

2017 SCIENCE

**DO NOT OPEN THIS BOOKLET
UNTIL INSTRUCTED.**
40 QUESTIONS
TIME ALLOWED: 55 MINUTES

STUDENT'S NAME:

Mark only **ONE** answer for each question.
Your score will be the number of correct answers.
Marks are **NOT** deducted for incorrect answers.

There are **40 MULTIPLE-CHOICE QUESTIONS** (1–40).
Use the information provided to choose the **BEST** answer from the four possible options.

You may use a calculator and a ruler.



1. Sue wants to make coloured eggs by dyeing the eggshells with plant juice.

The diagram shows the eggshell colours that some plant juices produce.



Mixing blue dye and red dye makes purple dye.

Which plant juices should Sue mix to dye the eggshells purple?

- (A) elderberry and red beetroot
- (B) purple cabbage and red beetroot
- (C) purple cabbage and elderberry
- (D) yellow onion skins and elderberry

2. Mark planted some seedlings and measured their height at the end of each day over 7 days.

The seedlings were 5 centimetres tall when he planted them. He recorded the results in this table.

End of day	Height (cm)
1	5.5
2	6
3	7
4	9.5
5	10
6	11.5
7	12

During which day did the seedlings grow the most in height?

- (A) day 3
- (B) day 4
- (C) day 6
- (D) day 7

3. Like humans, chimpanzees make sounds to express emotions.

The table lists some sounds and the emotion each expresses.

Sound	Emotion
'wraa'	fear
pant-hoot	excitement
lip smack, pant	happiness
soft bark, cough	annoyance
scream, bark	fear, anger
'hoo', whimper	distress

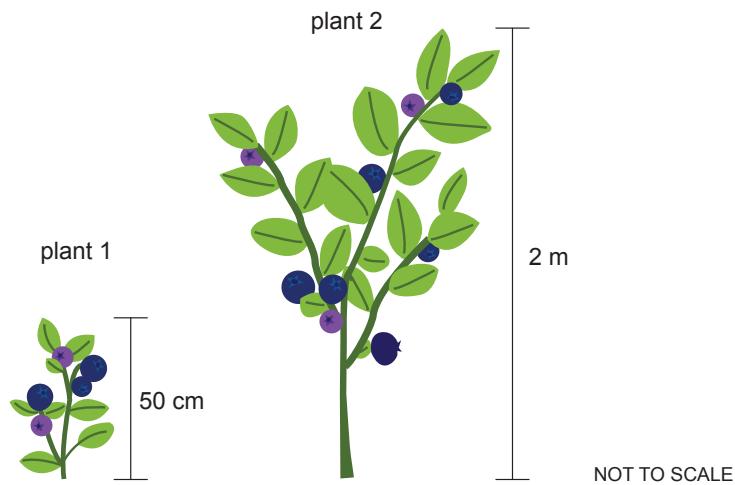
One chimpanzee makes pant-hoot and lip smack noises when seeing another chimpanzee.

What emotions is the chimpanzee expressing?

- (A) fear and distress
 (C) distress and annoyance

- (B) excitement and distress
 (D) excitement and happiness

4. The diagram shows the measurements of two plants.



How many times taller than plant 1, is plant 2?

- (A) 0.4
 (C) 4

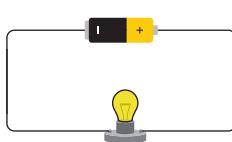
- (B) 2.5
 (D) 25

5. For an electric circuit to work, the circuit requires:

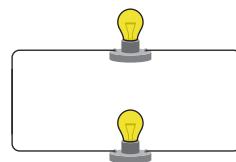
- a power source such as a battery,
- an unbroken pathway of metal wire,
- components, such as bulbs or motors, that allow electricity to pass through them.

Which circuit will have electricity flowing around it?

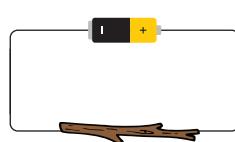
(A)



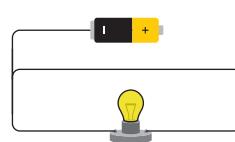
(B)



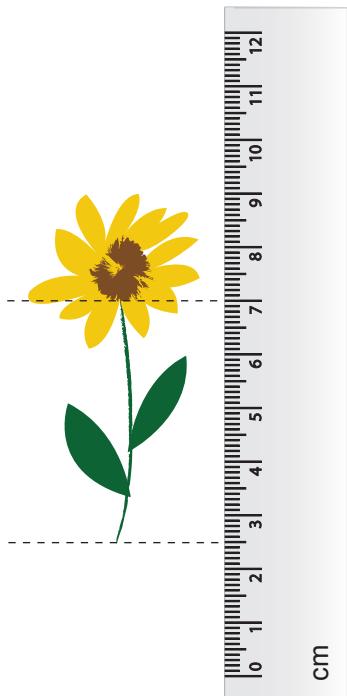
(C)



(D)



6. Kyle measured a plant using a ruler, as shown.

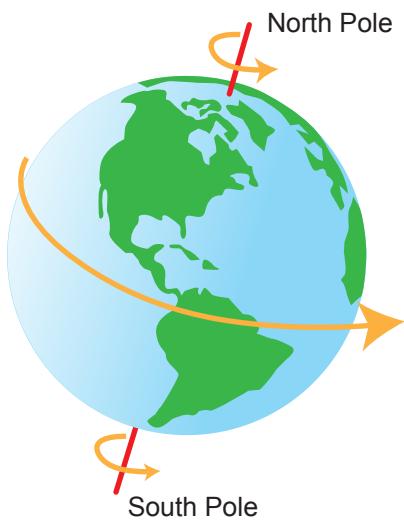


How many centimetres long is the stem of the plant?

- (A) $4\frac{1}{2}$
(B) 5
(C) $5\frac{1}{2}$
(D) 7

7. Each planet in the Solar System spins on its axis while it moves around the Sun, just like Earth. The time it takes a planet to spin one full rotation on its axis is called a day.

The table lists the approximate duration of a day on different planets in the Solar System.



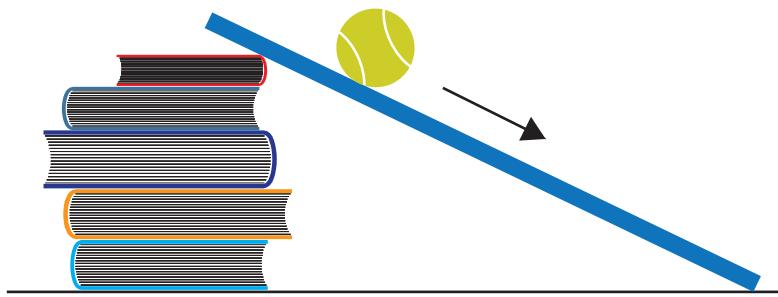
Planet	Duration of day (Earth hours)
Mercury	1408
Venus	5832
Earth	24
Mars	25
Jupiter	10
Saturn	11
Uranus	17
Neptune	16

How many planets have a day that is longer than a day on Earth?

