CAMBRIDGE
International Education

Cambridge O Level

BIOLOGY **5090/12**

Paper 1 Multiple Choice **May/June 2026**

1 hour

You must answer on the multiple choice answer sheet.

You will need: Multiple choice answer sheet
Soft clean eraser
Soft pencil (type B or HB is recommended)

2472128205

INSTRUCTIONS

- 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 multiple choice answer sheet.
- Follow the instructions on the multiple choice answer sheet.
- Write in soft pencil.
- Write your name, centre number and candidate number on the multiple choice answer sheet in the spaces provided unless this has been done for you.
- Do **not** use correction fluid or tape.
- Do **not** write on any bar codes.
- You may use a calculator.

INFORMATION

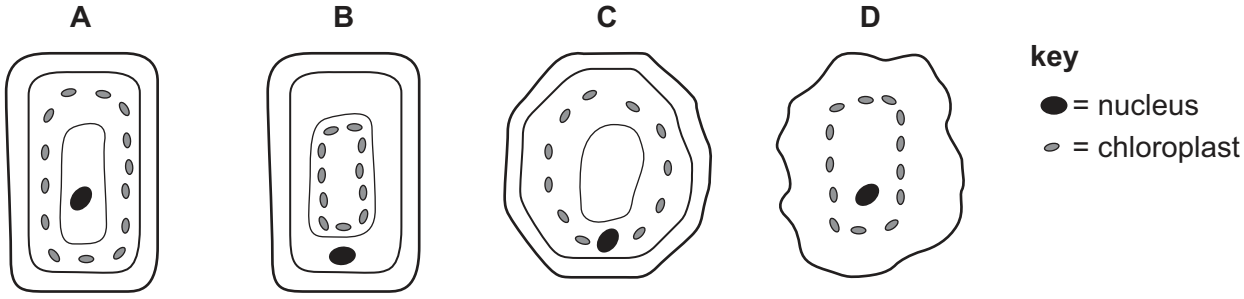
- The total mark for this paper is 40.
- Each correct answer will score one mark.
- Any rough working should be done on this question paper.

This document has **20** pages. Any blank pages are indicated.

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1 Which diagram shows the positions of the chloroplasts and the nucleus in a cell?



2 What is the formula used to calculate the actual size of an object from an image of that object?

A actual size = magnification × image size

B actual size = magnification + image size

C $\text{actual size} = \frac{\text{magnification}}{\text{image size}}$

D $\text{actual size} = \frac{\text{image size}}{\text{magnification}}$

3 Which statement about diffusion is correct?

A Diffusion always involves the movement of water molecules.

B Diffusion depends on the presence of a partially permeable membrane.

C Diffusion only happens to molecules in a solution.

D Diffusion always involves molecules moving down a concentration gradient.

4 Which change in conditions will increase the rate of diffusion through a membrane?

A decreasing temperature

B decreasing thickness of membrane (diffusion distance)

C decreasing surface area

D decreasing concentration gradient

5 Which statements about osmosis are correct?

1 Glucose molecules can move by osmosis.

2 Water molecules pass through a partially permeable membrane.

3 Molecules move down a water potential gradient.

A 1, 2 and 3 **B** 1 and 2 only **C** 1 and 3 only **D** 2 and 3 only

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6 Benedict's solution can be used to find out how much glucose a substance contains.

The table shows the colour of Benedict's solution when heated with substances containing different concentrations of glucose.

colour of Benedict's solution	glucose content / %
blue	0
green	0.5–1.0
yellow	1.1–1.5
orange	1.6–2.0
red	>2.0

Four different substances, **A**, **B**, **C** and **D**, are tested with Benedict's solution.

Which substance has a 1.3% glucose content?

