Name

iG Bio ALL EQ FINAL MASTER P2 21sw to 16m **DRAFT**

Cholera is in topic 10, not topic 7

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Questions for material **only in 2022** exams

This material is still examinable in 2022!

Bio 6 **Q# 1/** iGCSE Biology/2019/m/Paper 22/ www.SmashingScience.org :o)

13 What will happen to a green plant grown in soil that is deficient in nitrate ions?

A It will have large leaves and good root growth.

B It will have purple leaves and poor root growth.

C It will have small leaves and a thin stem.

D It will have white leaves and a thick stem.

Bio 6 **Q# 2/** iGCSE Biology/2016/m/Paper 22/ www.SmashingScience.org :o)

13 Which row shows the effects of deficiencies in nitrate and magnesium ions on plant growth?

	effect of nitrate ion deficiency	effect of magnesium ion deficiency
A	green leaves	long roots
B	long roots	thin stem
C	stunted growth	yellow leaves
D	thick stem	large leaves

Bio 7 **Q# 3/** iGCSE Biology/2017/m/Paper 22/ www.SmashingScience.org :o)

12 Which nutrient is deficient in the diet of a child with kwashiorkor?

A calcium

B iron

C protein

D vitamin D

Bio 9 **Q# 4/** iGCSE Biology/2016/m/Paper 22/ www.SmashingScience.org :o)

20 Why is aspirin sometimes used as a drug to reduce the risk of coronary heart disease?

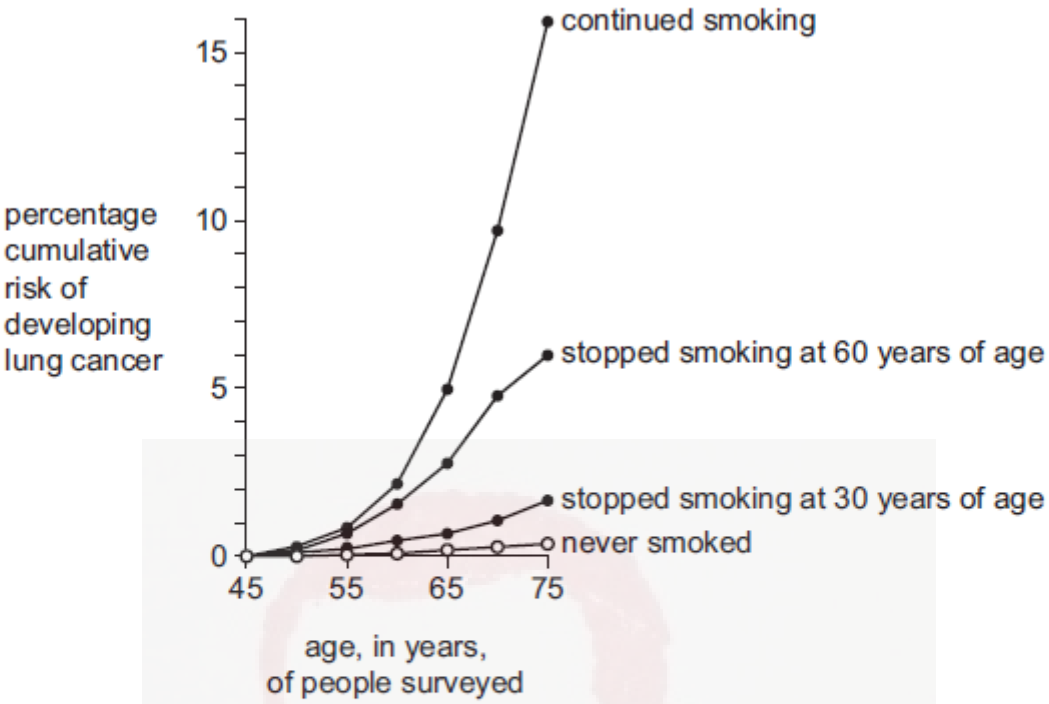
A It reduces blood pressure.

B It reduces pain.

C It reduces the tendency for blood to clot.

D It relaxes artery walls.

29 Scientists carried out a survey on the effect of giving up smoking on the risk of developing lung cancer. The results are shown in the graph.



The scientists made three conclusions:

1 Stopping smoking reduces the risk of developing lung cancer.

2 Age increases the risk of lung cancer for smokers and non-smokers.

3 The earlier people stop smoking, the lower the risk.

Which conclusions are correct?

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

26 Which statement is a reason why viruses are unharmed by antibiotics such as penicillin?

A They are very small in size.

B They do not have a cell wall.

C They have genetic material.

D They have a protein coat.

27 Several athletes have been banned from their sport for using the drug nandrolone. This drug helps the body to build up muscle tissue.

What sort of drug is nandrolone?

A anabolic steroid

B antibiotic

C depressant

D neurotransmitter

Bio 15 **Q# 7/** iGCSE Biology/2018/s/Paper 21/ www.SmashingScience.org :o)

27 Which hormone may be used to improve sporting performance?

A FSH

B LH

C oestrogen

D testosterone

Bio 15 **Q# 8/** iGCSE Biology/2016/s/Paper 21/ www.SmashingScience.org :o)

28 Which organ is most often damaged by regularly drinking too much alcohol?

A heart

B liver

C pancreas

D stomach

Bio 15 **Q# 9/** iGCSE Biology/2016/m/Paper 22/ www.SmashingScience.org :o)

29 Possible effects of drug abuse include

1 addiction,

2 reduced self-control,

3 severe withdrawal symptoms.

Which effects may occur as a result of drinking too much alcohol?

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

Bio 16 **Q# 10/** iGCSE Biology/2021/m/Paper 22/ www.SmashingScience.org :o)

30 Which types of contact between humans can spread HIV?

1 blood transfusions

2 sexual intercourse

3 saliva

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

31 Which method of birth control works by preventing an egg from being released?

A condom

B contraceptive pill

C monitoring body temperature

D vasectomy

Bio 16 **Q# 11/** iGCSE Biology/2019/w/Paper 21/ www.SmashingScience.org :o)

29 HIV is transmitted by body fluids during sexual contact.

HIV affects the immune system.

Which statement best describes the effect of HIV?

A The body has increased immunity.

B The body produces fewer antibodies.

C The body produces more antibodies.

D The number of lymphocytes increases.

Bio 16 **Q# 12/** iGCSE Biology/2019/s/Paper 21/ www.SmashingScience.org :o)

31 Which statement about HIV is correct?

A It causes an increase in the number of lymphocytes.

B It is caused by bacteria.

C It increases the ability to produce antibodies.

D It is transmitted through sexual contact.

Bio 16 **Q# 13/** iGCSE Biology/2018/m/Paper 22/ www.SmashingScience.org :o)

25 What is a consequence of HIV infection on the human body?

A decreased lymphocyte numbers

B increased protection against bacterial infections

C increased haemoglobin production

D sickle-cell anaemia

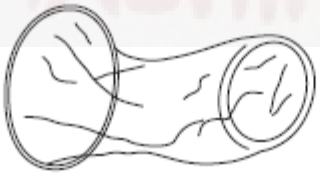
Bio 16 **Q# 14/** iGCSE Biology/2017/s/Paper 21/ www.SmashingScience.org :o)

30 The diagram shows four types of birth control device.

Which is **not** a barrier method of contraception?

A

B



C

D

31 Which blood component is destroyed in people who are HIV positive?

A lymphocytes

B phagocytes

C platelets

D red blood cells

Bio 16 **Q# 15/** iGCSE Biology/2017/m/Paper 22/ www.SmashingScience.org :o)

28 Which hormone is given to women undergoing fertility treatment?

A adrenaline

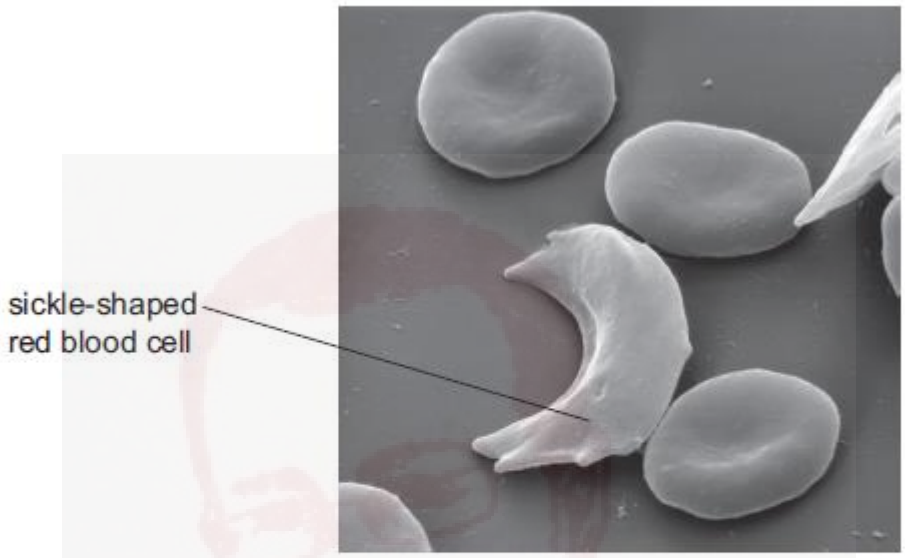
B FSH

C insulin

D oestrogen

Bio 17 **Q# 16/** iGCSE Biology/2020/m/Paper 22/ www.SmashingScience.org :o)

35 The photomicrograph shows some red blood cells.



What are the possible genotype combinations of this person?

A Hb^SHb^A or Hb^SHb^S

B Hb^SHb^A or Hb^AHb^A

C Hb^AHb^A only

D Hb^SHb^S or Hb^AHb^A

Bio 18 **Q# 17/** iGCSE Biology/2020/w/Paper 21/ www.SmashingScience.org :o)

33 Which statement explains why the allele for sickle-cell anaemia is commonly found in human populations in certain parts of the world?

A It is transmitted by mosquitoes.

B It protects people against malaria.

C It prevents people being bitten by mosquitoes.

D It increases oxygen transport.

Bio 18 **Q# 18/** iGCSE Biology/2019/s/Paper 21/ www.SmashingScience.org :o)

34 Why is the allele for sickle-cell anaemia common in some parts of the world?

A Malaria protects against sickle-cell anaemia.

B Sickle-cell anaemia is caused by malaria.

C Sickle-cell anaemia is transmitted by mosquitoes.

D The sickle-cell anaemia allele protects against malaria.

Bio 18 **Q# 19/** iGCSE Biology/2018/w/Paper 21/ www.SmashingScience.org :o)

33 Sickle-cell anaemia is a genetic disease that is caused by the allele Hb^S.

Hb^A is the normal allele.

A woman does not have the symptoms of the disease but her brother does show symptoms.

If her mother and father do **not** have symptoms, which statement is correct?

A The woman has the genotype Hb^SHb^S.

B The woman's brother has the genotype Hb^AHb^A.

C The woman's father and mother both have the genotype Hb^AHb^S.

D The woman's father and mother both have the genotype Hb^SHb^S.

Bio 18 **Q# 20/** iGCSE Biology/2018/s/Paper 21/ www.SmashingScience.org :o)

33 Sickle-cell anaemia is a genetic disorder which results in severe illness in homozygous individuals. In some human populations being heterozygous can be beneficial.

What could be the reason for this?

A Heterozygous individuals are not affected by the disorder.

B Heterozygous individuals are more resistant to malaria.

C It is caused by a dominant allele.

D The disorder is sex-linked.

Bio 18 **Q# 21/** iGCSE Biology/2018/m/Paper 22/ www.SmashingScience.org :o)

29 In areas of the world where malaria is present, the sickle-cell allele is more common.

What is the reason for this?

A Both diseases are caused by the same allele.

B Heterozygous individuals with the sickle-cell allele are less likely to have malaria.

C Heterozygous individuals with the sickle-cell allele are more likely to have malaria.

D These are parts of the world with many diseases.

Bio 18 **Q# 22/** iGCSE Biology/2017/w/Paper 21/ www.SmashingScience.org :o)

34 The distribution of the sickle-cell allele in human populations varies in different areas of the world.

What is an explanation for this difference?

A People that are heterozygous for the sickle-cell allele have a resistance to cholera.

B People that are heterozygous for the sickle-cell allele have a resistance to malaria.

C People that are heterozygous for the sickle-cell allele are more likely to suffer from anaemia.

D People with sickle-cell anaemia have more alleles.

Bio 18 **Q# 23/** iGCSE Biology/2016/w/Paper 21/ www.SmashingScience.org :o)

32 Hb^A is the allele for normal haemoglobin and Hb^S is the allele for abnormal haemoglobin that causes sickle-shaped red blood cells.

Which row correctly matches a genotype to its phenotype?

	genotype	person has sickle-cell anaemia	person has resistance to malaria
A	$Hb^A\ Hb^A$	✗	✓
B	$Hb^S\ Hb^A$	✓	✗
C	$Hb^S\ Hb^A$	✗	✓
D	$Hb^S\ Hb^S$	✗	✗

Bio 20 **Q# 24/** iGCSE Biology/2021/s/Paper 21/ www.SmashingScience.org :o)

40 Which hormones can cause the feminisation of male fish?

A adrenaline and progesterone

B adrenaline and testosterone

C oestrogen and progesterone

D oestrogen and testosterone

Mark Scheme Questions for material **only in 2022** exams

Bio 6 **Q# 1/** iGCSE Biology/2019/m/Paper 22/
13 | C

Bio 6 **Q# 2/** iGCSE Biology/2016/m/Paper 22/
13 **C**

Bio 7 **Q# 3/** iGCSE Biology/2017/m/Paper 22/
12 | C

Bio 9 **Q# 4/** iGCSE Biology/2016/m/Paper 22/
20 **C**

Bio 15 **Q# 5/** iGCSE Biology/2021/s/Paper 21/
29 | A

Bio 15 **Q# 6/** iGCSE Biology/2019/w/Paper 21/
26 | B
27 | A

Bio 15 **Q# 7/** iGCSE Biology/2018/s/Paper 21/
27 | D

Bio 15 **Q# 8/** iGCSE Biology/2016/s/Paper 21/
28 **B**

Bio 15 **Q# 9/** iGCSE Biology/2016/m/Paper 22/
29 **A**

Bio 16 **Q# 10/** iGCSE Biology/2021/m/Paper 22/
30 | A
31 | B

Bio 16 **Q# 11/** iGCSE Biology/2019/w/Paper 21/
29 | B

Bio 16 **Q# 12/** iGCSE Biology/2019/s/Paper 21/
31 | D

Bio 16 **Q# 13/** iGCSE Biology/2018/m/Paper 22/
25 | A

Bio 16 **Q# 14/** iGCSE Biology/2017/s/Paper 21/
30 | C
31 | A

Bio 16 **Q# 15/** iGCSE Biology/2017/m/Paper 22/
28 | B

Bio 17 **Q# 16/** iGCSE Biology/2020/m/Paper 22/
35 | A

Bio 18 **Q# 17/** iGCSE Biology/2020/w/Paper 21/
A

Bio 18 **Q# 18/** iGCSE Biology/2019/s/Paper 21/
34 | D

Bio 18 **Q# 19/** iGCSE Biology/2018/w/Paper 21/
33 | C

Bio 18 **Q# 20/** iGCSE Biology/2018/s/Paper 21/
33 | B

Bio 18 **Q# 21/** iGCSE Biology/2018/m/Paper 22/
29 | B

Bio 18 **Q# 22/** iGCSE Biology/2017/w/Paper 21/
34 | B

Bio 18 **Q# 23/** iGCSE Biology/2016/w/Paper 21/
32 **C**

Bio 20 **Q# 24/** iGCSE Biology/2021/s/Paper 21/
40 | C

1 What is a characteristic of all living organisms?

A breathing

B circulation

C egestion

D sensitivity

2 The table shows a section of DNA taken from four different organisms.

organism	base sequence									
W	C	A	C	A	A	T	C	G	A	A
X	G	T	C	A	A	T	G	G	T	G
Y	C	T	C	A	A	T	C	G	T	A
Z	C	T	C	A	T	T	C	G	T	A

Which two organisms are the most distantly related to each other?

A W and X **B** W and Z **C** X and Y **D** X and Z

3 Scientists discover a new species of animal.

It has a segmented body with two pairs of legs on each segment.

To which group of animals does this new species belong?

A arachnids

B crustaceans

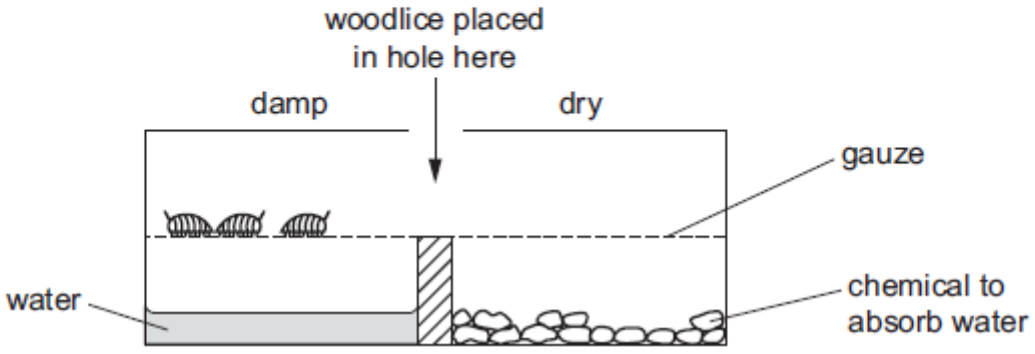
C insects

D myriapods

Bio 1 **Q# 2/** iGCSE Biology/2021/m/Paper 22/ www.SmashingScience.org :o)

1 Woodlice are small organisms that live in damp places.

In an experiment, three live woodlice are put into a glass container. The diagram shows what happens after 30 minutes.