- (A) 4 (B) 3 (C) 2 (D) 1

8. Dylan wants to investigate whether changing the slope of a ramp affects how long it takes a ball to roll down it.

He set up a ramp as shown.



Dylan can select only one extra piece of equipment to carry out this investigation.

Which of the following should he select?

- | | |
|-----------------|--------------------|
| (A) a stopwatch | (B) a thicker book |
| (C) a ruler | (D) a heavier ball |
9. A car travelling at 60 km per hour leaked oil onto the road. An oil drop fell onto the road every second, making this pattern on the road:



Later, the car travelled at 90 km per hour. What did the oil drop pattern on the road look like at this speed?

- | | |
|-----|--|
| (A) | A horizontal grey road surface with a very dense and uniform pattern of small black dots, indicating high-frequency oil drops. |
| (B) | A horizontal grey road surface with a sparse pattern of black dots, indicating low-frequency oil drops. |
| (C) | A horizontal grey road surface with a pattern of black dots where the distance between them increases from left to right, indicating the car is moving faster. |
| (D) | A horizontal grey road surface with only one black dot, indicating the car has stopped or the oil is no longer leaking. |

10. Veronica measured the temperature in her school playground three times a day over four days. The table shows her results.

Day	Highest temperature (°C)	Lowest temperature (°C)	Temperature at 11am (°C)
1	13	2	7
2	15	3	6
3	11	14	6
4	10	5	7

Veronica realised that she had made an error in recording the data.

On what day did Veronica make the error?

- (A) Day 1
- (B) Day 2
- (C) Day 3
- (D) Day 4

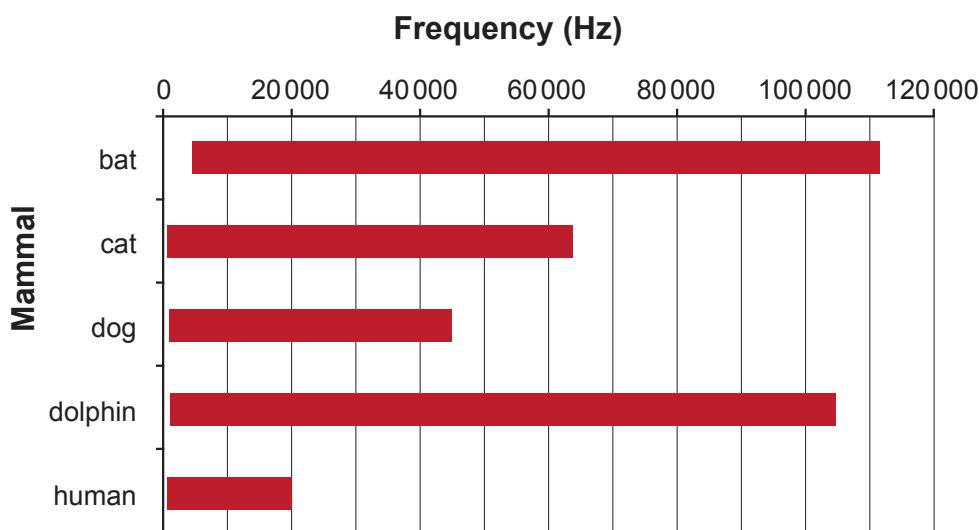
11. This is a photograph of the sole of one of Bernie's shoes.



Which of these is a photograph of the other shoe from this pair?



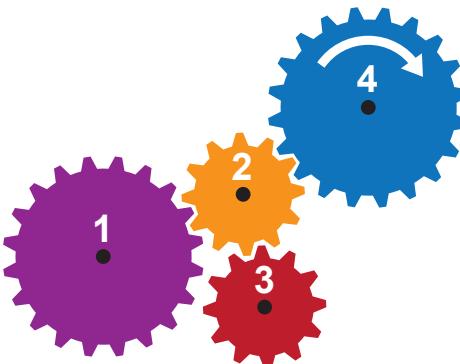
12. The frequency of a sound, measured in hertz (Hz), is what gives the sound its pitch. Different animals can hear sounds in different frequency ranges. This graph shows the hearing range of some mammals.



Which of these mammals can hear a sound with a frequency of 50 000 Hz?

13. A gear is a wheel with teeth around its edge. When the teeth on the gears fit together, one gear can make another gear turn. A gear with fewer teeth rotates faster than a gear with more teeth.

Alice put together a set of gears as shown in the diagram.

