

ANSWERS (EXPERIMENTING)

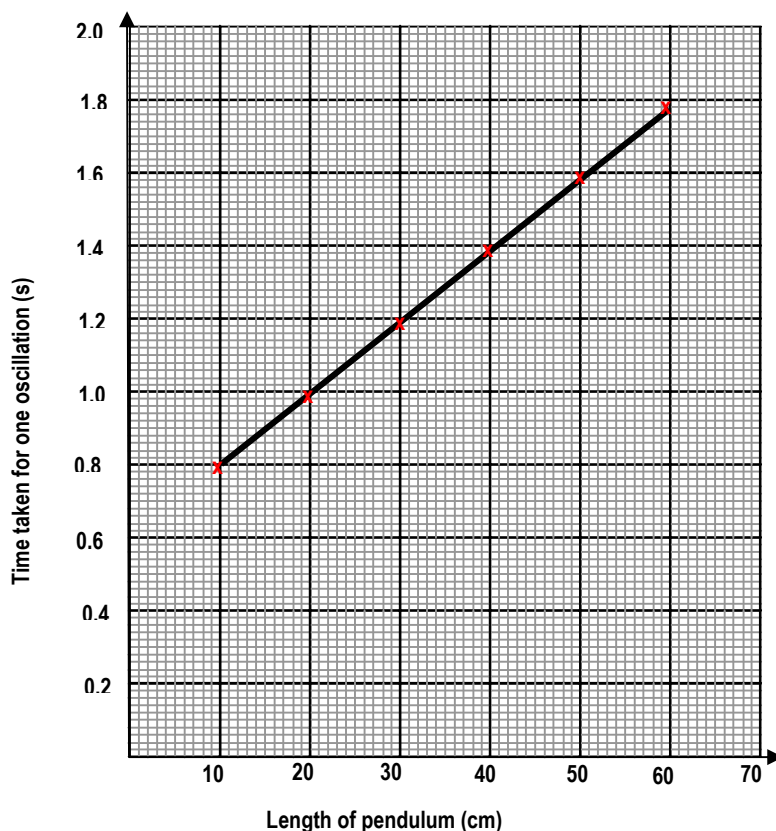
1(a)

Manipulated variable:	Length of pendulum / <i>Panjang bandul</i>
Responding variable:	Time taken to make ten complete swings. Period of oscillation / <i>Tempoh ayunan</i>
Fixed variable:	Mass of metal bob/pendulum bob / <i>Jisim bola logam</i>

(b)

Length of the pendulum (cm)	Time taken for 10 complete swings (s)	Time taken for 1 complete swing (s)
10	8.0	$\frac{8.0}{10} = 0.8$
20	10.0	1.0
30	12.0	1.2
40	14.0	1.4
50	16.0	1.6
60	18.0	1.8

(c)



(d)

- Longer pendulum takes longer time to make one oscillation. / *Semakin panjang bandul semakin panjang masa untuk satu ayunan*
- Shorter pendulum takes shorter time to make one oscillation. / *Semakin pendek bandul semakin pendek masa satu ayunan*

(e) The time taken for the pendulum to swing is affected by the length of the pendulum.

(f) 2.0 s atau 2 s

(g)

- The longer the length of the pendulum, the longer the time taken to make one complete swing.
- The shorter the pendulum, the more oscillations it makes in a given time.
- The pendulum will swing faster when its length is shortened.
- The longer the length of the pendulum, the longer is the period of oscillation.

2(a)

Manipulated variable:	The presence of organisms. Presence of living things. <i>Kehadiran benda hidup</i>
Responding variable:	The colour change in the bicarbonate indicator The colour change in the indicator Colour of bicarbonate indicator <i>Perubahan warna penunjuk bikarbonat</i>
Fixed variable:	Volume of bicarbonate indicator The type of indicator used Air in the boiling tube <i>Jenis penunjuk / bahan uji yang digunakan</i>

(b)(i)

- The bicarbonate indicator in test tubes A and B changes from red to yellow. There is no change in colour in C.
- The colour of bicarbonate indicator in test tubes A and B changes from red to yellow. The colour of the indicator in test tube C does not change.
- The colour of bicarbonate indicator changes to yellow in the boiling tubes with living things.

(b)(ii)

- Living things give out carbon dioxide during respiration.
- Living things release carbon dioxide during respiration.
- Grasshopper and plant shoot give out carbon dioxide during respiration.
- The bicarbonate indicator changes to yellow if there is carbon dioxide.

