

a

Draw the symbol diagrams for:

cell	resistor
battery	variable resistor
lamp (bulb)	ammeter
fuse	voltmeter
LED	diode
LDR	thermistor

c

A charge of 12A flows through an electric cooker for 1 hour. How much charge has been used?

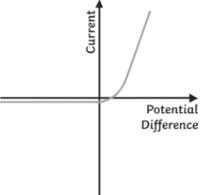
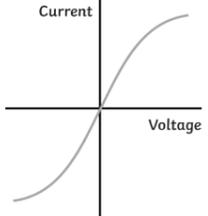
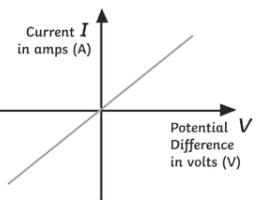
State the equation that links current, potential difference and resistance. Remember to include units.

A voltmeter reading is 3V and the resistance is 2Ω. What is the current?

d

Use the components stated below to identify the potential difference/current graphs:

filament lamp, diode, ohmic conductor

_____	
_____	
_____	

b

What is electric current?

State the equation that links charge, current and time.

Write the symbols and units for the following:

charge: _____

current: _____

time: _____

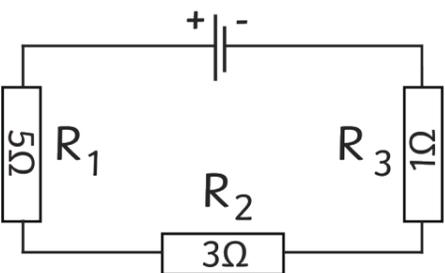
State Ohm's law.

e

Complete the table.

Type of Circuit	Potential Difference Shared or the Same?	Current Same or Split?
series		
parallel		

For the circuit below, calculate the total resistance.



On the diagram, draw where a voltmeter could be positioned to measure the voltage through one of the components.

f

Complete the following sentences.

For a thermistor: as the temperature increases, the resistance _____

Used in: _____

For an LDR: as the light intensity increases, the resistance _____

Used in: _____

g

State the two different types of electricity supply.

1. _____

2. _____

The UK mains supply has an AC supply of - ____V and frequency of ____Hz.

h

Label the diagram of the three pin plug.



What is the purpose of:

the neutral wire?

the live wire?

the earth wire?

Describe how each of the appliances below transfers energy.

Kettle

Hairdryer

Calculate the current flowing through a 2kW electric fire at a potential difference of 230V.

State the equation that links power, current and potential difference.

A 2.4kW kettle is connected to the mains power supply (230V). Calculate the current through the kettle.

You will need to rearrange your equation above.

What is the equation linking energy transferred, power and time?

what are the units for:

energy? _____

power? _____

time? _____

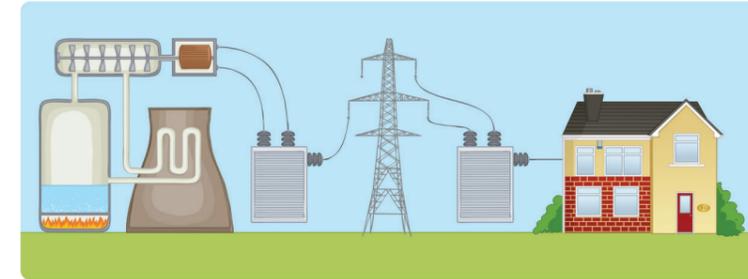
Most devices have a power rating. Describe the relationship between the power rating and the changes in stored energy when a device is used.



True or false:

- The current in a circuit can be altered by a variable resistor. _____
- A voltmeter is connected in parallel with a component. _____
- An ammeter is connected in parallel with a component. _____

Label the National Grid diagram.



Give two examples of when the demand for electricity is likely to be high.

1. _____
2. _____

Why is energy transferred at such high voltage in cables?

Describe how the following work:

step-up transformer.

step-down transformer.

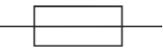
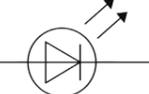
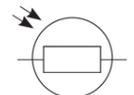


Describe an experiment to show how the length of a wire affects its resistance.



a

Draw the symbol diagrams for:

cell	resistor
	
battery	variable resistor
	
lamp (bulb)	ammeter
	
fuse	voltmeter
	
LED	diode
	
LDR	thermistor
	

c

A charge of 12A flows through an electric cooker for 1 hour. How much charge has been used?
Convert hours to seconds: 3600 seconds
 $12 \times 3600 = 43\ 200\text{C}$

State the equation that links current, potential difference and resistance. Remember to include units.
potential difference (V) = current (A) × resistance (Ω)

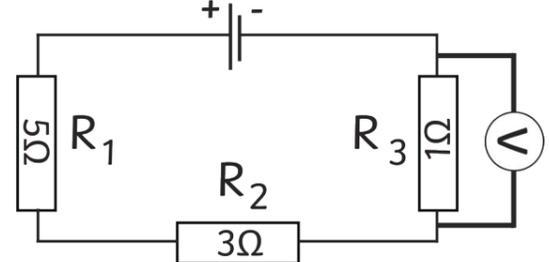
A voltmeter reading is 3V and the resistance is 2Ω. What is the current?
current = potential difference ÷ resistance
 $3 \div 2 = 1.5\text{A}$

e

Complete the table.