Which characteristic of living organisms is shown by this experiment?

A growth

B nutrition

C respiration

D sensitivity

2 Which species can breed with *Prunella vulgaris* to produce fertile offspring?

	Prunella modularis	*Vespula vulgaris*
A	✓	✓
B	✓	✗
C	✗	✓
D	✗	✗

key

✓ = yes

✗ = no

3 What is the correct order of arthropod groups, from those with the **most** legs to those with the fewest legs?

A arachnids → crustaceans → insects → myriapods

B arachnids → insects → myriapods → crustaceans

C myriapods → crustaceans → arachnids → insects

D myriapods → insects → arachnids → crustaceans

Bio 1 **Q# 3/** iGCSE Biology/2020/w/Paper 21/ www.SmashingScience.org :o)

1 Hedgehogs are mammals. Touching a hedgehog causes it to roll into a ball to protect itself.

Which characteristics is it displaying?

A excretion and movement

B growth and sensitivity

C movement and growth

D movement and sensitivity

2 What are features of the leaves of a plant that is a dicotyledon?

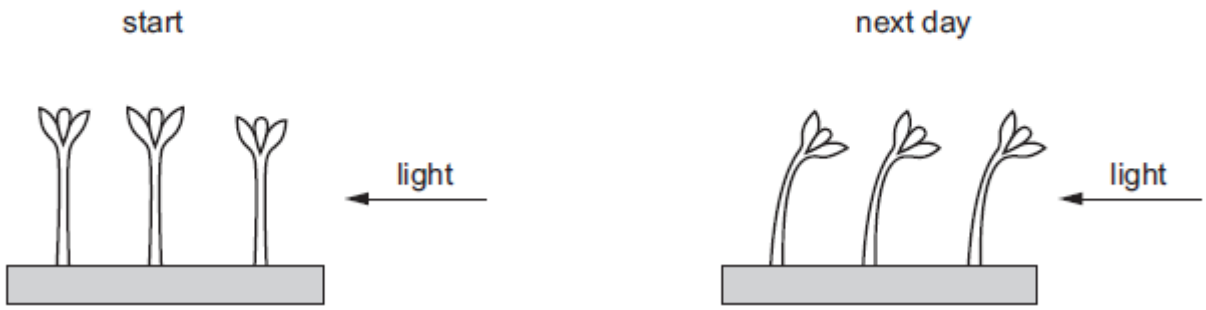
	broad leaves	parallel veins
A	✓	✓
B	✓	✗
C	✗	✓
D	✗	✗

key

✓ = yes

✗ = no

1 The diagram shows what happened in an experiment with plant seedlings.



Which characteristic of living things made the seedlings grow towards the light?

A excretion

B nutrition

C respiration

D sensitivity

2 A rat has the scientific name *Rattus rattus*.

What do the two parts of this name refer to?

A genus and species

B kingdom and genus

C kingdom and species

D variety and genus

1 Which characteristic do **all** living organisms show?

A breathing

B excretion

C photosynthesis

D tropism

2 Using the binomial naming system, the Arctic fox is called *Vulpes lagopus*.

Which row is correct?

	Vulpes	*lagopus*
A	genus	kingdom
B	genus	species
C	species	genus
D	species	kingdom

3 What is a characteristic of both insects and arachnids?

A eight legs

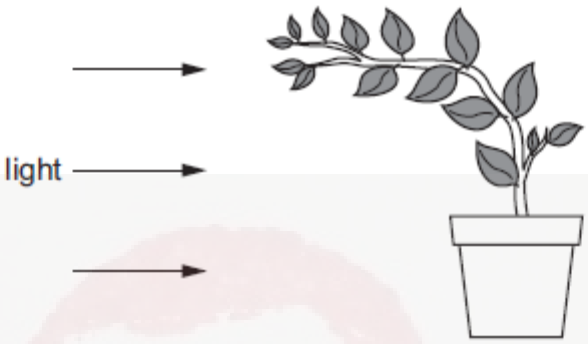
B exoskeleton

C three pairs of legs

D wings

Bio 1 **Q# 6/** iGCSE Biology/2019/w/Paper 21/ www.SmashingScience.org :o)

1 The diagram shows a plant.



Which characteristic of living organisms is shown by the plant in the diagram?

A excretion

B reproduction

C respiration

D sensitivity

2 Using the binomial system of naming organisms, the name of the lion is *Panthera leo*.

Which statement is correct?

A The lion belongs to the kingdom *Panthera*.

B The lion belongs to the genus *Panthera*.

C The lion belongs to the species *Panthera*.

D The lion belongs to the genus *leo*.

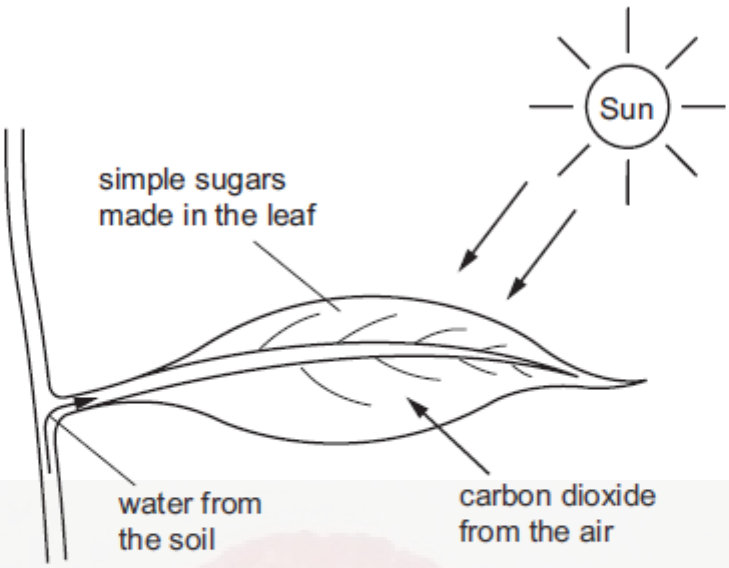
3 The table shows the number of animals collected in a sample from a woodland and the groups to which they belong.

animal group	number in sample
arachnids	10
crustaceans	8
insects	80
myriapods	7

How many arthropods in total, in this sample, have six or eight legs?

A 15 B 88 C 90 D 98

1 The diagram shows a leaf on a plant.



Which characteristic of life is represented by this diagram?

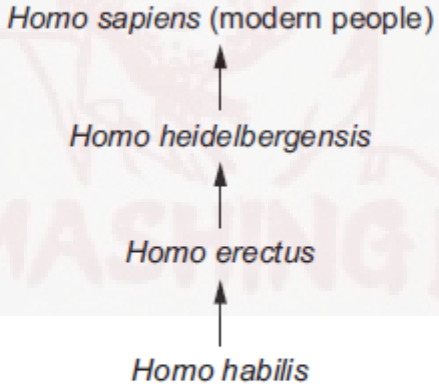
A excretion

B nutrition

C respiration

D sensitivity

2 The diagram shows how *Homo sapiens* (modern people) could have evolved from earlier ancestors.



Which statement about modern people and their ancestors is correct?

A They are in the same species and the same genus.

B They are in the same species but not the same genus.

C They are in the same genus but not the same species.

D They are neither the same species nor the same genus.

Bio 1 **Q# 8/** iGCSE Biology/2019/m/Paper 22/ www.SmashingScience.org :o)

1 A living organism, X, can make its own food, get rid of toxic materials and detect and respond to stimuli.

What **other** four processes must organism X carry out to stay alive?

A excretion, growth, movement, sensitivity

B excretion, growth, nutrition, respiration

C growth, movement, reproduction, respiration

D movement, reproduction, respiration, sensitivity

2 What is a correct way of naming a species using the binomial system?

A *Homo sapiens*

B *Homo Sapiens*

C human being

D sapiens

Bio 1 **Q# 9/** iGCSE Biology/2018/w/Paper 21/ www.SmashingScience.org :o)

1 The sundew is a carnivorous plant that can trap small insects with sticky hairs and then digest them. When an insect gets stuck, other nearby sticky hairs bend over to trap the insect.

Which characteristics of living organisms are demonstrated when the sundew traps insects?

A growth and excretion

B growth and sensitivity

C movement and excretion

D movement and sensitivity

2 Systems of classification show which organisms share more recent ancestors.

What is the most accurate system of classification?

A using anatomy

B using DNA base sequences

C using morphology

D using a pedigree diagram

Bio 1 **Q# 10/** iGCSE Biology/2018/s/Paper 21/ www.SmashingScience.org :o)

1 Which organisms carry out respiration, growth, movement and excretion?

A all animals and all plants

B animals only

C arthropods and flowering plants only

D plants only

2 The diagram shows an animal whose scientific name is *Falco peregrinus*.

To which species does it belong?

A bird

B *F. peregrinus*

C *Falco*

D vertebrate

3 What kind of skin do amphibians have?

A dry without scales

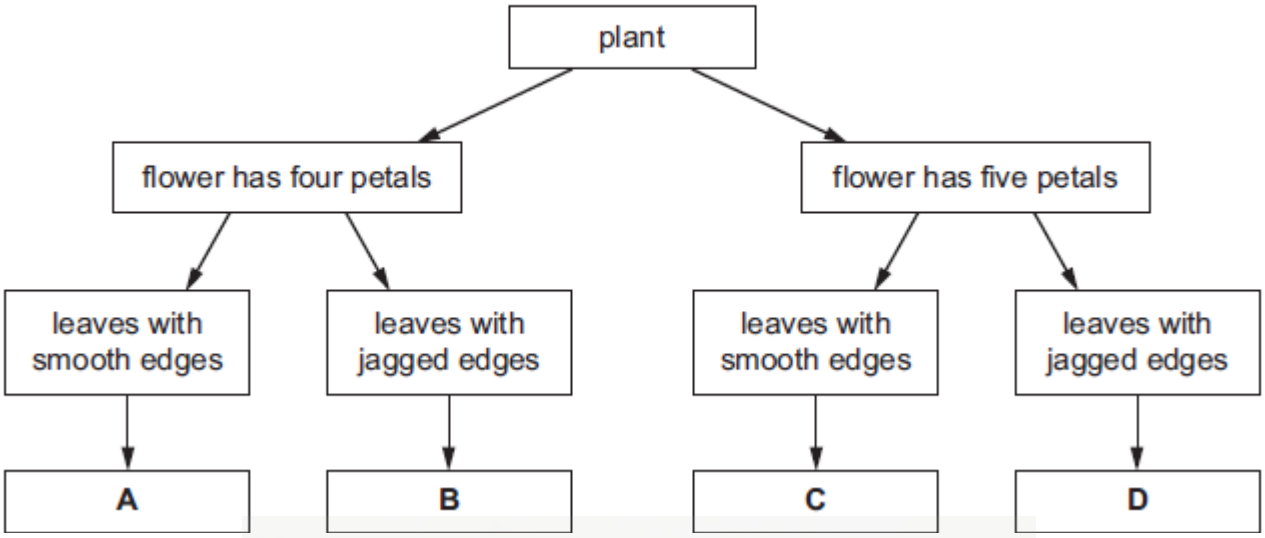
B dry with scales

C moist without scales

D moist with scales

4 The diagram shows a flowering plant.

Use the key to identify the plant.



1 Biology is the study of living things.

Which characteristic applies to all forms of life?

A able to move from place to place

B able to reproduce

C carry out photosynthesis

D possess a nervous system

2 Two animals have an identical sequence of amino acids in one of the proteins found in their cells.

What does this indicate about these animals?

A They have been eating the same types of food.

B They have not been exposed to substances that cause mutation.

C They must be members of the same genus.

D They share a recent ancestor.

3 The diagram shows part of a flowering plant.

Using the key, identify this plant.

1	three petals	go to 2
	more than three petals	go to 3
2	leaves longer than they are wide	**A**
	leaves wider than they are long	**B**
3	leaves parallel-veined	**C**
	leaves not parallel-veined	**D**

Bio 1 **Q# 12/** iGCSE Biology/2017/w/Paper 21/ www.SmashingScience.org :o)

1 Which term is defined as all the chemical reactions that occur in cells?

A photosynthesis

B protein synthesis

C respiration

D metabolism

2 The diagram shows a section of DNA from a chimpanzee.

A	G	C	T	A	C	A	G	A	G

Which diagram shows a section of DNA from the organism that is most closely related to the chimpanzee?

A

A	G	C	T	A	C	A	G	A	T

B

A	G	C	T	A	C	A	G	T	T

C

A	T	C	A	A	C	A	G	T	T

D

A	T	C	T	A	C	A	G	T	T

Bio 1 **Q# 13/** iGCSE Biology/2017/s/Paper 21/ www.SmashingScience.org :o)

1 Which characteristic do **all** living organisms show?

A breathing

B excretion

C photosynthesis

D tropism

1 The drawing shows a ground squirrel.

Which feature identifies this animal as a mammal?

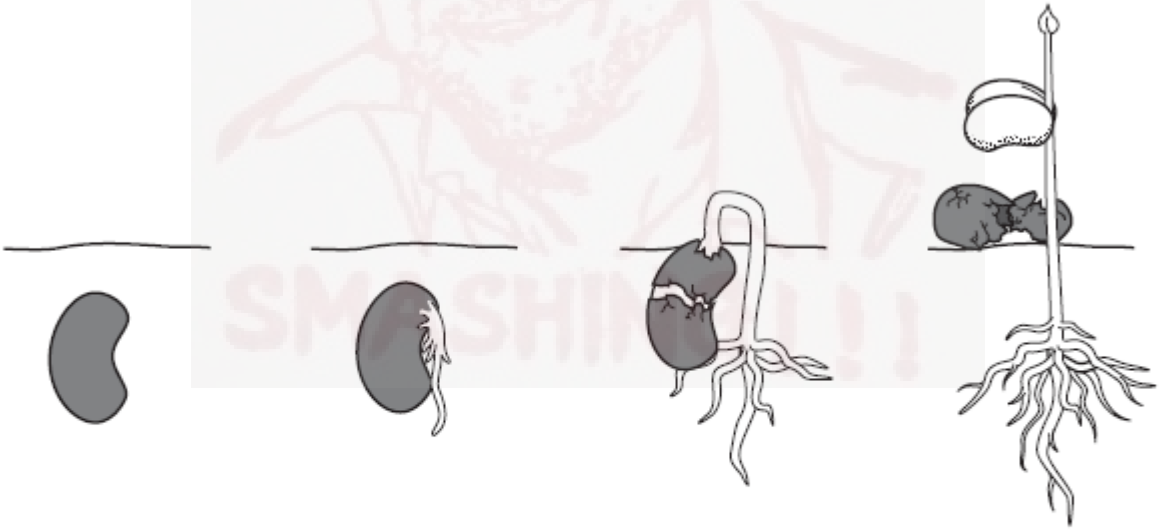
A eye

B four limbs

C fur

D tail

2 The diagram shows how a seed changes after it is planted in soil and watered.



Which characteristics of living things are demonstrated by this sequence?

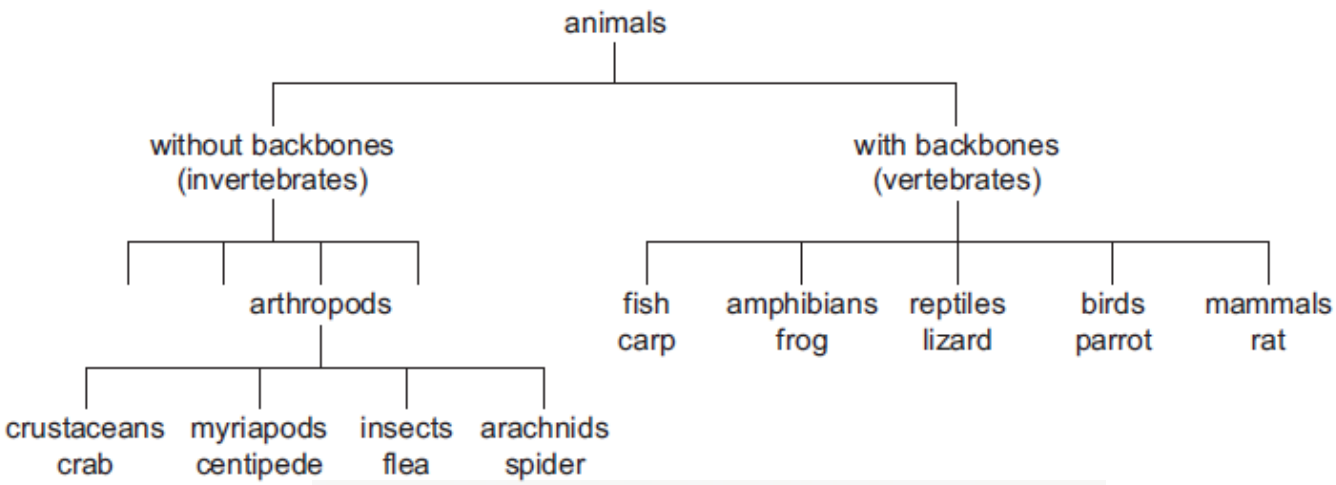
A excretion and growth

B growth and sensitivity

C nutrition and reproduction

D nutrition and sensitivity

3 The diagram shows part of the classification of the animal kingdom with an example of each group.



Which pair of animals have the most recent common ancestor as suggested by the classification?

