



UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
International General Certificate of Secondary Education

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BIOLOGY

0610/12

Paper 1 Multiple Choice

October/November 2009

45 minutes

Additional Materials: Multiple Choice Answer Sheet
Soft clean eraser
Soft pencil (type B or HB is recommended)

READ THESE INSTRUCTIONS FIRST

Write in soft pencil.

Do not use staples, paper clips, highlighters, glue or correction fluid.

Write your name, Centre number and candidate number on the Answer Sheet in the spaces provided unless this has been done for you.

There are **forty** questions on this paper. Answer **all** questions. For each question there are four possible answers **A, B, C** and **D**.

Choose the **one** you consider correct and record your choice in **soft pencil** on the separate Answer Sheet.

Read the instructions on the Answer Sheet very carefully.

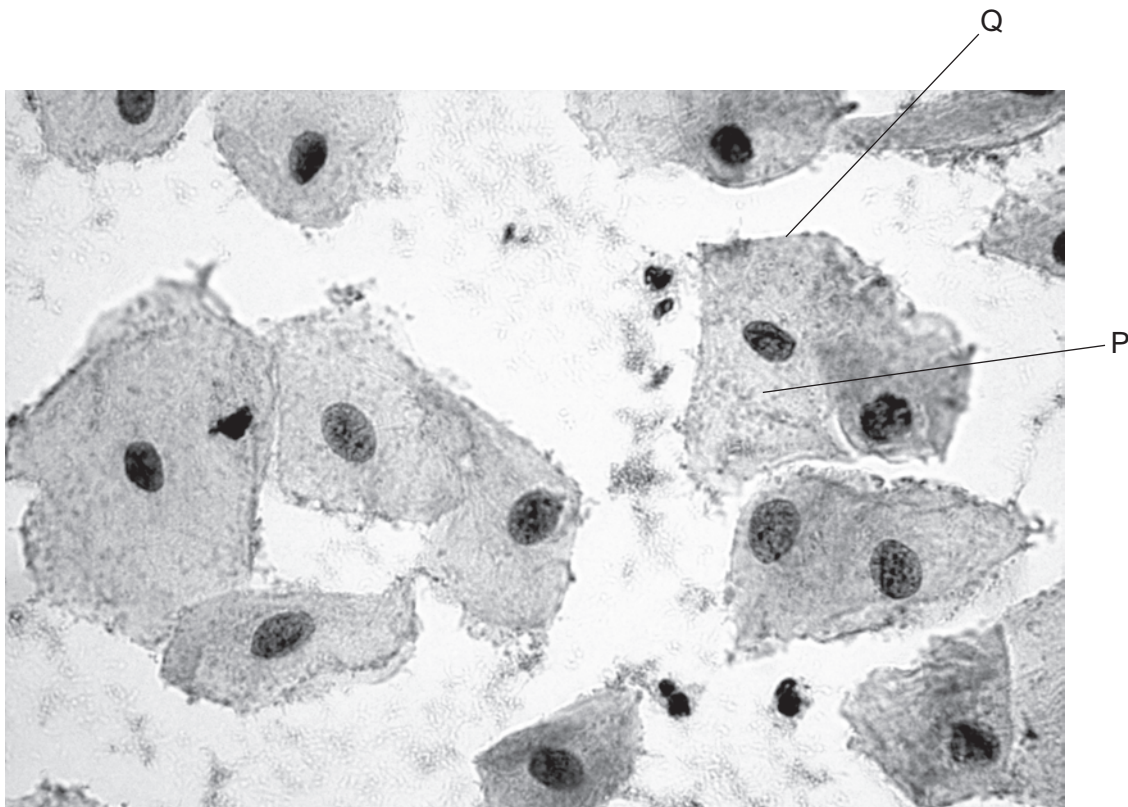
Each correct answer will score one mark. A mark will not be deducted for a wrong answer.

Any rough working should be done in this booklet.

This document consists of **17** printed pages and 3 blank pages.



1 The photograph shows some human cells under the microscope.



What are structures P and Q?

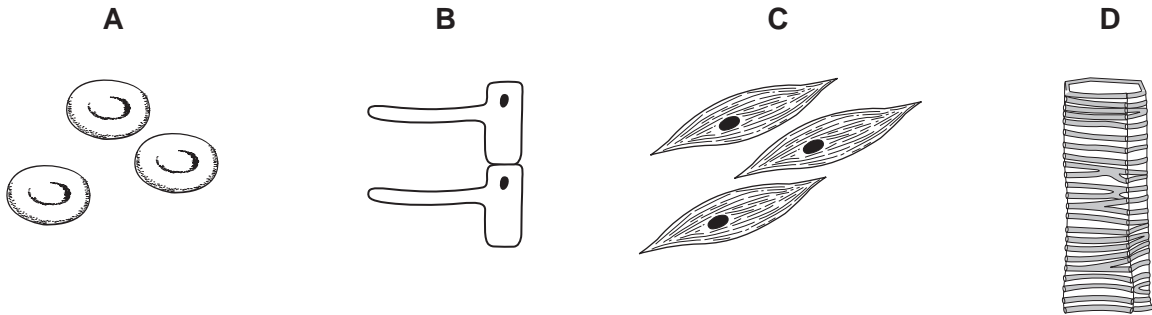
	P	Q
A	cytoplasm	cell membrane
B	cytoplasm	cell wall
C	nucleus	cell membrane
D	nucleus	cell wall