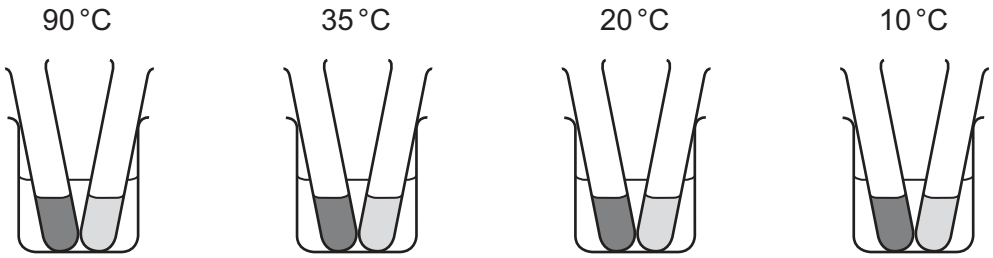
	colour of Benedict's solution
A	yellow
B	blue
C	orange
D	green

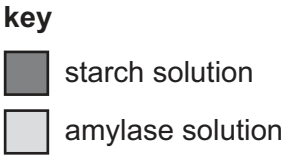
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7 The diagram shows an experiment on amylase.

Each beaker contains water maintained at the temperature shown.





Each test-tube of amylase is poured into the test-tube of starch solution in the same beaker, and then samples of each mixture are tested with iodine solution.

Samples of the mixture are then tested with iodine solution again at five minute intervals.

Which results will be obtained?

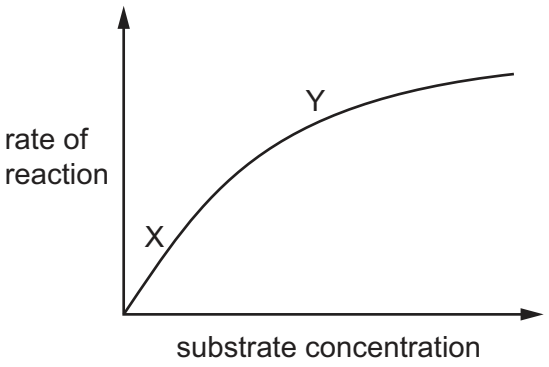
	90 °C	**35 °C**	**20 °C**	**10 °C**
A	blue-black after 30 minutes	goes yellow-brown immediately	goes yellow-brown after five minutes	blue-black after 30 minutes
B	blue-black after 30 minutes	goes yellow-brown after five minutes	goes yellow-brown immediately	blue-black after 30 minutes
C	goes yellow-brown immediately	goes yellow-brown after five minutes	goes yellow-brown after five minutes	blue-black after 30 minutes
D	goes yellow-brown after five minutes	blue-black after 30 minutes	blue-black after 30 minutes	goes yellow-brown after five minutes

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8 The graph shows the effect of substrate concentration on the rate of an enzyme-controlled reaction.

The results were obtained using a constant enzyme concentration, a temperature of 30 °C and a pH of 7.0.



Which statement explains the shape of the graph from X to Y?

A Denaturation of the enzyme molecules is increasing.

B The enzyme active sites are **not** all occupied.

C The concentration of substrate molecules is decreasing.

D The frequency of effective collisions between enzyme active sites and substrate molecules is decreasing.