A centipede and carp

B flea and frog

C lizard and parrot

D spider and rat

Bio 1 **Q# 15/** iGCSE Biology/2016/w/Paper 21/ www.SmashingScience.org :o)

1 The diagram shows a plant that has been placed near a sunlit window for a few weeks.

Which two characteristics of living organisms have affected the shape of the plant?

A excretion and sensitivity

B growth and reproduction

C reproduction and excretion

D sensitivity and growth

2 What is a characteristic of amphibians but **not** of reptiles?

A four limbs

B laying eggs in water

C scaly skin

D using lungs for breathing

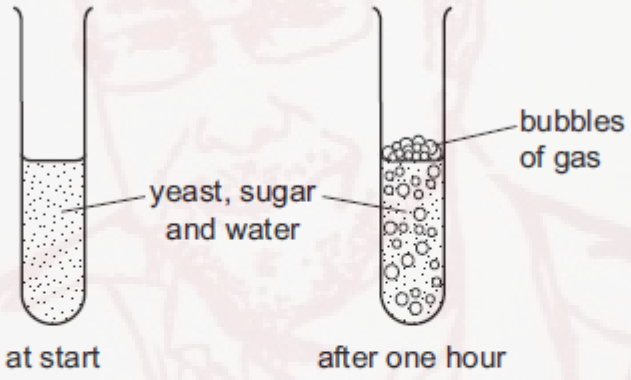
3 The diagram shows an insect.

Use the key to identify the insect.

1	wings present	.....	go to 2
	wings absent	.....	**A**
2	two pairs of wings	.....	go to 3
	one pair of wings	.....	**B**
3	wings with circular markings	.....	**C**
	wings without circular markings	.....	**D**

Bio 1 **Q# 16/** iGCSE Biology/2016/s/Paper 21/ www.SmashingScience.org :o)

1 Some yeast, sugar and water are mixed in a test-tube. The diagrams show the test-tube at the start and after one hour.



Which process causes this change?

A growth

B reproduction

C respiration

D sensitivity

2 Which name is given to a group of individuals that can reproduce to produce fertile offspring?

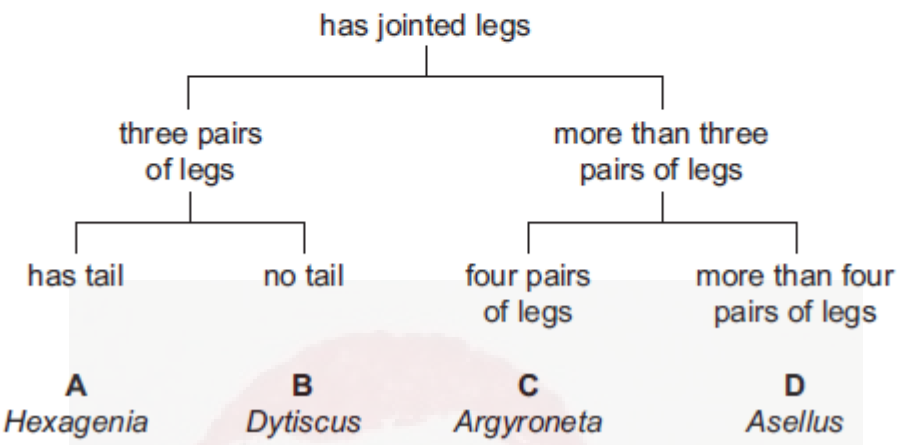
A a genus

B a kingdom

C a species

D an organ system

3 Use the key to identify the animal shown in the diagram.



Bio 1 **Q# 17/** iGCSE Biology/2016/m/Paper 22/ www.SmashingScience.org :o)

1 What is a correct way of naming an organism using the binomial system?

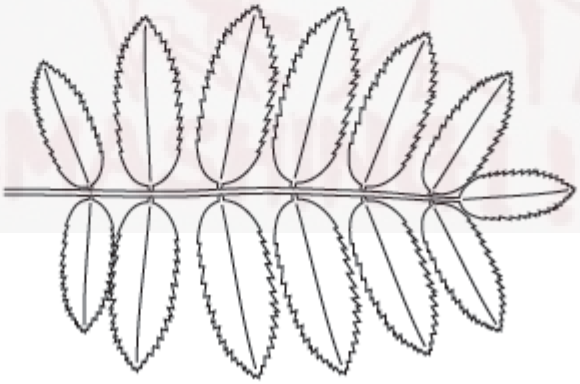
A *Common buttercup*

B ranunculus acris

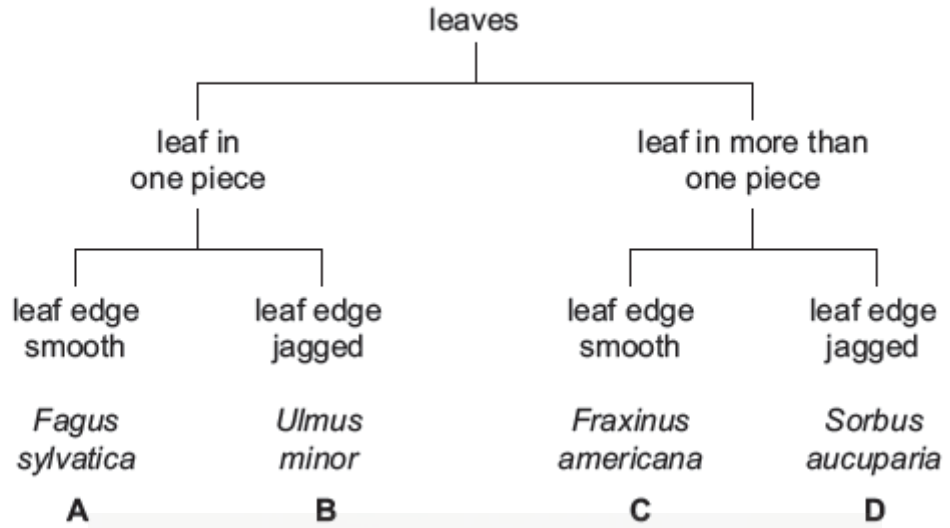
C *Ranunculus acris*

D Ranunculus sp.

2 The diagram shows a leaf.

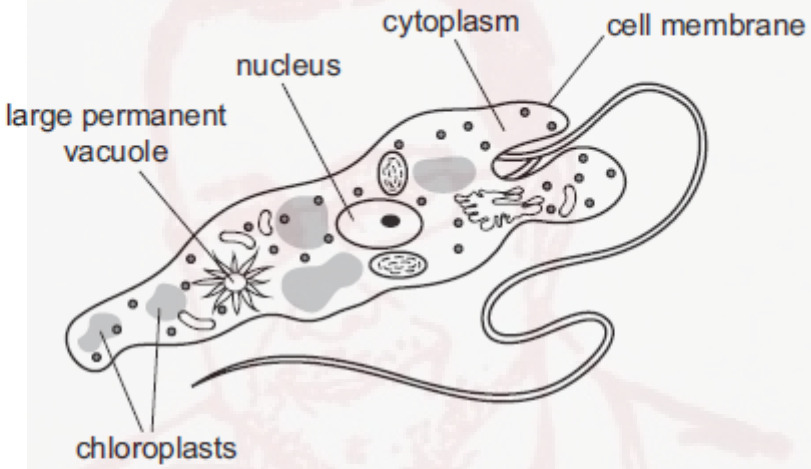


Use the key to identify the plant to which the leaf belongs.



Paper 2 Bio Topic# 2 **Q# 18/** iGCSE Biology/2021/s/Paper 21/ www.SmashingScience.org :o)

4 The diagram shows a single-celled organism called *Euglena*.



Which labelled structures would also be found in an animal cell?

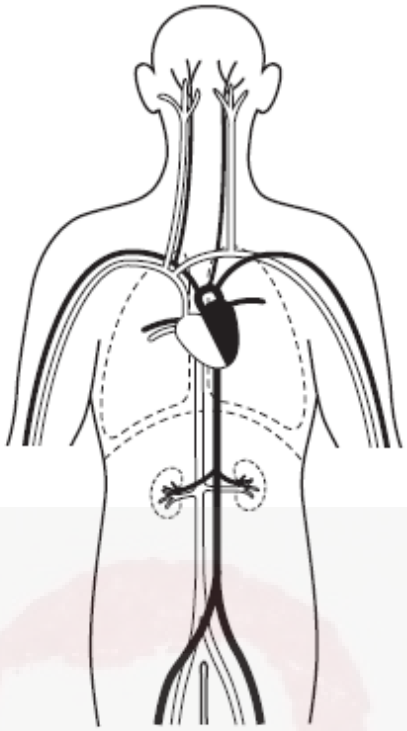
A cell membrane, chloroplast, nucleus

B chloroplast, cytoplasm, nucleus

C cell membrane, cytoplasm, nucleus

D cell membrane, cytoplasm, large permanent vacuole

5 The diagram shows some of the blood vessels and other structures in the human body.



The blood vessels shown are all parts of the same

A cell.

B organ.

C organ system.

D tissue.

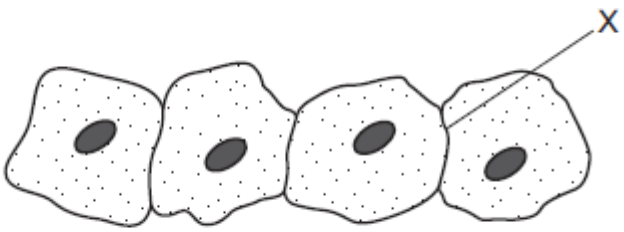
6 A photograph shows a plant cell nucleus measuring 2 mm across.

If the magnification of the cell is ×500, what is the actual size of the nucleus?

A 0.00002 mm **B** 0.004 mm **C** 0.04 mm **D** 250 mm

Bio 2 **Q# 19/** iGCSE Biology/2021/m/Paper 22/ www.SmashingScience.org :o)

4 The diagram shows four animal cells, as seen under a light microscope.



What will be present at X?

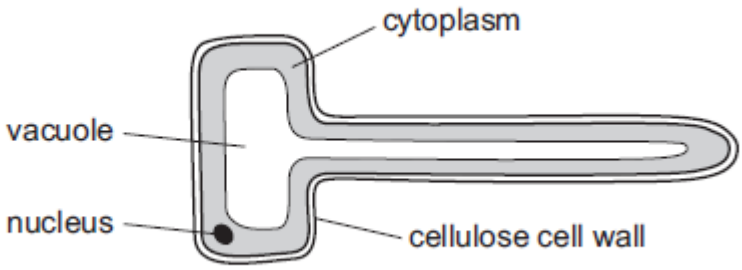
A one cell membrane

B one cell wall

C two cell membranes

D two cell walls

5 The diagram shows a root hair cell.



How is this cell modified for the absorption of water?

A It has a cellulose cell wall.

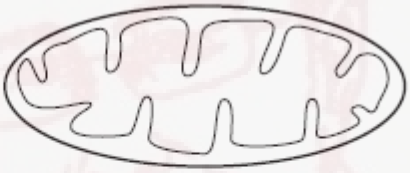
B It has a thin layer of cytoplasm.

C It has a large surface area.

D It has a large vacuole.

6 A student draws a diagram of a mitochondrion.

The diagram has a magnification of ×20 000.



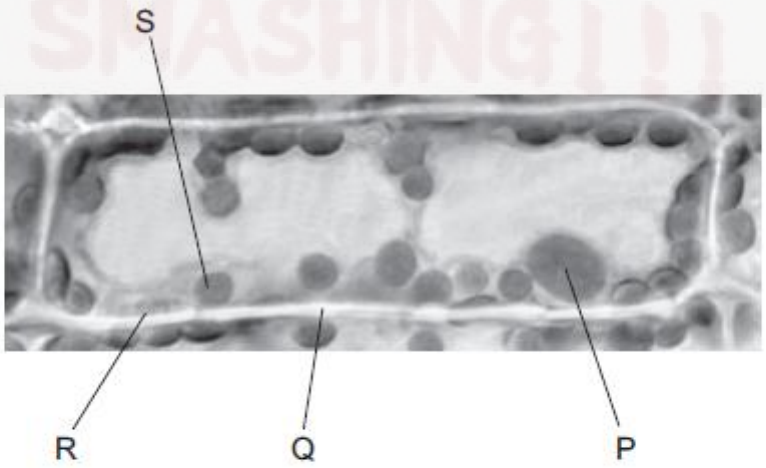
The diagram is 5 cm long.

What is the actual size of the mitochondrion?

A 0.00025 µm **B** 0.0025 µm **C** 0.025 µm **D** 2.5 µm

Bio 2 **Q# 20/** iGCSE Biology/2020/w/Paper 21/ www.SmashingScience.org :o)

3 The photomicrograph shows a cell from a type of aquatic plant.



Which parts labelled on the photomicrograph indicate that this is a plant cell?

A P and R **B** P and S **C** Q and R **D** Q and S

4 The diagram shows an image of a chloroplast. The image is 5 cm long.

The actual length of the chloroplast is 5 µm.

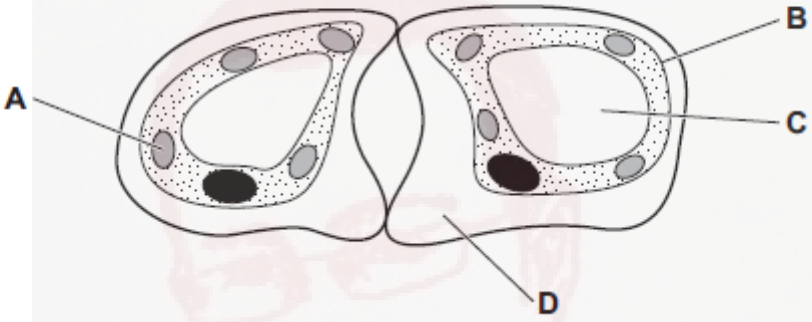
What is the magnification of the image?

A ×10 **B** ×1000 **C** ×10 000 **D** ×100 000

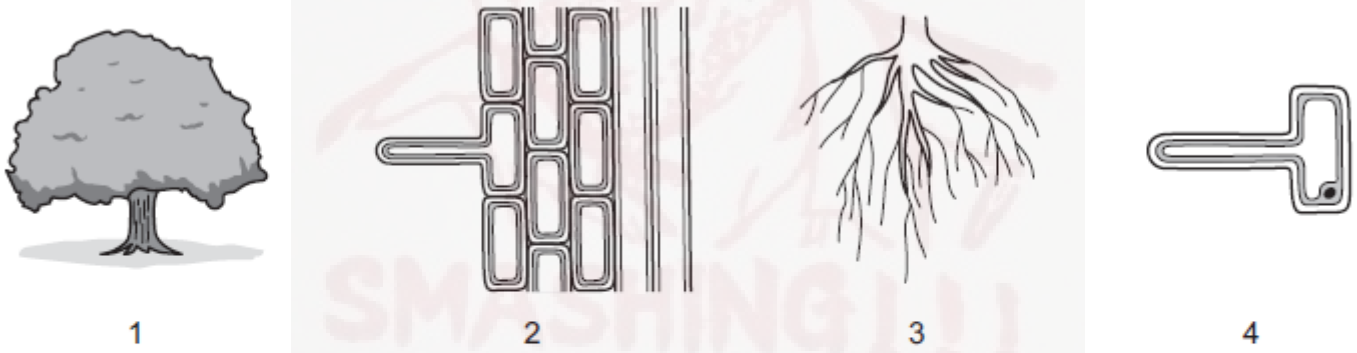
Bio 2 **Q# 21/** iGCSE Biology/2020/s/Paper 21/ www.SmashingScience.org :o)

3 The diagram shows two guard cells.

Which label shows the cell wall?



4 The diagrams show different levels of organisation in a plant. (Not drawn to scale.)



Which sequence shows the levels of organisation in order from smallest to largest?

A 4 → 2 → 3 → 1

B 4 → 3 → 1 → 2

C 3 → 4 → 2 → 1

D 3 → 2 → 1 → 4

4 What structures can be found in both plant and animal cells?

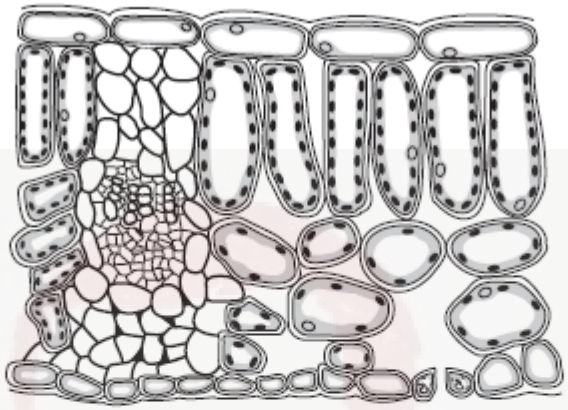
A cell walls and cell membranes

B nuclei and cell walls

C cytoplasm and chloroplasts

D cell membranes and nuclei

5 The actual thickness of the leaf shown in the diagram is 2000 μm, but its thickness in the diagram is 50 mm.



What is the magnification of the diagram?