Type of Circuit	Potential Difference Shared or the Same?	Current Same or Split?
series	shared	same
parallel	same	split between branches

For the circuit below, calculate the total resistance.
9Ω

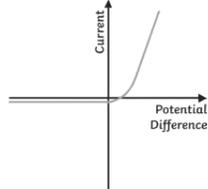
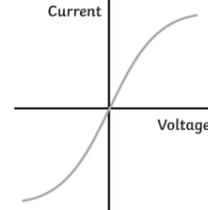
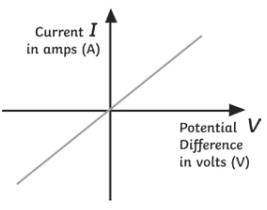


On the diagram, draw where a voltmeter could be positioned to measure the voltage through one of the components.

d

Use the components stated below to identify the potential difference/current graphs:

filament lamp, diode, ohmic conductor

diode	
filament lamp	
ohmic conductor	

State Ohm's law.
The current flowing through a resistor at a constant temperature is directly proportional to the voltage across the resistor.

b

What is electric current?
The flow of electrical charge.

State the equation that links charge, current and time.
charge = current × time

Write the symbols and units for the following:
 charge: **(Q) coulombs, C**
 current: **(I) amperes, A**
 time: **(t) seconds, s**

f

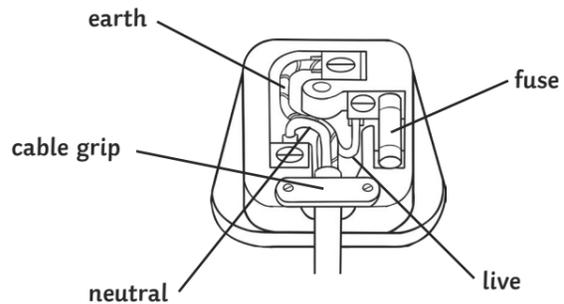
Complete the following sentences.

For a thermistor: as the temperature increases, the resistance **decreases**.
 Used in: **thermostats**

For an LDR: as the light intensity increases, the resistance **decreases**.
 Used in: **street lights**

h

Label the diagram of the three pin plug.



What is the purpose of:
 the neutral wire?
It completes the circuit and carries away the current.
 the live wire?
It provides alternating potential difference.
 the earth wire?
It is a safety feature to prevent the application from becoming live.

g

State the two different types of electricity supply.

- alternating current**
- direct current**

The UK mains supply has an AC supply of **230V** and frequency of **50Hz**.

Describe how each of the appliances below transfers energy. a

Kettle
Energy is transferred electrically from chemical energy stores in the power station to the internal (thermal) energy store of the heating element of the kettle.

Hairdryer
Energy is transferred electrically from chemical energy stores in the power station to the kinetic energy store of the motor and the internal (thermal) energy store of the heating element of the hairdryer.

Calculate the current flowing through a 2kW electric fire at a potential difference of 230V.
current = $2000 \div 230$
8.69A d

State the equation that links power, current and potential difference. e
power (W) = potential difference (V) × current (A)

A 2.4kW kettle is connected to the mains power supply (230V). Calculate the current through the kettle.

You will need to rearrange your equation above.

$2.4 \times 1000 = 2400$

Current = power ÷ potential difference
= $2400 \div 230$
= 10.43A

What is the equation linking energy transferred, power and time? b

energy transferred = power × time

what are the units for:

energy? **joules (J)**

power? **watts (W)**

time? **seconds (s)**

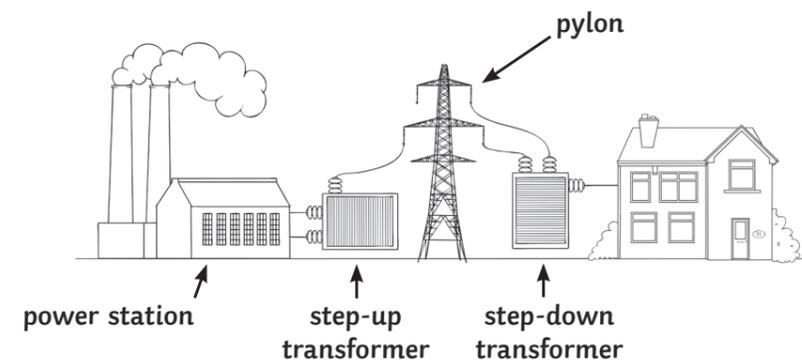
Most devices have a power rating. Describe the relationship between the power rating and the changes in stored energy when a device is used. c
A device with a higher power rating will transfer stored energy to other types of energy at a faster rate.



True or false: f

- The current in a circuit can be altered by a variable resistor. **true**
- A voltmeter is connected in parallel with a component. **true**
- An ammeter is connected in parallel with a component. **false**

Label the National Grid diagram. g



Give two examples of when the demand for electricity is likely to be high.

1. **At half-time or the end of large sporting events.**
2. **First thing in the morning when people are getting up, or later when arriving home.**

Why is energy transferred at such high voltage in cables? h

High voltage means that the energy is transferred at low currents. This results in less resistance, therefore less energy is lost as heat, so the transmission is more efficient.

Describe how the following work:

step-up transformer.

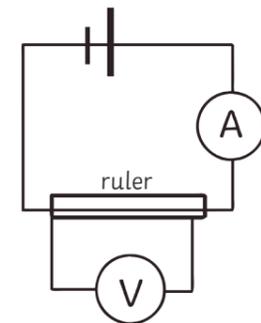
Potential difference is increased.

step-down transformer.

Potential difference is decreased.



Describe an experiment to show how the length of a wire affects its resistance. i



Set up the apparatus as shown. Attach the first crocodile clip at 0cm. Attach the second crocodile clip at 10cm. Record the potential difference and the current. Connect the second crocodile clip at different lengths (20cm, 30cm) and repeat the process. Use the results to calculate resistance at different lengths, using the formula:
resistance = potential difference ÷ current