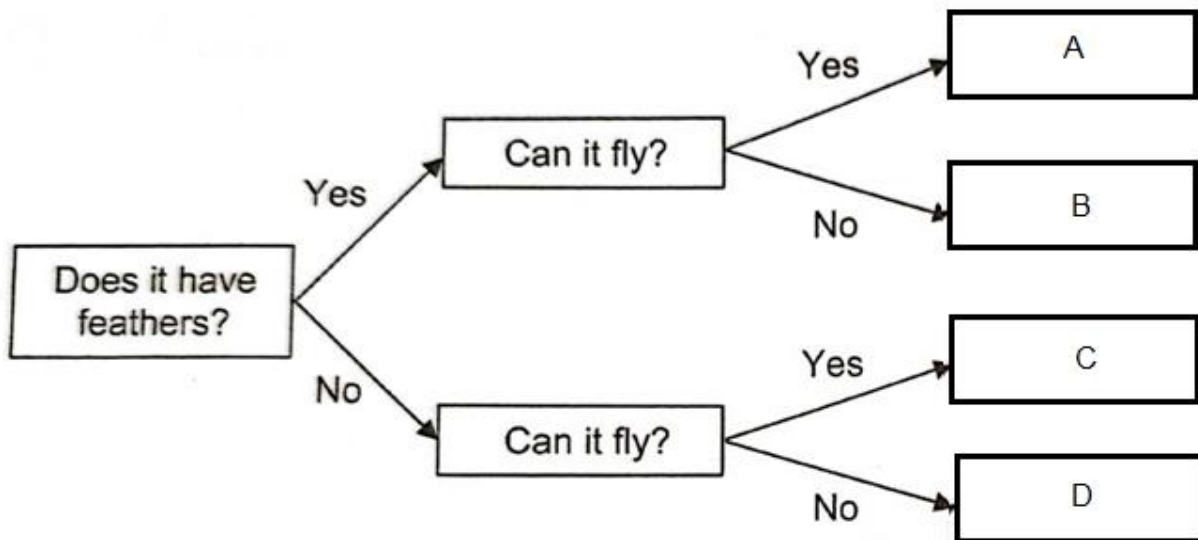


## Life Sciences

### 2021/ Booklet A/ Question 6

Study the chart on classification of organisms.



Which of the following is possible?

- (1) A is a butterfly.
- (2) C is a mosquito.
- (3) B and D are birds.
- (4) A and B are mammals.

( )





Topic: Diversity – Animals

Process Skill: Classifying, Comparing, Inferring

Suggested Answer: (2)

**2019/ Booklet B/ Question 33**

Ravi wanted to investigate the conditions needed for leaf growth using three types of soil. Four pots of identical plants were placed in the same area within a garden. The diagram shows the four pots of plants after two weeks.

				
Pot	P	Q	R	S
Type of soil	garden soil	garden soil	sandy soil	clayey soil
Availability of water	Yes	No	Yes	Yes

- (a) State which pots must be compared to conclude about the effect of each variable on leaf growth.

Variable	Pots to compare
Type of soil	
Availability of water	

Ravi conducted a second experiment to find how the amount of fertiliser affects leaf growth. He conducted a fair test, planting the same number of plants in five big pots, V, W, X, Y and Z. The pots are filled with garden soil.

The results of his experiment are as shown.

Pot	V	W	X	Y	Z
Amount of fertiliser(g)	0	5	10	15	20
Average surface area of a leaf after two weeks (cm <sup>2</sup> )	20	30	36	20	14

(b) What can Ravi conclude about the effect of fertiliser on leaf growth?

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(c) Explain why the results of Ravi's second experiment cannot be used to improve the leaf growth in pot S from his first experiment.

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Topic: Interactions - Man's Impact on the Environment

Process skills: Investigative Process

Suggested Answers:

(a)

Variable	Pots to compare
Type of soil	P, R, S
Availability of water	P,Q

(b) As the amount of fertilisers increase, the average surface area of the leaves increased. After 10g of fertilisers are added, as the amount of fertilisers increase, the average surface area of the leaves decreased.

(c) [C] (Stated) The results of Ravi's second experiment cannot be used to improve the leaf growth in pot S from the first experiment.