2 Which cell moves dust particles out of the body?

- A** ciliated
- B** muscle
- C** red blood
- D** xylem

- 3 The diagrams show four types of tissues found in living organisms.

Which tissue is involved in contraction?

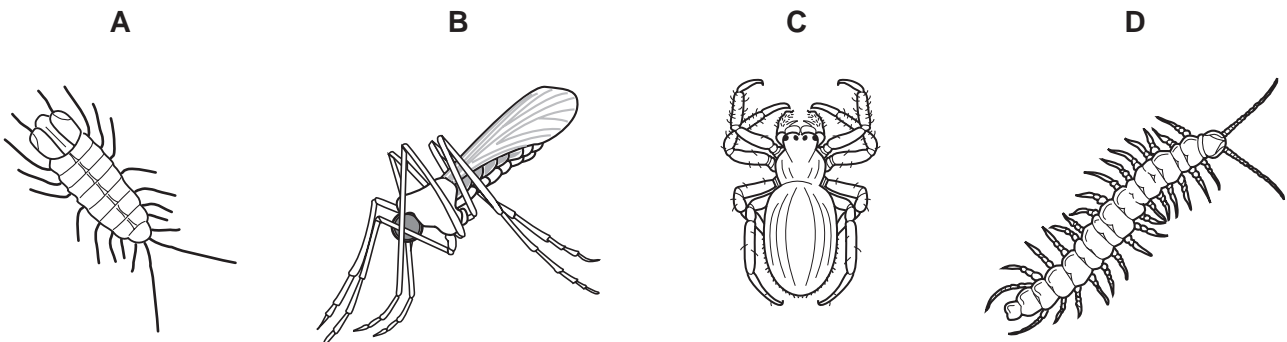


- 4 Which process produces heat to maintain a person's body temperature?

- A excretion
- B nutrition
- C reproduction
- D respiration

- 5 The diagram shows four arthropods.

Which arthropod is an insect?



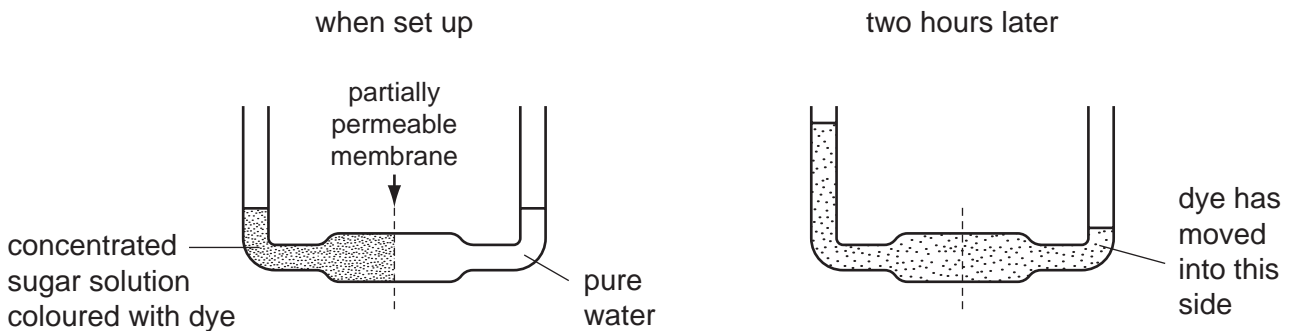
- 6 Which shows an organism that has been named using the binomial system?

- A *Bacterium*
- B *Flowering plant*
- C *HIV*
- D *Homo sapiens*

7 What increases the rate of diffusion of oxygen into red blood cells in the lungs?

- A Air leaving the lungs is saturated with water vapour.
- B Air leaving the lungs still contains 16 % oxygen.
- C Blood arriving in the lungs is saturated with oxygen.
- D Blood is taken away from the lungs as it circulates.

