

Changing States

Discussion Questions:

- 1) What are the three states of water?
- 2) What is the boiling point of water?
- 3) What is the freezing point of water?
- 4) Why do we sometimes see a cloud above a boiling kettle?

Pour a glass of cold tap water. Measure the temperature with a thermometer.



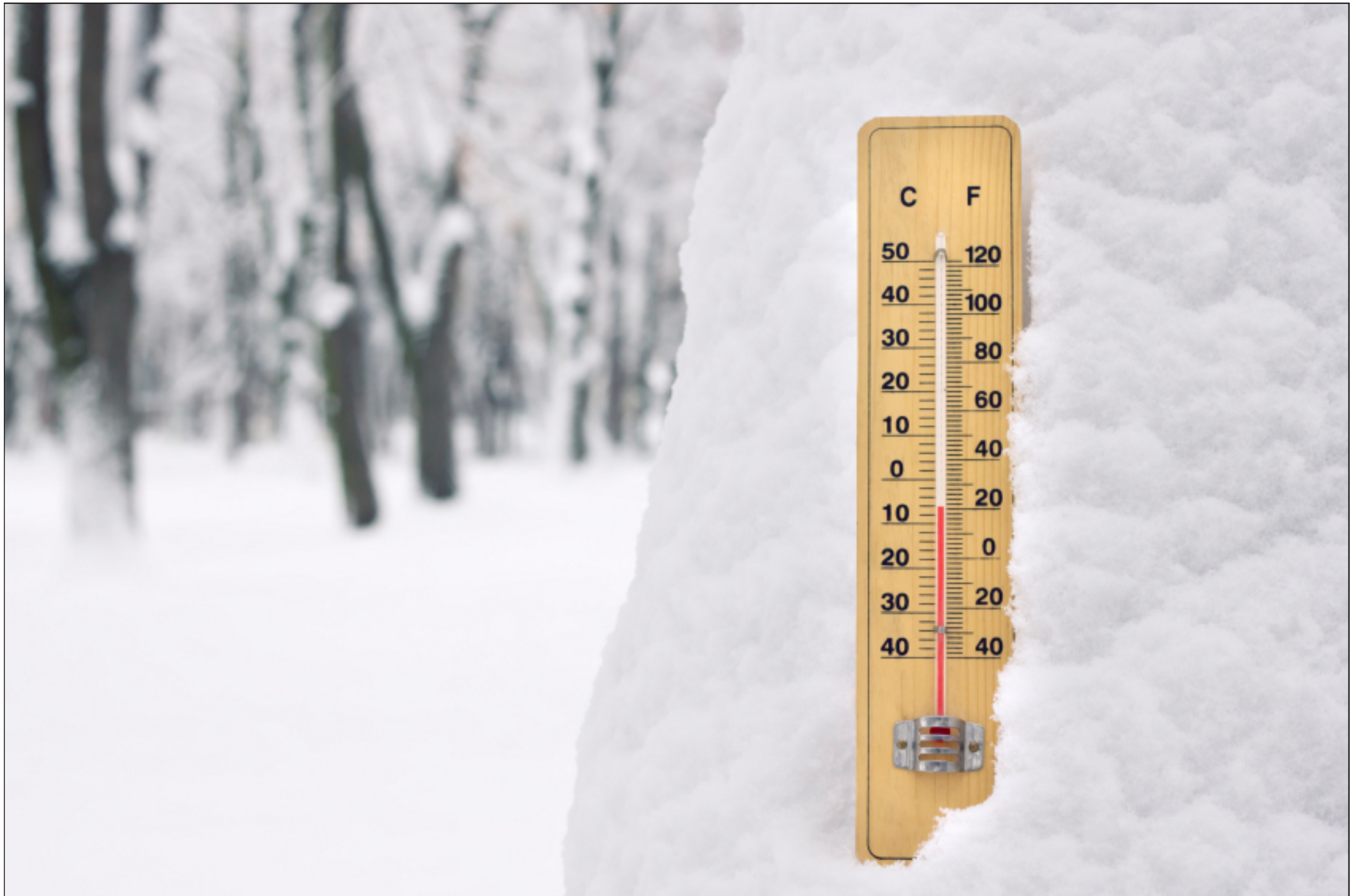
Now pour a glass of water that has been in the fridge overnight. Measure the temperature. How are the two measurements different?



At what temperature do you think water start to freeze?



Can the temperature of ice go below this measurement?



At what temperature do you think ice will start to melt?



Steam

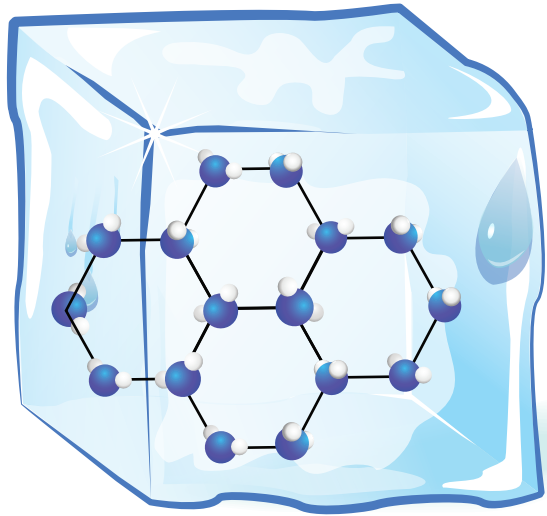
Steam is the name given to water that is changing state from liquid to gas through heating. The cloud of steam disappears quickly into the atmosphere.

This water vapour will eventually cool as it rises high into the atmosphere. It will begin to condense and turn back into water droplets, collecting together as clouds in the sky. When the cloud becomes saturated and can hold no more water, it will return to the ground as precipitation (rainfall, snow, hail.)



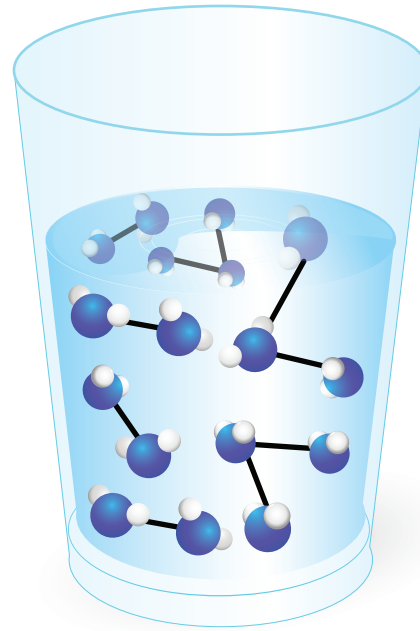
Once water reaches its boiling point of 100 degrees Celsius, its temperature will rise no further. Water will continue to boil and evaporate at 100 degrees Celsius until all the water has become vapour.

What happens to the molecules in water when it changes state?



Solid

When water cools the movement of molecules slows down. When water approaches the freezing point the molecules are attracted to each other. They clump together as ice crystals, forming a solid.



Liquid

When water is in a liquid state the molecules cling together but are still moving. The molecules near the surface are still be able to escape to the air, especially when they are heated by the sun. This is why evaporation occurs at room temperature.



Gas

Heat makes the molecules in the water begin to move about more quickly. When the water temperature boils the molecules are moving about very quickly, making it easy for them to escape to the air.