

# Summary – Heat and Energy

## Types of Energy and energy changes

- Heat energy (*e.g.* from a radiator)
- Potential energy (*e.g.* an elastic band or someone on a mountain)
- Kinetic energy (*e.g.* a moving car)
- Sound energy (*e.g.* the school bell)
- Light energy (*e.g.* a torch)
- Chemical energy (*e.g.* petrol or diesel fuel)

The objects we use every convert between the different types of energy

*e.g.* a car changes chemical energy into kinetic energy

*e.g.* a torch changes electrical energy into light energy

## Conduction and Convection

When atoms and molecules get hotter, they vibrate

**Heat energy travels through a solid** when vibrating atoms and molecules **bump into each other**. This is called “**conduction**”.

**Heat energy travels through a liquid or gas** when hot particles **move towards** cold particles. This is called “**convection**”.

## Heat loss

We try to **stop heat energy moving** around by using **insulation** such as gloves, hats and coats. Houses tend to **lose** most energy from **doors and windows** as it is **difficult to insulate** these.

## Colour and heat

**White and silver** objects tend to **reflect** (bounce off) heat energy. **Black or dark** object tend to **absorb** (“soak up”) heat energy.

## **Saving Energy**

We can **save energy** by doing things like turning electrical items off when we're not using them, walking instead of taking the car and not boiling a full kettle for a cup of tea.

There are lots of other examples!

## **Renewable and non-renewable energy generation**

If an energy generation method is **renewable**, that means it will **not run out**.

If an energy generation method is non-**renewable**, that means it will **run out**.

## **Renewable energy generation Methods**

- Wind power (Using a wind turbine to change kinetic energy into electrical energy)
- Solar power (using a solar panel to change light energy into electrical energy)
- Biomass (using fuel made from plants to change chemical energy into electrical energy)
- Wave power (using a wave power generators to change kinetic energy into electrical energy)
- Hydro-electric power (using a dam to change potential energy into electrical energy)

## **Non-Renewable energy generation Methods**

- Burning coal, oil and gas (using fossil fuels to change chemical energy into electrical energy)
- Nuclear power (using uranium mined from the ground to change nuclear energy into electrical energy)

## **Disadvantages of renewable and non-renewable energies**

- Wind and solar power are dependant on the weather
- Coal oil and gas will eventually run out
- People worry about the safety of nuclear power
- Wind and solar power can be expensive