Gas

The particles are

move quickly in

The particles are

far apart and

all directions.

arranged in a

random wav.

The particles

completely fill

their container.

The particles can

flow and

easily be

compressed.

Matter

Keyword	Definition
Particle	A term for a small piece of matter. For example atoms.
Matter	A substance which is made up by atoms or molecules.
Internal Energy	The total kinetic energy and potential energy of the particles in an object.
Specific Heat Capacity	The amount of energy needed to raise the temperature of 1kg of substance by 1°C.
Thermal Conductivity	A measure of how well a material conducts energy when it is heated.
Conduction	The transfer of heat through a material by transferring kinetic energy from one particle to another.
Convection	The transfer of thermal energy through a moving liquid or gas.
Infrared Radiation	Electromagnetic radiation emitted from a hot object.
Pressure	The force exerted per unit of area. Pressure = force ÷ area
Density	The amount of mass that 1cm³ of a substance has.

Further Reading:

Density

(formula)

https://www.bbc.co.uk/bitesize/guides/zttrd2p/revision/1 https://www.bbc.co.uk/bitesize/guides/z2gjtv4/revision/5 https://www.bbc.co.uk/bitesize/guides/zssbgk7/revision/1

 $p = m \div v$

Density = mass ÷ volume



Convection Radiation

Energy is transferred Energy is transferred by the mass motion of by electromagnetic radiation



Calculating Pressure Pressure = Force ÷ Area N/m²

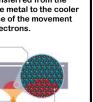
Conduction

Heat energy is conducted from the hot end of an object to the cold end. In metals, there are 'free

electrons'. This is when electrons in a metal can leave their atoms and move through the structure. When the metal is heated, the particles gain kinetic energy and energy is transferred from the hot part of the metal to the cooler parts because of the movement of the free electrons.

Forces between particles:

around each other.



Therefore, particles can only vibrate in a fixed position.

Convection

Liquids and gases are fluids because they can be made to flow. Liquids and gases expand when they're heated. The fluids in hot areas are less dense than into the colder area. The fluids then cool, and become more



in cold areas, so the particles rise dense. Therefore, the cold fluids fall into the warmer areas. In this way, convection currents that transfer heat from place to place are set up.

(squashed) Density:

1kg of a gas has a larger volume than 1kg of a solid. There is empty space between particles in a gas, but in a solid, they're tightly packed together.

Calculating Density:

Solid

The particles

The particles

place to place.

Particles have a

fixed shape and

cannot flow.

The particles

compressed

cannot be

cannot move from

position.

vibrate in a fixed

Density = Mass + Volume Density = 20g ÷ 200cm³ Density = 0.1g/cm³

Specific heat capacity

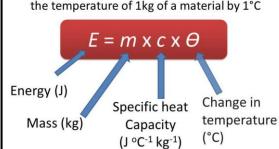
Gas: The forces of attraction between the particles are overcome.

Solid: There are strong forces of attraction between the particles in a solid.

Liquid: There are weaker forces of attraction between the particles in a liquid. Therefore, the particles are close together, and are able to move

Therefore, the particles are far apart and move quickly in all directions.

 This is the amount of energy needed to raise the temperature of 1kg of a material by 1°C



Internal Energy:

The internal energy is the total amount of kinetic energy and potential energy of all the particles in the system.

Liquid

The particles are

close together and

move around each

The particles are

random position.

The particles flow

of the bottom of

their container.

The particles

compressed.

cannot be

and take the shape

arranged in a

other.

