

# Science of snowflakes



Why has a snowflake got 6 sides?



# Science of snowflakes

## Stay safe

Whether you are a scientist researching a new medicine or an engineer solving climate change, safety always comes first. An adult must always be around and supervising when doing this activity. You are responsible for:

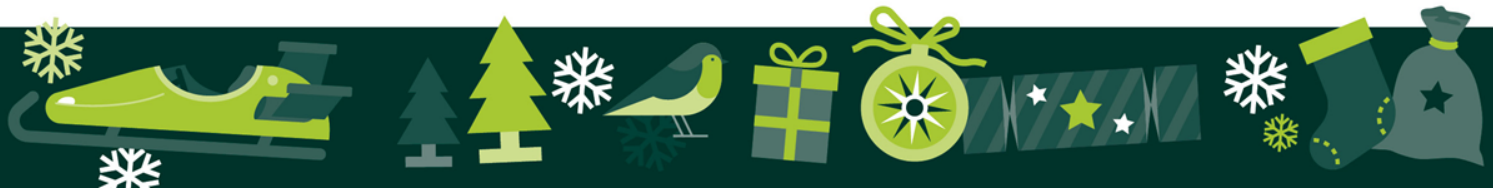
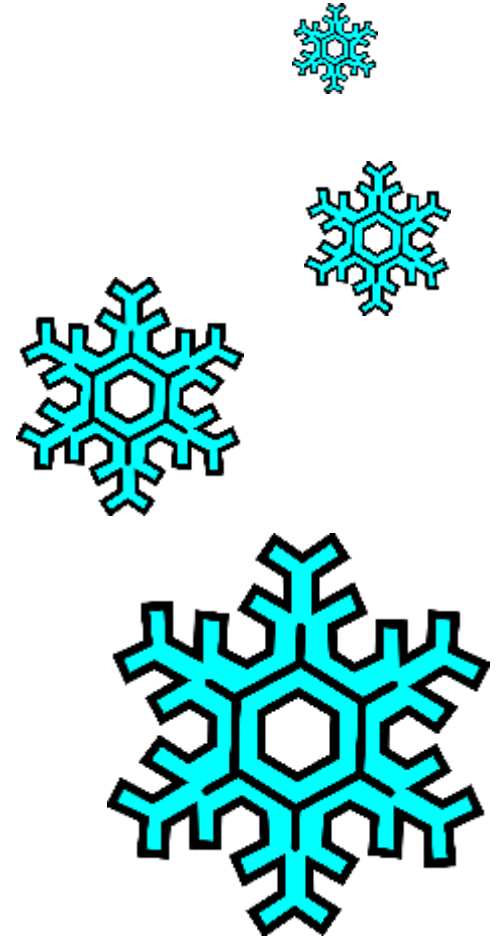
- ensuring that any equipment used for this activity is in good working condition
- behaving sensibly and following any safety instructions so as not to hurt or injure yourself or others

Please note that in the absence of any negligence or other breach of duty by us, this activity is carried out at your own risk. It is important to take extra care at the stages marked with this symbol: ⚠



# Snowflakes

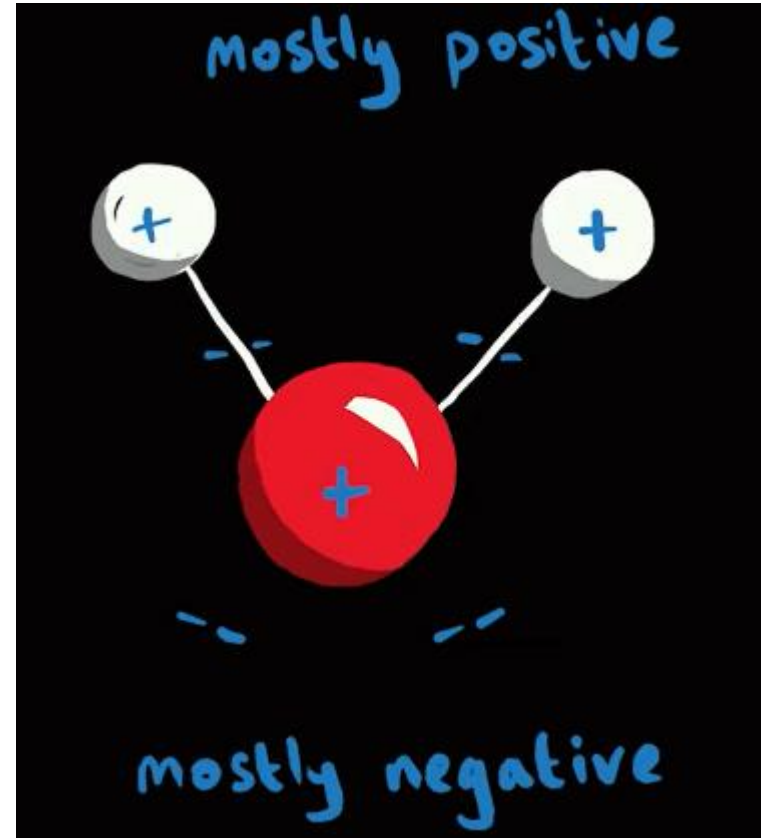
- They are always flat with 6 sides
- They are made from H<sub>2</sub>O (Water):
  - 2 molecules of hydrogen
  - 1 molecule of oxygen
- Their molecules move freely above 4°C
- Below 4°C the molecules freeze in the air, making hexagon shapes