8 The diagrams show an experiment when set up and the same experiment two hours later.

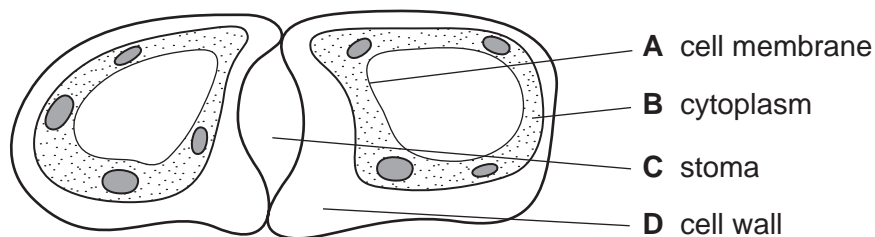


What explains the movement of water and dye?

	movement of water	movement of dye
A	diffusion	osmosis
B	osmosis	diffusion
C	osmosis	translocation
D	translocation	diffusion

9 The diagram shows a student's drawing of guard cells.

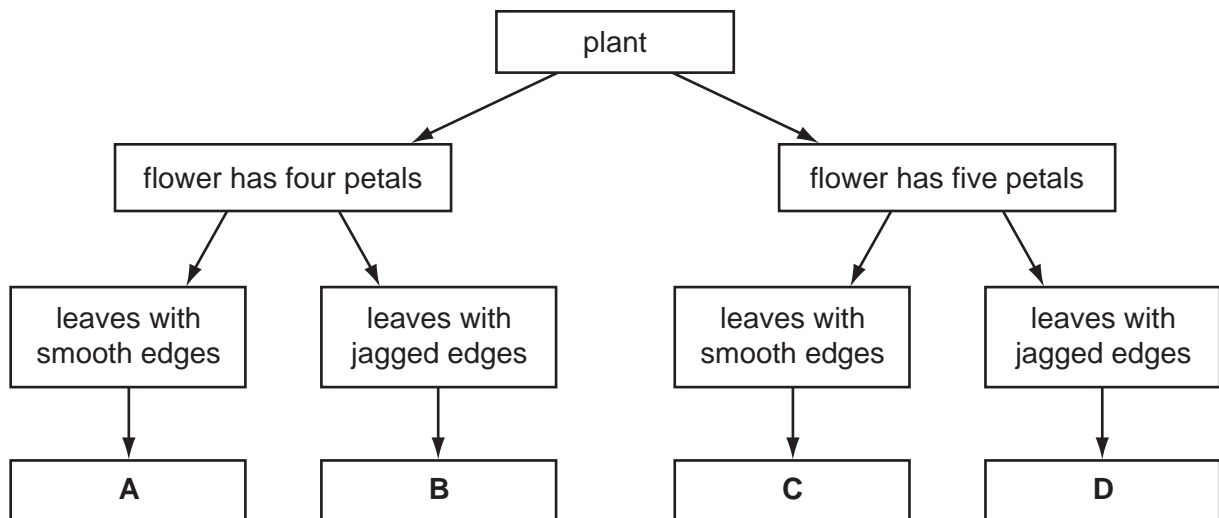
Which labelling line is **not** correct?



10 The diagram shows a flowering plant.



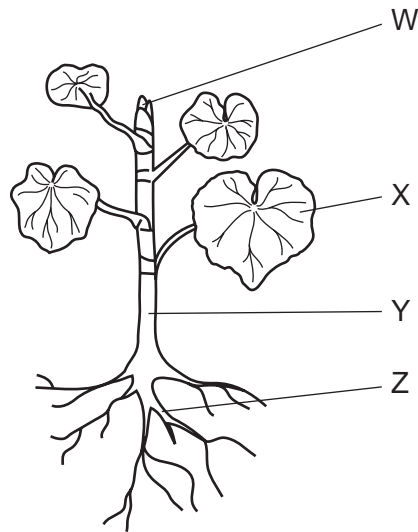
Use the key to identify the plant.



11 Which substances do root hairs take from the soil?

- A water and carbon dioxide
- B water and mineral ions
- C carbon dioxide and oxygen and mineral ions
- D carbon dioxide and oxygen and water

12 The diagram shows a plant.

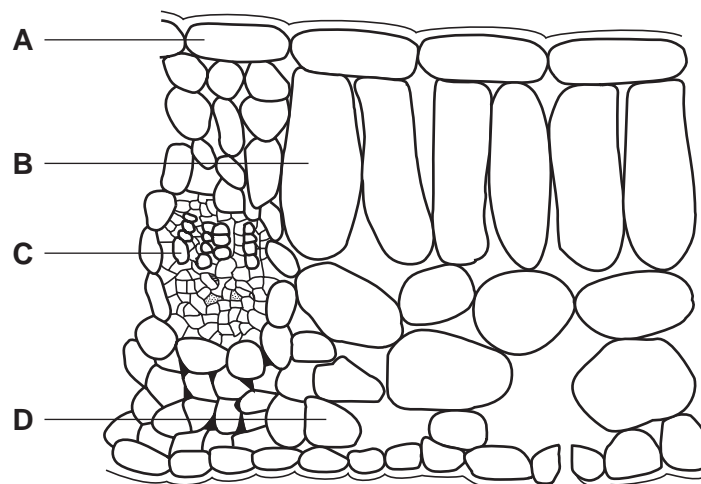


What is the pathway taken by most of the water absorbed by this plant?