(b)(iii)

Carbon dioxide

- *Gas Karbon dioksida*
- Carbon dioxide gas released during respiration.

(c)

Because there are no living things inside.

- Test tube C does not contain any living organisms/ living things inside.
- Test tube C does not contain any living things/ living organisms
- *Tabung uji C tidak mengandungi benda hidup*

(d)

As a controlled experiment.

- For comparison
- Test tube C is a control experiment.
- Act as a control experiment.
- *Sebagai eksperimen kawalan /perbandingan*

(e)

Living organisms release carbon dioxide gas during respiration.

- Living things give out carbon dioxide during respiration.
- Carbon dioxide gas is released during respiration.
- Carbon dioxide is released during respiration.
- Carbon dioxide is given out during respiration.

(f)

To prevent photosynthesis from taking place in test-tube B.

- So that the plant shoot in B cannot carry out photosynthesis.

(g)

Test-tube	Colour of bicarbonate indicator
A	Red changes to yellow / Yellow
B	No change / Red
C	No change / Red

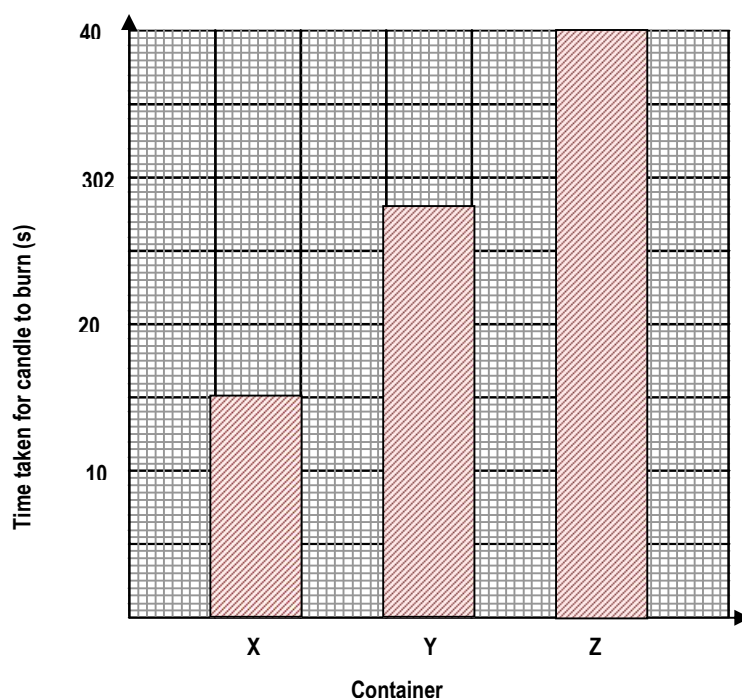
3(a)

Manipulated variable:	Size of container Volume of air in the container / <i>Saiz bekas</i>
Responding variable:	Time taken for candle to extinguish Time taken for candle flame to go off. Length of time a candle burns / <i>Masa untuk lilin menyala</i>
Fixed variable:	Type and size of candle(s) Type of candle / <i>Jenis lilin/ saiz lilin</i>

(b)

Container	Time taken for candle to burn (s)
X	15.0 s
Y	28.0 s
Z	40.0 s

(c)



- Candle can burn longer in container Z which contains more air.
- Bigger container contains more oxygen (air).
- Smaller container contains lesser air
- Container Z contains more air compares to containers X and Y.
- A candle burns longer in a larger container.
- Time taken for candle to burn depend on/affected by the size of the container.

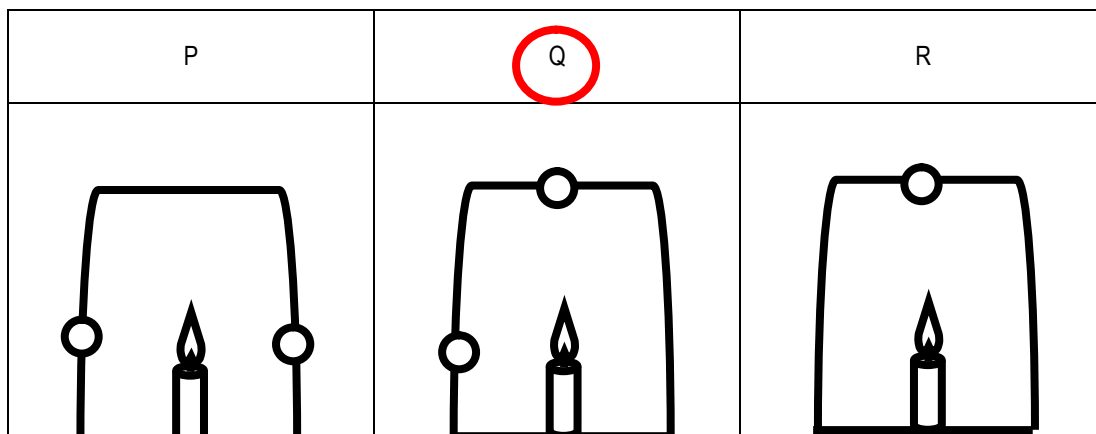
(d)