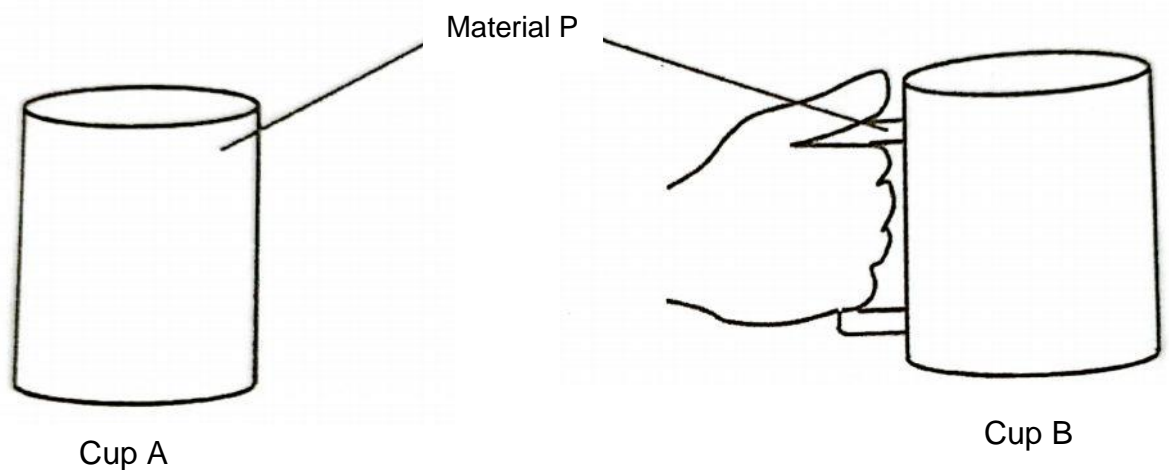
[E] The two types of soil used were different. Pot S used clayey soil instead of garden soil.

[R] The type of soil could affect the growth of the plant.

## Physical Sciences

### 2021/ Booklet A/ Question 24

Eric has two cups, A and B, made of material P. He poured an equal amount of hot water into each cup. Cup A was too hot to hold but he can hold cup B easily as shown.



Which of the following best explains why Eric can hold cup B easily but not cup A?

- (1) Cup A is a good conductor of heat.
- (2) Cup B is a poor conductor of heat.
- (3) Distance from heat source is further in cup B.
- (4) Cup A is a good conductor of heat but the handle of cup B is not.

( )

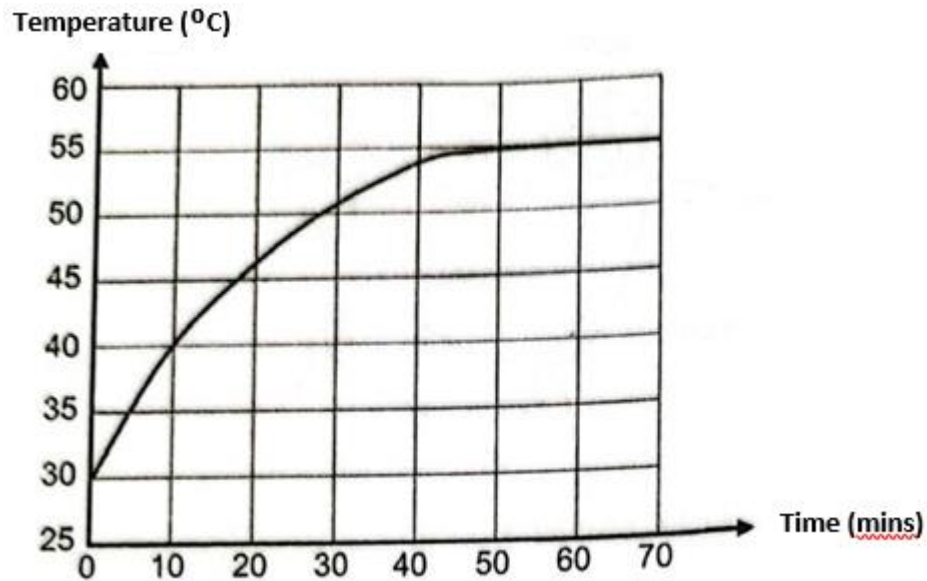
Topic: Energy – Heat

Process Skills: Inferring

Suggested Answer: (3)

**2021/ Booklet B/ Question 36**

Cars parked under the sun become hot quickly as heat that enters the cars cannot escape easily. Alex measured the temperature inside a car parked under the sun. He started timing immediately after the car was parked. His results are as shown.



(a) State what is temperature.

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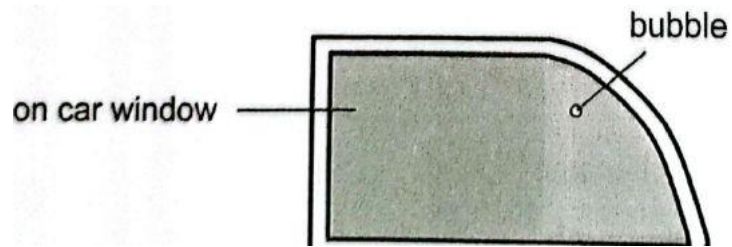
(b) State the temperature of the surroundings.