- A $X \rightarrow Y \rightarrow Z$
- B $W \rightarrow Y \rightarrow Z$
- C $Z \rightarrow Y \rightarrow X$
- D $Z \rightarrow Y \rightarrow W$

13 The diagram shows a section through a leaf.

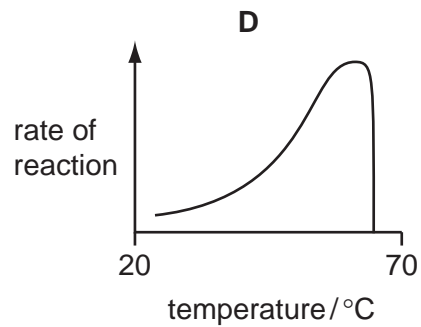
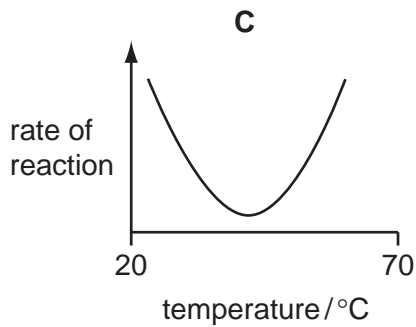
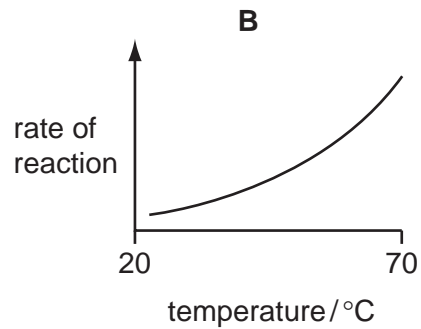
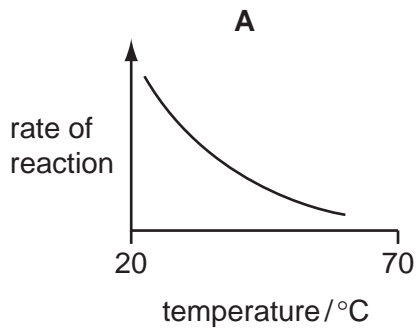
Which cell type absorbs the most carbon dioxide during the day?



14 Which element is found in a molecule of chlorophyll?

- A calcium
- B iron
- C lead
- D magnesium

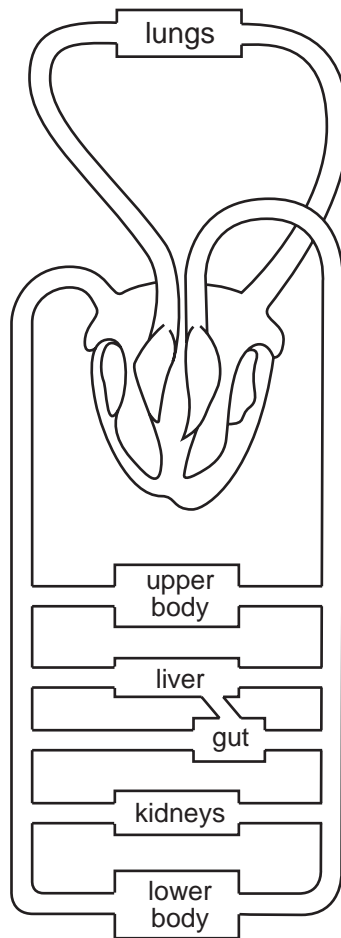
15 Which graph shows the effect of temperature on the activity of a human digestive enzyme?



16 What describes the aortic (semi-lunar) and bicuspid (mitral) heart valves when the left ventricle is relaxing?

	aortic valve	bicuspid valve
A	closed	closed
B	closed	open
C	open	closed
D	open	open

17 The diagram shows the blood circulatory system of a human.

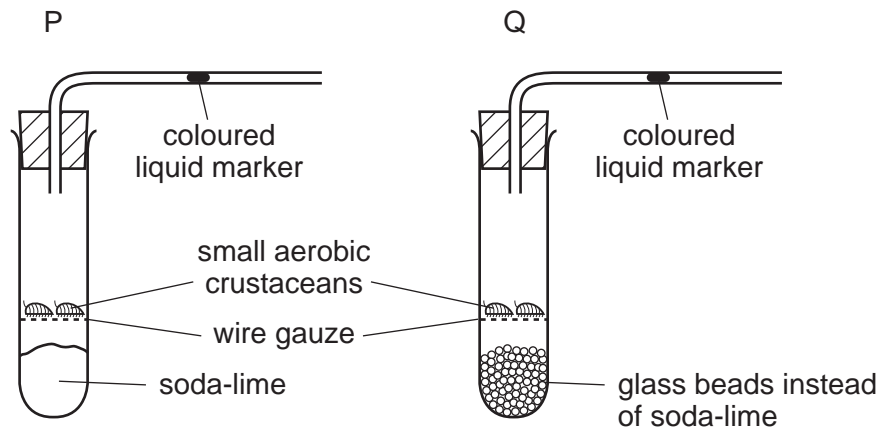


How many times does the blood pass through the heart on its way from the kidneys to the aorta?

