

Knowledge organiser - 7.6 Future of Energy

ENERGY IN FUEL

- Energy is stored in food and fuel.
- Energy in fuel is used to heat homes and cook food.
- Fuel is also burnt in power stations to produce current in order for electrical appliances to work at home.

CLIMATE CHANGE

- Human activities that add extra CO₂ to the atmosphere include:
 - Burning fossil fuels and burning or cutting down forests
 - Farming animals (cows)
- Extra carbon dioxide causes global warming. This can change weather patterns (increase rainfall → flooding, droughts and heatwaves → crop failures).
- Long term changes are called climate change, this leads to glaciers and polar ice melting making sea levels rise (flooding). Or lead to extinction of plants and animal species.

How can we prevent climate change?

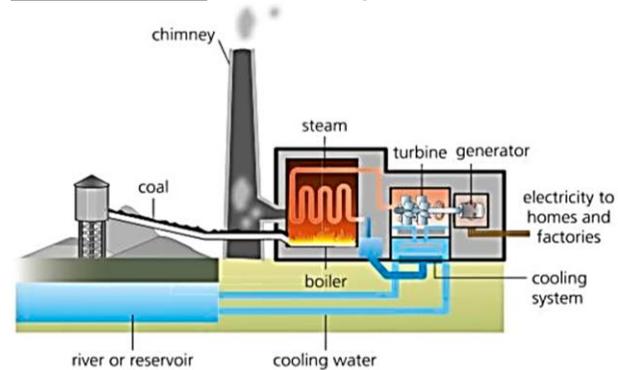
- Using solar panels and other renewable resources to generate electricity.
- Using cars less.
- Buying and wasting less.

RECYCLING

- ☺ Resources will last longer.
- ☺ Uses less energy than using new materials.
- ☺ Reduces waste and pollution.
- ⊕ Some people think separating rubbish is a nuisance.
- ⊕ Lorries that collect recycling create pollution.
- ⊕ Companies that recycle plastic waste need to separate different plastic from each other. This is done by hand and takes a long time.

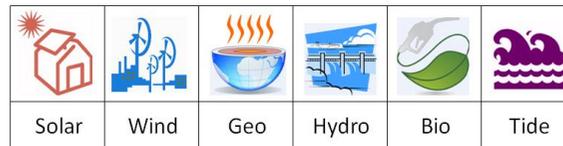


POWER STATIONS burn coal and gas,



1. Fuel is burnt in a furnace to heat water in the boiler.
 2. The water turns to steam; this turns a turbine.
 3. The turbine turns a generator which generates electricity.
- ☺ Fossil fuels are reliable and produce lots of electricity.
 - ⊕ Release carbon dioxide and contribute to global warming.
 - ⊕ Produce pollutants; sulfur dioxide, nitrogen oxides and particulates.

RENEWABLE RESOURCES



- ☺ No carbon dioxide released
- ☺ May be free to use (wind and Sun)
- ⊕ Equipment may be expensive
- ⊕ Can be unreliable (weather/ time of day dependent)



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ENERGY STORES:

1. Chemical
2. Thermal
3. Elastic
4. Kinetic
5. Gravitational potential
6. Nuclear
7. Magnetic
8. Electrostatic

(Revision tip: use the first letter of each store to write a mnemonic to help you remember them).

Energy is transferred by:

1. Heating
2. Mechanically (by movement/ change in position)
3. Electric current
4. Waves (sound & light)

REDUCING ENERGY USE

1. Use fewer appliances.
2. Use appliances with a lower power rating.
3. Use appliances for fewer hours.
4. Insulate the home; this reduces the rate at which energy is transferred to surroundings; reducing need to heat the house.
5. Governments can raise awareness; this will make fuel last longer and benefit the environment.

KEYWORD	DEFINITION
Carbon Footprint	A carbon footprint is the total amount of greenhouse gases (including carbon dioxide and methane) that are generated by our actions.
Chemical energy store	Emptied during chemical reactions when energy is transferred to surroundings; e.g. burning fuel.
Dissipation	Becoming spread out wastefully to the surroundings.
Elastic energy store	Filled when a material is stretched or compressed; e.g. stretching a spring.
Energy	Energy is needed to make things happen.
Energy resources	Something with stored energy that can be released in a useful way.
Fossil fuels	Non-renewable energy resource formed from dead animals and plants, millions of years ago. E.g. coal, oil and natural gas.
Gravitational potential energy store	Filled when an object is raised; e.g. book on a shelf or when climbing a ladder.
Joules	The unit of energy, symbol J 1 kilojoule (kJ) = 1000 J
Kinetic energy store	Filled when an object speeds up/ moves; e.g. when a car accelerates.
Law of conservation of energy	Energy cannot be created or destroyed, only transferred between stores.
Non-renewable	An energy resource that cannot be replaced and will be used up, such as coal, oil or gas, or nuclear.
Power	How quickly energy is transferred by a device (watts).
Renewable	An energy resource that can be replaced and will not run out; e.g. solar, wind, waves, geothermal and biomass.
Thermal energy store	Filled when an object is warmed up; e.g. heating water in a kettle.