

Combined Science - Physics - Key Stage 4 - Electricity

Domestic Electricity Worksheet

Miss Walrond



Q1.

- (a) Batteries supply direct current (d.c).

Another type of current is alternating current (a.c).

Each statement in the table below may be true about d.c, or true about a.c, or true for both d.c and a.c.

Put a tick (✓) in the correct box in each row.

[2]

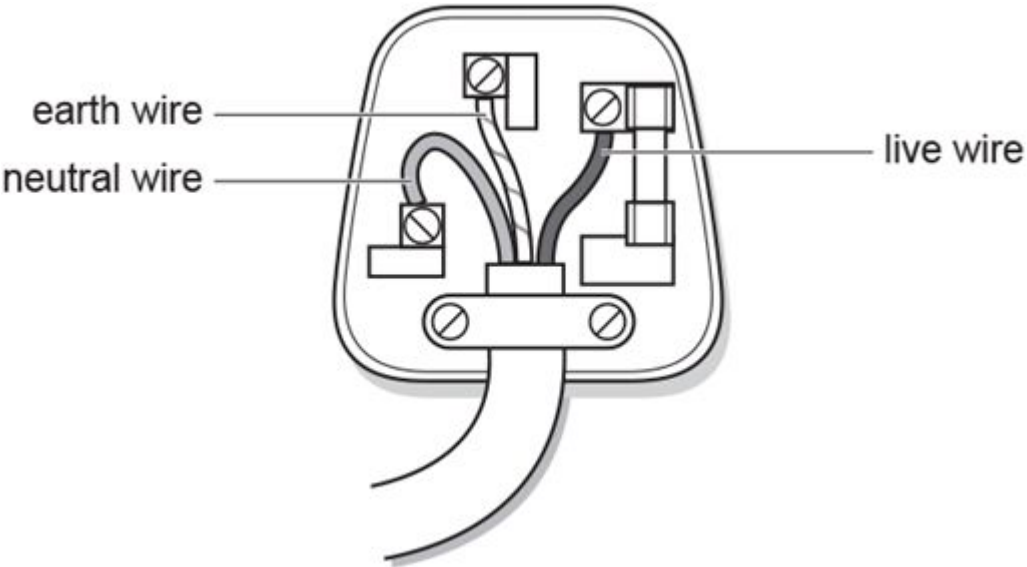
| | True only for d.c | True only for a.c | True for both |
|---|------------------------------|------------------------------|----------------------|
| The current always flows in the same direction. | | | |
| The domestic supply in the UK uses this. | | | |

OCR, Twenty First Century Science B, Paper j259/01, June 2018.



Q1.

(b) The diagram shows the inside of a three-pin plug.



i. Put a tick (✓) in the correct box in each row to show the correct descriptions of the live, neutral and earth wires.

| Wire | Connected to the National Grid | Is at the same voltage as the ground |
|---------|--------------------------------|--------------------------------------|
| Live | | |
| Neutral | | |
| Earth | | |

[2]



Q1.

ii. Put a  around the voltage between the live and neutral wires.

0 V 12 V 230 V 25 000 V

[1]

OCR, Gateway Physics A, Paper j259/01, June 2018.



Answers



Q1.

a.

| | True only for d.c | True only for a.c | True for both |
|---|----------------------|----------------------|---------------|
| Current always flows in the same direction. | ✓ | | |
| The domestic supply in the UK uses this. | | ✓ | |

2



Q1.

b. i.

| Wire | Connected to National Grid | Is at the same voltage as the ground |
|---------|----------------------------|--------------------------------------|
| Live | ✓ | |
| Neutral | ✓ | |
| Earth | | ✓ |