- A** one
- B** two
- C** four
- D** more than four

18 The diagram shows two experiments on the gaseous exchange in small aerobic crustaceans.

Soda-lime absorbs carbon dioxide.



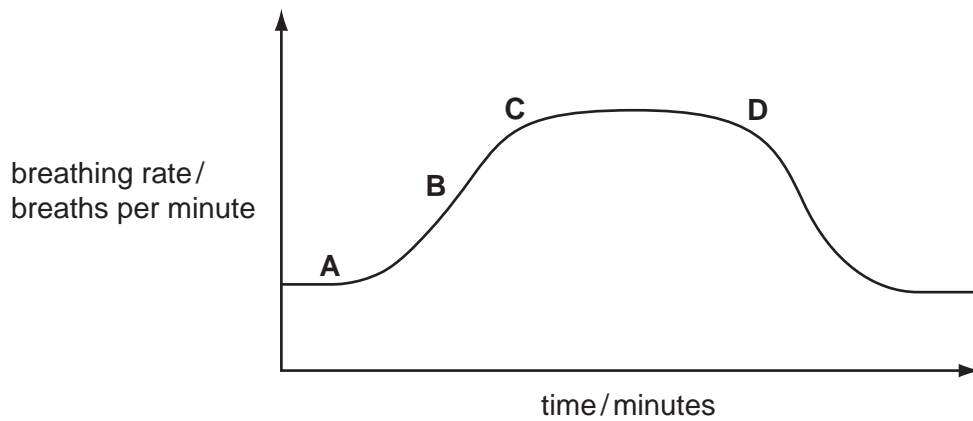
Which way does the liquid marker move?

	P	Q
A	left	right
B	left	stays still
C	right	left
D	right	stays still

19 Which word equation represents anaerobic respiration in human muscle?

- A** glucose \rightarrow carbon dioxide + ethanol (alcohol)
- B** glucose \rightarrow carbon dioxide + lactic acid
- C** glucose \rightarrow ethanol (alcohol)
- D** glucose \rightarrow lactic acid

20 From the graph, when did the person begin a period of vigorous exercise after resting?



21 After a meal, the concentration of blood glucose increases.

What then causes the concentration of blood glucose to return to normal?

- A adrenalin
- B blood cells
- C insulin
- D platelets

22 A bright light suddenly shines into a person's eyes.

What happens?

- A The lenses become more concave.
- B The lenses become more convex.
- C The pupils become larger.
- D The pupils become smaller.

23 In which organ is alcohol broken down?

- A brain
- B kidney
- C liver
- D stomach

- 24** Blood passes through the kidney and some substances leave the blood as filtered liquid. From this liquid certain substances are reabsorbed back into the blood.

The table shows the percentage of four substances in the blood plasma, the filtered liquid and urine.

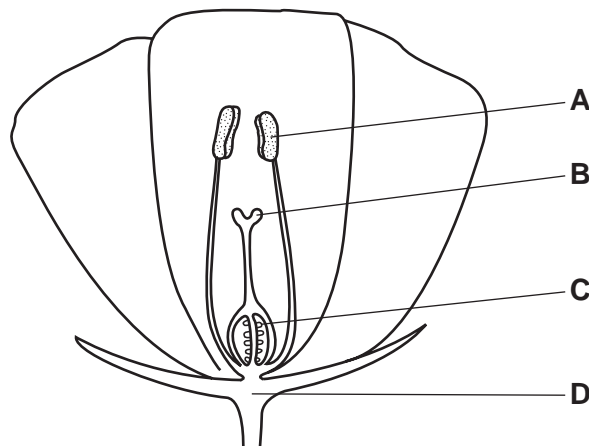
substance	percentage of substance		
	in the blood plasma	in the filtered liquid	in the urine
glucose	0.10	0.10	0.00
protein	9.00	0.00	0.00
urea	0.03	0.03	2.00
water	90.0	99.0	97.0

Which substances are reabsorbed from the filtered liquid?