9 What do plants use cellulose for?

A making cell membranes

B making cell walls

C respiration

D storing energy

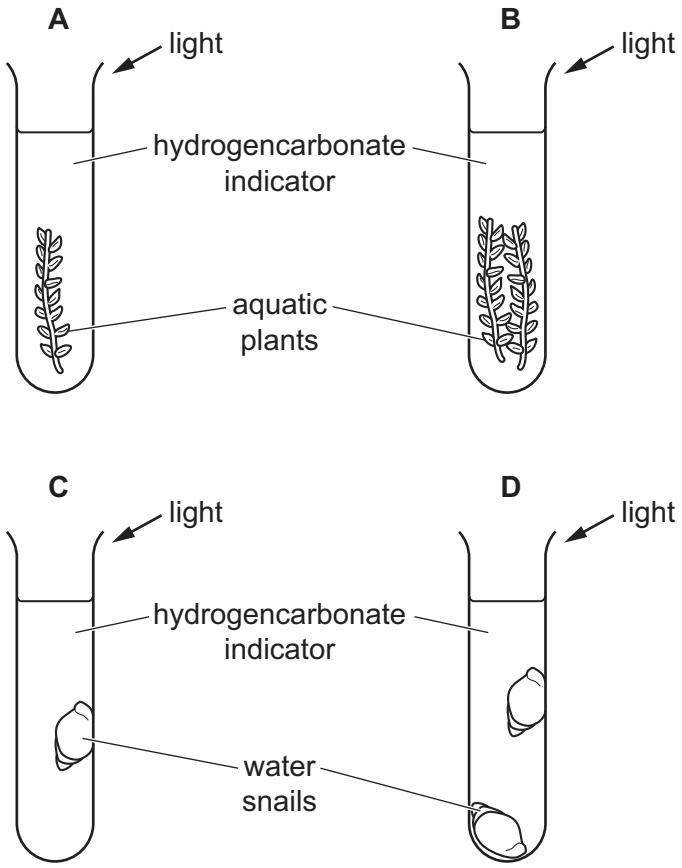
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10 Hydrogencarbonate indicator changes colour from red to purple as the concentration of carbon dioxide in the indicator is reduced.

The test-tubes in an experiment are set up at the same time in identical conditions.

In which test-tube does the indicator change colour to purple first?



11 Which parts of the digestive system produce protease enzymes?

A colon and liver

B liver and stomach

C pancreas and colon

D pancreas and stomach

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12 Which row shows the correct percentages of gases found in atmospheric air?

	oxygen / %	nitrogen / %	carbon dioxide / %
A	16	79	4
B	20	79	0.4
C	20	79	0.04
D	79	20	0.4

13 Which row describes the structures in the lungs?

	network of capillaries	total surface area of alveoli	width of walls of alveoli	width of capillary walls
A	large	large	thin	thin
B	large	small	thin	thick
C	small	large	thick	thin
D	small	small	thick	thick

14 A respirometer is used in experiments to measure the volume of oxygen used up.

The volumes of oxygen consumed are shown in the table.

respirometer	contents of respirometer	volume of oxygen used up in 30 minutes / cm^3
X	germinating pea seeds	2.4
Y	dead pea seeds	0.1
Z	glass beads	0.0

Why does respirometer X record the highest volume of oxygen used up?

A There are some microbes on the dead pea seeds.

B The pea seeds are carrying out photosynthesis.

C The pea seeds are respiring anaerobically.

D The pea seeds are respiring aerobically.

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15 A student writes a chemical equation for aerobic respiration.

$$2C_3H_6O_3 + 6O_2 \rightarrow 6CO_2 + 6H_2O$$

What is wrong with the equation?

A The equation is **not** balanced.

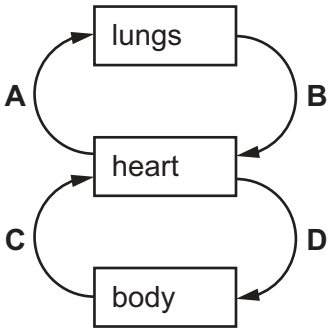
B The formula for glucose is **not** correct.

C There are too many oxygen molecules.

D Water is a reactant **not** a product.

