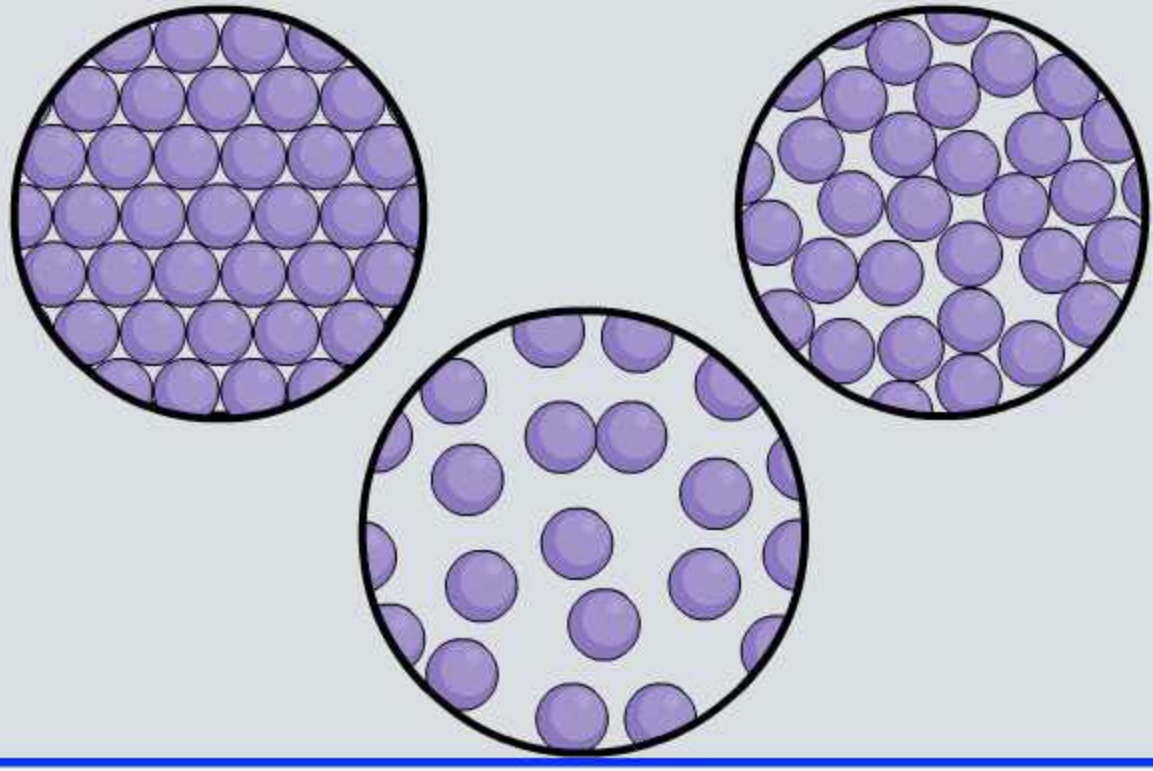