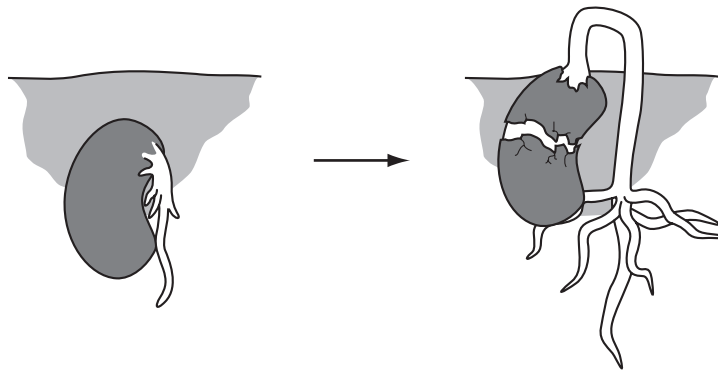
- A** glucose and water
- B** protein and glucose
- C** urea and protein
- D** water and urea

- 25** The diagram shows a flower in section.

Where will fertilisation occur?



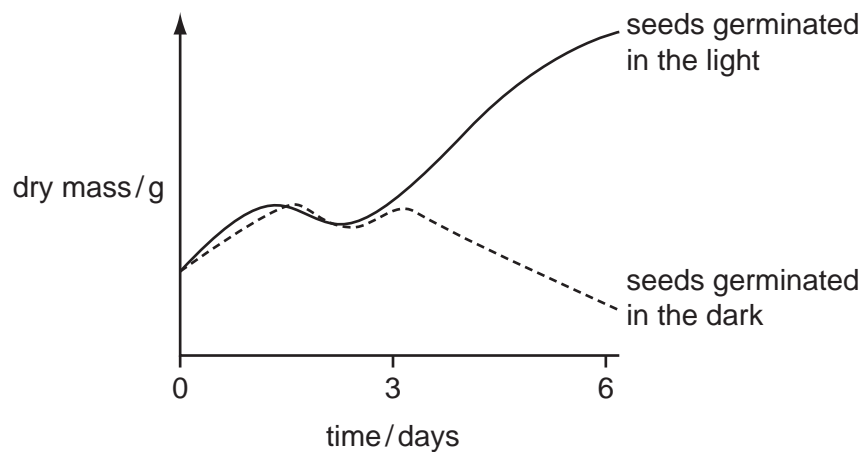
- 26 The diagram shows a bean seed when planted and the same seed two days later.



Which conditions are necessary for these changes to occur?

	suitable temperature	presence of water	presence of carbon dioxide	presence of oxygen
A	✓	✓	✓	✗
B	✓	✓	✗	✓
C	✓	✗	✓	✓
D	✗	✓	✓	✓

- 27 The graph shows the changes in the dry masses of two similar samples of seeds from the start of germination.



What causes the change in dry mass after day 3 of the seeds germinated in the light?

- A** All the stored food has been used up.
- B** A lot of water has been absorbed.
- C** Photosynthesis has begun.
- D** The respiration rate has increased.

28 How does the rhythm method of family planning work?

- A** A physical barrier stops sperms reaching the egg.
- B** Implantation is prevented.
- C** Intercourse is avoided near the time of ovulation.
- D** Ovulation is prevented.

29 In cats, the allele for short hair is dominant to the allele for long hair.

A short-haired cat and a long-haired cat had several families of offspring (kittens). All their kittens were short-haired.

One of these kittens matured and mated with a long-haired cat.

What would be the expected phenotypes of their offspring?

- A** 1 : 1 short to long
- B** 3 : 1 short to long
- C** all long-haired
- D** all short-haired

30 A man who was blood group A and a woman who was blood group B had four children, each with a different blood group A, B, AB and O.

Which type of variation does this demonstrate?

- A** continuous, environmental and genetic
- B** continuous and genetic only
- C** discontinuous, environmental and genetic
- D** discontinuous and genetic only

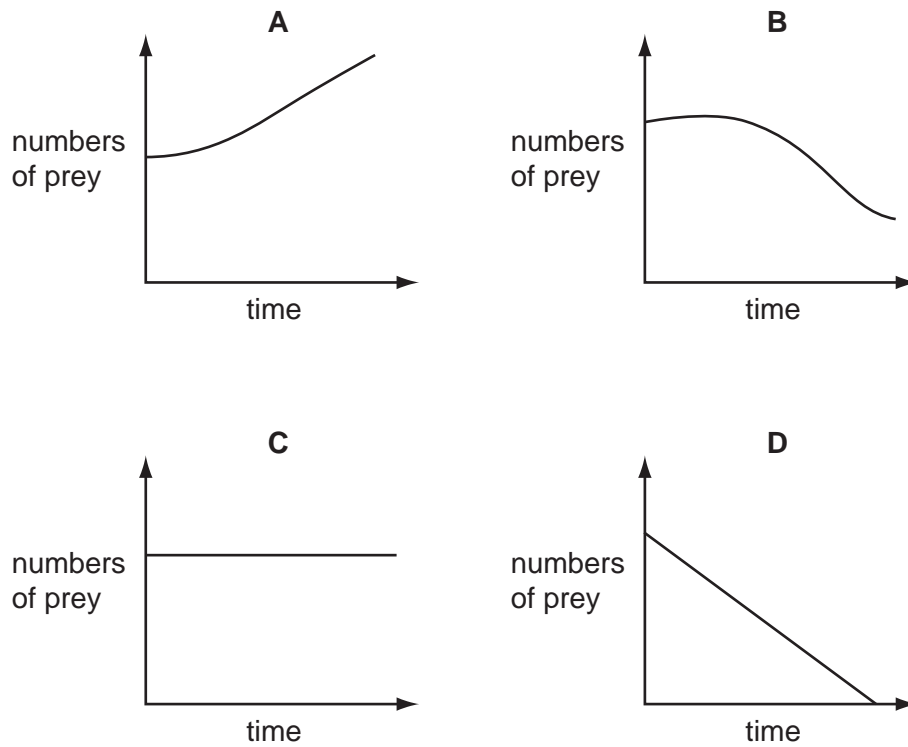
31 Albinism is an inherited condition in which pigment does not develop in the skin, hair and eyes.