- Candle burns longer in bigger container.
- Bigger container contains more air that allows longer burning period
- Candle takes a longer time to extinguish in bigger container compares to smaller container.
- Candle extinguishes faster in smaller container in relation to bigger container.
- A candle will burn longer in a larger container because there is more oxygen.

(f)

- *Semakin besar bekas semakin lama masa lilin menyala*

(g)



4(a)

Manipulated variable:	Surface area of filter paper Size of filter paper / <i>Saiz kertas turas/ luas permukaan</i>
Responding variable:	Rate of evaporation Time taken for evaporation of filter paper to take place Rate of water evaporation / <i>Kadar penyejatan air / masa untuk air menyejat</i>
Controlled variable:	The surrounding temperature The environmental condition/ temperature Air movement Humidity / <i>Kelembapan / Suhu persekitaran</i>

(b)

- The larger the surface area, the faster is the rate of evaporation of water.
- The smaller the surface area, the slower is the rate of evaporation of water.

(d)

- Filter paper R takes longer time to dry compares to P and Q.
- Filter paper P dries faster than filter papers Q and R.
- The filter paper with the largest surface area dries up the fastest.

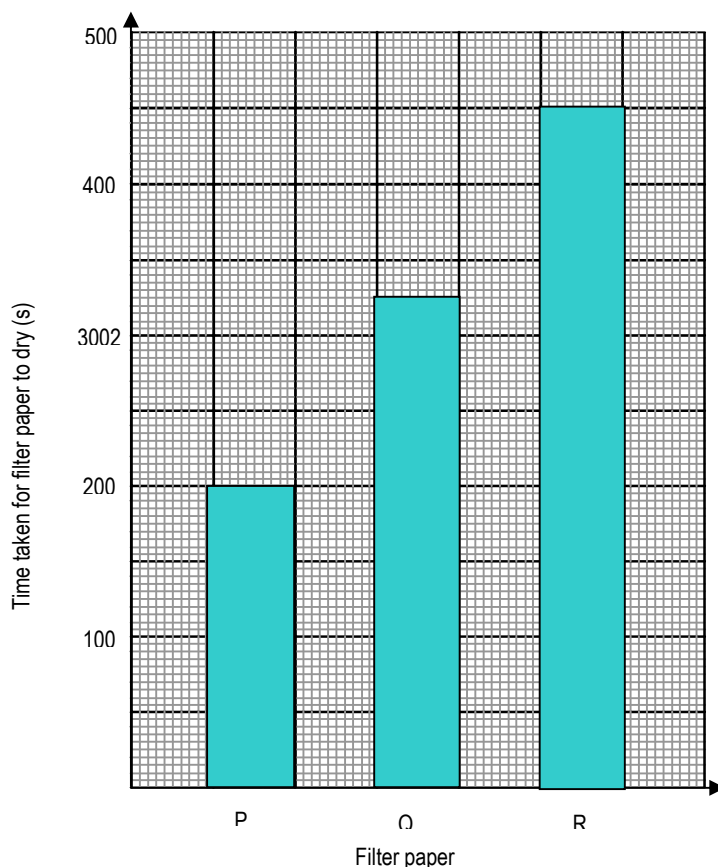
(e)

- The rate of evaporation of water will increase if the exposed surface area of filter paper increases.
- The rate of water evaporation depends on the size of the surface area.

(f)

- Filter paper with larger surface area takes shorter time to dry.
- Filter paper with smaller surface area takes longer time to dry.
- The larger the surface area of the filter paper, the faster is the time taken for the filter paper to dry

(c)



(g) (i) Container Y / Y

(ii)

- Larger exposed surface area of water evaporates faster.
- Rate of evaporation increases when the surface area of water exposed increases.
- Because Y has the largest surface area.