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(c) State the time taken for temperature to reach 40 °C.

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Alex put a film over a car window to reduce the amount of sunlight coming into the car. A bubble was seen as shown.



(d) Explain why the bubble became larger after some days.

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Topic: Energy- Heat

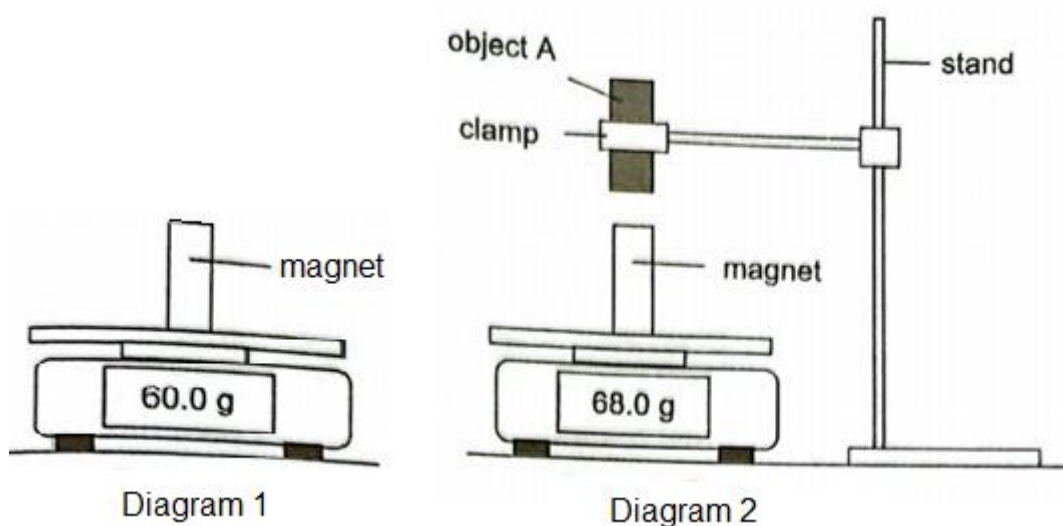
Process Skills: Inferring

Answers:

- (a) Temperature is a measurement of how hot or cold an object is.
- (b)  $30^{\circ}\text{C}$
- (c) 10 min
- (d) [C] (stated) The bubble became larger after some days.  
[E] The air trapped in the bubble gained heat from the sun  
[R] and expanded.

**2019/ Booklet B/ Question 38**

Leela placed a magnet on top of a balance as shown in Diagram 1.



She brought object A close to the magnet as shown in Diagram 2.

(a) State what object A is. [1]

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(b) Explain why the reading of the balance increased in Diagram 2. [2]

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(c) Leela replaced object A with an iron bar of the same size in the set-up in Diagram 2.

(i) State which reading P, Q, R, S or T, shown below is possible on the balance.

P	Q	R	S	T
54.0g	60.0g	64.0g	68.0g	72.0g

Reading: \_\_\_\_\_

Explain your answer. [1]

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- (ii) State a variable that Leela must keep constant when comparing object A and the iron bar. [1]

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Topic(s): Interactions – Magnets and Forces

Process Skills: Inferring, Formulating hypothesis, Investigative Process

Answers:

- (a) Magnet
- (b) [C] The reading of the balance increased. (Stated)  
[E] The like poles of magnet and object A are facing each other.  
[R] Hence, they repel and the amount of force acting on the balance is increased.
- (c) (i) [C] Reading: P  
[E] Magnet will attract the iron bar  
[R] and therefore the magnet will exert a lesser amount of force on the balance.  
(ii) The height of the iron bar / The distance between the iron bar and magnet / orientation of iron bar and magnet



**2021/ Booklet B/ Question 39**

Kumar set up the apparatus in Diagram 1.

