Physics

Electric city at home

- Mains electric city
- It is supplied from the power stations through National grid
- AC means alternating current
- In AC current changes direction 50 times per second(50 Hertz)
- UK main supply is 230 volts
- Unlike DC, AC has live and neutral wires instead of positive and negative

Cables have three wires

Appliances are connected with three core cables

Livewire(Brown)

It carries 230 volt from main supply

most dangerous wire

Neutral wire

it has a colour of blue

it complete the circuit with lifewire

it has nearly zero volts

Earth wire

it has a colour of green or yellow

it is safety wire

it stops the case becoming live

Dangers of electricity

- lifewire exposed we will get a shock like if a wire is damaged so we will get a shock
- if there is a damp conditions and you know wire conducts electric city so then you will get a shock
- overloaded sockets means overheating and there will be a fire risk
- over heating cables means melt insulation and it will expose wires
- open circuits means Life by still has voltage even it is switch off

Safety measures

- fuses and circuits breaker they cut off current if it gets to high
- Insulation plastic coating prevent contact with livewires
- some appliances have no Earth wire because casing is fully insulated
- metal casing connected to earth wire so current flows to ground not through a person

Power of electrical appliances

- energy transfer in applian

- everyday appliances transfer electrical energy into other useful forms
- Kettle toaster heater they converts electrical into thermal energy
- Fan, electrical car motor then electrical energy is converted to kinetic energy
- Microwave electrical energy is converted to thermal plus electromagnetic
- Some energy is always wasted you only thermal or sound

Factors affecting energy transfer
time, longer appliances on more energy wasted as heat
Power hi power rating means more energy transferred per second
Examples

- electric in electric motor electrical energy is converted to kinetic energy
- in heating devices electrical energy is converted to thermal energy

Power
Power is called rate of energy transfer
its unit is Watt
the formula of power is

P=VxI

P= I2 x R

Example

1 kilowatt hair dryer is connected to 230V

what is the current

P=VxI

I=P/V

I=1000 / 230 = 4.34 A

Where A is the unit of current called ampere

Energy transferred per charge

- **Formula is**
- **E = Q x V**
- **Where where E is the energy Q is the charge and V is the voltage**
- **Example is**
- **There is a fan motor powered by 3 volt battery**
- **charge is 320C**
- **E= 320 x 3**
- **960J**
- **The unit of energy is joules**