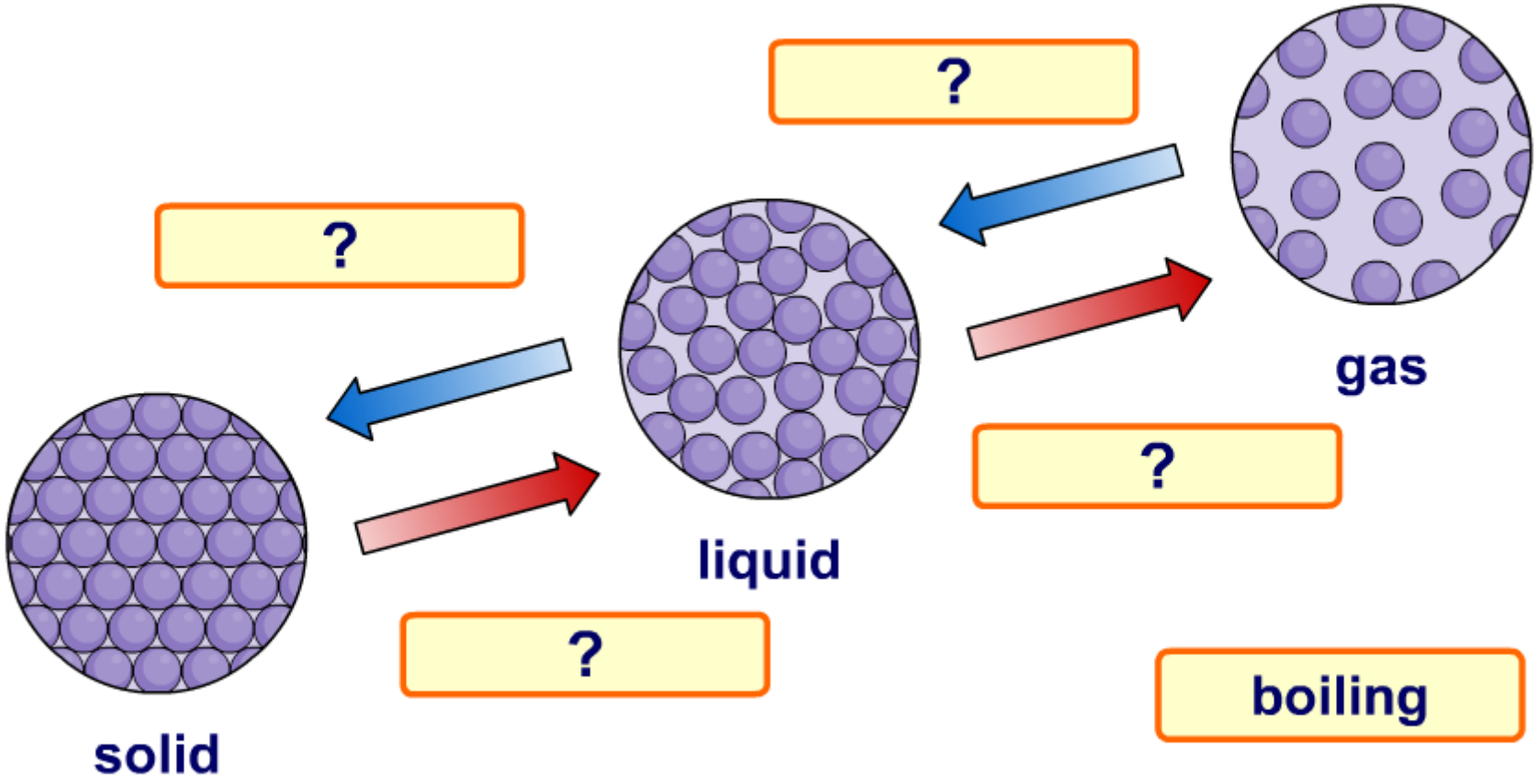
Changing State