16 The diagram shows the double circulatory system in a human.

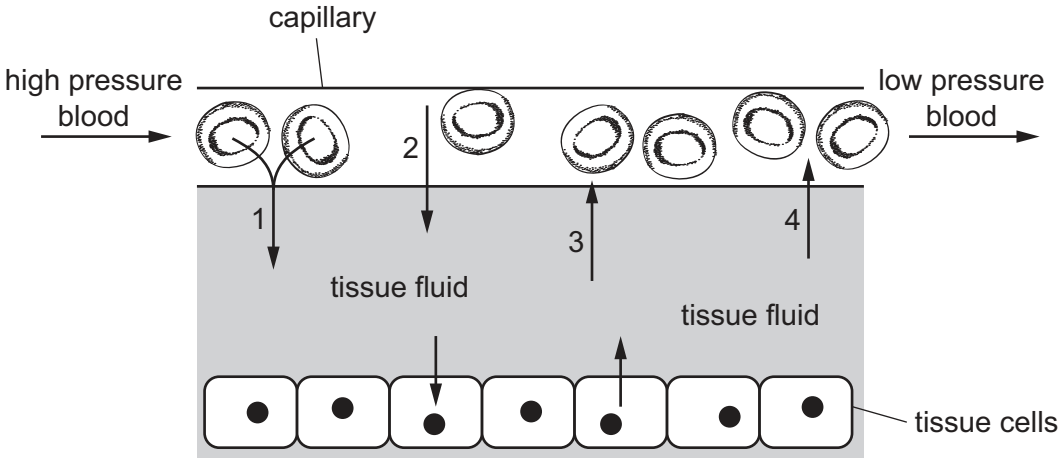
Which arrow shows the blood vessel with the highest pressure?



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17 The diagram shows the transfer of materials between blood in a capillary and tissue fluid.



Which row shows the correct labels for the arrows in the diagram?

	1	2	3	4
A	carbon dioxide	glucose	oxygen	water
B	glucose	water	oxygen	urea
C	oxygen	glucose	carbon dioxide	water
D	oxygen	water	carbon dioxide	glucose

18 When people donate blood they usually give 0.470 dm^3.

If 1 cm^3 of blood contains 5000 million red blood cells, how many red blood cells will be present in one donation?

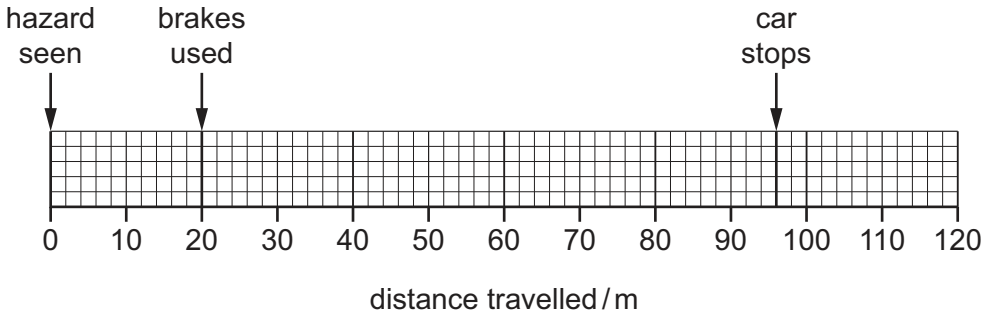
A 2.35×10^6 **B** 2.35×10^9 **C** 2.35×10^{10} **D** 2.35×10^{12}

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19 The chart gives information about a car being driven at 110 km / h by someone who has **not** consumed alcohol.

It shows how far the car travels from the time the driver sees a hazard and reacts by using the brakes and how far the car will then travel before finally stopping.



If the same driver consumes alcohol before driving, the distance travelled before reacting to the hazard increases by 20%.

What would then be the total distance travelled by the car before stopping?

A 96 m **B** 100 m **C** 111.2 m **D** 115.2 m

20 Scientists have observed that the number of cases of malaria in an area decreases when ponds and other pools of water are removed.

Which statement explains why this happens?

A Malaria is spread by polluted water in ponds and rivers.

B Malaria is spread by inhaling contaminated water droplets.

C The malarial pathogen lives and breeds in still water.

D The vector of malaria spends part of its life cycle in still water.

21 The following are effects of the abuse of certain drugs.

1 acts as a depressant

2 associated with emphysema

3 causes reduced self-control

4 increases reaction time

5 there is a risk of infection with HIV

What are effects of excessive alcohol consumption?

A 1, 2 and 3 **B** 1, 3 and 4 **C** 2, 3 and 4 **D** 3, 4 and 5

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22 Which statements about smoking tobacco are correct?