A ×0.025 **B** ×25 **C** ×100 **D** ×100 000

6 What is the function of a root hair cell?

A absorption

B photosynthesis

C reproduction

D support

4 Which features do animal cells share with plant cells?

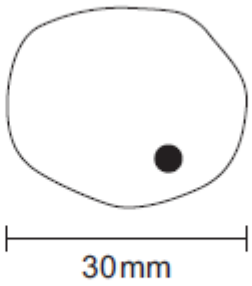
	chloroplast	cytoplasm	nucleus
A	✓	✓	✓
B	✓	✗	✓
C	✗	✓	✓
D	✗	✗	✗

key

✓ = yes

✗ = no

5 The diagram shows a cell with an actual size of 30 µm.

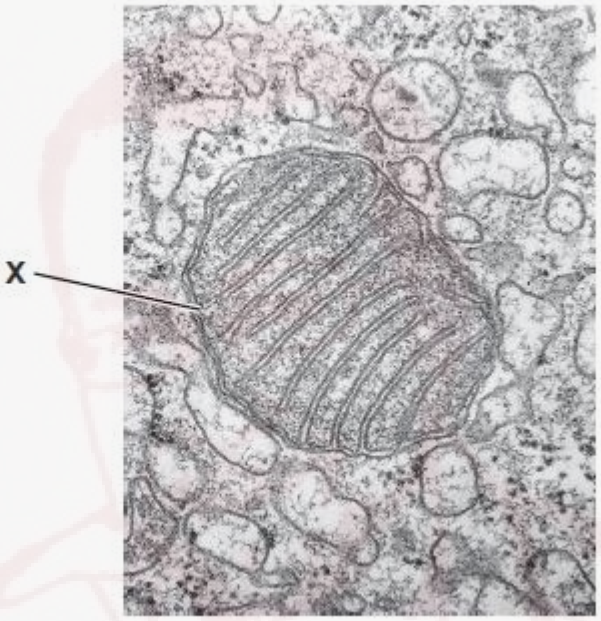


What is the magnification of the diagram?

A ×10 **B** ×100 **C** ×1000 **D** ×10 000

Bio 2 **Q# 24/** iGCSE Biology/2019/s/Paper 21/ www.SmashingScience.org :o)

3 The photomicrograph shows part of an animal cell.



What is the structure labelled **X**?

A chloroplast

B mitochondrion

C ribosome

D vacuole

4 Which features are possessed by **all** plant cells?

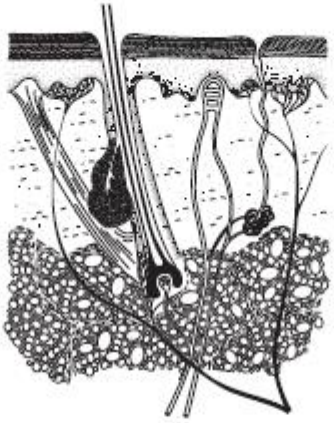
	a cell wall	chloroplasts
A	✓	✓
B	✓	✗
C	✗	✓
D	✗	✗

key

✓ = present

✗ = absent

5 The diagram shows part of the skin.



What is the correct level of organisation for the skin?

A cell

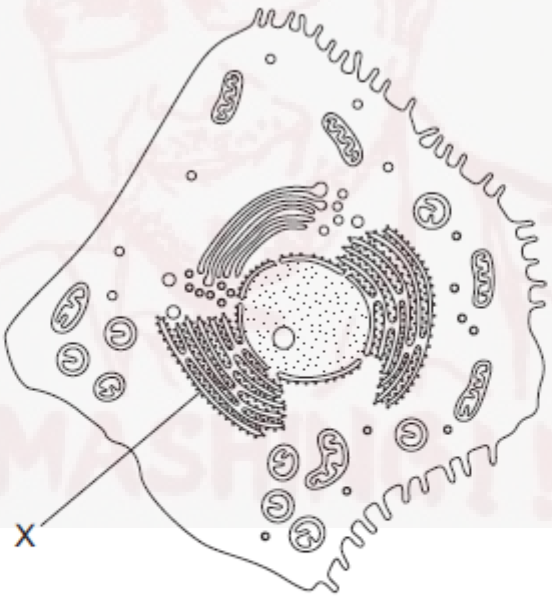
B organ

C organ system

D tissue

Bio 2 **Q# 25/** iGCSE Biology/2019/m/Paper 22/ www.SmashingScience.org :o)

3 The drawing is of a magnified human liver cell.



What is structure X?

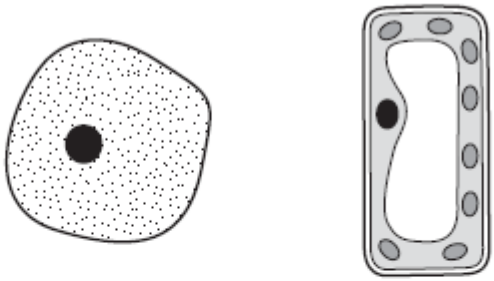
A cytoplasm

B mitochondrion

C nucleus

D rough endoplasmic reticulum

4 The diagram shows two cells.



Which process can be carried out by only one of these cells?

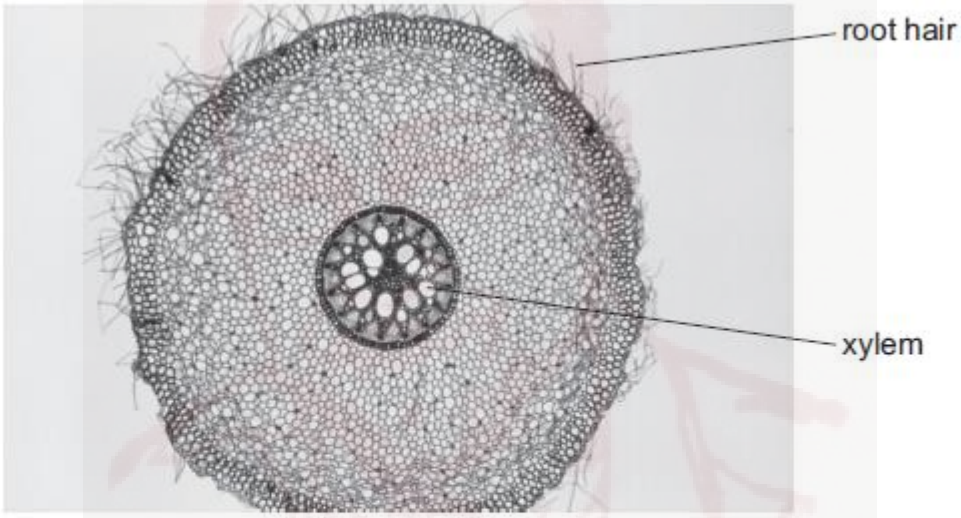
A controlling the chemical reactions in the cell

B controlling the movement of substances into the cell

C making starch inside the cell

D using glucose inside the cell

5 The photograph shows a cross-section of a root.



The root hair and the xylem are part of the same

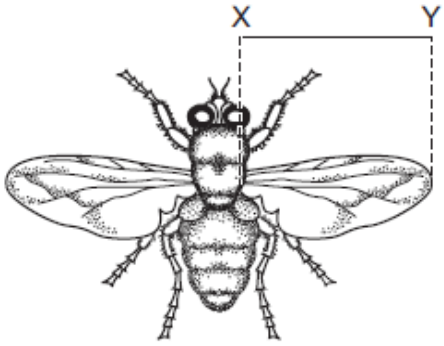
A cell and organism.

B cell and tissue.

C organ and organism.

D tissue and organ.

6 The diagram shows a fly.



The line XY represents the length of the wing.

The length of line XY is 26 mm.

The actual size of the wing between XY is 4 mm.

What is the magnification of the image?

A ×0.15 **B** ×6.5 **C** ×22 **D** ×104

Bio 2 **Q# 26/** iGCSE Biology/2018/w/Paper 21/ www.SmashingScience.org :o)

3 Which part of a plant cell controls the movement of substances into and out of the cell?

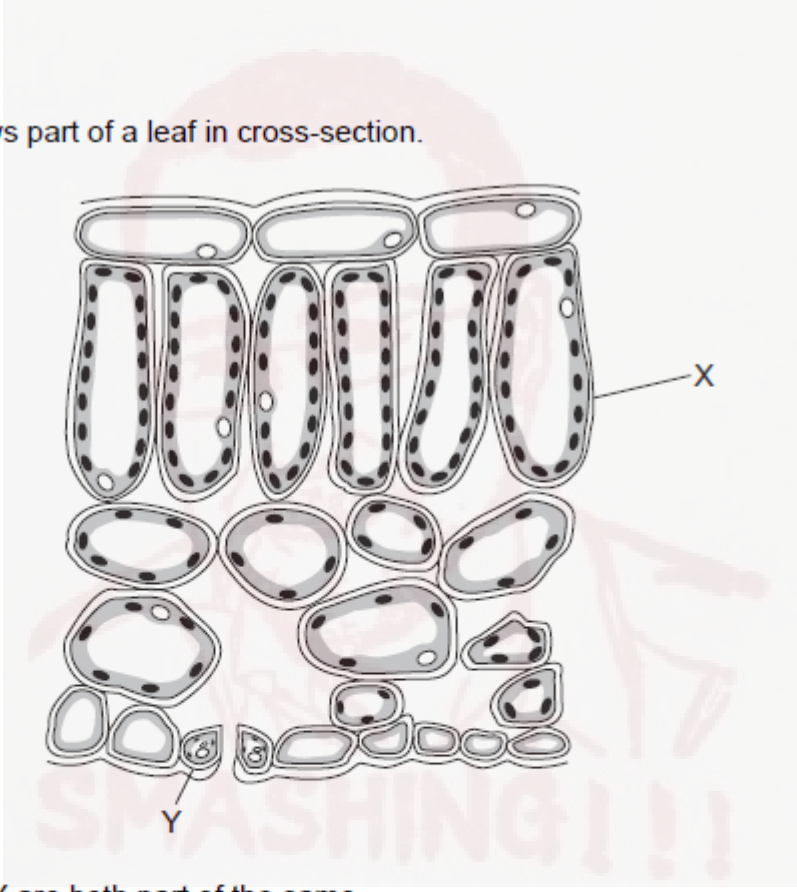
A cell membrane

B cell wall

C cytoplasm

D vacuole

4 The diagram shows part of a leaf in cross-section.



Structures X and Y are both part of the same

A cell.

B organ.

C tissue.

D vessel.

22 The table shows the presence or absence of chemicals in solution in different parts of a healthy kidney.

Which row is correct?

	chemical	blood plasma in glomerulus	fluid entering kidney tubule	fluid in ureter
A	glucose	✓	✗	✗
B	protein	✓	✓	✓
C	salts	✓	✗	✗
D	urea	✓	✓	✓

key
✓ = present
✗ = absent

5 In which part of the cell does aerobic respiration occur?

A cytoplasm

B mitochondrion

C ribosome

D vesicle

6 Why do some root cells have root hairs?

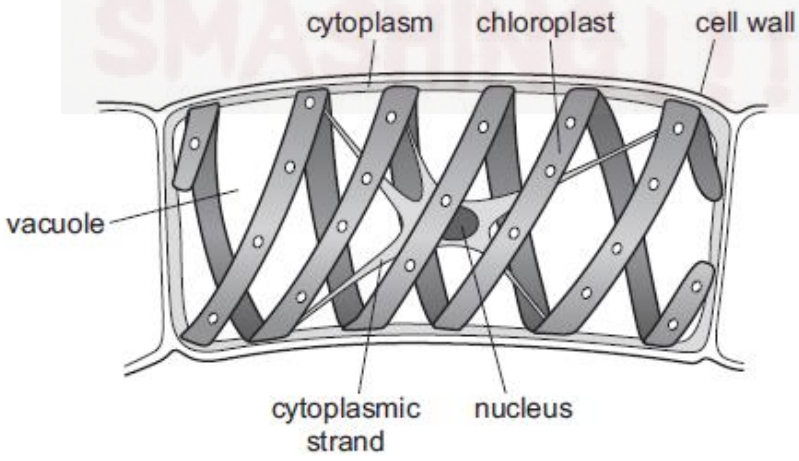
A for the maintenance of the temperature of the cell sap

B to increase the surface area of the cells

C to increase the volume of the cell sap

D to provide a place for cell nuclei

4 The diagram shows a single cell from an organism called *Spirogyra*.



Which features does *Spirogyra* share with plant cells?

	cell wall	chloroplast	cytoplasm	nucleus	vacuole
A	✓	✓	✓	✓	✓
B	✓	✓	✗	✗	✓
C	✓	✗	✓	✓	✗
D	✗	✓	✓	✗	✓

5 A student was told that a drawing of a bacterial cell had been magnified 30 000 times. The length of the drawing was 45 mm.

What was the actual length of the bacterium?

A 0.15 mm **B** 1.5 µm **C** 0.66 mm **D** 0.66 µm

Bio 2 **Q# 30/** iGCSE Biology/2017/w/Paper 21/ www.SmashingScience.org :o)

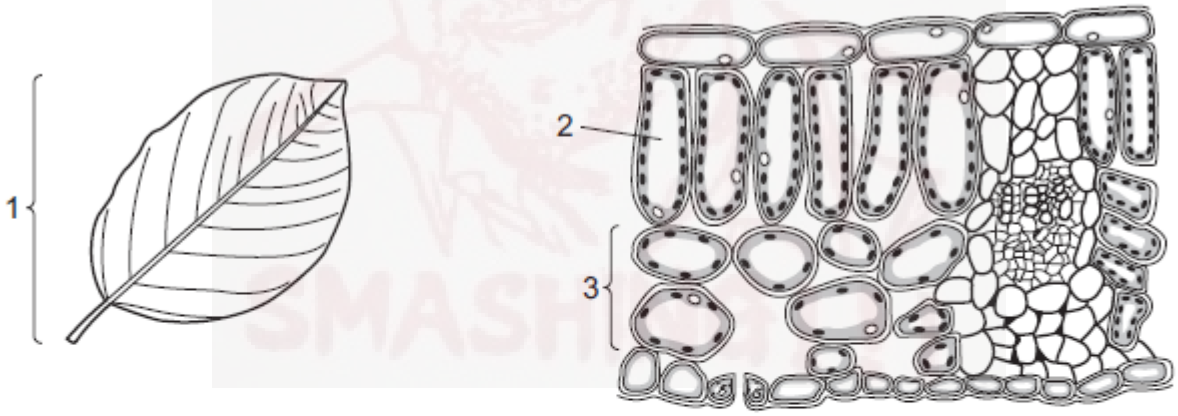
3 The length of a mitochondrion in a photomicrograph is 15 mm.

The actual length of the mitochondrion is 3 µm.

What is the magnification of the photomicrograph?

A ×5 **B** ×45 **C** ×5000 **D** ×45 000

4 The diagrams show a leaf and its internal structure.



What are the levels of organisation of the labelled structures?

	1	2	3
A	cell	tissue	organ system
B	organ	cell	tissue
C	organ system	tissue	cell
D	tissue	cell	organ

11 Which structure would be found in large numbers in cells that have a high energy requirement?

A chloroplast

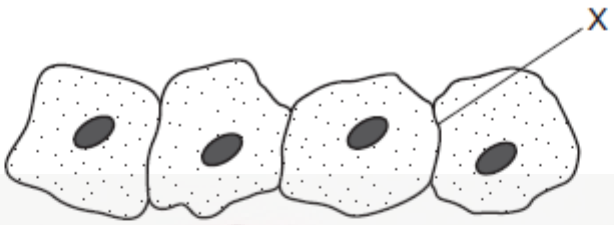
B endoplasmic reticulum

C large vacuole

D mitochondrion

Bio 2 **Q# 31/** iGCSE Biology/2017/s/Paper 21/ www.SmashingScience.org :o)

2 The diagram shows some animal cells, as seen under the microscope.



What will be present at X?

A one cell membrane

B one cell wall

C two cell membranes

D two cell walls

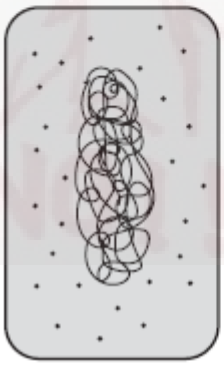
3 Each of the diagrams shows an area of cytoplasm.

Which is from a prokaryote?