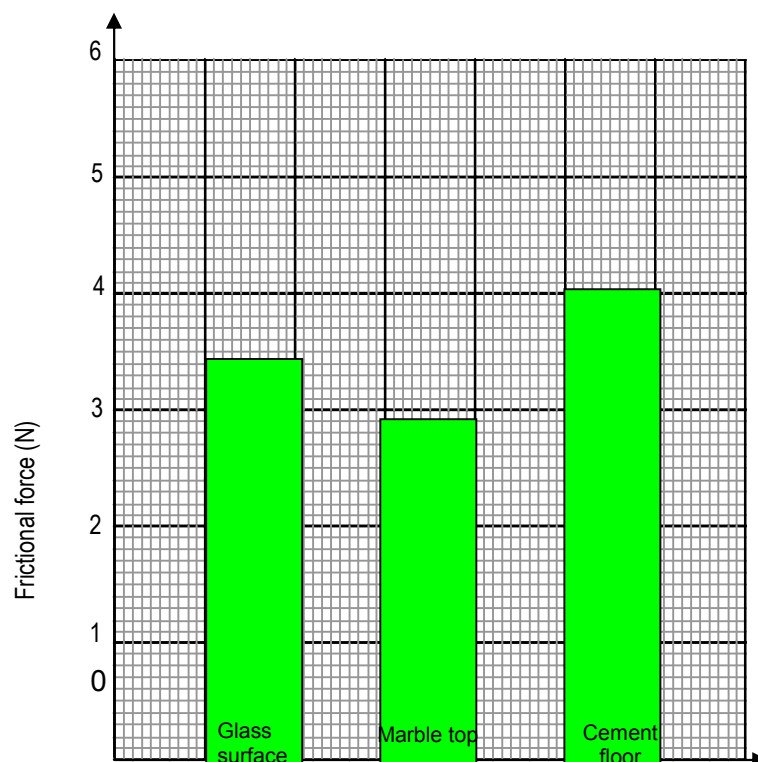
5(a)

Manipulated variable:	Different types of surface / Types of surface
Responding variable:	Magnitude of force / Magnitude of frictional force / Readings of spring balance
Fixed variable:	Wooden block / Mass of wooden block / Type of spring balance

(b)

Type of surface	Reading of spring balance (N)
Glass surface	4.5 N
Marble top	3.8 N
Cement floor	5.2 N

(c)



(d)

- Cement floor has the highest frictional force.
- The highest frictional force acts on the wooden block that is pulled along the cement floor followed by the glass surface and marble top.
- The wooden block that is pulled along the cement floor produces the highest frictional force acting on it compared to the glass surface and marble top.

(e)

- Frictional force varies with different types of surfaces.
- The frictional force acting on objects depends on the types of surface/ surface condition that influence the magnitude of friction.

(f)

(i) a sandy beach: more than 5.2 N (any value between 5.2N and 6.0N)

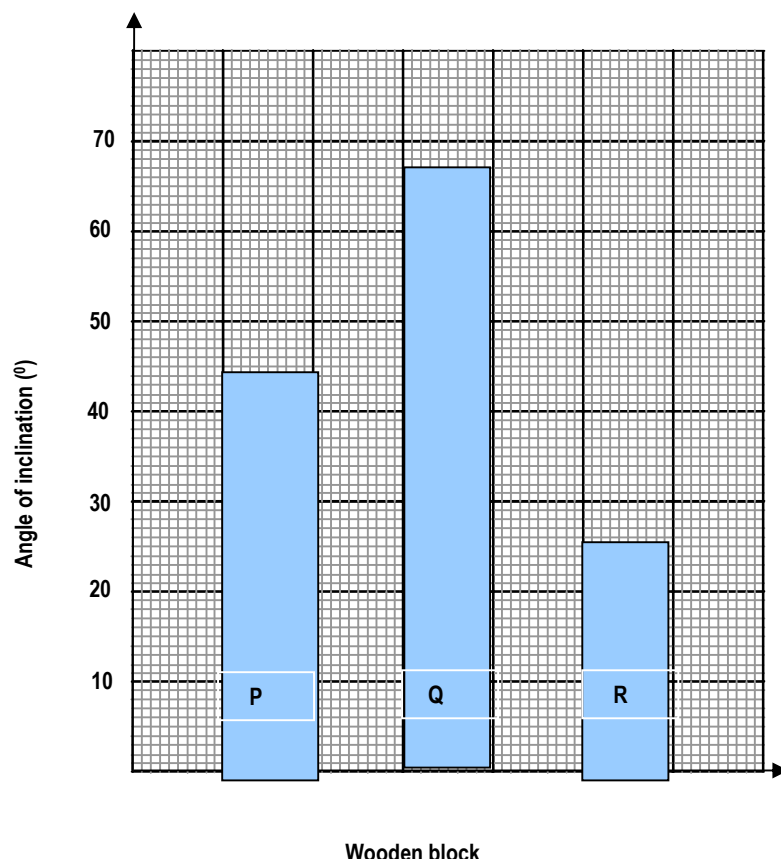
(ii) a waxed marble floor: less than 3.8 N (any value between 3.8N and 6.0N)