1 Smoking during pregnancy may lead to a baby with reduced birth weight.

2 Smoking may lead to obesity and scurvy.

3 Smoking may lead to the blockage of coronary arteries.

A 1, 2 and 3 **B** 1 and 2 only **C** 1 and 3 only **D** 2 and 3 only

23 Which disease can be treated using antibiotics?

A cholera

B AIDS

C malaria

D scurvy

24 The normal mass of urea excreted in urine in 24 hours by a man is between 12 and 20 g.

One man excretes only 7 g of urea in his urine over a 24-hour period.

What could **not** be the reason for this low mass of urea?

A The man had low levels of protein in his diet.

B The man's kidneys were functioning incorrectly.

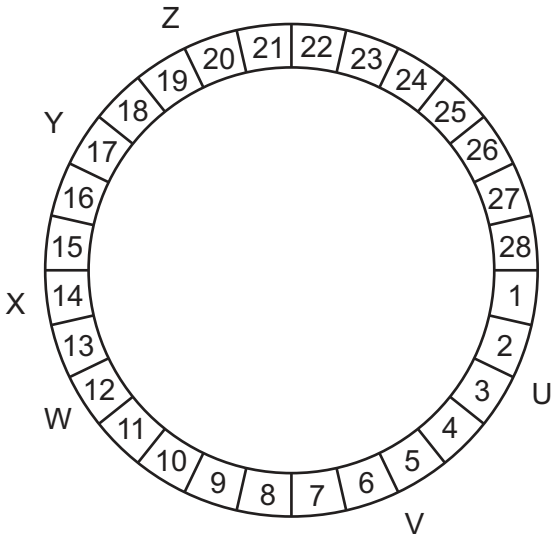
C The man had low levels of salts in his diet.

D The man's liver was functioning incorrectly.

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25 The diagram shows the 28-days of a typical menstrual cycle. The letters around the outside indicate different points in the cycle.



Which row shows the points in the cycle?

	stage of cycle		
	maximum thickness of uterus lining	**menstruation**	**ovulation**
A	Z	W	X
B	X	U	Y
C	Z	U	X
D	V	X	Z

26 Which statement about plant growth responses is correct?

A A root of a plant that grows downwards into the soil is an example of positive phototropism.

B When a shoot of a plant is growing with light from one side, auxin will be equally distributed throughout the shoot.

C Auxin is a chemical made by plants which stimulates growth in shoots.

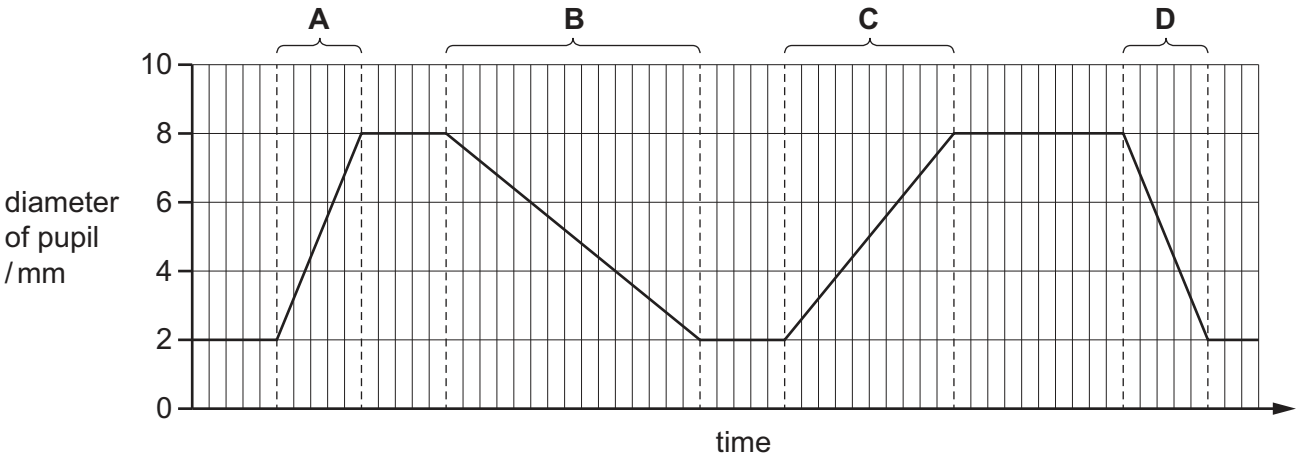
D A root of a plant that grows downwards into the soil is an example of negative gravitropism.