2

b. ii. 230 V

1

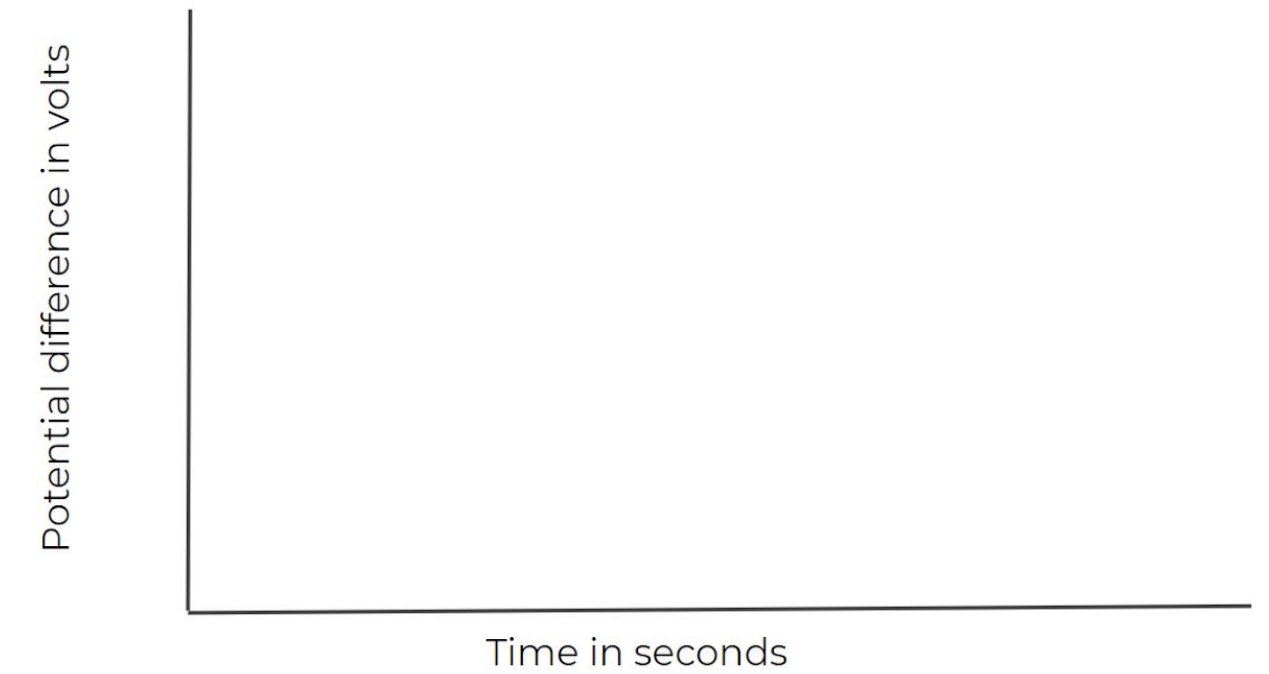


In lesson questions



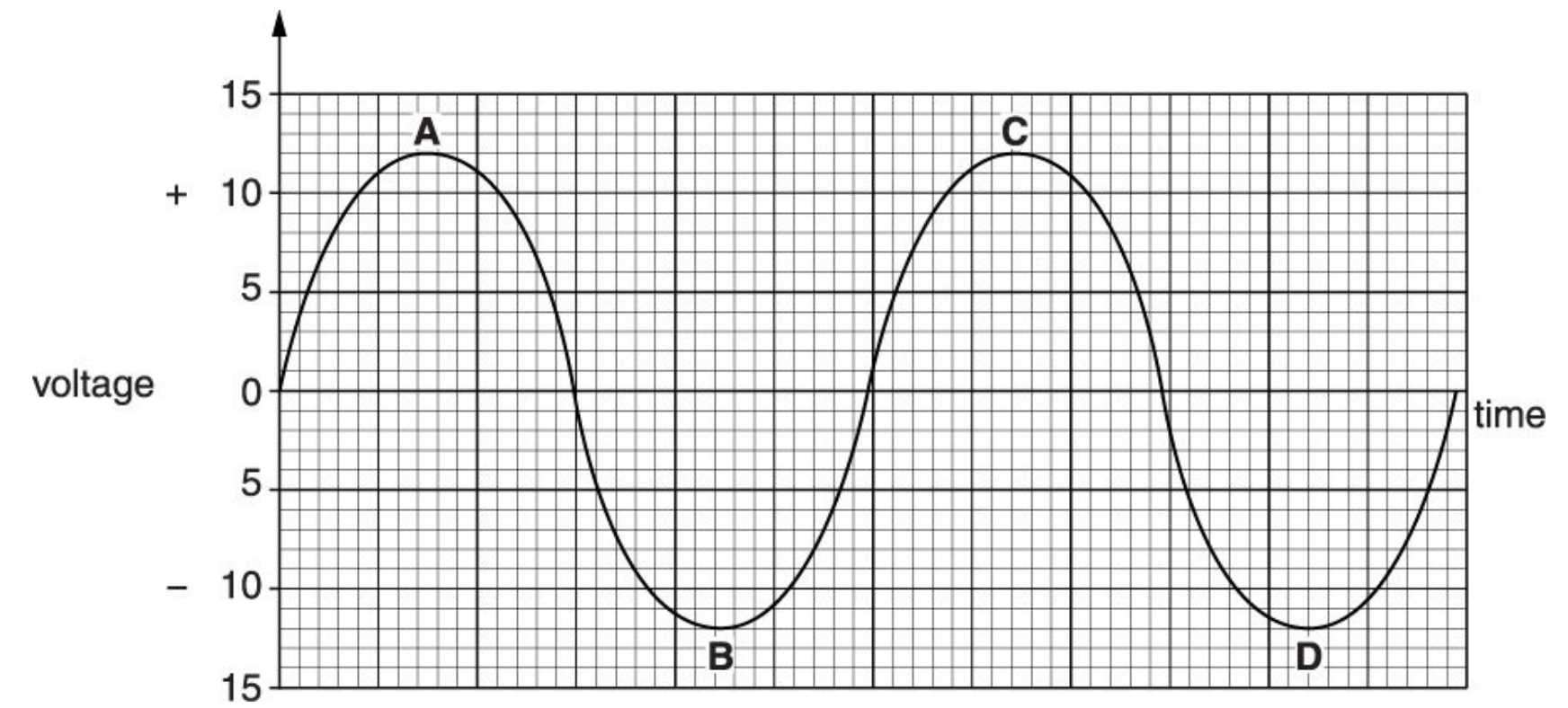
Direct Current (d.c.)

1. What is direct current?
2. Give one source of direct current.
3. Copy the sketch graph to the right.
4. Draw a line to show a direct potential difference source of 3V.



Alternating current (a.c.)

1. What is alternating current?
2. Give one source of alternating current.
3. Copy the sketch graph to the right.
4. Draw a double ended arrow to show the peak voltage.



Mains electricity

The UK mains electricity supply has a potential difference of about 230 V and a frequency of 50 Hz.

In Trinidad and Tobago, their electricity has a potential difference of about 115 V and a frequency of 60 Hz.

Explain the differences between the two supplies.



3-core cable

1. Name the red, blue and green/yellow striped wires.
2. What material is the wire made of?
3. What material is the insulation made of?



Independent Task: The 3 pin plug

Write down the names of labels 1-5.

Write down the materials of labels 1-4.

What is the purpose of the earth wire?



Double Insulation

Describe what is meant by double insulation.



Answers



Review: Direct Current (d.c.)

1. Direct current is when the electrons all travel in one direction around a circuit.
2. An example of a direct current source is a cell or a battery.



Review: Alternating Current (a.c.)

1. Alternating current is when the current changes direction many times a second.
2. An example of an alternating current source is the mains supply in your house.



Review: Mains Electricity

The power supply in **Trinidad and Tobago** has a **lower peak voltage** at 115 V compared to 230 V in the UK.

The **frequency** of the power supply is **higher in Trinidad and Tobago** though at 60 Hz compared to 50Hz in the UK.



Review: 3-core cable

1. The brown wire is the live wire.
The blue wire is the neutral wire.
The green/yellow striped wire is the earth wire.
2. The wires are made of copper.
3. The insulation is made of plastic.



Review - Independent Task: The 3 pin plug

- 1 - cable grip - plastic**
- 2 - neutral wire pin - brass**
- 3 - earth wire pin - brass**
- 4 - live wire pin - brass**
- 5- fuse**

The earth wire connects the outer case of an appliance to the ground. It will direct current away from the appliance if there is a fault.



Review: Double Insulation

Double insulation is where an appliance has the internal electronics completely encased in plastic. This is underneath the outer casing.