- The rougher the surface, the larger the frictional force.
- The rougher the surface, the greater is the frictional force

6(a)

Manipulated variable:	Base area of objects Angle of inclination
Responding variable:	Stability of object
Fixed variable:	Mass of object Position of centre of gravity

(b)



(c)

- Wooden block Q which has the largest angle of inclination topples first.

(d)

(i) Block Q

(ii)

- Block R topples first because it has the lowest angle of inclination.
- Block Q needed the highest angle of inclination to topple over.

(e) 67° - 70°

(f)

- The larger the angle of inclination of the board, the lesser the stability of the wooden block.

(g)

- The base area affects the stability of the wooden block.

7(a)

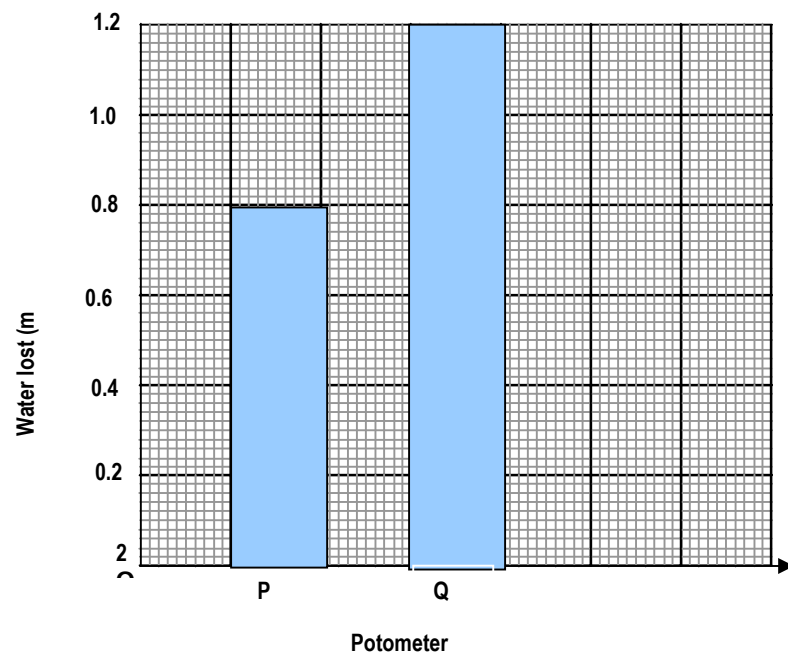
Potometer	Water level (mℓ)		
	Initial reading	Final reading	Water lost
P	69.8	69.0	0.8
Q	73.0	71.8	1.2

(b) 68.3 mℓ.

(c)

Manipulated variable:	The movement of air / The presence of wind
Responding variable:	Volume of water lost /Rate of transpiration Water level in the calibrated pipette
Controlled variable:	Type of plants/presence of light/ / humidity/temperature /Size of plants Length of time / Duration of activity

(d)



(e)

- Plant Q loses more water than plant P.
- Q has a higher water lost.
- Q records a higher water lost rate

(f)

- The rate of transpiration depends on the wind.
- The rate of transpiration depends on the presence of wind.
- The rate of transpiration depends on the movement of air.

(g)

- The greater the wind, the higher the rate of transpiration.
- The higher the air movement, the higher the rate of transpiration.

(h)

- The wind will affect the rate of transpiration.
- The presence of wind will affect the rate of transpiration.
- Moving air affects the rate of transpiration.