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27 The diameter of a person's pupil is measured as the light intensity is varied.

During which time period does the light intensity increase fastest?



28 What is produced when a cell divides once by mitosis?

A two cells with genetically different chromosomes

B two cells with genetically identical chromosomes

C four cells with genetically different chromosomes

D four cells with genetically identical chromosomes

29 The gametes and the embryo are important in plant reproduction.

Which row shows the chromosome content of the nucleus in the female gamete and of a nucleus in the plumule of the plant embryo?

	nucleus in female gamete	**nucleus in plumule of plant embryo**
A	diploid	diploid
B	haploid	diploid
C	diploid	haploid
D	haploid	haploid

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30 The table gives some information about four different organisms.

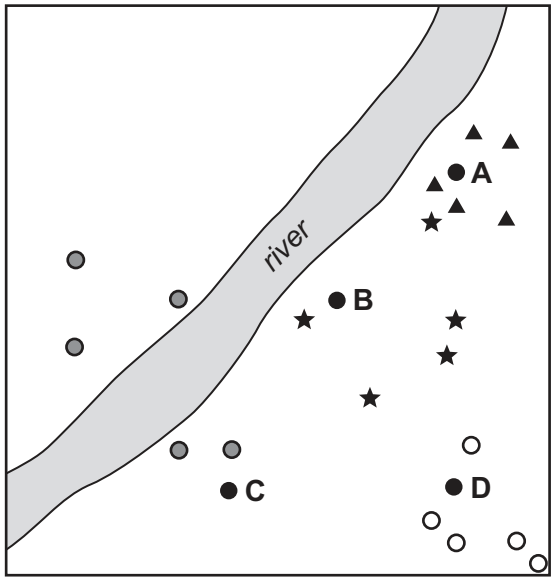
Which organism will **only** produce offspring that are genetically identical?

	organism	kingdom	mode of reproduction
A	bacteria	prokaryote	asexual
B	aphid	animal	asexual and sexual
C	rose bush	plant	sexual
D	*Mucor*	fungus	asexual and sexual

31 **A**, **B**, **C** and **D** are flowering plants of four different species growing in a field.

The positions of these plants and some of their germinating seeds are shown.

Which plant has its seeds dispersed by wind?



key

- ● parent plant
- ▲ germinating seeds from plant **A**
- ★ germinating seeds from plant **B**
- ◉ germinating seeds from plant **C**
- ○ germinating seeds from plant **D**

32 A section of a DNA molecule contains 400 bases, 80 of which are base A.

Which percentage of the bases in this section of DNA are base C?

A 25 **B** 30 **C** 60 **D** 80

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33 Which statement about recessive alleles is correct?

A They always affect the phenotype.

B They always cause a harmful effect.

C They can only be inherited by males.

D They can only affect the phenotype if two are present.

34 A father has blood group A and the mother has blood group B. One of their children has blood group O.

What are the genotypes of the two parents?

A I^AI^A and I^BI^B

B I^AI^A and I^BI^O

C I^AI^O and I^BI^B

D I^AI^O and I^BI^O

35 Which statement describes the function of a DNA molecule?

A The copying of a nucleotide in a DNA molecule produces a gene.

B The formation of a nucleotide using a gene manufactures an amino acid.

C The order of the bases in a DNA molecule codes for the sequence of amino acids in a protein.