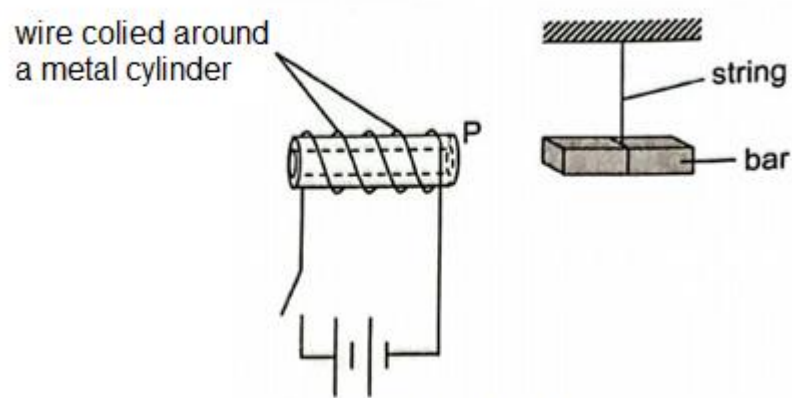


Diagram 1

When he closed the switch, the bar swung towards the point P.  
Kumar concluded that the bar is a magnet.

(a) State if you agree with Kumar's conclusion. Explain your answer.

[1]

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Kumar designed part of a game named "Bobbing Carrots" as shown in Diagram 2. An iron rod and a spring are fixed to the plastic carrot from below. The bottom end of the spring is fixed to a wooden board.

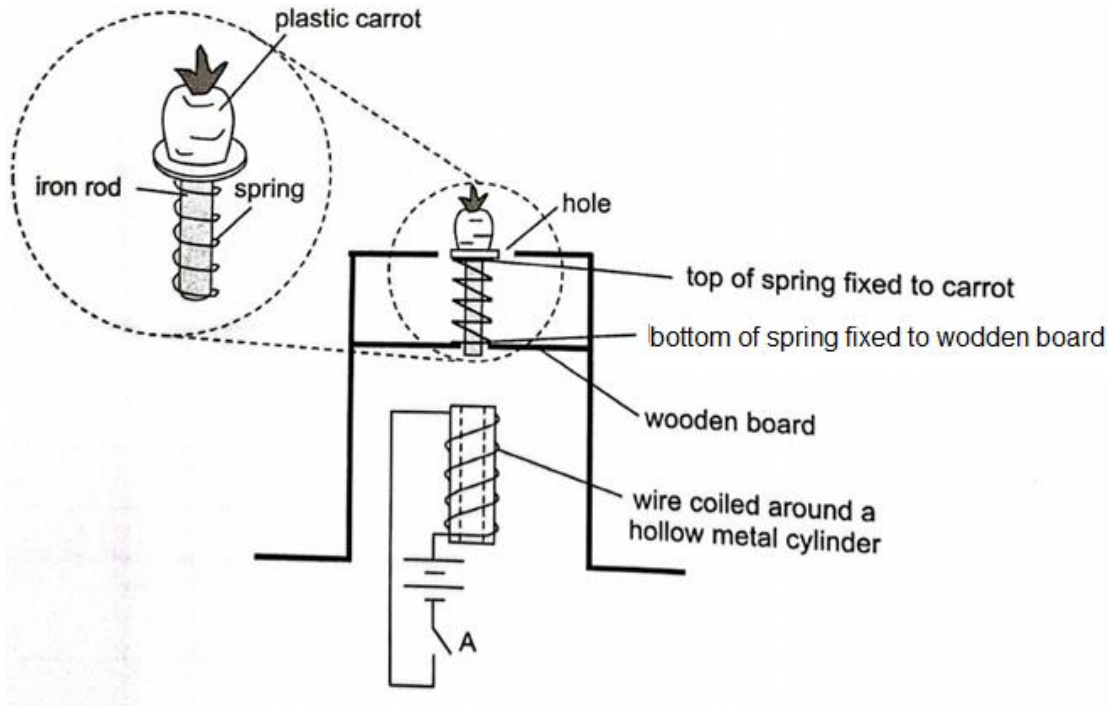


Diagram 2

When Kumar closes switch A, the carrot will drop below the hole.

(b) Explain why the carrot appears above the hole when Kumar opens switch A. [2]

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(c) Suggest two ways to make the carrot drop into the hole faster while making sure that the carrot appears above the hole when the switch is opened. [2]

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Topics: Interactions - Magnets, Forces & Systems - Electricity (Upper block), Forces (Upper block)  
Process Skills: Inferring

Answers:

(a) [C] No.

[E] When the switch is closed, the metal cylinder becomes an electromagnet, thus attracting the metal bar.

[R] There was no repulsion. Only a test of repulsion can confirm that the metal bar is a magnet.

(b) [C] When switch A was opened, the metal cylinder loses its magnetism.

[E] The iron rod would no longer be attracted to the electromagnet.

[R] The compressed spring will then exert an upward force, pushing the carrot out of the hole.

(c) Increase the number of coils of wire around the metal cylinder.

Increase the number of batteries in the set up.