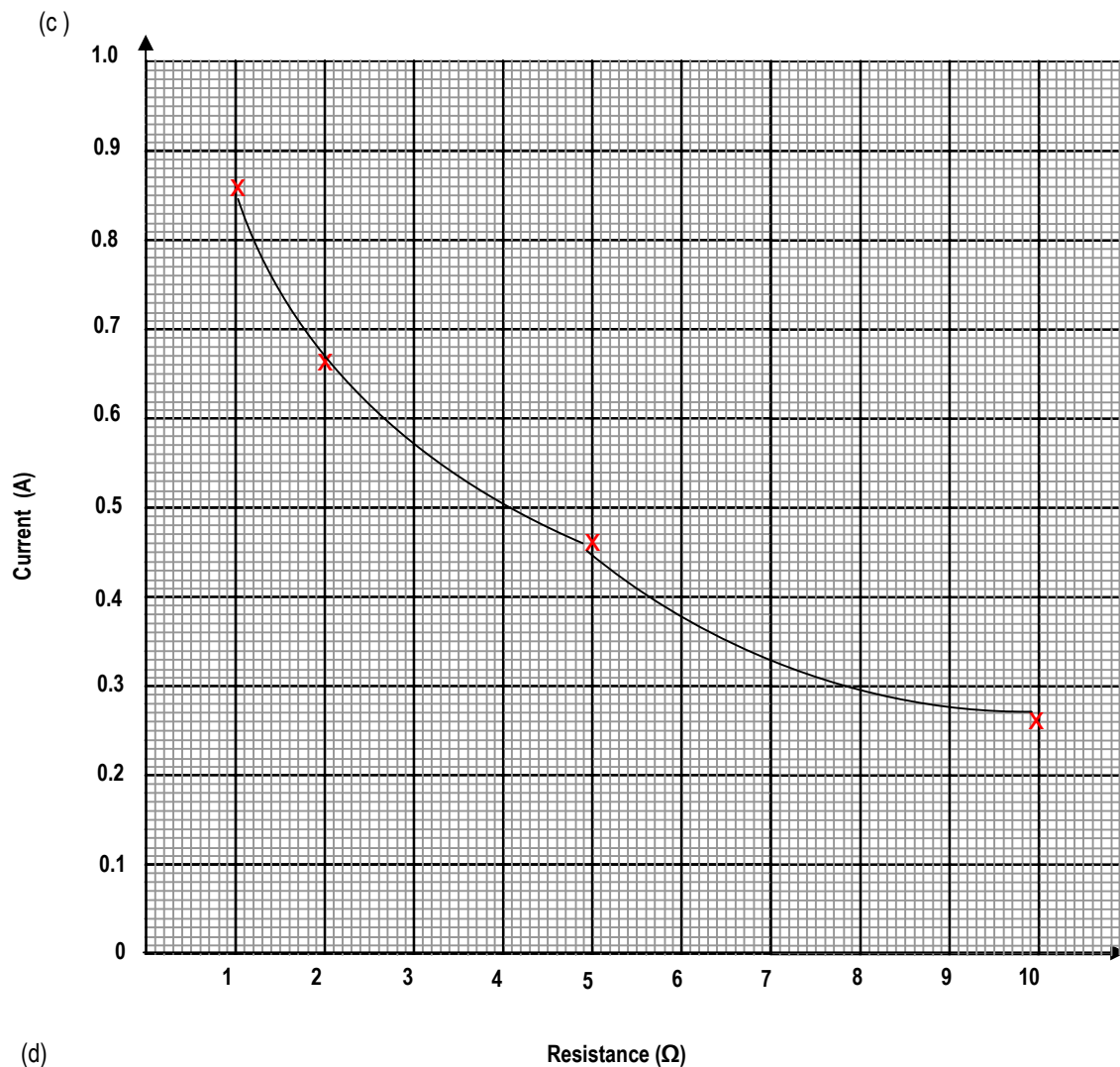
8.

(a)

Manipulated variable:	The value of resistance
Responding variable:	The value of current /Ammeter reading
Fixed variable:	Number of dry cells

(b)

Resistor (Ω)	1	2	5	10
Reading of ammeter (A)	0.9	0.7	0.5	0.3



(d) The current depends on the value of resistance.

(e) 0.38 A

(f) The higher the resistance the dimmer the bulb.
The brightness of the bulb decreases when the resistance increases

(g) The higher the resistance, the lower the current flowing through the circuit.
The lower the resistance, the higher the current flowing through the circuit.