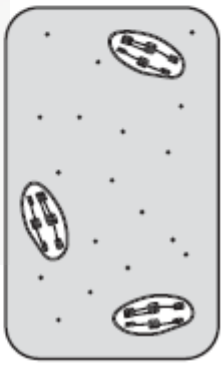
A

B

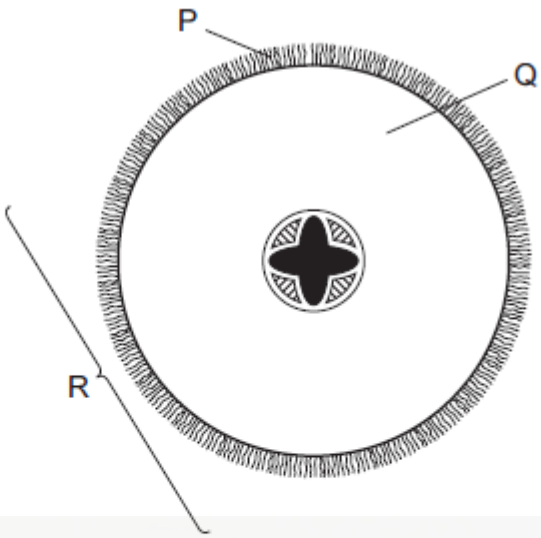
C



D



4 The diagram shows a section through a root.

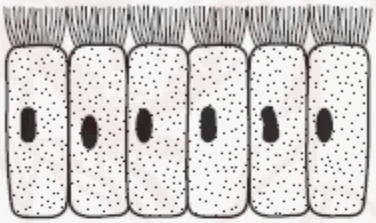


What are the levels of organisation of the labelled structures?

	cell	organ	tissue
A	P	Q	R
B	P	R	Q
C	Q	R	P
D	R	Q	P

Bio 2 **Q# 32/** iGCSE Biology/2017/m/Paper 22/ www.SmashingScience.org :o)

4 The diagram shows a sample of material taken from an organism.



Which level of organisation does the sample show?

A cell

B organ

C organ system

D tissue

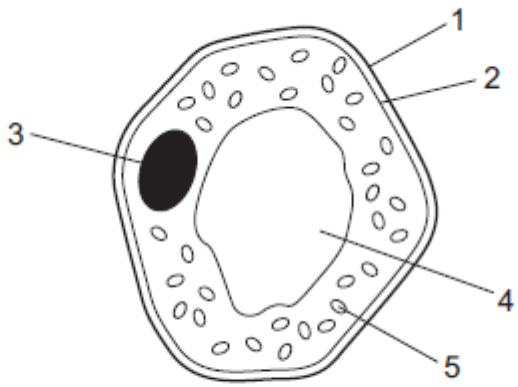
5 The length of a specimen in a photograph is 45 mm. Its actual length is 25 mm.

What is the magnification of the photograph?

A ×0.6 **B** ×1.6 **C** ×1.8 **D** ×1125

Bio 2 **Q# 33/** iGCSE Biology/2016/w/Paper 21/ www.SmashingScience.org :o)

4 The diagram shows a spongy mesophyll cell from a green leaf.

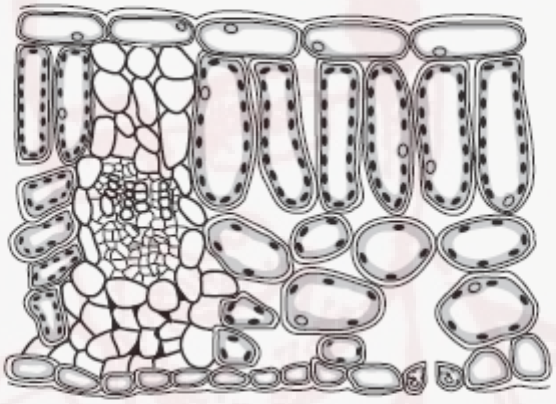


Which labelled structures are **not** found in animal cells?

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

Bio 2 **Q# 34/** iGCSE Biology/2016/s/Paper 21/ www.SmashingScience.org :o)

5 The actual thickness of the leaf shown in the diagram is 2000 μm, but its thickness in the diagram is 50 mm.



What is the magnification of the diagram?

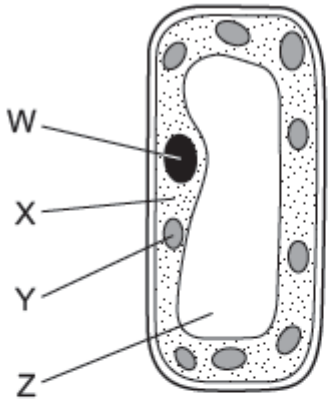
A ×0.025 **B** ×25 **C** ×100 **D** ×100 000

Bio 2 **Q# 35/** iGCSE Biology/2016/s/Paper 21/ www.SmashingScience.org :o)

33 Which structures are present in a bacterial cell?

	cell wall	nucleus
A	✓	✓
B	✓	✗
C	✗	✓
D	✗	✗

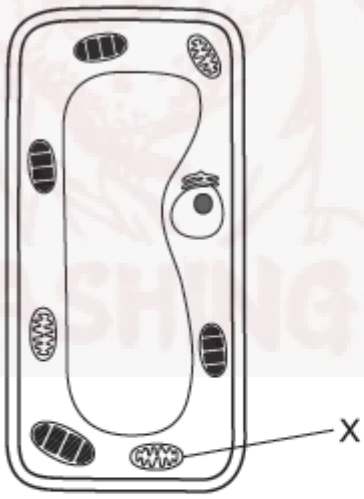
3 The diagram shows a palisade mesophyll cell from a green leaf.



In which labelled part does photosynthesis occur and where is starch stored?

	photosynthesis occurs	starch is stored
A	X	W
B	X	Z
C	Y	X
D	Y	Y

4 The diagram shows the detailed structure of a plant cell.



What is organelle X?

A chloroplast

B mitochondrion

C nucleus

D vacuole

7 By which process do oxygen and carbon dioxide move between cells and capillaries?

A breathing

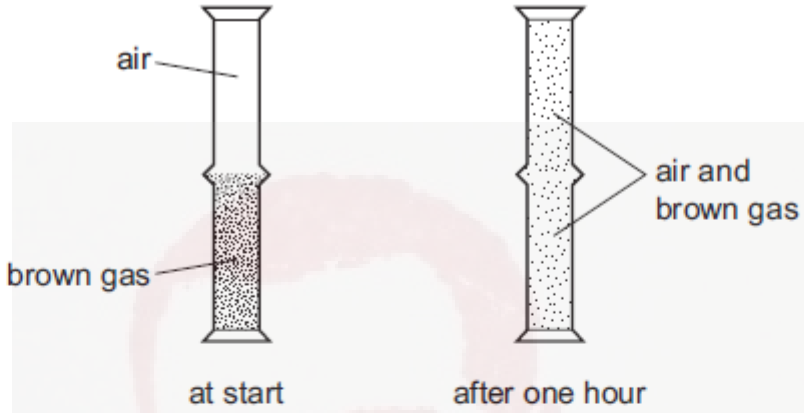
B diffusion

C excretion

D respiration

Bio 3 **Q# 38/** iGCSE Biology/2021/m/Paper 22/ www.SmashingScience.org :o)

7 A jar of air was placed upside down on top of a jar containing a brown gas as shown.



Which process has taken place?

A diffusion both upwards and downwards

B diffusion downwards only

C diffusion upwards only

D diffusion and osmosis

8 Which row describes active transport?

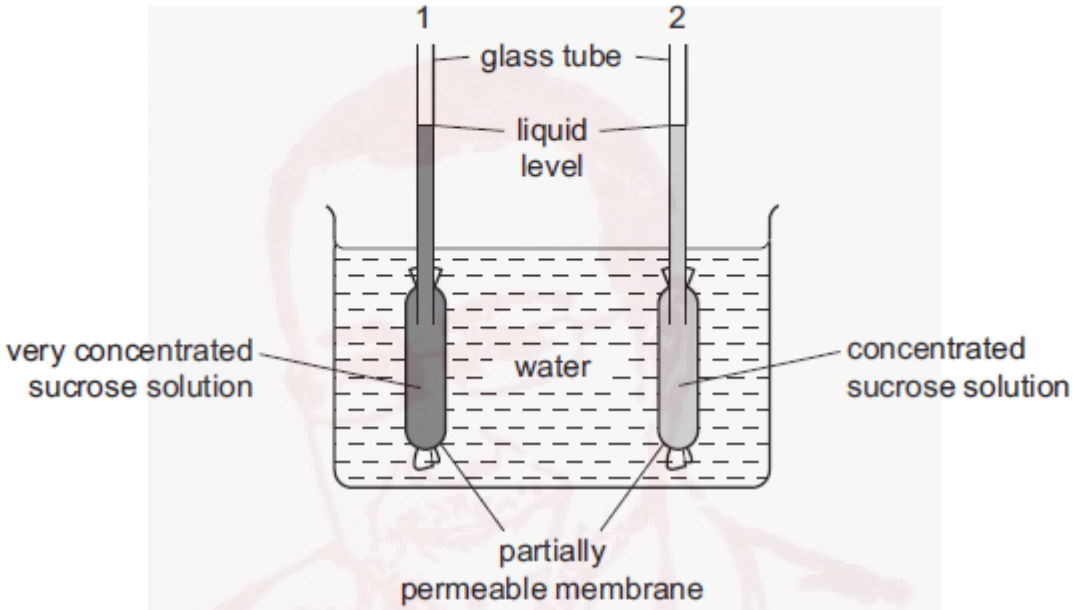
	particles move through a cell membrane		energy from respiration needed
	from a region of	to a region of	
A	higher concentration	lower concentration	no
B	higher concentration	lower concentration	yes
C	lower concentration	higher concentration	no
D	lower concentration	higher concentration	yes

5 What are features of osmosis?

	diffusion is involved	requires cell walls	requires a partially permeable membrane
A	✓	✗	✓
B	✓	✗	✗
C	✗	✓	✓
D	✗	✓	✗

key
✓ = yes
✗ = no

6 The diagram shows apparatus which can be used to demonstrate osmosis.

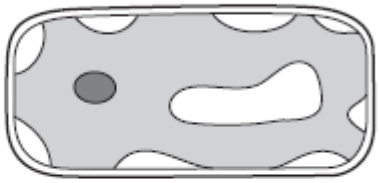


After one hour, what would happen to the liquid levels in the glass tubes?

	liquid level in tube 1	liquid level in tube 2
A	falls	falls
B	falls	rises
C	rises	falls
D	rises	rises

5 Which diagram shows the appearance of a plant cell several minutes after it has been placed in a concentrated solution of sugar?

A



B

C

D

6 Plant cells are placed in a solution with a higher water potential than the plant cell contents.

What will happen?

	direction of water movement	volume of vacuole
A	enters cells	decreases
B	enters cells	increases
C	leaves cells	decreases
D	leaves cells	increases

7 Which row describes osmosis?

	movement of water	energy from respiration used	movement through a partially permeable membrane
A	✓	✓	✗
B	✓	✗	✓
C	✗	✓	✗
D	✗	✗	✓

key

✓ = yes

✗ = no

8 A student made the following statements about the movement of ions by active transport.

1 It is the net movement of particles from a low concentration to a high concentration.

2 It is the net movement of particles from a high concentration to a low concentration.

3 It requires the use of energy from respiration.

4 It can only take place in living cells.

Which statements are correct?

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

Bio 3 **Q# 42/** iGCSE Biology/2019/w/Paper 21/ www.SmashingScience.org :o)

6 Red blood cells were placed in pure water.

Movement of water across the cell membrane caused a change in their appearance.

What caused this change in appearance?

	direction of water movement	from higher to lower water potential	from lower to higher water potential
A	into cells	yes	no
B	into cells	no	yes
C	out of cells	yes	no
D	out of cells	no	yes

7 Some examples of substances moving across membranes are listed.

1 glucose molecules into the epithelium that lines the small intestine

2 nitrate ions from a dilute solution in soil into a more concentrated solution in root hair cells

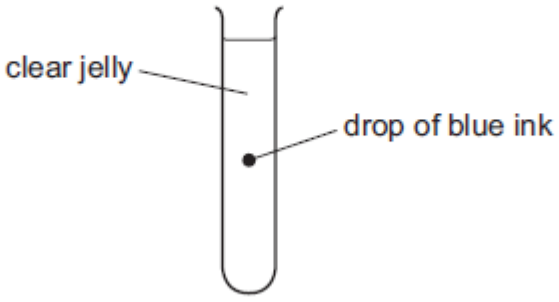
3 water molecules from mesophyll cells into the air spaces of a leaf

For which must oxygen be present?

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

Bio 3 **Q# 43/** iGCSE Biology/2019/s/Paper 21/ www.SmashingScience.org :o)

6 The diagram shows a test-tube containing clear jelly. A drop of blue ink is injected into the middle of the jelly.



The blue colour of the ink spreads throughout the jelly.

By which process does the blue ink spread through the jelly?

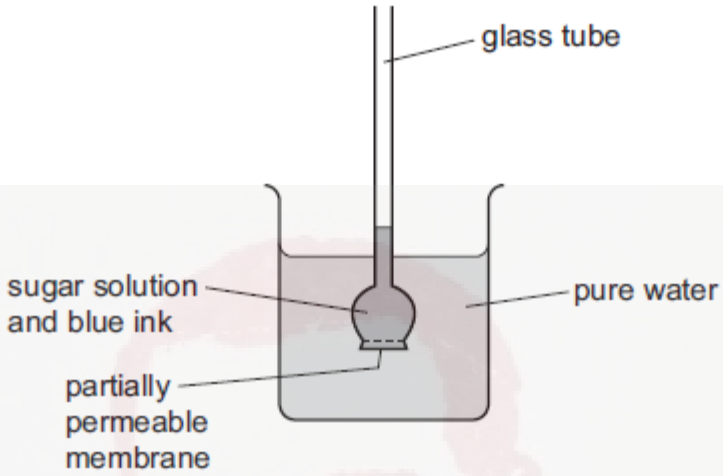
A active transport

B catalysis

C diffusion

D osmosis

7 The apparatus shown was set up.



Some hours later, the water in the beaker had turned blue, and the liquid in the glass tube had moved upwards.

Which processes caused these changes?

	water turned blue	liquid in glass tube moved upwards
A	osmosis	diffusion
B	active transport	osmosis
C	diffusion	active transport
D	diffusion	osmosis

Bio 3 **Q# 44/** iGCSE Biology/2019/m/Paper 22/ www.SmashingScience.org :o)

7 A frog is an animal. A frog's skin is permeable to oxygen and carbon dioxide.

When a frog is swimming in pond water, in which directions will there be a net diffusion of oxygen and carbon dioxide?

	from the frog into the water	from the water into the frog
A	carbon dioxide	oxygen
B	carbon dioxide and oxygen	no movement
C	oxygen	carbon dioxide
D	no movement	carbon dioxide and oxygen

8 Which process only involves the movement of water through the partially permeable membrane of a cell?

A absorption

B evaporation

C osmosis

D transpiration

Bio 3 **Q# 45/** iGCSE Biology/2018/w/Paper 21/ www.SmashingScience.org :o)

5 How do carbon dioxide and oxygen move into and out of a mesophyll cell?

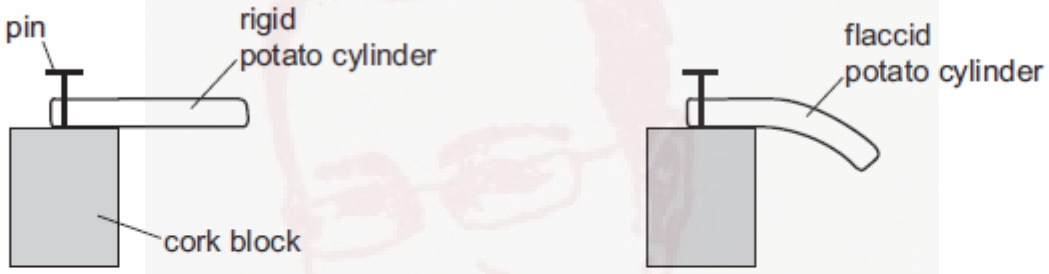
A active transport

B diffusion

C respiration

D transpiration

6 Four freshly cut potato cylinders were soaked for one hour in different salt solutions before being pinned to cork blocks. Two of the blocks are shown.



Which solution would cause the potato cylinder to be most flaccid?

A 0.1 mol per dm^3 salt solution

B 0.3 mol per dm^3 salt solution

C 0.7 mol per dm^3 salt solution

D 1.0 mol per dm^3 salt solution

Bio 3 **Q# 46/** iGCSE Biology/2018/s/Paper 21/ www.SmashingScience.org :o)

7 Which words correctly complete the paragraph?

Diffusion may be defined as the net movement of particles from a region of their .....1..... concentration, to a region of their .....2..... concentration, where movement is .....3..... a concentration gradient.

