

(Black body) Radiation: - heat can be transferred by radiation as an electromagnetic wave eg. visible light - this is the only way light can travel through space
 - white reflects heat, so is a poor absorber of thermal energy - solar cells are black because black absorbs heat - black heats up and cools down the quickest - silver reflect heat best and cools down the slowest

Evaporation: - a surface effect - different to boiling as that happens throughout the liquid - when you get wet, the thermal energy from your body is conducted by the water. This speeds up the evaporation. In this way, thermal energy goes from your body to the air, making you cold - this is why we sweat in summer

Convection: - when particles in a fluid gain thermal energy they vibrate more and spread out, becoming less dense, so they rise. As the particles cool down, the particles don't vibrate as much and come back together, becoming more dense again and rising

Sea breeze: During the day, the land heats up quicker than the sea, so the hot air rises and cold air from the sea moves in

Land breeze: Because the land heats up more quickly it also cools down more quickly. So at night hot air from the sea rises and cold air from the land moves in.

Reducing heat loss (trapping air): air is a poor thermal conductor. To be a good insulator, air needs to be trapped, or it will transfer heat by convection. eg. wood jumpers, tur

Doors	convection currents cause draughts. Hot air escapes and is replaced by colder air	draught excluders	Bi-metallic strip: The iron and copper get the same amount of thermal energy but the copper has a lower specific heat capacity so heats up faster. The copper reaches a higher temperature so the particles vibrate more than the iron. The spaces between the particles are also bigger. Because of this the copper bar will expand and since it is riveted to the iron bar, will
Windows	trapped air between two panes of glass, some have partial vacuum in between	double glazing	
Walls	foam or fibres injected into the cavity between the two outside walls. This traps air for better insulation	cavity wall insulators	
Roof	insulating materials laid between the ceiling rafters and on the inside of the roof	loft insulation	

bend with the copper bar on the outside because it is longer

- Energy Resources
- All energy originally comes from the sun
 - Renewable energy resources are resources that can be replaced (usually within a human lifetime) and won't run out eg. solar, wind, wave, hydroelectric, tidal, geothermal, biomass
 - Non-renewable energy resources will not replace themselves and will eventually run out eg. oil, coal, gas, nuclear

Fossil Fuel	Made From	Waste Products + their pollution
Coal	Fossilized trees and plants	soot → smog sulphur + nitrogen oxides → acid rain carbon dioxide → greenhouse gases
Oil	Fossilized sea creatures	sulphur + nitrogen oxides → acid rain carbon dioxide → greenhouse gases
Gas	Fossilized sea creatures	sulphur + nitrogen oxides → acid rain carbon dioxide → greenhouse gases

Renewable Energy	Explanation
Solar Energy	Light is converted into electricity using photo-voltaic cells. Solar panels can heat up water as it runs through thin copper pipes in the panels.
Wind Energy	Kinetic energy from the wind turns the blades which is connected to a gearbox which turns them more. This is connected to a generator which generates electricity
Biomass	Biological matter which is burnt to heat water, and the steam turns turbines and generators to generate electricity
Hydro-electric Energy	Water is stored behind a dam, when released, water rushes down pipes, to turn a turbine. This spins a generator to make electricity

- Space
- Weight: the force of gravity pulling down on the mass of an object. Measured in Newtons (N)
 - Mass: the amount of matter inside an object. Does not change. Measured in grams (g) / kilograms (kg)
 - All masses have a gravitational force but the smaller the object, the smaller the gravitational pull.
 - On the earth: $1\text{kg} = 10\text{N}$, On the moon: $1\text{kg} = 1.7\text{N}$, On Jupiter: $1\text{kg} = 27\text{N}$
 - Weight = mass \times gravitational pull
 - As you get further away from the earth, the gravitational effect lessens
 - A day: The time it takes for a planet to spin once on its own axis (on earth: 24 hrs (23 hrs 56 mins))
 - A year: The time it takes a planet to orbit its star once (on earth 365 $\frac{1}{4}$ days)

Inner planets: hard, rocky, quite small	Outer planets: large	Memoronic	Planet			
<ul style="list-style-type: none"> We see the other planets because of reflected light from the sun The only light source in our solar system is the sun Our solar system is part of a galaxy (the milky way); and there are many millions of systems in our galaxy, and there are many hundreds of thousands of galaxies in our universe 	<ul style="list-style-type: none"> Mercury Venus Earth Mars 	<ul style="list-style-type: none"> My Very Elegant Mother 	<ul style="list-style-type: none"> rocky planets / inner planets 			
				<ul style="list-style-type: none"> Jupiter Saturn Uranus Neptune Pluto 	<ul style="list-style-type: none"> gas giant planets 3 dwarf planets Outer planets 	<ul style="list-style-type: none"> Just Served Us Nine Prunes