

# Edexcel IGCSE Physics

## 5 - Change of State (Physics Only)

### Flashcards

This work by [PMT Education](https://www.pmt.education) is licensed under [CC BY-NC-ND 4.0](https://creativecommons.org/licenses/by-nc-nd/4.0/)



# What is meant by a state of matter?



# What is meant by a state of matter?

A form in which matter can exist, based on the particle arrangement in a substance.



Name the 3 different states of matter.



Name the 3 different states of matter.

- Solid
- Liquid
- Gas



Order the 3 states of matter, starting with the one where the particles have least kinetic energy and ending with the one which particles have the most.



Order the 3 states of matter, starting with the one where the particles have least kinetic energy and ending with the one which particles have the most.

Solid → Liquid → Gas



Use kinetic theory to explain the structure of liquids.





Use kinetic theory to explain the structure of liquids?

The particles have some kinetic energy.

They are free to move and can move around in random directions within the volume of the liquid.



Explain the movement of particles in a solid.



Explain the movement of particles in a solid.

The particles vibrate around a fixed position as they do not have enough kinetic energy to move freely.



What is the difference between the structure of particles in a gas and the structure of particles in a solid?



What is the difference between the structure of particles in a gas and the structure of particles in a solid?

Particles in a solid are tightly packed together with strong forces holding the atoms together. They are arranged in a uniform structure. They can only vibrate at fixed positions. Particles in a gas have almost no forces between them therefore they are completely free to move, and move at high speeds in random directions. They are separated with large distances



Which state of matter has the highest density and why?



Which state of matter has the highest density and why?

Solids, because the particles are tightly packed together in a uniform structure.



Does a gas have a high or low density  
and why?





Does a gas have a high or low density and why?

A low density, because there is no attraction between the particles meaning that they are very spread out. This means there are less particles per unit volume.



Why is a liquid described to have a moderate density?



Why is a liquid described to have a moderate density but still similar to that of a solid?

The particles are still tightly packed together but they can slide over each other.



Name physical changes that can occur which don't change the mass of a substance.



Name physical changes that can occur which don't change the mass of a substance.

- Melting
- Freezing
- Boiling
- Evaporating
- Condensing



Why does heating increase the temperature of substance?



Why does heating increase the temperature of substance?

Temperature of a substance depends on the average kinetic energy of the particles. When you heat the substance, you put in thermal energy therefore kinetic energy of the particles increases therefore they move faster and temperature increases.



How does heating cause a substance to change state?





# How does heating cause a substance to change state?

At specific temperatures (melting point, boiling point...) when you heat the substance, thermal energy supplied is used to break the bonds of attraction between particles causing a state change. During state change temperature does not change since average KE does not increase.



# What is specific heat capacity?



# What is specific heat capacity?

The energy required to raise one kilogram of a material by one degree Celsius.



What equation is used to calculate the energy required to change the temperature of a substance?



What equation is used to calculate the energy required to change the temperature of a substance?

$$Q = m \times c \times \Delta T$$

change in thermal energy (J) = mass (kg) ×  
specific heat capacity (J/kg °C) × change in  
temperature (°C)



Give an example of how unwanted energy transfer while heating can be reduced.



Give an example of how unwanted energy transfer while heating can be reduced?

Through using insulation, which prevents energy being transferred to the surroundings.

