Energy

- **Energy** is needed to make things happen
- It is measured in **joules** or **kilojoules**

- The **law of conservation of energy** says that energy cannot be created or destroyed, only transferred
- This means that the total energy before a change if always equal to the total energy after a change

Energy can be in different energy **stores**, including:

- **Chemical** – to do with food, fuels and batteries
- **Thermal** – to do with hot objects
- **Kinetic** – to do with moving objects
- **Gravitational potential** – to do with the position in a gravitational field
- **Elastic potential** – to do with changing shape, squashing and stretching

Food & Energy

• Food has energy in a chemical energy store
• Different foods contain different amounts of energy
• Different activities require different amounts of energy
• Different people need different amounts of energy depending on what they do each day

Power & Energy

• Power is a measure of how much energy is transferred per second
• Power is measured in watts (W)
• Each appliance has it's own power rating to tell us how quickly it uses energy
• We can calculate power with the equation

$$\text{power (W)} = \frac{\text{energy (J)}}{\text{time (s)}}$$

Dissipation of Energy

- We say that energy is dissipated when it is transferred to a non-useful store, it cannot be used for what it was intended for
- Energy can be wasted through friction, heating up components or heating the surroundings
- Efficiency is a measure of how much of the energy has been used in a useful way, we can calculate this with the equation:

$$\text{efficiency (\%)} = \frac{\text{useful energy output}}{\text{energy input}} \times 100$$

Non-renewable energy

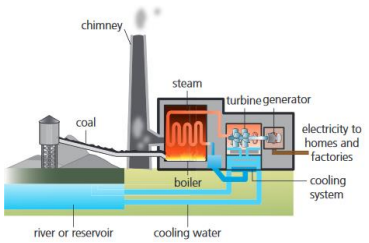
• Non-renewable energy cannot be replaced within your lifetime
• Non-renewable energy resources include coal, oil, natural gas and nuclear resources
• Coal, oil and natural gas are also known as fossil fuels, they release carbon dioxide when burned which contributes to global warming

Renewable energy

• Renewable energy can be replaced within your lifetime
• Renewable energy resources include wind, tidal, wave, biomass, solar, hydroelectric and geothermal
• Renewable energy resources do not produce much carbon dioxide, meaning that they have a smaller effect on global warming

Power Stations

Thermal power stations burn coal, oil and natural gas, which are all non-renewable energy resources



Fuel is burned underneath water → Water is heated and turns into steam → The steam turns a turbine which turns a generator → Electricity is generated

Key words and Vocabulary

Make sure you can write definitions for these key terms:
Chemical, dissipated, efficiency, elastic potential, energy, energy resources, fossil fuels, graviational potential, joules, kinetic, kilojoules, law of conservation of energy, non-renewable, power, renewable, thermal, watts