# Snowflakes – why a hexagon shape?

1 of 3

- There are electrons and protons in the oxygen and hydrogen molecules
- This creates a polar charge

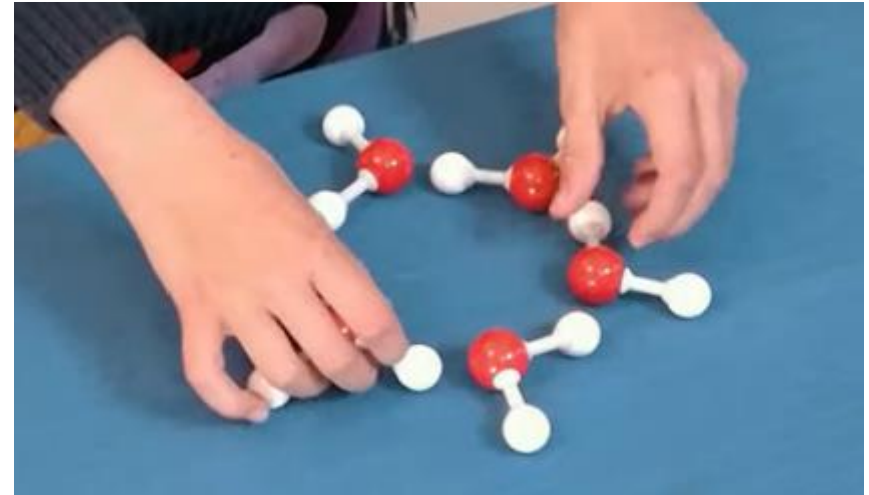




# Snowflakes – why a hexagon shape?

2 of 3

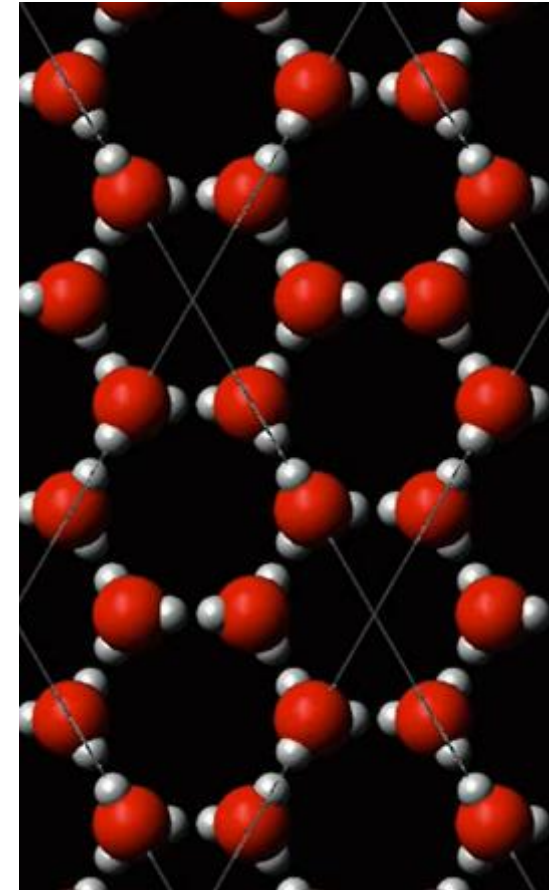
- The hydrogen molecules are attracted to the oxygen molecules
- This is called hydrogen bonding
- So below 4°C the hydrogen bonds crystallise to form snow, snowflakes and ice



# Snowflakes – why a hexagon shape?

3 of 3

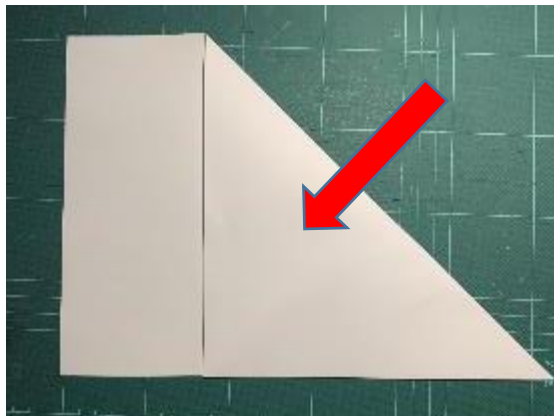
- The polar charge holds the molecules together
- As they crystallise, they create a hexagon lattice
- The hexagons then tessellate to make snow, snowflakes and ice