The albino allele is recessive.

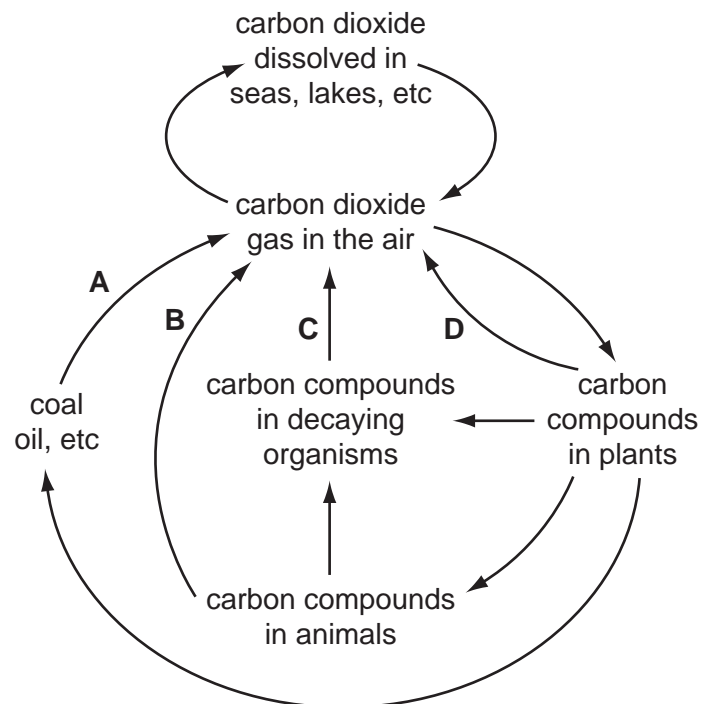
What are the chances of albino parents having a normal child?

- A** 0 %
- B** 50 %
- C** 75 %
- D** 100 %

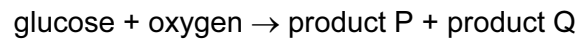
32 Which graph shows the effect on the numbers of prey when their predators are removed?



33 Which arrow represents carbon dioxide from plant respiration?

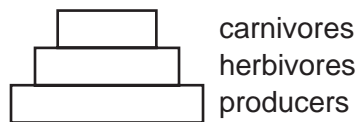


- 34 The equation shows the breakdown of glucose during aerobic respiration.

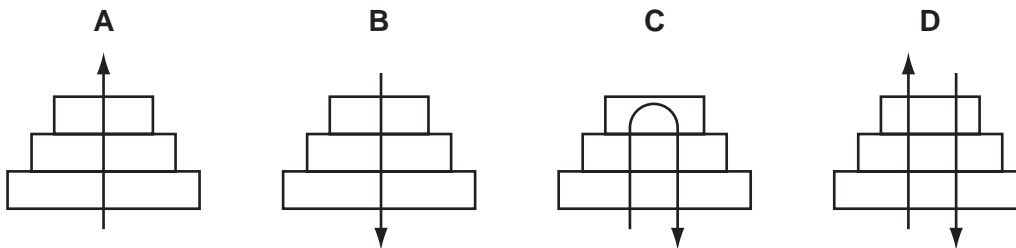


This process is a part of

- A the carbon cycle only.
 - B the energy cycle only.
 - C the carbon and water cycles.
 - D the water cycle only.
- 35 The diagram represents a pyramid of biomass within an ecosystem.



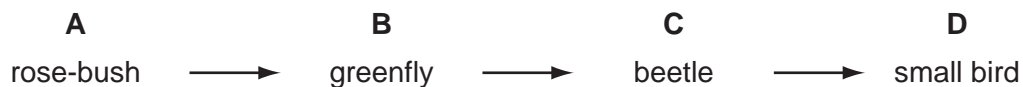
What shows the direction of energy flow through the pyramid?



- 36 The diagram shows a food chain.

