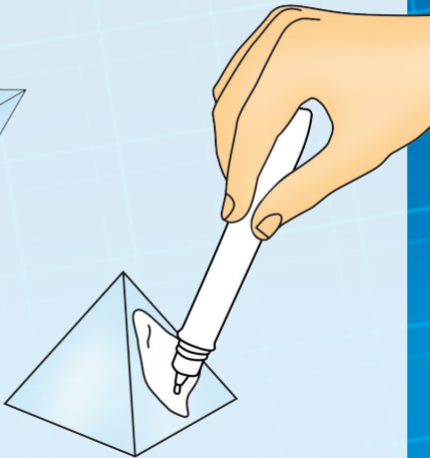


3. Where the edges come together, use a clear circular sticker to secure them.

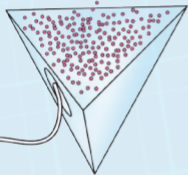
4. After the shape is fully assembled, cut a piece of string about one foot long. Affix the string to the crystal shape with a circular sticker.



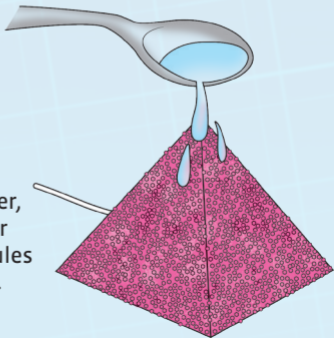
5. With the glue pen, coat all sides of the crystal shape in a thin layer of glue.



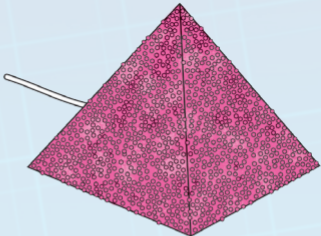
6. Select a color of crystal granules and cut the packet open. Sprinkle the crystal granules on each glue-covered side of the crystal shape.



7. With a spoon or a dropper, drip a few drops of water to soak the crystal granules on all sides of the shape.



8. Let the crystal shape sit undisturbed until it is dry.



9. Repeat with the other crystal shapes.

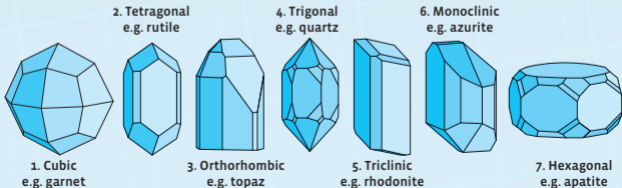
10. You can hang the finished crystal shapes in a window or anywhere you like!

The crystal granules are mostly composed of **polyvinyl alcohol (PVA)**, which are small water-soluble particles with irregular shapes and a little elasticity. They become sticky when wet. Once the granules are moistened, the surfaces of the particles start to dissolve slowly and they become sticky. Therefore, all the particles will stick together and form a solid coating as they dry.

# WHAT ARE CRYSTALS?

Crystals have amazing geometric shapes, which form when dissolved substances gradually harden. They can form many different shapes. The shape of a particular crystal is determined by the type of atoms or molecules that make up that crystal.

The atoms or molecules line themselves up in highly organized structures. A few atoms form a **unit cell**, a small three-dimensional box, which is too small to see. The unit cells repeat themselves over and over again, creating the perfectly regular larger crystal shapes you can see. There are seven groupings of unit cells, also known as **lattice systems**.



## THE CRYSTAL SHAPES IN THIS KIT



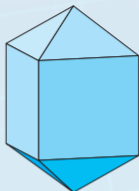
### **Octahedron**

Diamond, alum, magnetite, fluorite, and pyrite crystallize in this form.



### **Tetrahedron**

This form is found in zinc ore (sphalerite).



### **Tetragonal prism with double pyramid**

Minerals such as rutile, the precious stone zircon, and the tungsten scheelite have this form.



### **Rhomboid**

This very common crystal form is found in calcite.



### **Scalenoedron**

Magnesite crystallizes in this form.