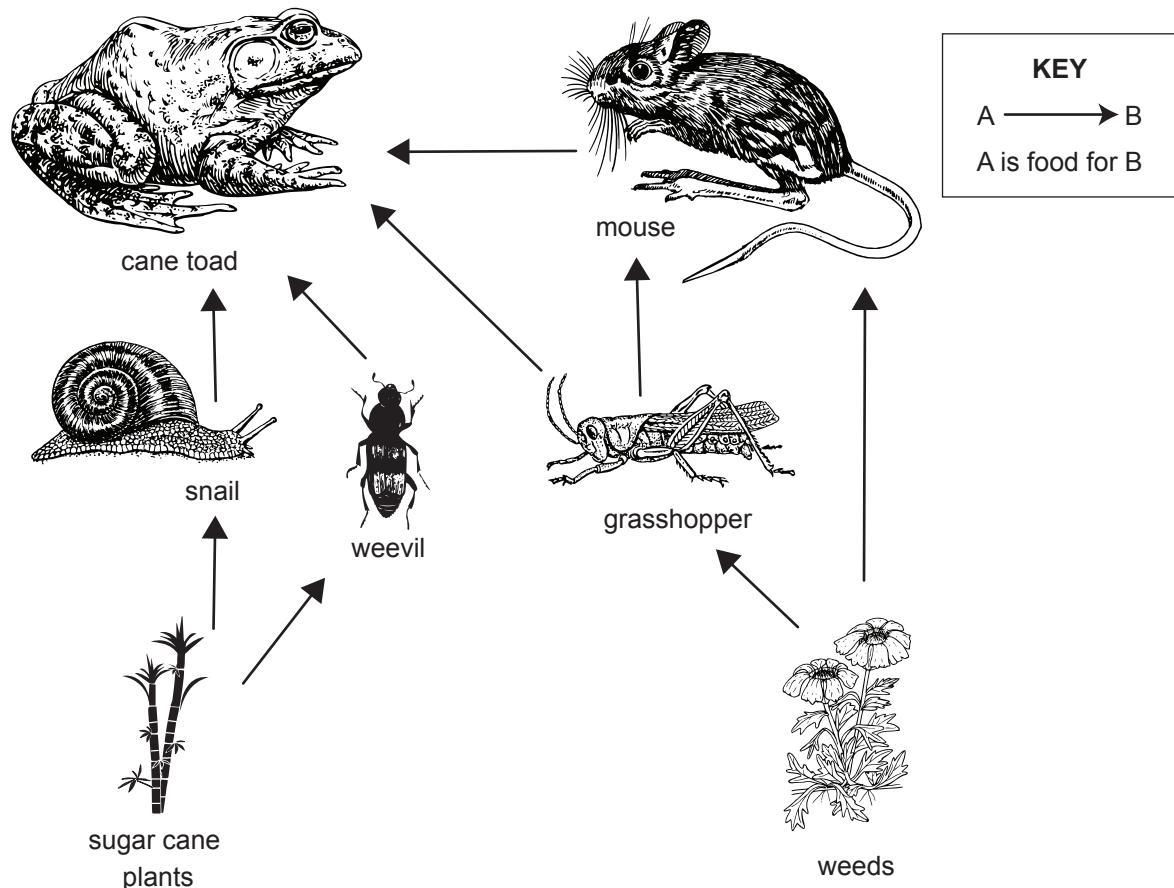


Which statement is correct?

- (A) Gear 2 and gear 3 rotate in the same direction and at the same speed.
 - (B) Gear 1 rotates in the opposite direction to gear 3, but faster than gear 3.
 - (C) Gear 3 rotates in the same direction as gear 4, but faster than gear 4.
 - (D) Gear 4 moves in the opposite direction to gear 1, and at the same speed.

14. Prey is an animal that gets eaten by another animal, a predator.

The diagram represents the relationship between plants and animals living on a sugar cane farm in Australia.



Which of the following are predators of grasshoppers?

- (A) weeds and mouse
- (B) mouse and weevil
- (C) mouse and cane toad
- (D) cane toad and weevil

15. A key allows users to identify an object, such as an animal or a plant, using the characteristics of the object.

The diagram shows a key for a group of animals called vertebrates.

1.	has feathers	bird
	does not have feathers	go to 2
2.	has scales	go to 3
	does not have scales	go to 4
3.	has gills	fish
	does not have gills	reptile
4.	has fur	mammal
	does not have fur	amphibian

A caecilian does not have feathers, does not have scales and does not have fur.

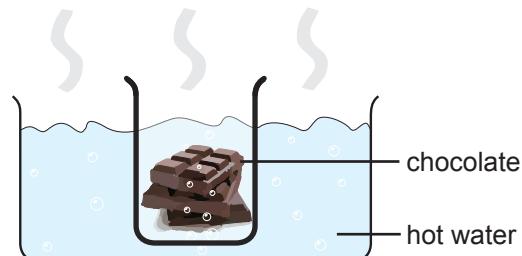
What type of vertebrate is a caecilian?

- (A) fish
- (B) reptile
- (C) mammal
- (D) amphibian

16. Igneous rock and sedimentary rock are two types of rocks. Igneous rocks form when hot liquid rock below Earth's surface cools and hardens. Sedimentary rocks form when existing rock pieces and sediment are pressed together.

Alex used chocolate to demonstrate the formation of rocks of different types, using these steps:

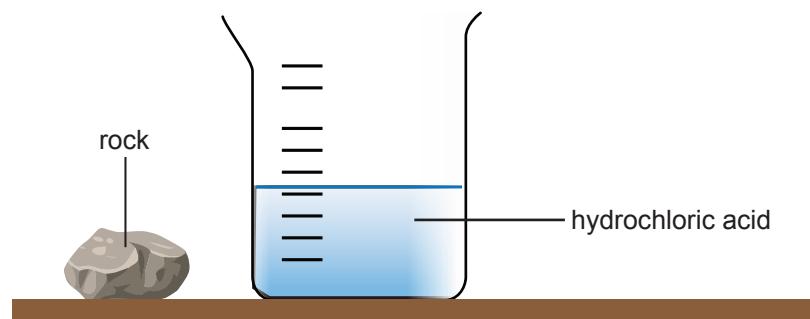
1. Place a container with chocolate in a tub of hot water until the chocolate melts.
2. Take the container out of the hot water and let the chocolate cool.
3. Once the chocolate is hard again, scrape it into small pieces.
4. Press the pieces down to make a block.



Which option correctly matches the steps in Alex's demonstration with the formation of igneous rocks and sedimentary rocks?

	Formation of igneous rocks	Formation of sedimentary rocks
(A)	Step 2	Step 4
(B)	Step 4	Step 2
(C)	Step 1	Step 3
(D)	Step 2	Step 3

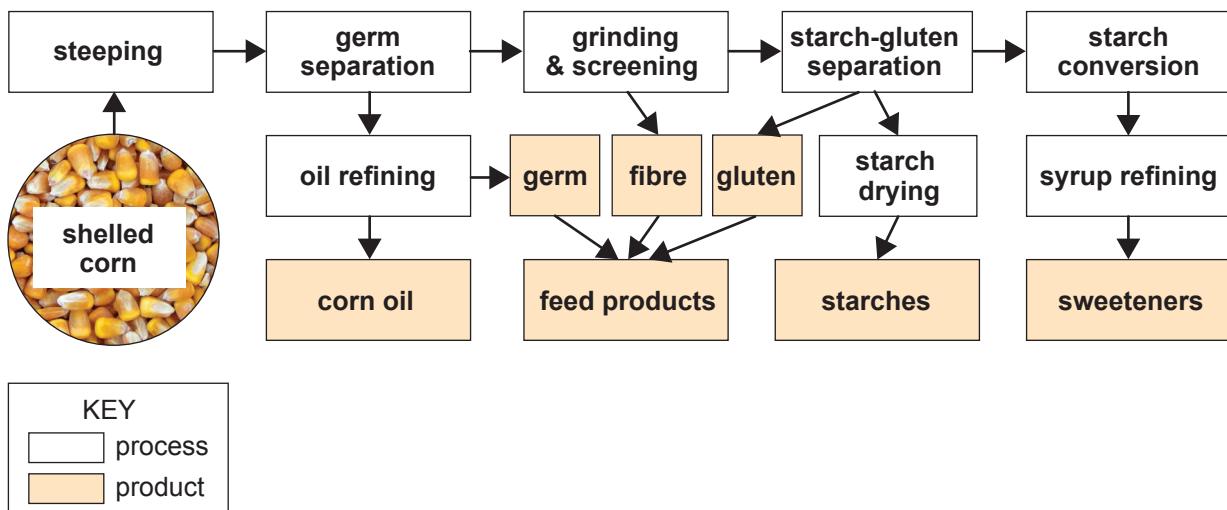
17. Kate's teacher gave Kate some hydrochloric acid and a rock. She told Kate that some rocks will react with hydrochloric acid to produce carbon dioxide. Carbon dioxide is a gas that has no colour or smell.