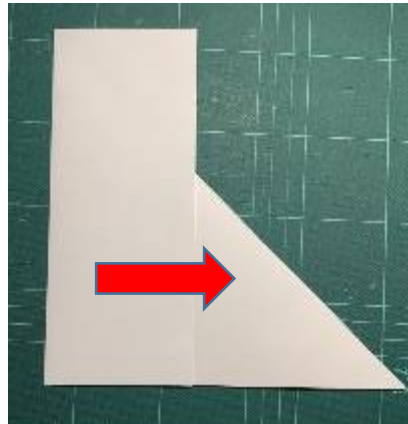


# Snowflake activity - make a snowflake

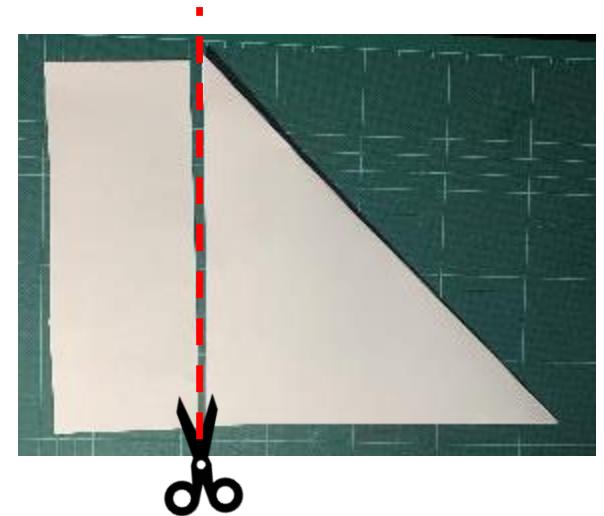
## Step 1- Make a square



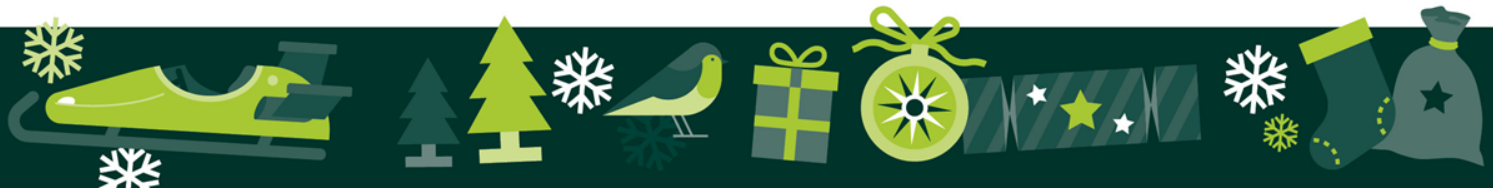
Fold one corner of A4 paper



Fold over one end of the paper



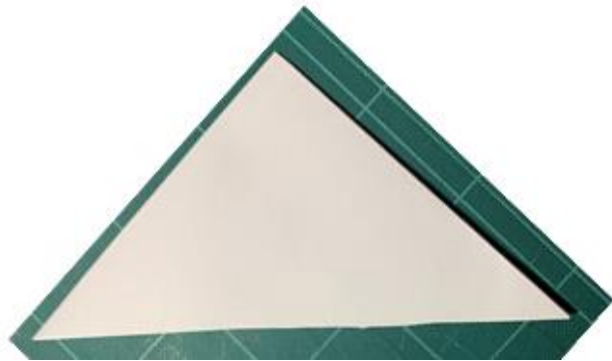
Cut off at the fold  
⚠



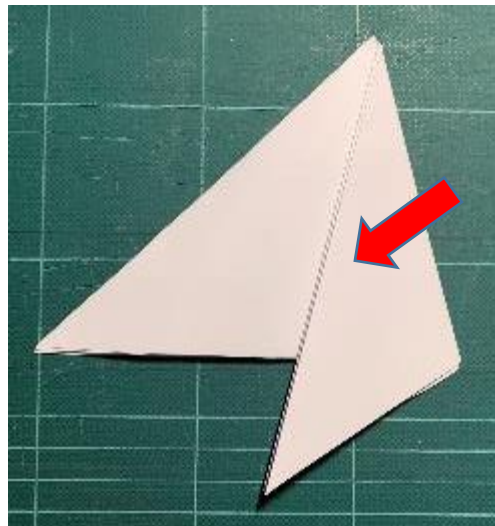


# Snowflake activity - make a snowflake

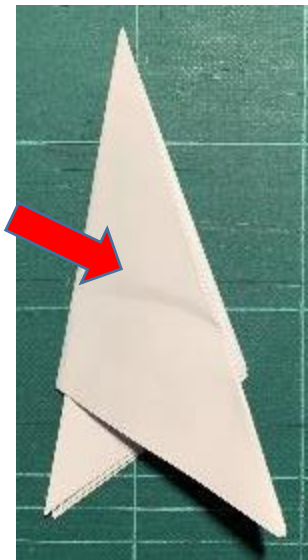