Changes of state activity

What are the changes of state?



solve

Changes of state – heating curve

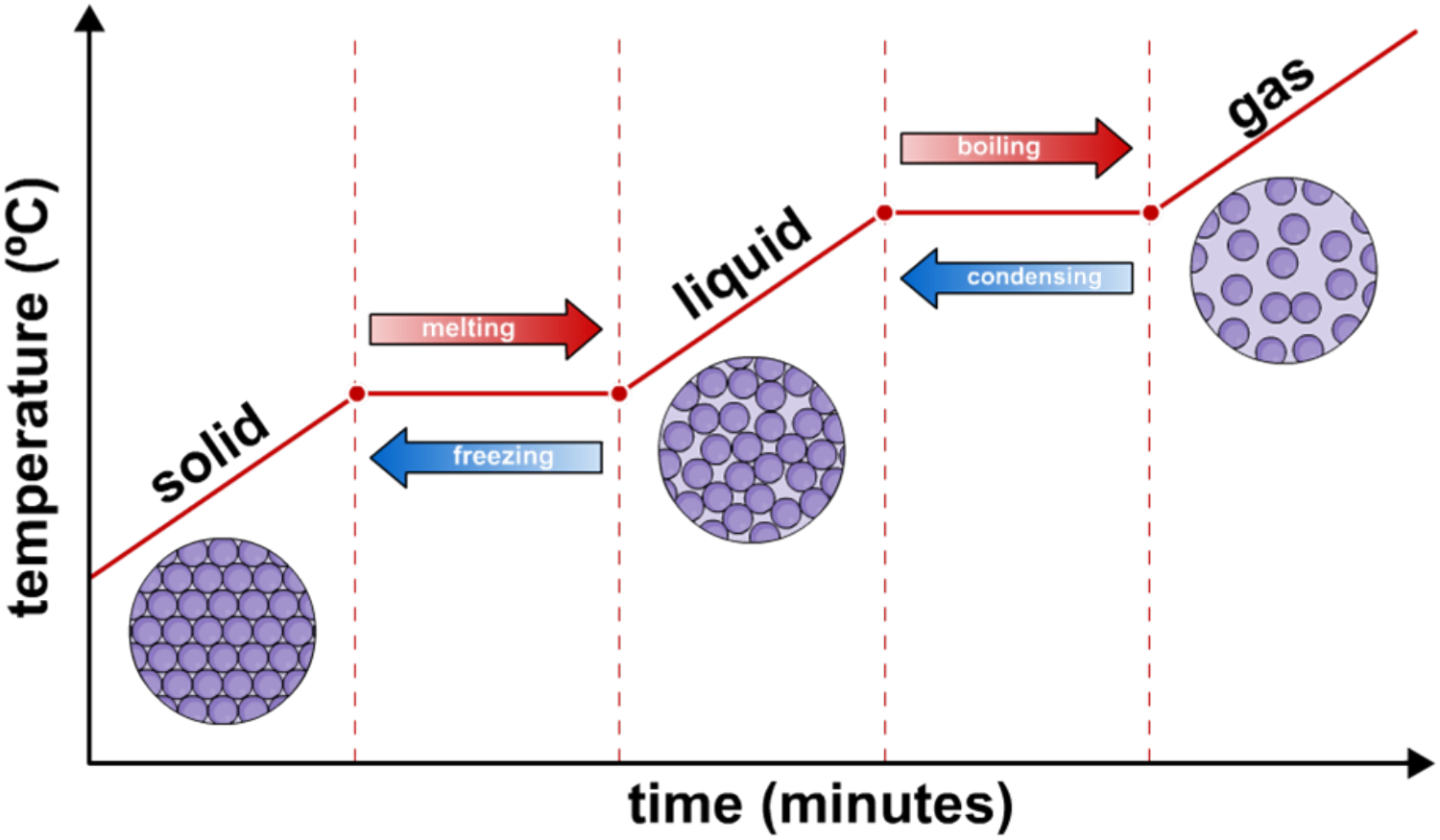
If a solid is heated, its temperature rises until it reaches its melting point.

At the melting point, the temperature stops rising while the solid melts, because energy goes into separating the particles.

Once the solid has melted, the temperature rises again until it reaches the boiling point.