How can Kate find out whether this rock produces carbon dioxide?

- (A) put the rock in the container and smell it
- (B) put the rock in the container and look for bubbles in the liquid
- (C) put the rock in the container and look for a change of colour
- (D) put the rock in the container and look for a rise in water level

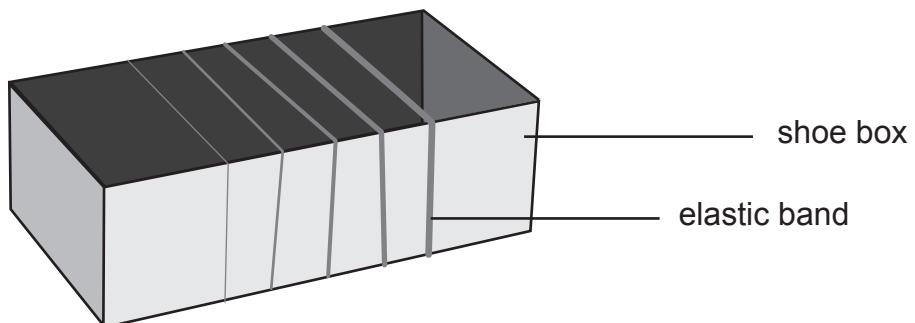
18. The diagram summarises the steps in producing a number of products from corn.



Which of these steps does NOT produce feed products?

- (A) oil refining
- (B) grinding and screening
- (C) starch-gluten separation
- (D) starch drying

19. Megan made a musical instrument using some elastic bands and an empty shoe box. The elastic bands all had different lengths and thicknesses. When she plucked them, each band made a sound with a different pitch.

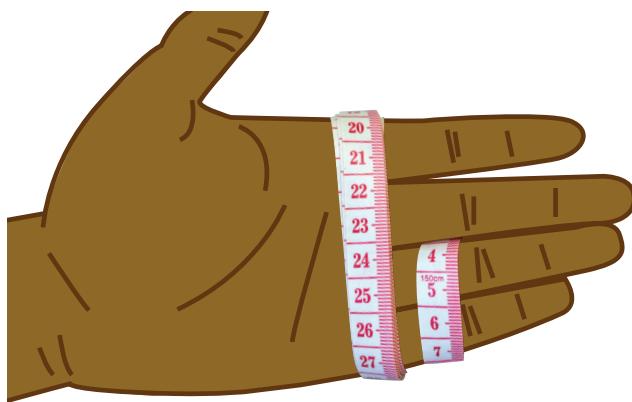


Megan was investigating whether the thickness of an elastic band affects the pitch of the sound it produces when plucked.

What must she do to make her investigation a fair test?

- (A) pluck each elastic band three times
- (B) use elastic bands made from different types of rubber
- (C) use elastic bands with exactly the same thickness but different lengths
- (D) use elastic bands with exactly the same length but different thicknesses

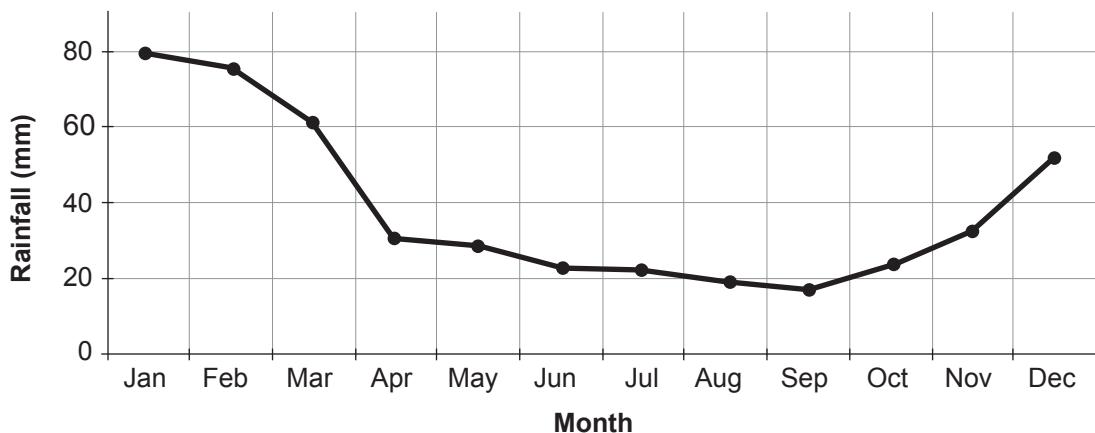
20. Jack wrapped a measuring tape around his fingers several times, as shown.



Approximately how many centimetres wide is each of Jack's fingers at the base?

- (A) 3.5
(B) 2
(C) 1.5
(D) 1

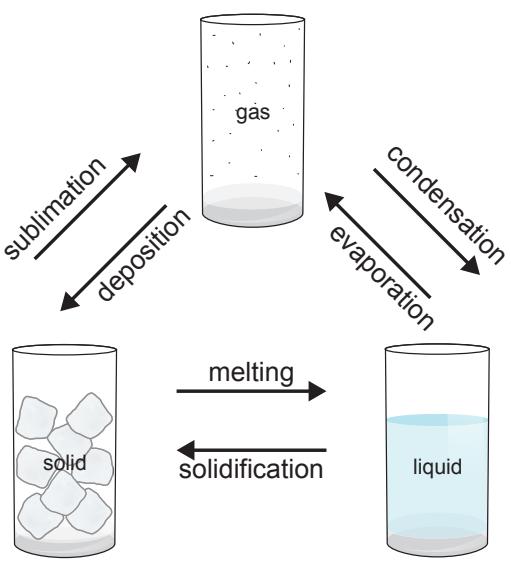
21. The graph summarises the average monthly rainfall for the years 1961–1990.



Which of the following periods had the lowest average amount of rainfall?

- (A) Jan – Mar (B) Apr – Jun (C) July – Sep (D) Oct – Dec

22. Matter can change from one state to another by heating or cooling. The diagram shows the changes of state for a substance.



Iodine is a purple solid at room temperature. When placed in a warm container, it fills the container with a purple gas without melting.

Which process does iodine undergo when heated?