	1	2	3
A	higher	lower	down
B	higher	lower	up
C	lower	higher	down
D	lower	higher	up

8 Which part of a plant root hair is partially permeable?

A the cell sap

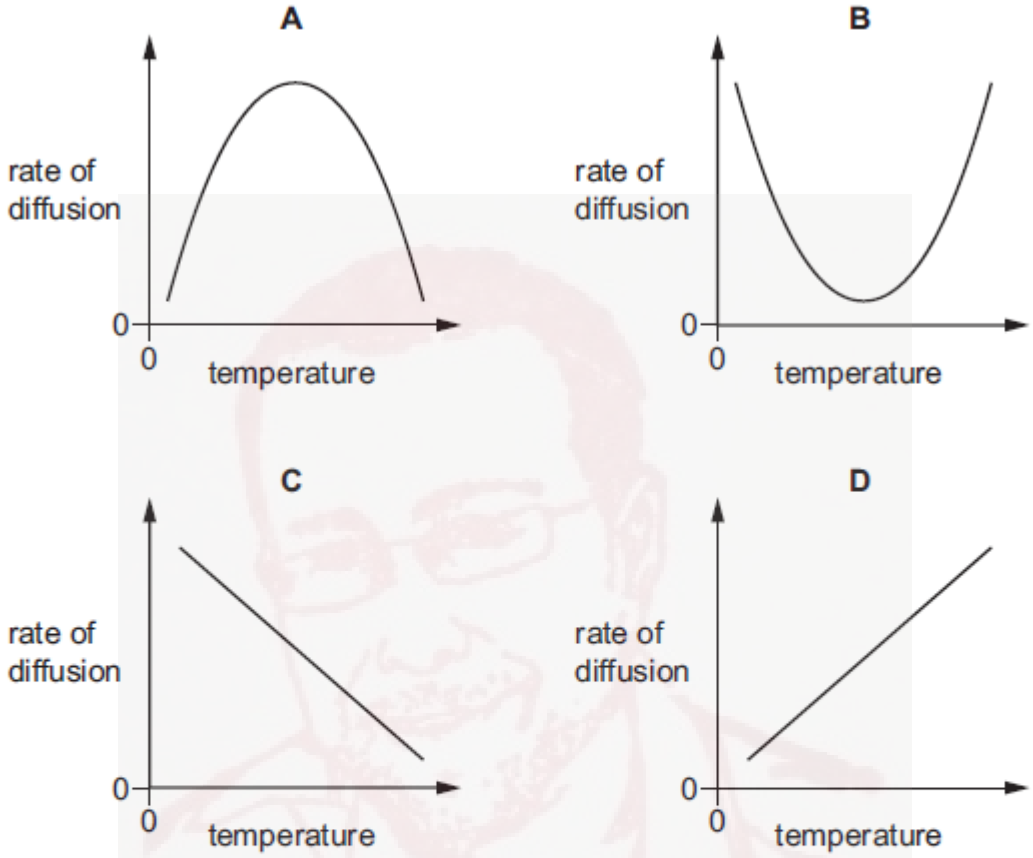
B the cell surface membrane

C the cell vacuole

D the cell wall

Bio 3 **Q# 47/** iGCSE Biology/2018/m/Paper 22/ www.SmashingScience.org :o)

6 Which graph represents the effect of increasing temperature on the rate of diffusion?



7 Protoplasts are plant cells that have had their cell walls removed.

What happens if plant protoplasts are placed in distilled water?

A They get larger and become turgid.

B They get larger and burst.

C They get smaller and become plasmolysed.

D They get smaller and shrivel up.

5 Different factors affect the rate of diffusion of molecules across a membrane.

Which row represents changes to factors that will increase the rate of diffusion?

	concentration gradient across a membrane	thickness of membrane	surface area of membrane	temperature
A	decrease	decrease	increase	increase
B	decrease	increase	increase	decrease
C	increase	decrease	increase	increase
D	increase	increase	decrease	decrease

6 A red blood cell and a palisade mesophyll cell are placed in a solution which has a higher water potential than the cells.

What will happen to each cell?

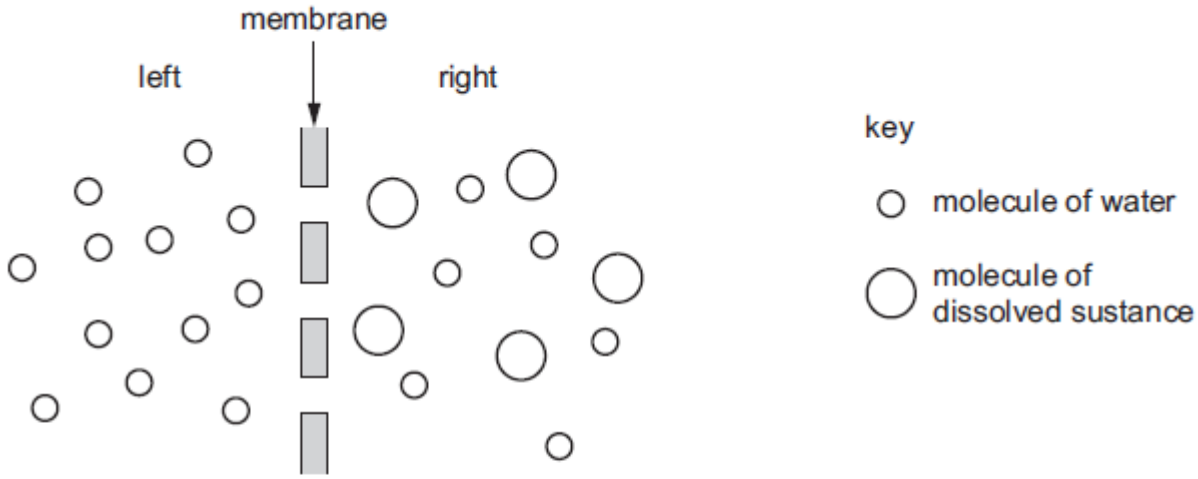
	red blood cell	palisade mesophyll cell
A	bursts	bursts
B	bursts	gains mass
C	loses mass	gains mass
D	loses mass	loses mass

5 Which characteristics are correct for **both** osmosis and diffusion?

	require a partially permeable membrane	require a concentration gradient	are energy consuming processes
A	✓	✓	✗
B	✓	✗	✓
C	✗	✓	✗
D	✗	✗	✓

Bio 3 **Q# 50/** iGCSE Biology/2017/m/Paper 22/ www.SmashingScience.org :o)

7 The diagram represents two liquids, separated by a membrane through which osmosis can occur.



Which statement describes how the molecules will move?

A Molecules of dissolved substance move from left to right.

B Molecules of dissolved substance move from right to left.

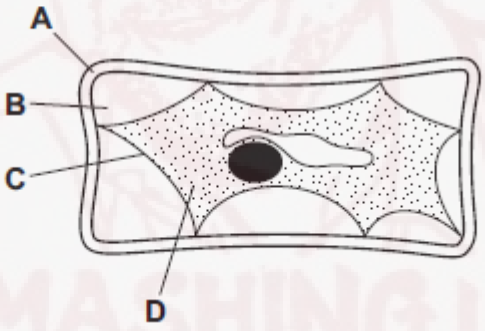
C Overall, water molecules move from left to right.

D Overall, water molecules move from right to left.

Bio 3 **Q# 51/** iGCSE Biology/2016/w/Paper 21/ www.SmashingScience.org :o)

6 The diagram shows a plant cell which has lost water to its surroundings by osmosis.

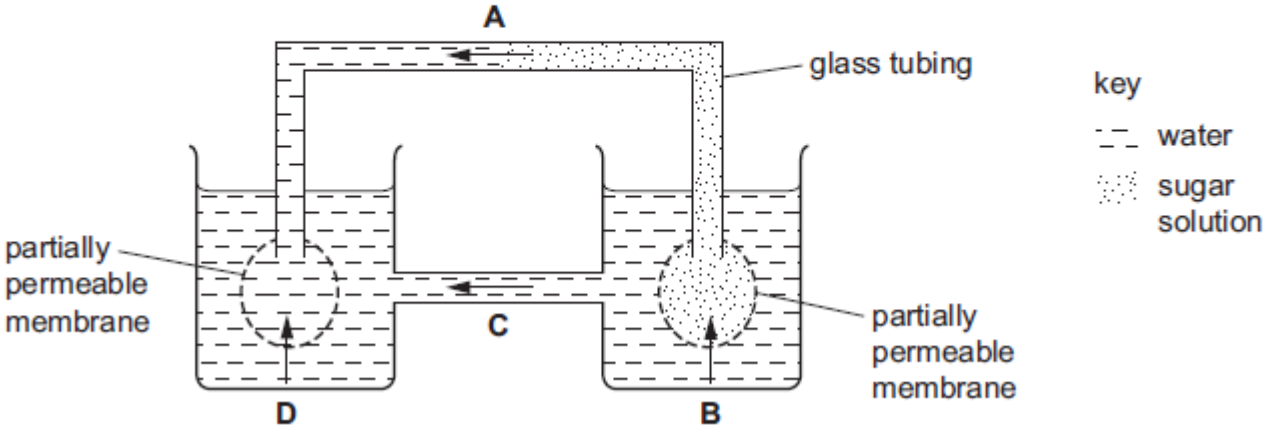
Which part is the partially permeable membrane?



Bio 3 **Q# 52/** iGCSE Biology/2016/s/Paper 21/ www.SmashingScience.org :o)

6 The diagram shows an experiment on osmosis.

Which arrow shows the direction of the net movement of water at the start of the experiment?



7 Active transport is the movement of

A molecules from a region of their higher concentration to a region of their lower concentration.

B particles from a region of lower concentration to a region of higher concentration using energy from respiration.

C urine by relaxation of a sphincter muscle in the bladder.

D water through a partially permeable membrane from a more dilute to a more concentrated solution.

Bio 3 **Q# 53/** iGCSE Biology/2016/m/Paper 22/ www.SmashingScience.org :o)

5 The data show the results of an investigation on osmosis using sticks of potato.

concentration of sugar solution / mol per dm^3	length of potato stick at start / mm	length of potato stick after 24 hours / mm
0.6	60	54

Which statements explain this change in length?

	movement of water	cause of the movement
A	into the potato cells	The sugar solution has a higher water potential than the potato cells.
B	into the potato cells	The sugar solution has a lower water potential than the potato cells.
C	out of the potato cells	The sugar solution has a higher water potential than the potato cells.
D	out of the potato cells	The sugar solution has a lower water potential than the potato cells.

6 What causes the diffusion of oxygen into a plant cell?

A active transport

B movement of molecules

C osmosis

D photosynthesis

7 What is **not** an example of active transport?

A absorption of water by root hairs

B reabsorption of glucose by kidney tubules

C uptake of glucose by villi

D uptake of ions by root hairs

9 Which element is found in proteins but **not** carbohydrates?

A carbon

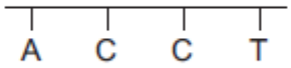
B hydrogen

C nitrogen

D oxygen

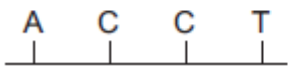
Bio 4 **Q# 55/** iGCSE Biology/2021/s/Paper 21/ www.SmashingScience.org :o)

10 The diagram shows a short section of a single strand of DNA.

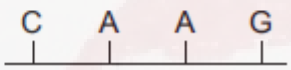


Which strand of DNA will combine with this strand to form part of a double helix?

A

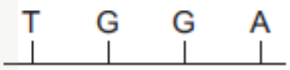


B



C

D



Bio 4 **Q# 56/** iGCSE Biology/2021/m/Paper 22/ www.SmashingScience.org :o)

9 The bases on one strand of a DNA molecule have the sequence CAGCT.

What is the sequence of bases on the other strand?

A CAGCT **B** GTCGA **C** TGATC **D** GCTAG

Bio 4 **Q# 57/** iGCSE Biology/2020/w/Paper 21/ www.SmashingScience.org :o)

7 Which substances are made by linking together glucose molecules only?

A cellulose, glycogen and starch

B fats, cellulose and proteins

C proteins, oils and glycogen

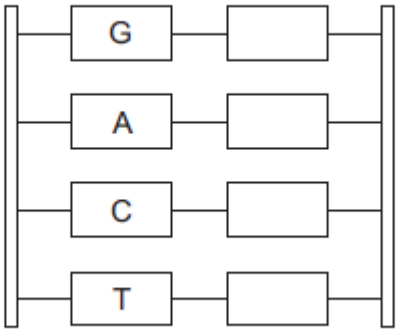
D starch, fats and oils

8 When bases pair up in the formation of DNA, what is one of the pairings?

A G with A **B** G with C **C** G with G **D** G with T

Bio 4 **Q# 58/** iGCSE Biology/2020/s/Paper 21/ www.SmashingScience.org :o)

7 The diagram shows a section of DNA, with four bases identified on one strand.



Which sequence of bases would be on the other strand, starting from the top?

A AGTC **B** CTGA **C** GACT **D** TCAG

8 Which food-testing solution shows a positive result when it turns from blue to purple?

A Benedict's solution

B biuret solution

C ethanol

D iodine solution

Bio 4 **Q# 59/** iGCSE Biology/2019/w/Paper 21/ www.SmashingScience.org :o)

8 Which identifies the chemical elements found in proteins?

	carbon	hydrogen	oxygen	nitrogen
A	✓	✓	✓	✓
B	✓	✓	✓	✗
C	✓	✗	✓	✗
D	✗	✓	✗	✓

key
✓ = present
✗ = absent

Bio 4 **Q# 60/** iGCSE Biology/2019/s/Paper 21/ www.SmashingScience.org :o)

8 Four solutions were tested to see whether they contained protein, starch or glucose.

The colours of the solutions after the tests are recorded in the table.

Which solution contained protein and glucose but **not** starch?

	biuret test	iodine test	Benedict's test
A	blue	brown	orange
B	blue	blue-black	blue
C	purple	brown	orange
D	purple	blue-black	blue

9 Small molecules are used as the basic units in the synthesis of large food molecules.

Which statement is correct?

A Amino acids are basic units of carbohydrates.

B Fatty acids are basic units of glycogen.

C Glycerol is a basic unit of oils.

D Simple sugar is a basic unit of protein.

Bio 4 **Q# 61/** iGCSE Biology/2018/w/Paper 21/ www.SmashingScience.org :o)

7 The data show the concentrations of sugar and starch in an onion.

total sugar including reducing sugar /g per 100g	starch /g per 100g
3.7	0.0

The onion is tested with Benedict's solution and iodine solution.

Which set of results is correct?

	Benedict's solution	iodine solution
A	blue	blue-black
B	blue	brown
C	brick red	blue-black
D	brick red	brown

8 Which statement about the structure of DNA is correct?

A Base A always pairs with base C.

B Base A always pairs with base T.

C It consists of proteins.

D It forms a single helix.

Bio 4 **Q# 62/** iGCSE Biology/2018/s/Paper 21/ www.SmashingScience.org :o)

9 The table shows the results of food tests carried out on a fruit.

test	Benedict's	biuret	ethanol	iodine
result	positive	positive	negative	negative

What did the fruit contain?

A fat and reducing sugar

B fat and starch

C protein and reducing sugar

D protein and starch

Bio 4 **Q# 63/** iGCSE Biology/2018/m/Paper 22/ www.SmashingScience.org :o)

8 When a food substance is tested with iodine solution, which colour shows the presence of starch?

A blue-black

B brown

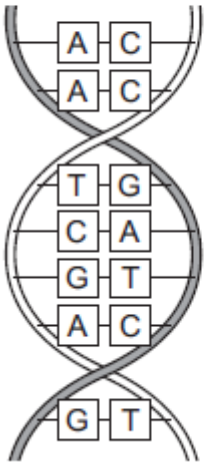
C orange

D purple

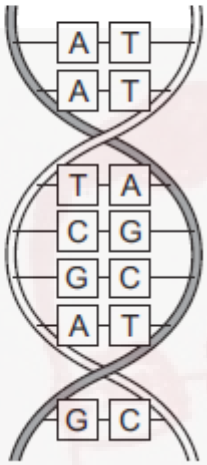
Bio 4 **Q# 64/** iGCSE Biology/2017/s/Paper 21/ www.SmashingScience.org :o)

6 Which diagram shows the structure of DNA?

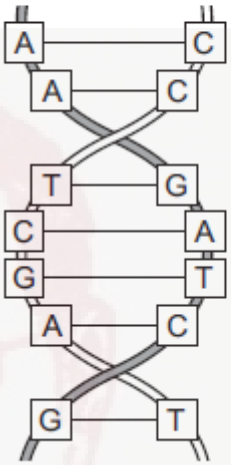
A



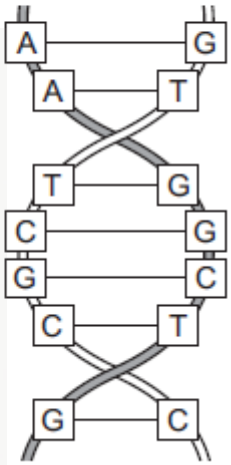
B



C



D



Bio 4 **Q# 65/** iGCSE Biology/2017/m/Paper 22/ www.SmashingScience.org :o)

8 Which element is found in proteins but **not** carbohydrates?

A carbon

B hydrogen

C nitrogen

D oxygen

Bio 4 **Q# 66/** iGCSE Biology/2016/s/Paper 21/ www.SmashingScience.org :o)

8 When bases pair up in the formation of DNA, what is one of the pairings?

A G with A **B** G with C **C** G with G **D** G with T

9 Small molecules are used as the basic units in the synthesis of large food molecules.

Which statement is correct?

A Amino acids are basic units of carbohydrates.

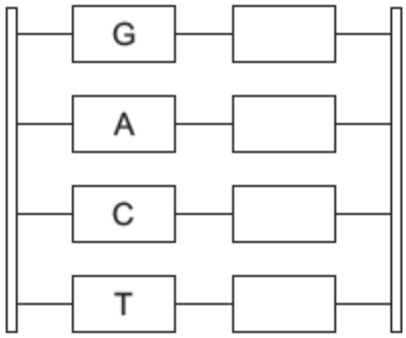
B Fatty acids are basic units of glycogen.

C Glycerol is a basic unit of oils.

D Simple sugar is a basic unit of protein.