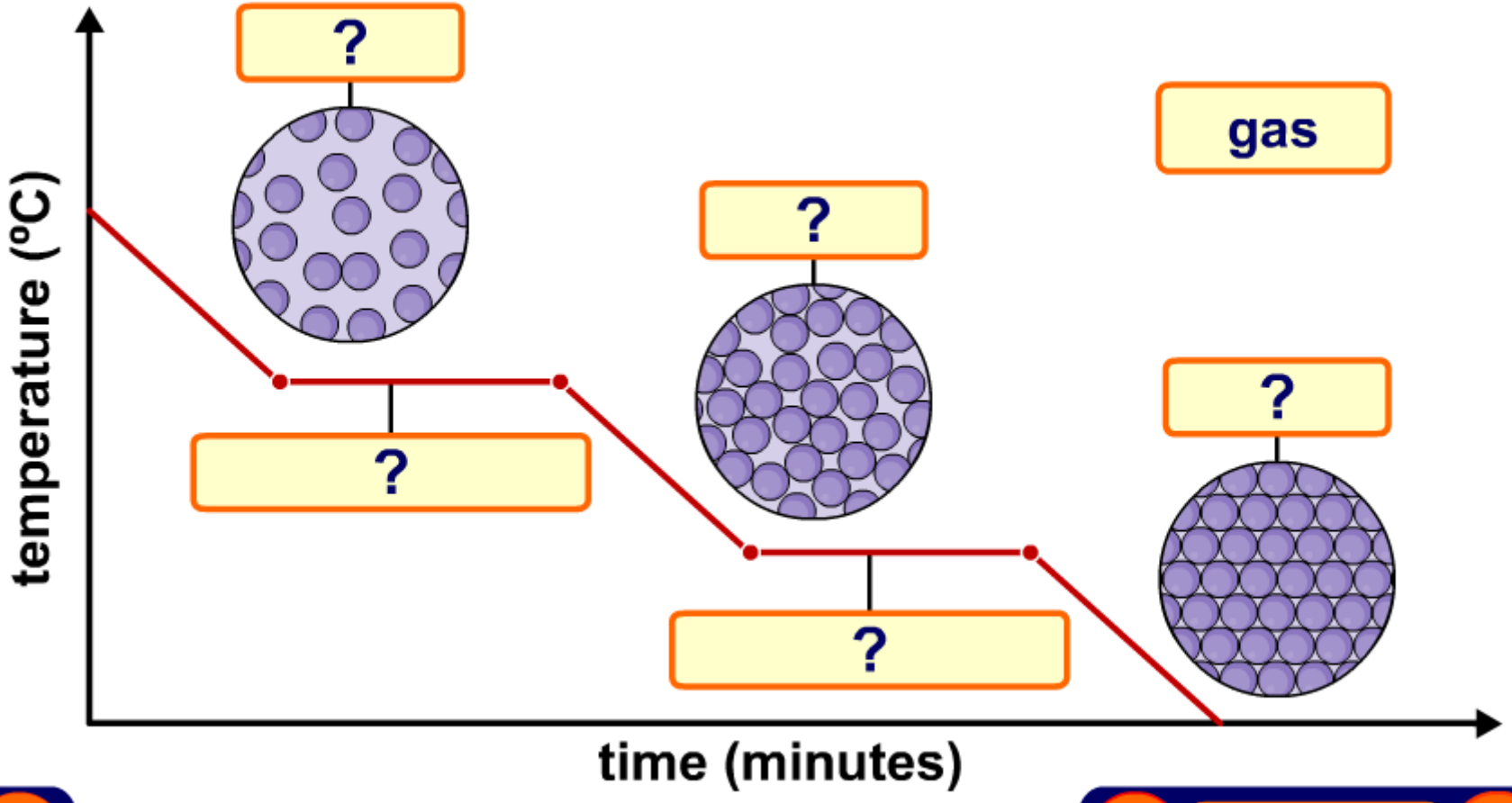
Changes of state – heating curve

At the boiling point, the temperature again stays the same as energy goes into further separating the particles.



Changes of state – cooling curve

What are the labels for this cooling curve for a gas?



solve

What is evaporation?

Evaporation occurs when the particles in a liquid escape to form a vapor.

Evaporation can take place at any temperature but it occurs most rapidly at a liquid's boiling point.

The particles that escape take some energy from the remaining particles, so the temperature of the liquid falls.

Evaporation is another method of heat transfer.

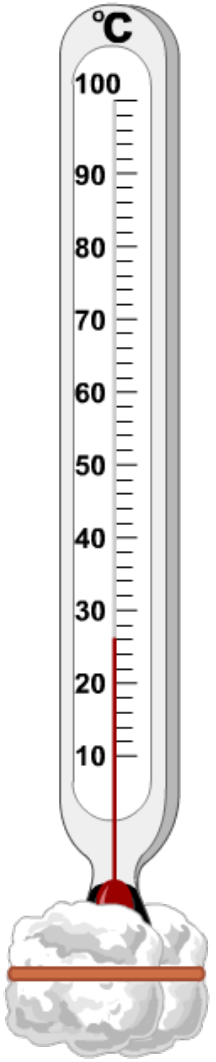
Evaporation experiment

Evaporation from different liquids can be investigated using this experiment:

1. Take four equal masses of cotton wool and soak each one in a different liquid – ethanol, water, propanol and octanol.

2. Wrap each piece of cotton wool around the bottom of a thermometer and secure it with a rubber band.

3. Read the temperature every 30 seconds and record the results in a table.



Evaporation experiment – results

Liquid	Temperature (°C)							Temp. change (°C)
	0 min	0.5 min	1.0 min	1.5 min	2.0 min	2.5 min	3.0 min	
ethanol								
water								
propanol								
octanol								

Evaporation experiment – analysis

Draw a bar chart of your results:

- with temperature change on the y axis,
- with the type of liquid on the x axis.

Plot a line graph of your results:

- with temperature on the y axis,
- with time on the x axis,
- and four lines plotted, one for each liquid.

Are any of the results anomalous?