- (A) sublimation
(B) evaporation
(C) deposition
(D) solidification

23. Soil erosion is the removal of the top layer of soil by wind or water.

Susan conducted an experiment using three plastic dishes, filled with the same amount of identical soil. Each dish had a different groundcover on top.

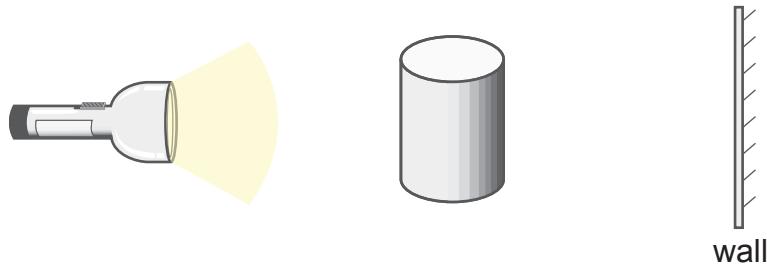


Susan poured 500 mL of water into each dish and collected the material that overflowed in separate beakers. She then evaporated the water from each beaker. She weighed and recorded the amount of soil that was left.

What question can Susan answer with her results?

- (A) Does the type of soil affect soil erosion?
- (B) Does the amount of rainfall affect soil erosion?
- (C) Does the colour of overflow affect soil erosion?
- (D) Does the type of groundcover affect soil erosion?

24. Joyce shines a torch onto a cylinder, as shown.



Which diagram shows the shadow produced by the cylinder on the wall?

- (A)
 - (B)
 - (C)
 - (D)
- The options show:
- (A) An oval shadow.
 - (B) A circular shadow.
 - (C) A rectangular shadow.
 - (D) An oval shadow.

25. The table classifies flowers by their heights when fully grown.

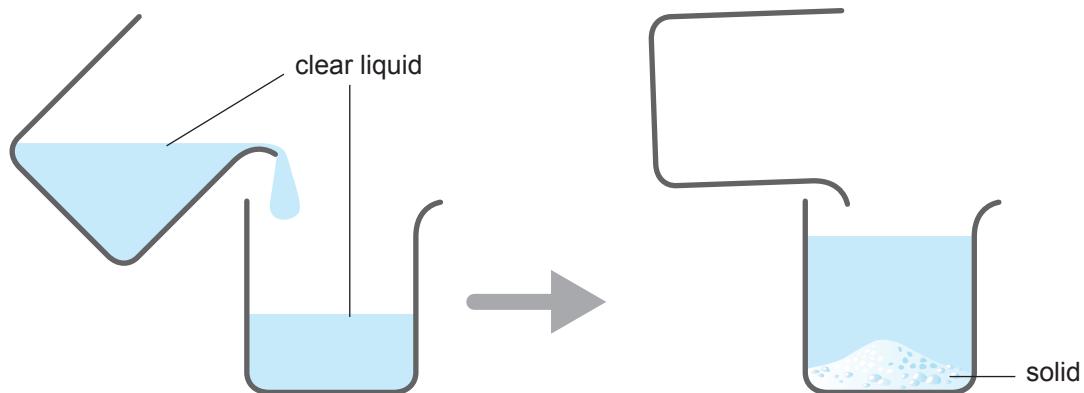
Short		Medium		Tall	
Name	Height (cm)	Name	Height (cm)	Name	Height (cm)
Grecian windflower	5 – 15	Lily of the valley	15 – 30	Spanish bluebell	25 – 46
Siberian squill	12 – 20	Jonquilla daffodil	25 – 40	Lily-flowered tulip	36 – 60
Dwarf iris	10 – 15	Hyacinth	20 – 30	Short cup daffodil	30 – 46

Which statement is correct based on the table?

- (A) A flower with a height of 34 cm when fully grown must be a tall flower.
- (B) A flower with a height of 15 cm when fully grown must be a short flower.
- (C) A flower with a height of 20 cm when fully grown must be a short flower.
- (D) A flower with a height of 23 cm when fully grown must be a medium flower.

26. An observation is anything that you can see, hear, smell, feel or taste.

Alissa had two beakers, each containing a clear liquid. She poured the liquid from one beaker into the other, as shown.



Which statement is an observation about Alissa's experiment?

- (A) A solid formed and sank to the bottom.
- (B) One of the liquids had something dissolved in it.
- (C) The two beakers had exactly the same liquid in them.
- (D) The chemicals dissolved in the two beakers were different.

27. The chemical formula for water is H_2O and can be represented by the following diagram:

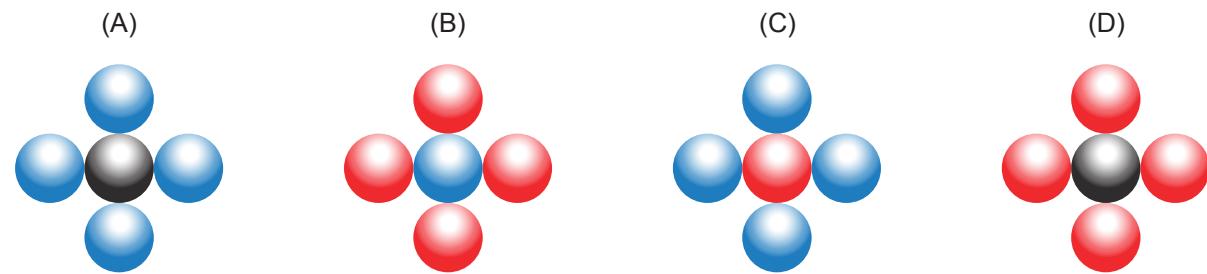


The chemical formula for carbon dioxide is CO_2 and can be represented by the following diagram:

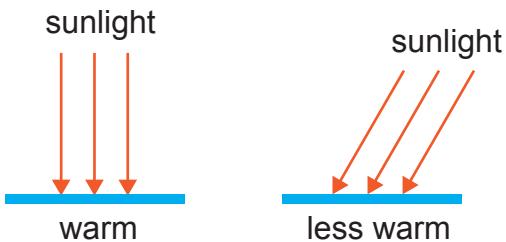


Methane, the main gas found in natural gas, has the chemical formula CH_4 .

Which diagram could represent methane?