Bio 4 **Q# 67/** iGCSE Biology/2016/m/Paper 22/ www.SmashingScience.org :o)

8 The diagram shows a section of DNA, with four bases identified on one strand.



Which sequence of bases would be on the other strand, starting from the top?

A AGTC **B** CTGA **C** GACT **D** TCAG

Paper 2 Bio Topic# 5 **Q# 68/** iGCSE Biology/2021/s/Paper 21/ www.SmashingScience.org :o)

12 Which statement describes a catalyst?

A a substance that decreases the rate of a chemical reaction and is not changed by the reaction

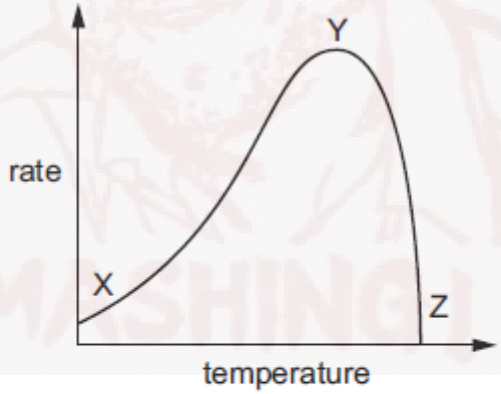
B a substance that decreases the rate of a chemical reaction and is changed by the reaction

C a substance that increases the rate of a chemical reaction and is changed by the reaction

D a substance that increases the rate of a chemical reaction and is not changed by the reaction

Bio 5 **Q# 69/** iGCSE Biology/2021/m/Paper 22/ www.SmashingScience.org :o)

10 The graph shows the effect of temperature on the rate of an enzyme-controlled reaction.



Which statements are correct?

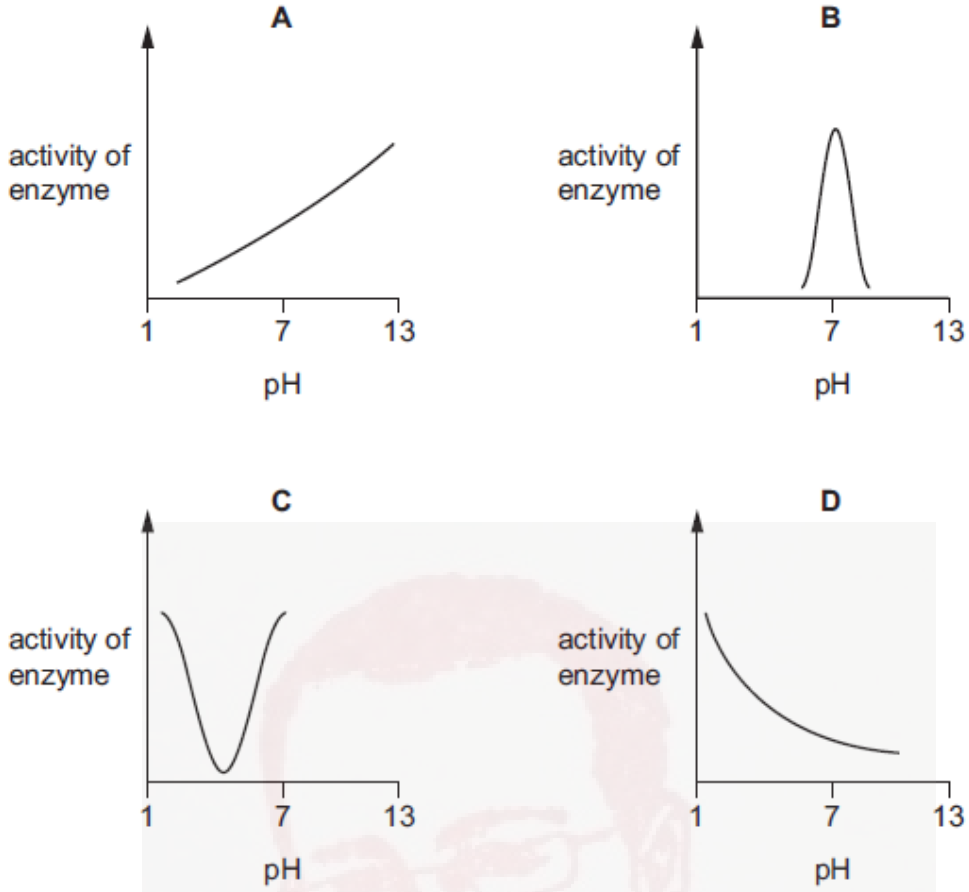
1 The collision frequency between substrate and enzyme increases between X and Y.

2 The shape of the active site is altered between Y and Z.

3 The enzyme is denatured irreversibly at X and Z.

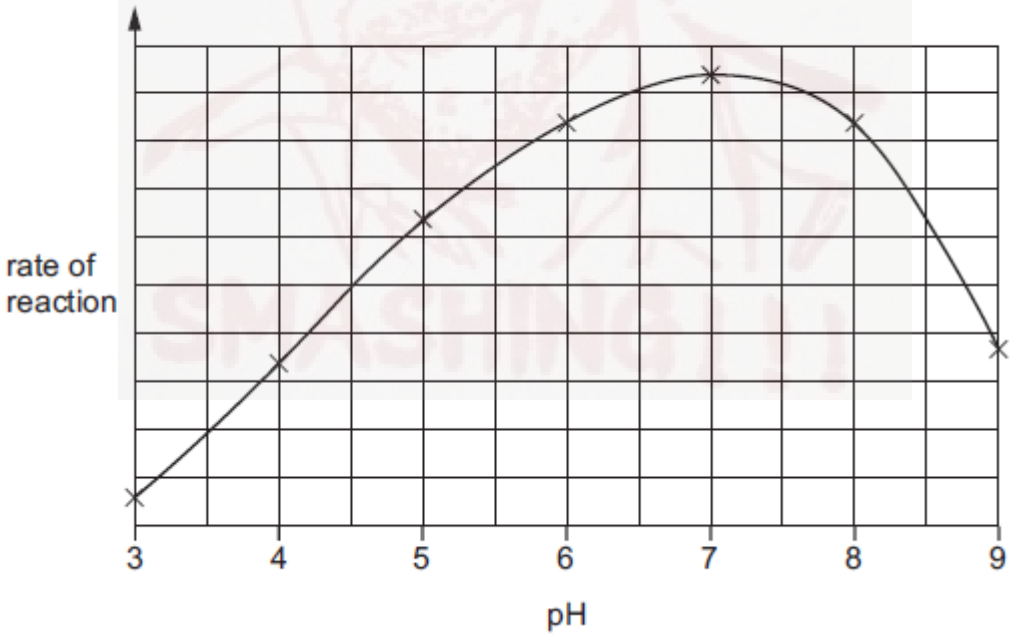
A 1, 2 and 3 **B** 1 and 2 only **C** 1 only **D** 2 and 3 only

11 Which graph represents the effect of pH on the activity of a digestive enzyme?



Bio 5 **Q# 70/** iGCSE Biology/2020/w/Paper 21/ www.SmashingScience.org :o)

9 The graph shows the effect of pH on the rate of reaction of an enzyme.



What does the graph show?

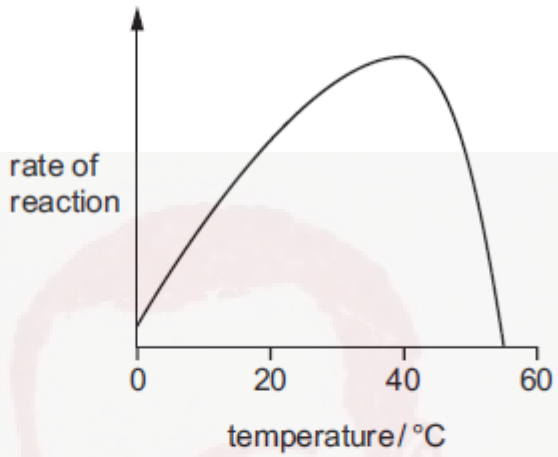
A The enzyme is destroyed at pH 9.

B The enzyme works best at pH 6.

C The rate of reaction halves as the pH changes from pH 5 to pH 7.

D The rate of reaction is the same at pH 5 and pH 8.5.

10 The graph shows how enzyme activity is affected by temperature.



How can the change in activity between 40 °C and 55 °C be explained?

A Heat has killed the enzyme.

B The enzyme has been used up.

C The reactants are moving faster.

D The substrate is less likely to fit into the active site.

Bio 5 **Q# 71/** iGCSE Biology/2020/s/Paper 21/ www.SmashingScience.org :o)

9 What is the definition of an enzyme?

A a carbohydrate that acts as a catalyst

B a DNA molecule that acts as a catalyst

C a fat that acts as a catalyst

D a protein that acts as a catalyst

Bio 5 **Q# 72/** iGCSE Biology/2020/m/Paper 22/ www.SmashingScience.org :o)

9 A test was performed on a food substance. A positive result was shown by a colour change to blue-black.

What solution was used for the test?

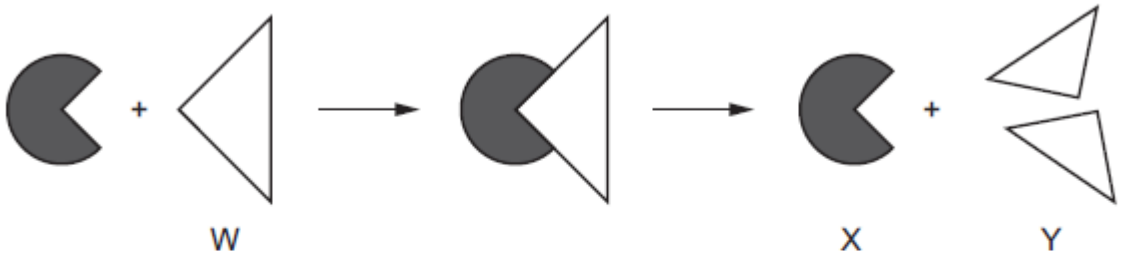
A biuret solution

B DCPIP solution

C iodine solution

D Benedict's solution

11 The diagram represents enzyme action.



What are parts W, X and Y in this chemical reaction?

	enzyme	product	substrate
A	W	X	Y
B	X	W	Y
C	X	Y	W
D	Y	W	X

9 What is the correct definition of the term *enzyme*?

A carbohydrates that act as biological catalysts

B carbohydrates that act as substrates

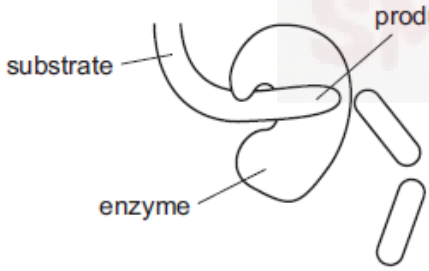
C proteins that act as biological catalysts

D proteins that act as substrates

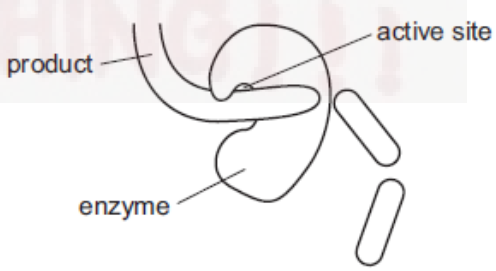
10 The diagrams show a protease enzyme catalysing the breaking of part of a protein molecule into smaller pieces.

Which diagram has three correct labels?

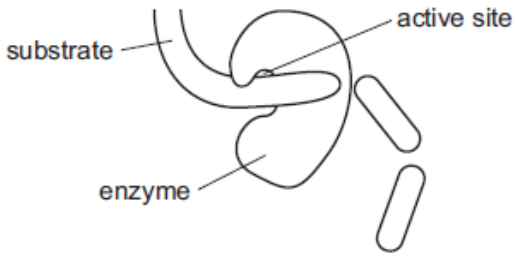
A



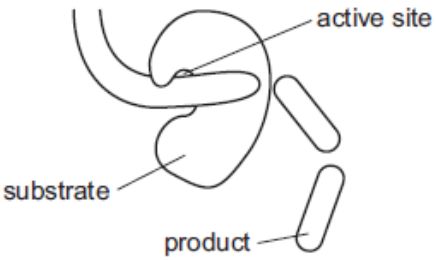
B



C



D



9 Which statement about biological molecules is correct?

A DNA contains the bases A, C, G and T.

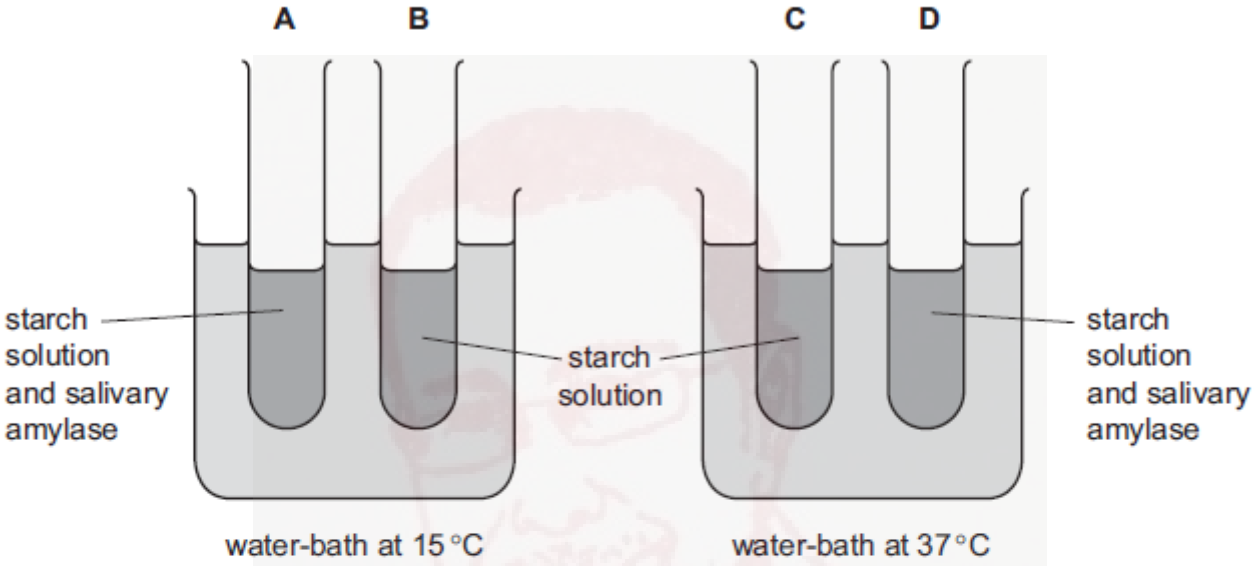
B Glycogen is made from glycerol molecules.

C Oils are made from amino acids and glucose.

D Proteins are made from fatty acids.

9 The apparatus shown is used for an experiment on starch digestion.

Which test-tube contains the most sugar after 20 minutes?



10 A student wrote some notes about enzymes.

She wrote:

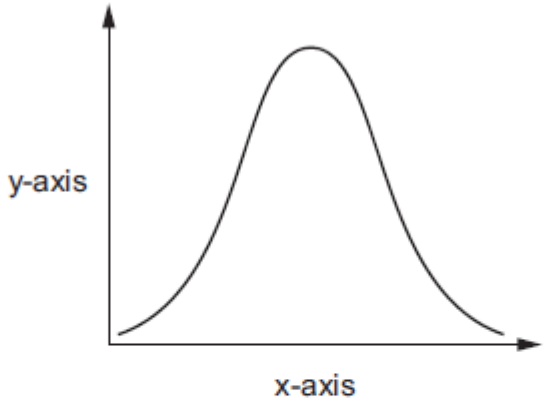
'The .....1..... of the enzyme is .....2..... to an area on the substrate.

This area on the substrate can fit into it to form an .....3..... complex'.

Which words correctly complete gaps 1, 2 and 3?

	1	2	3
A	active site	complementary	enzyme-substrate
B	active site	similar	enzyme-product
C	shape	complementary	enzyme-product
D	shape	similar	enzyme-substrate

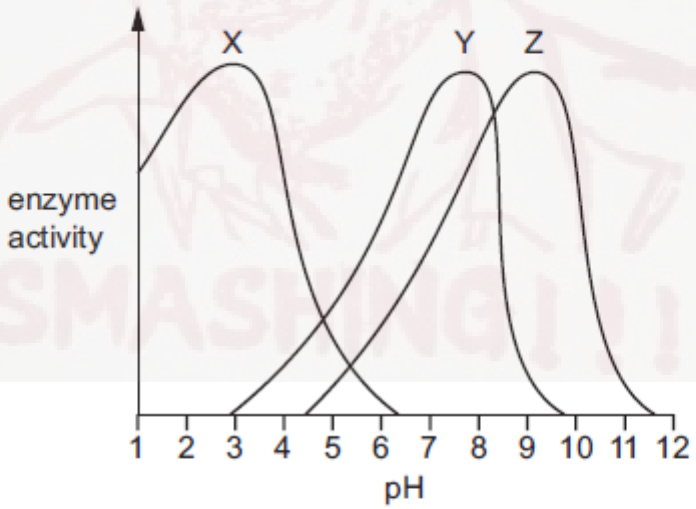
10 An experiment was carried out to investigate the effect of pH on enzyme action. The graph shows the results.



