Understanding the Ice Crystal

Watch the video entitled *Understanding the Ice Crystal* and answer the questions below.

Q1 Which state of matter is a block of ice?
A1 Ice is a solid.

Q2 List two properties of this state of matter.
A2 Ice has a definite shape and a definite volume.

Q3 How are the particles arranged in the large ice crystals?
A3 The particles in ice are closely packed into position. As a result they keep their shape and volume.

Q4 When water changes to ice is this a physical or a chemical change?
A4 This is a physical change as there is no new substance formed.

Q5 Ice crystals are formed from water. What is this change in state of matter called?
A5 This is called freezing. It occurs when a liquid is cooled and changes into a solid.

Q6 What is the unusual property of ice?
A6 Ice is lighter and less dense than liquid water; hence it floats.

Q7 What happened when the man banged the bottle of cooled water on the table?
A7 Tiny ice crystals formed inside the bottle of water.

Q8 What does the ice need in order to form a crystal?
A8 The ice needs a seed in order to form crystals. The seed acts like a template or starting point on which the rest of the ice grows.

Q9 State two ways in which the man can form ice crystals in the bottle of cooled water.
A9(i) The man can bang the bottle, forming bubbles which behave as a seed helping to form ice crystals.
A9(ii) The man can put a tiny ice crystal into the cooled bottle of water and this will also behave as a seed and help to form more ice crystals.

Q10 Explain how ice crystals are formed and why they float on water.
A10 Water molecules are held loosely together by bonds that are constantly making and breaking. When the temperatures fall to zero degrees these bonds hold tight, forming a hexagonal lattice. This is the ice crystal. The water molecules are held far apart and this makes the ice less dense than liquid water so it floats.