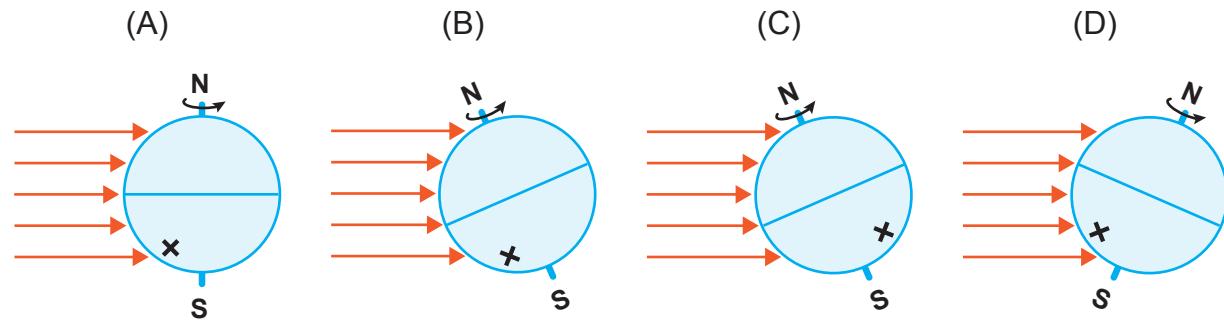


28. When a surface receives sunlight, the angle at which the sunlight strikes the surface affects the amount of heat the surface receives.



The angle at which the sunlight strikes a location on Earth's surface changes as Earth moves around the Sun during a year. This causes the different seasons at a location on Earth.

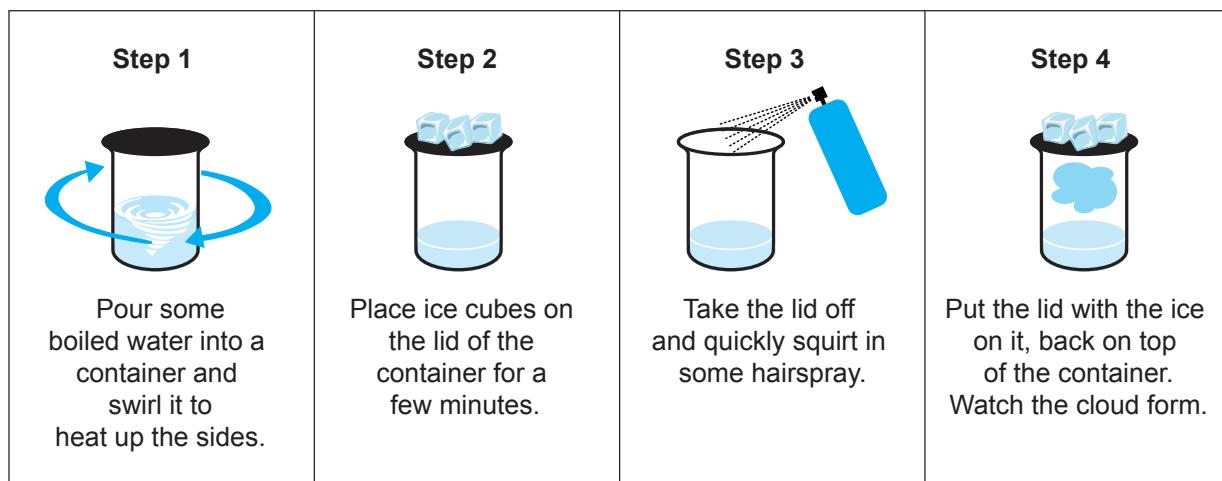
In which of the diagrams is it warmest at location X?

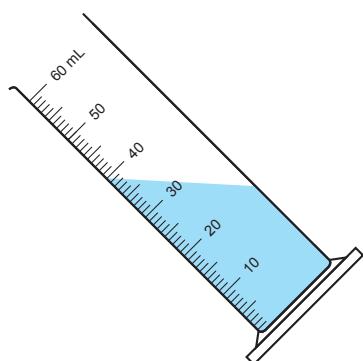


For questions 29 and 30 use the information below.

Warm air is less dense than cold air and tends to rise. When warm air containing water vapour rises and cools down, the water vapour condenses onto small particles floating in the air. Eventually a cloud forms.

Jo carried out this experiment to demonstrate the formation of a cloud.





How much water (mL) is in the measuring cylinder?

- (A) 20
 - (B) 30
 - (C) 35
 - (D) 40

32. One serving of food is the amount of a type of food that an average person would normally eat in one meal. By measuring food in servings, it is possible to compare the nutrients and energy content (kJ) in foods.

The table outlines the energy content in one serving of some different foods.

Food	Serving size	Energy (kJ)
Soft drink	200 mL	21
Popcorn	1 large cup	65
Pepperoni pizza	1 slice	120
Cheeseburger	1 burger	80

According to the table, which of these has the greatest energy content?

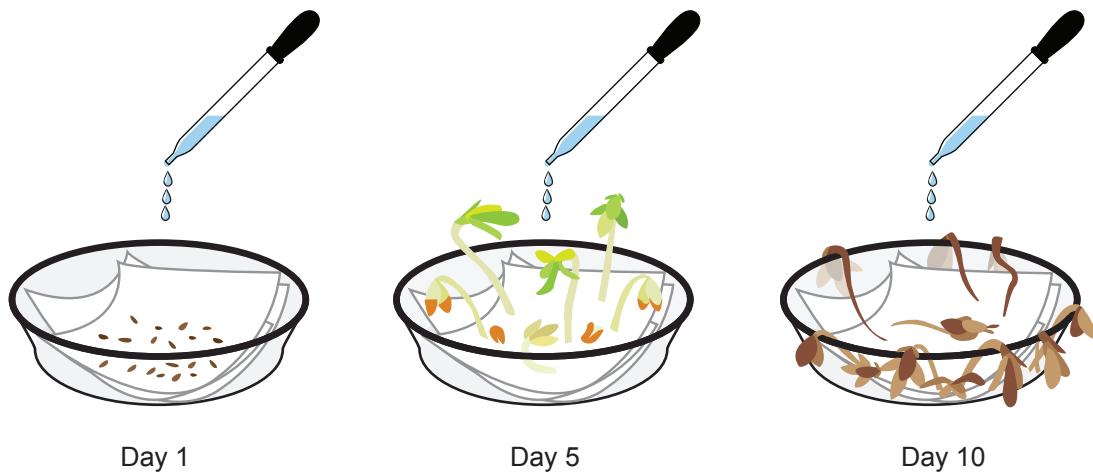
- (A) 600 mL soft drink
(B) 1 slice of pepperoni pizza
(C) 2 large cups of popcorn
(D) 2 cheeseburgers

For questions 33 and 34 use the information below.

Plants need light, water and nutrients to grow. Plants normally get their nutrients from the soil.

Ben wanted to investigate what is needed to sprout and grow cress seeds. He put some cress seeds on paper towels in a bowl near the window. For ten days he added a small amount of water each day to keep the paper towel wet.