## Step 2



Place the triangle in the position shown



Fold the right side as shown



Fold the left side as shown

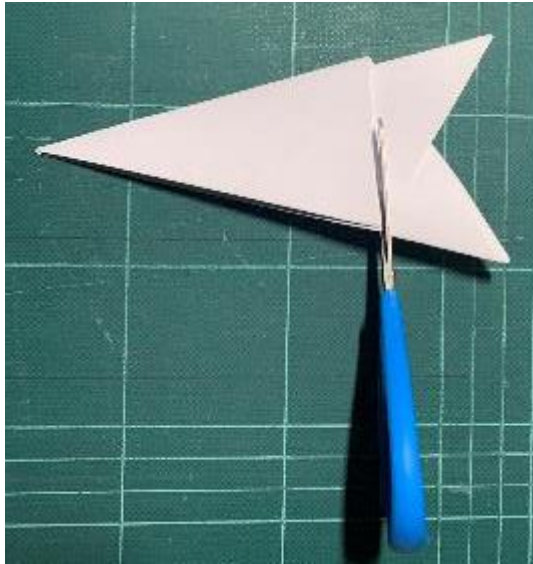






# Snowflake activity - make a snowflake

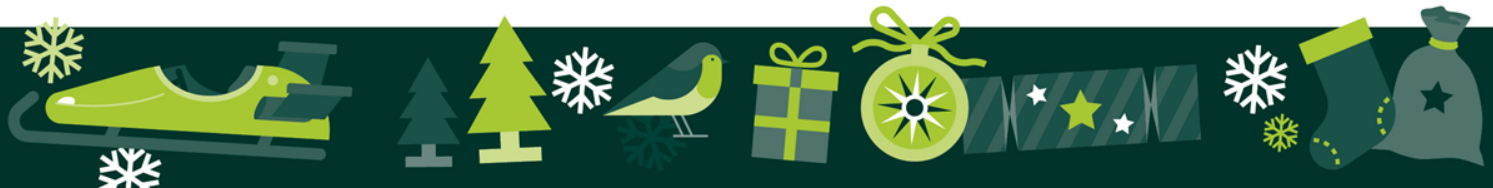
## Step 3



Cut the 2 folds on the bottom ⚠



Draw a design on the triangle



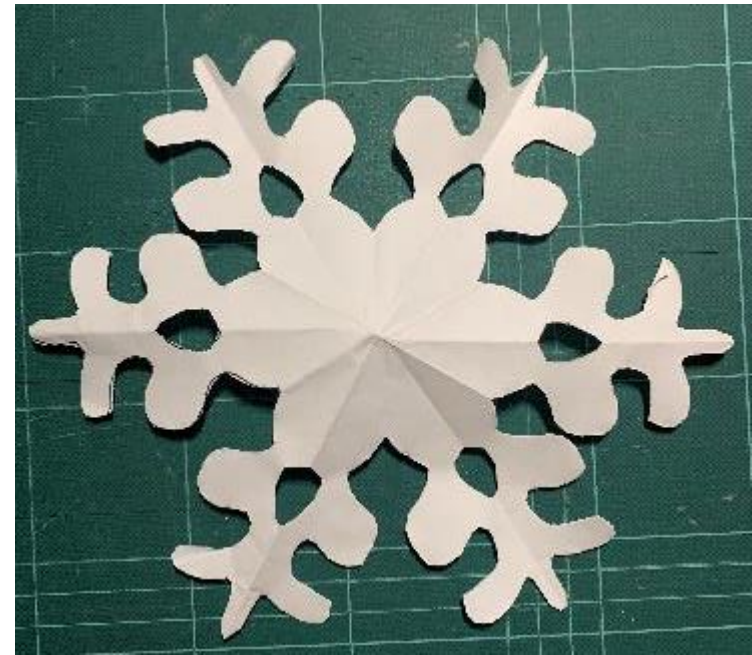


# Snowflake activity - make a snowflake

## Step 4



Cut out the pattern ⚠



Unfold the paper to reveal your snowflake