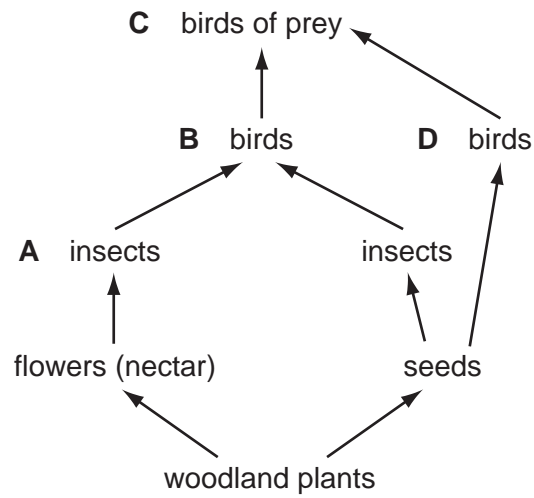
A person sprays the rose-bush with pesticide.

Which organism does the person want to kill?



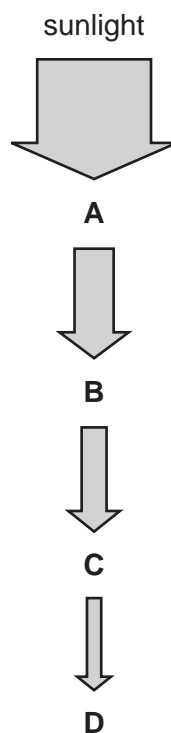
37 The diagram shows some food relationships in a woodland area.

Which of the labelled animals are in competition with seed-eating insects for their food?

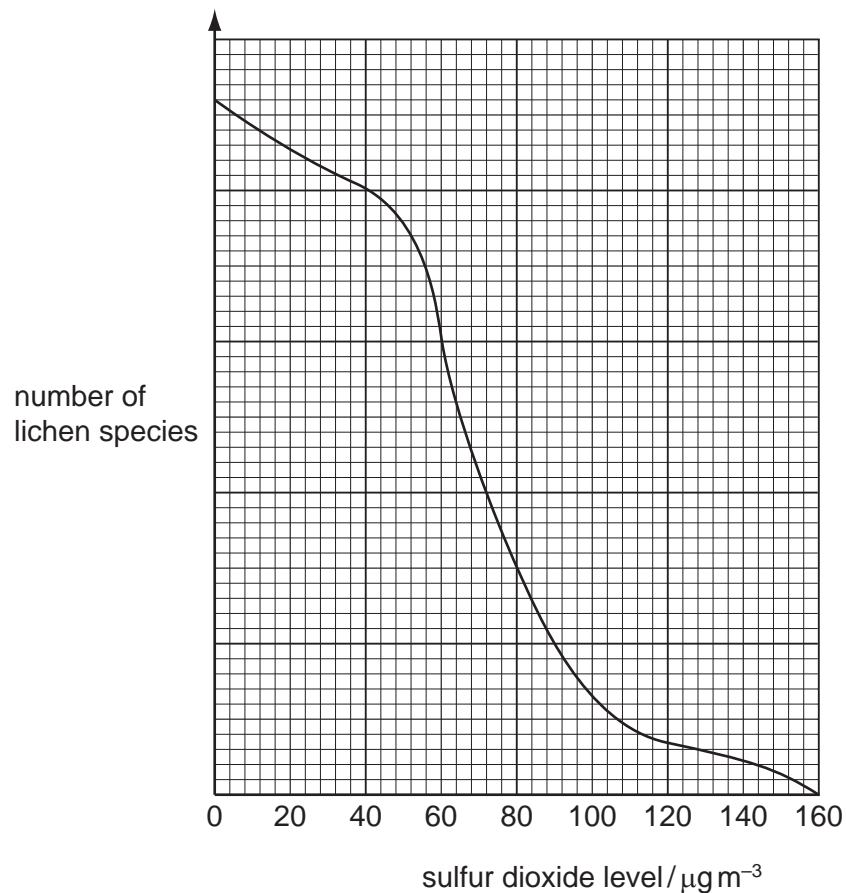


38 The diagram shows the flow of energy through four organisms in a food chain.

Which organism is a producer?



- 39 The graph shows the relationship between sulfur dioxide pollution and the number of lichen species found on trees.



From the graph, which statement is correct?

- A** As sulfur dioxide levels increase the number of lichen species decreases.
 - B** Lichens cannot survive if any sulfur dioxide is present.
 - C** Lichens are not affected by sulfur dioxide pollution.
 - D** As sulfur dioxide levels increase so do numbers of lichen species.
- 40 The levels of carbon dioxide in the Earth's atmosphere have increased during the last one hundred years.

What is the **most** likely cause of this?

- A** cutting down large areas of forest
- B** increased production of crops
- C** over-use of inorganic fertilisers
- D** widespread use of pesticides

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