Ben summarised his observations in these three drawings:



33. What conclusion could Ben draw?

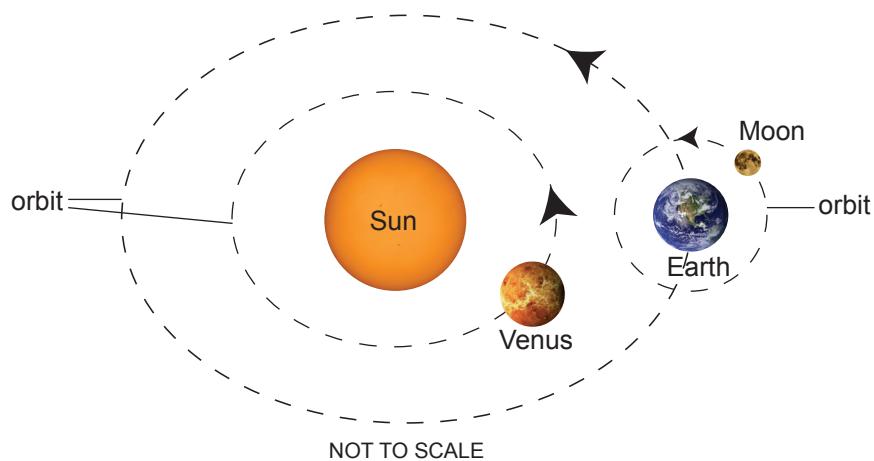
- (A) Cress can only live for 5 to 10 days.
(B) Cress seeds need water to sprout but do not need water to grow.
(C) Cress seeds need more than just water to keep alive.
(D) Cress seeds use water and the nutrients in the paper towels to grow.

34. What does Ben need to do to find out whether light affects the sprouting?

- (A) Repeat exactly what he did in the first investigation.
(B) Repeat the investigation with the bowl in a cupboard.
(C) Repeat the investigation with the bowl in a cupboard with no water to be added.
(D) Repeat the investigation with the bowl placed outside the window.

35. A satellite is any object that moves around a larger object in space. The path that a satellite follows, as it moves around the larger object, is called its orbit.

The diagram shows the movement of Venus, Earth and the Moon in relation to the Sun.

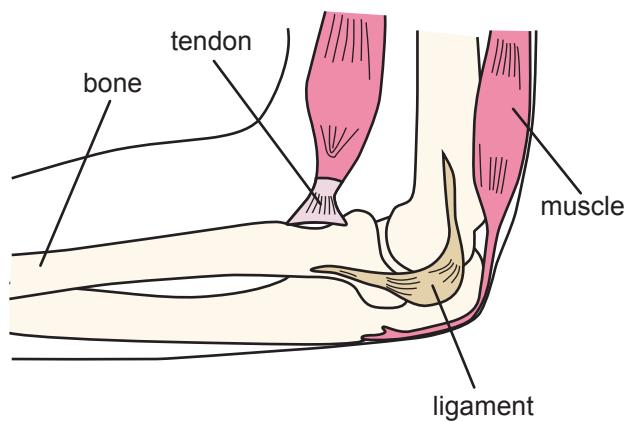


Which statement is correct?

- (A) Earth is in orbit around the Moon and Venus is a satellite of the Sun.
- (B) The Moon is in orbit around Earth and Earth is a satellite of Venus.
- (C) Earth is a satellite of the Moon and the Moon is in orbit around Venus.
- (D) The Moon is a satellite of Earth and Venus is in orbit around the Sun.

36. Our skeleton consists of bones that give our body shape and allow us to move. The bones are moved by muscles. Tendons and ligaments are connective tissues.

The diagram represents an elbow joint.



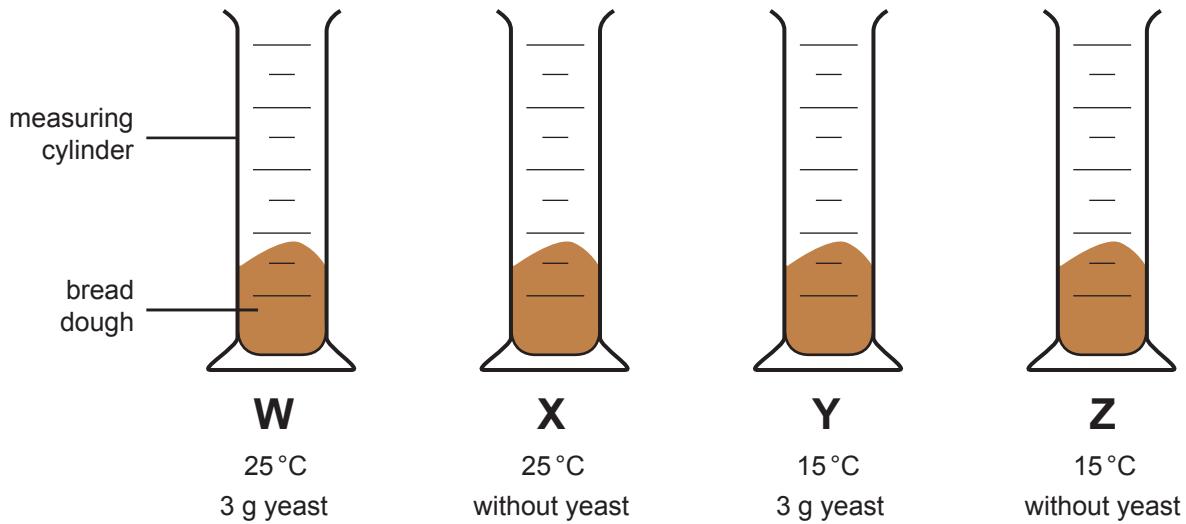
Which of these identifies what ligaments and tendons connect?

Ligaments connect	Tendons connect
(A) bone and muscle.	bone and bone.
(B) bone and bone.	bone and muscle.
(C) muscle and muscle.	bone and bone.
(D) bone and bone.	muscle and muscle.

For questions 37 and 38 use the information below.

Michelle read that bread dough needs yeast and warmth to rise.

She set up an experiment to investigate this, as shown.



She left each measuring cylinder for 24 hours and recorded how high each piece of dough rose.

37. To find out the effect of the presence of yeast on how much the dough rises, which two cylinders can Michelle compare?

- (A) W and X
- (B) X and Y
- (C) W and Y
- (D) W and Z

38. Michelle read that the more yeast added, the higher the dough will rise; the higher the temperature, the higher the dough will rise.

