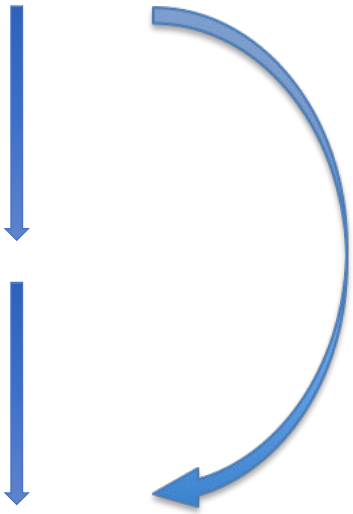
Changes of state

Names of state changes

Complete the chart below. Include the name(s) of each change of state, and three particle diagrams.

Energy	Name of state change	State	Name of state change
high energy  low energy		gas liquid solid	

Particles and state changes

Complete the table below.

State change	Name for state change	Change in particle energy	Change in particle arrangement
solid to liquid		increases	
	evaporating		still random but further apart
gas to liquid		decreases	
liquid to solid			random to ordered
	boiling		

Extension

Give **two** similarities and **two** differences between evaporating and boiling.

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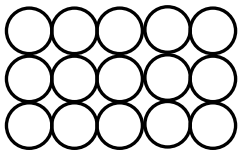
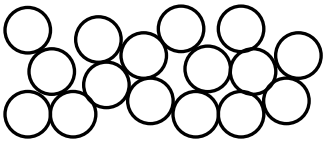
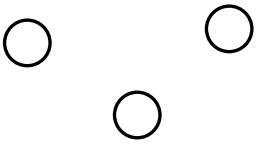
Changes of state – ANSWERS

Names of state changes

In the chart:

- solid → liquid = melting
- liquid → gas = evaporation / boiling
- solid → gas = sublimation
- gas → liquid = condensing
- liquid → solid = freezing
- gas → solid = deposition

Diagrams:

solid	liquid	gas
		
• Circles in a regular arrangement, packed closely • All circles touching at least two other circles	• Circles not in a regular arrangement but packed closely • Most circles touching at least two other circles • Some larger spaces due to the irregular arrangement	• Few circles drawn • Random arrangement • No circle touching another circle

Particles and state changes

Completed table:

State change	Name for state change	Change in particle energy	Change in particle arrangement
solid to liquid	melting	increases	regular to random
liquid to gas	evaporating	increases	still random but further apart
gas to liquid	condensing	decreases	still random but closer together
liquid to solid	freezing	decreases	random to ordered
liquid to gas	boiling	decreases	still random but further apart

Extension

Similarities:

- both involve liquid to gas; both involve an increase in the distance between particles

Differences:

- evaporating only happens at the surface but boiling happens throughout the liquid
- evaporating can happen below the boiling point but boiling happens at or above the boiling point