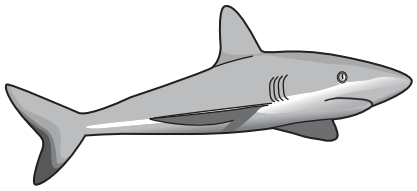
D The repeating chain of four bases in sequence codes for a chromosome.

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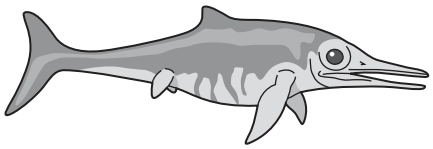
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36 The diagrams show three different animals.

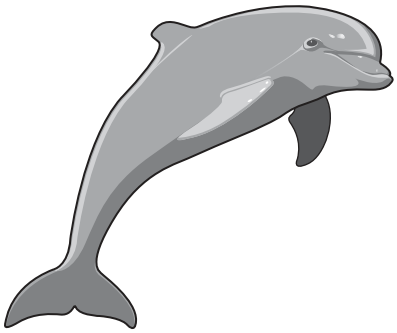
shark
(a fish)



ichthyosaur
(a reptile)



dolphin
(a mammal)



Why do the three animals look alike?

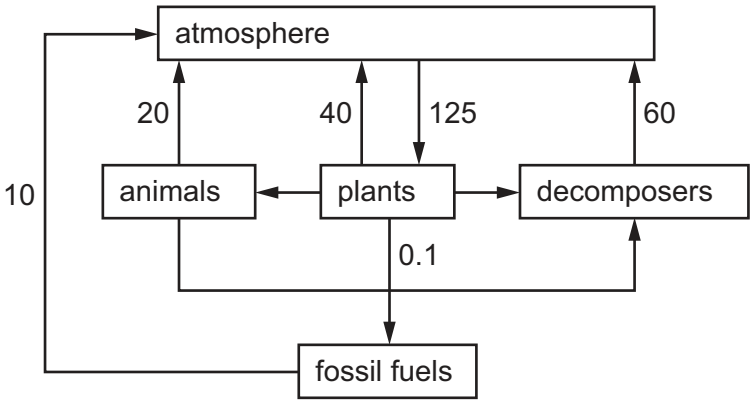
A They all evolved in similar environmental conditions.

B They all belong to the same kingdom.

C They are all vertebrates.

D They are closely related.

37 The diagram shows the movement of carbon in the carbon cycle in gigatonnes per year. One gigatonnes = one billion tonnes.



How many gigatonnes of carbon are moved by respiration each year?

A 120 **B** 125 **C** 130 **D** 255

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38 Which enzyme is added to fruit to aid juice production?

A lactase

B lipase

C pectinase

D protease

39 What is **not** a consequence of air pollution by greenhouse gases?

A abnormal weather patterns

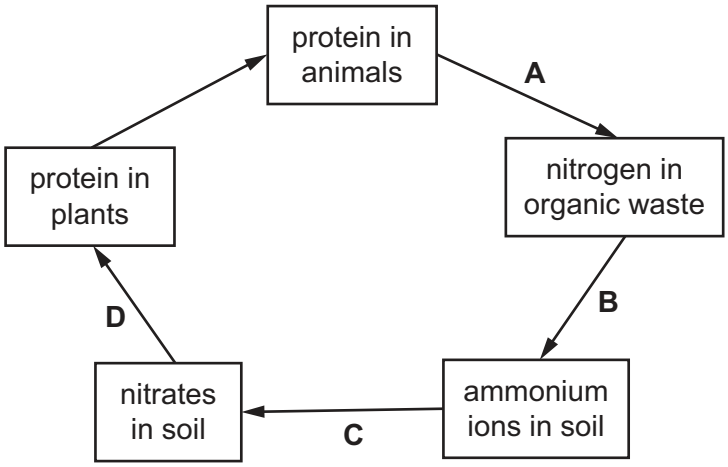
B eutrophication

C rising global temperatures

D rising sea levels

40 The diagram shows part of the nitrogen cycle.

Which process is nitrification?



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