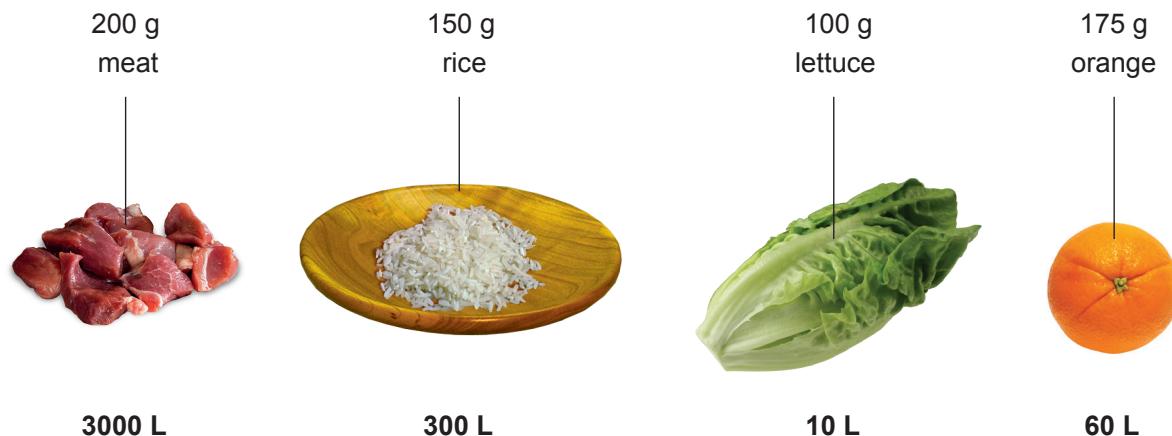
Michelle then set up another cylinder, V, with the same amount of dough and 6 g of yeast added. She kept it at 20 °C for 24 hours, and recorded the height of the dough.

Which statement MUST be true based on what Michelle read?

- (A) The dough in V will rise the highest among all cylinders.
- (B) The dough in W and V will rise the same amount
- (C) The dough in X will rise higher than that in V.
- (D) The dough in V will rise higher than that in Y.

39. Water is needed to produce food.

The diagram shows how much water is needed in producing various amounts of different types of food.

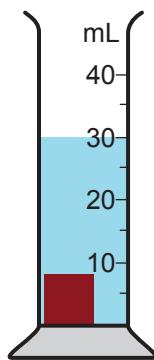


Which statement is supported by the information in the diagram?

- (A) There is less water in an orange than there is in rice.
- (B) It takes less water to grow lettuce than to grow the same mass of rice.
- (C) It takes more water to produce meat because the animals eat lots of plants.
- (D) The more water it takes to produce an amount of food, the heavier this amount of food will be.

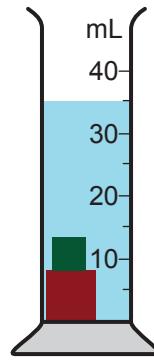
40. The volume of an object is equal to the volume of water it displaces when the object is fully underwater.

Frank placed a block in a measuring cylinder that contained some water, as shown.



He then added another, smaller block.

The volume of the larger block is twice the volume of the smaller one.



How much water is in the measuring cylinder?

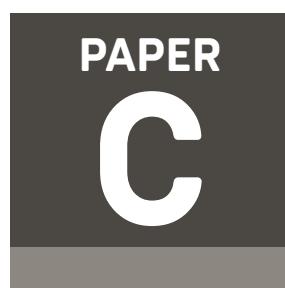
- (A) 10 mL
- (B) 20 mL
- (C) 25 mL
- (D) 30 mL

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Australia	Year 5
Brunei	Primary 5
Egypt	Year 5
Hong Kong	Primary 5
Indian Subcontinent ¹	Class 5
Indonesia	Year 6
Malaysia	Standard 5
Middle East ²	Class 5
New Zealand/Pacific ³	Year 6
Singapore	Primary 4
Southern Africa ⁴	Grade 5



1 Indian Subcontinent Region: India, Sri Lanka, Nepal, Bhutan and Bangladesh.

2 Middle East Region: United Arab Emirates, Qatar, Kuwait, Saudi Arabia, Bahrain, Oman, Turkey, Lebanon, Tunisia, Morocco, Libya, Algeria, Jordan and Pakistan.

3 Pacific Region: Vanuatu, Papua New Guinea and Fiji.

4 Southern Africa Region: South Africa, Botswana, Lesotho, Swaziland, Zimbabwe and Namibia.

2017 SCIENCE ANSWER KEYS



S

QUESTION NUMBER	PAPER A	PAPER B	PAPER C	PAPER D	PAPER E	PAPER F	PAPER G	PAPER H	PAPERS I&J
1	A	B	C	C	A	C	A	C	C
2	B	C	B	D	D	B	C	D	B
3	A	C	D	A	B	C	B	B	A
4	B	B	C	C	D	C	C	C	B
5	C	C	A	D	D	A	C	A	A
6	C	D	A	B	B	A	B	B	D
7	A	D	B	A	A	C	C	D	B
8	C	A	A	C	B	C	A	D	A
9	D	B	C	D	A	D	B	B	D
10	C	A	C	A	C	B	A	B	C
11	C	D	A	D	A	B	A	C	C
12	A	A	B	D	D	D	B	B	A
13	B	B	C	A	B	A	B	A	D
14	D	C	C	B	D	A	D	C	A
15	D	D	D	B	B	B	A	A	C
16	C	D	A	C	C	D	C	D	D
17	B	A	B	B	C	A	C	C	A
18	D	D	D	C	D	C	A	B	C
19	D	A	D	D	A	C	B	C	B
20	A	B	B	A	B	C	D	A	D
21	C	A	C	C	D	B	C	D	C
22	B	C	A	B	B	C	C	B	D
23	D	B	D	D	C	D	B	D	D
24	A	A	C	B	D	D	A	C	B
25	B	C	D	D	D	B	D	D	A



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QUESTION NUMBER	PAPER A	PAPER B	PAPER C	PAPER D	PAPER E	PAPER F	PAPER G	PAPER H	PAPERS I & J
26	C	D	A	C	A	C	D	A	A
27	B	C	A	C	C	D	C	D	D
28	D	B	D	A	B	A	D	D	B
29	B	B	C	D	A	C	D	C	B
30	A	D	D	B	D	B	A	A	C
31			B	B	C	A	D	B	D
32			D	A	B	D	C	A	A
33			C	C	A	D	A	B	C
34			B	D	C	A	D	D	D
35			D	A	A	D	B	D	C
36			B	A	B	B	A	C	C
37			A	B	D	D	D	A	A
38			D	A	C	D	B	C	B
39			B	B	D	C	A	B	D
40			B	D	A	B	B	A	B
41					D	B	C	B	D
42					C	A	D	B	C
43					B	C	B	C	B
44					C	B	A	C	A
45					C	A	B	B	B