What are the labels for the x-axis and the y-axis?

	x-axis	y-axis
A	pH	rate of reaction
B	pH	time
C	rate of reaction	pH
D	time	pH

9 The graph shows the activity of three digestive enzymes at differing pH levels.



Which statement is correct?

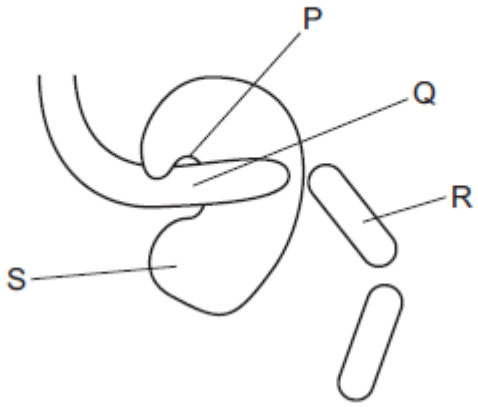
A Enzymes X and Y are both active at pH 7.

B Enzymes X and Z are both active at pH 4.

C Enzymes Y and Z are both active at pH 4.

D Enzymes Y and Z are both active at pH 8.

7 The diagram shows a protease molecule catalysing the break down of a protein molecule.



What are the parts labelled P, Q, R and S?

	enzyme	product	substrate	active site
A	P	Q	R	S
B	R	S	P	Q
C	S	P	Q	R
D	S	R	Q	P

8 The diagram shows the structure of part of a DNA molecule.

What does X represent?

A amino acid

B base

C carbon

D protein

9 Which statement about enzymes is correct?

A Enzymes become part of the product.

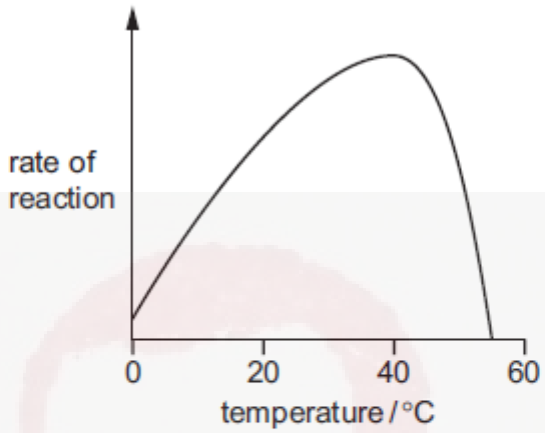
B Lowering the pH always slows down the reaction rate.

C Raising the temperature always increases the reaction rate.

D The specificity of an enzyme depends on the shape of its active site.

Bio 5 **Q# 81/** iGCSE Biology/2017/s/Paper 21/ www.SmashingScience.org :o)

7 The graph shows how enzyme activity is affected by temperature.



How can the change in activity between 40 °C and 55 °C be explained?

A Heat has killed the enzyme.

B The enzyme has been used up.

C The reactants are moving faster.

D The substrate is less likely to fit into the active site.

Bio 5 **Q# 82/** iGCSE Biology/2017/m/Paper 22/ www.SmashingScience.org :o)

9 Many enzymes do not work at temperatures above 60 °C.

Which statement explains this?

A Product molecules are not made because the active site has changed shape.

B Product molecules change shape so they do not fit the active site.

C Substrate molecules are moving too fast.

D Substrate molecules are moving too slowly.

Bio 5 **Q# 83/** iGCSE Biology/2016/w/Paper 21/ www.SmashingScience.org :o)

8 What controls the speed of chemical reactions in all living cells?

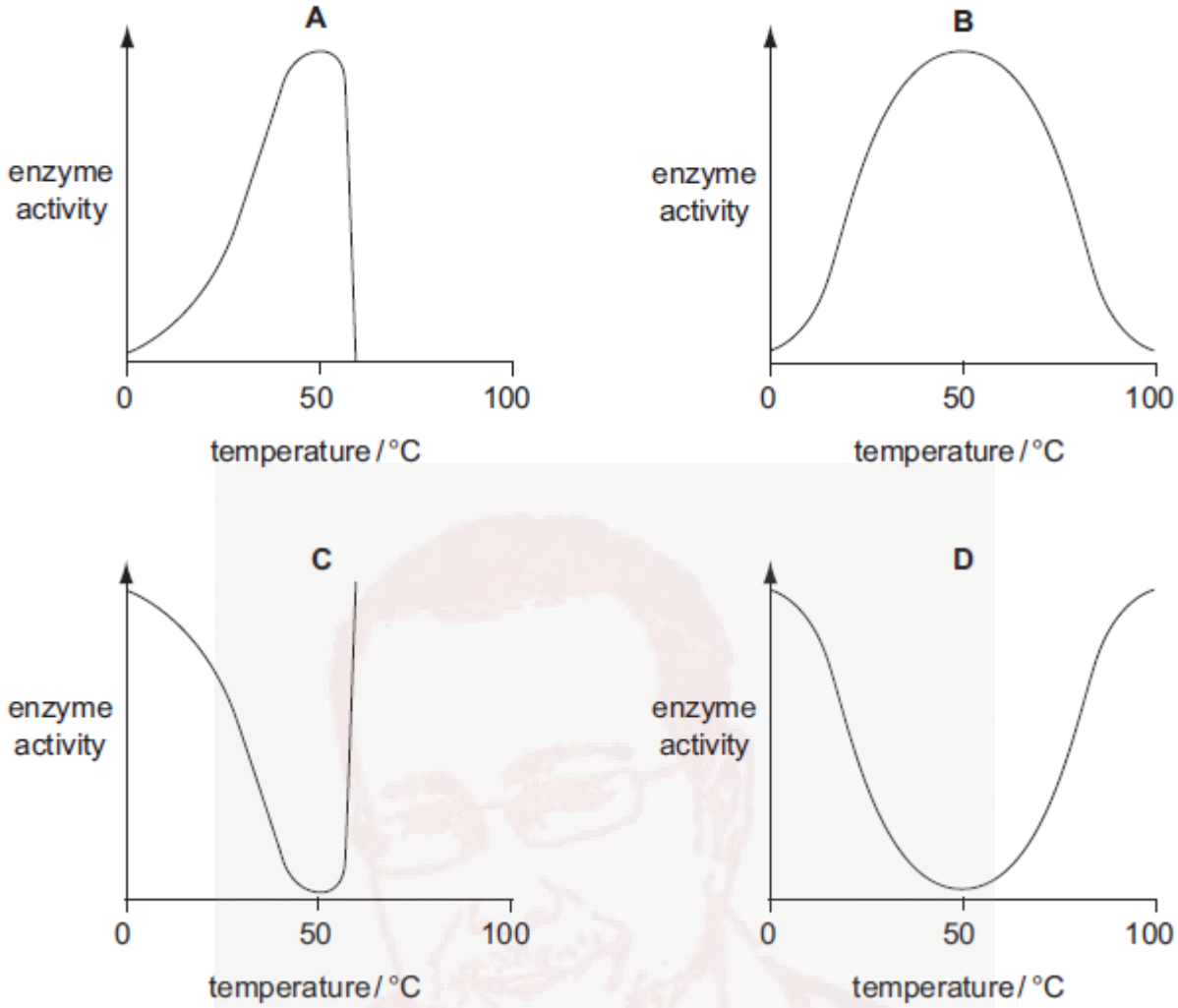
A enzymes

B hormones

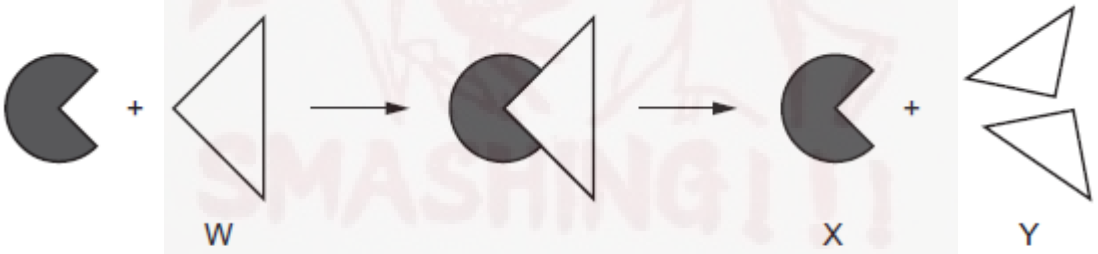
C ions

D vitamins

10 Which graph shows the effect of temperature on the activity of an enzyme?



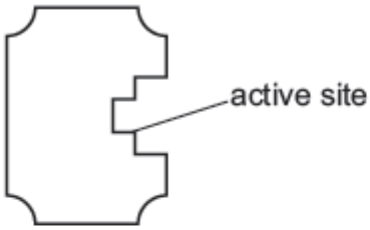
11 The diagram represents enzyme action.



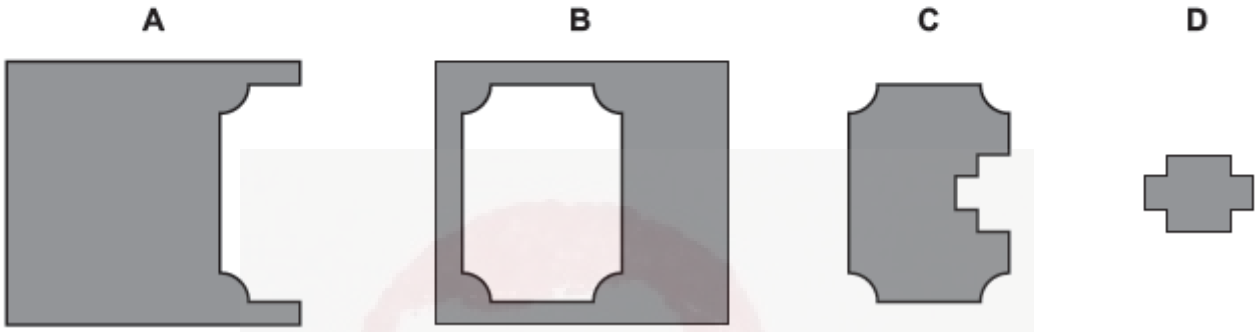
What are parts W, X and Y in this chemical reaction?

	enzyme	product	substrate
A	W	X	Y
B	X	W	Y
C	X	Y	W
D	Y	W	X

10 The diagram represents the shape of an enzyme molecule.

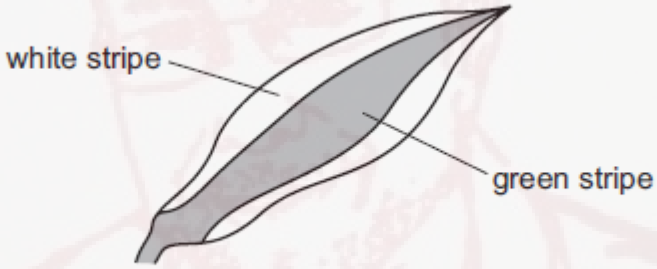


With which substrate would this enzyme most easily form an enzyme-substrate complex?



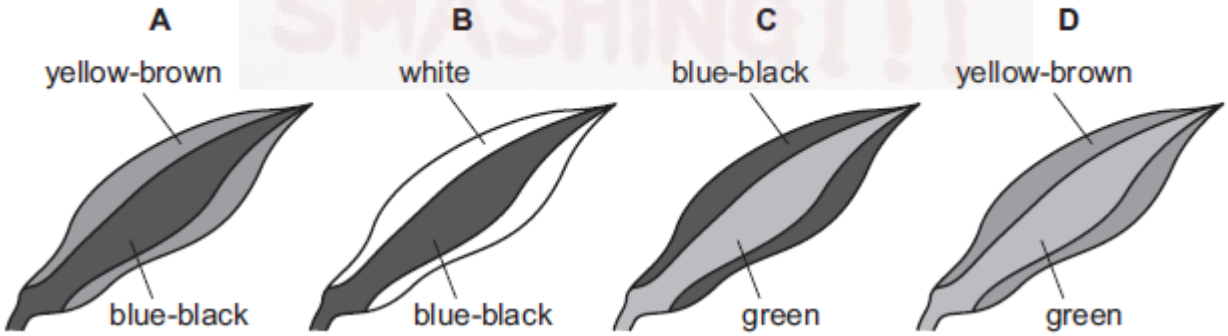
Paper 2 Bio Topic# 6 **Q# 86/** iGCSE Biology/2021/s/Paper 21/ www.SmashingScience.org :o)

13 A plant with striped leaves was kept in bright light for six hours.



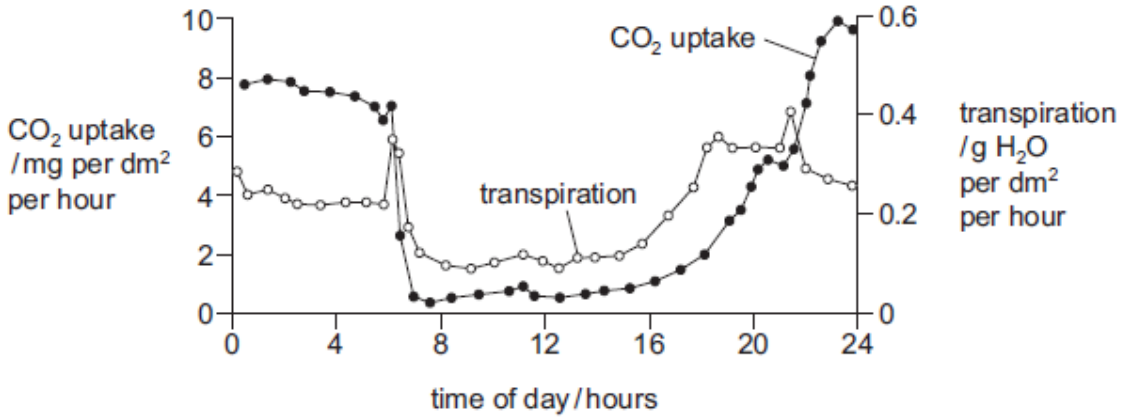
A leaf was taken from the plant and the chlorophyll was removed. The leaf was then tested for starch using iodine solution.

Which diagram shows the result of the test?



14 The graph shows daily carbon dioxide uptake and transpiration by the plant *Agave americana*.

The plant is adapted to live in very dry conditions.



What can be concluded from this graph?

A More stomata are closed during dark periods.

B More stomata are closed during light periods.

C There is no carbon dioxide uptake during dark periods.

D There is no water uptake during light periods.

Bio 6 **Q# 87/** iGCSE Biology/2021/m/Paper 22/ www.SmashingScience.org :o)

12 In which process is oxygen a waste product?

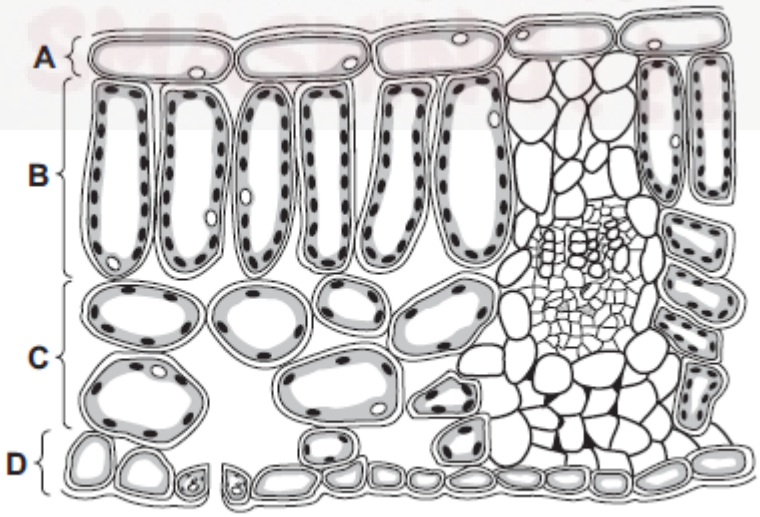
A active transport

B aerobic respiration

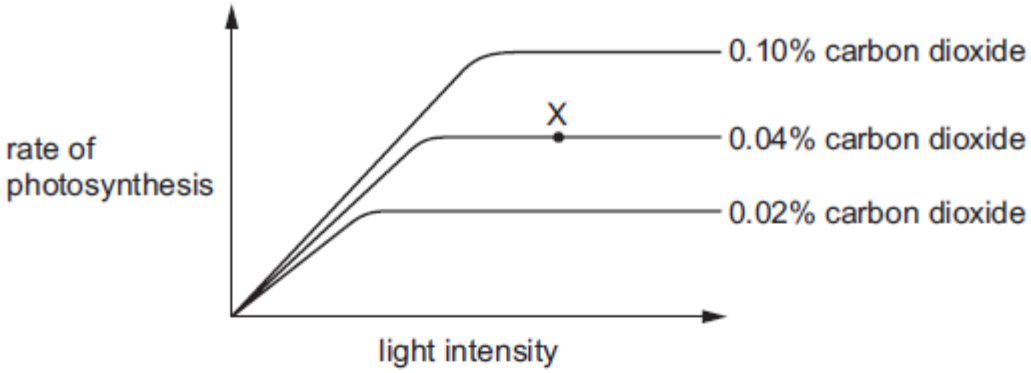
C anaerobic respiration

D photosynthesis

13 Which layer in the leaf contains interconnecting air spaces?



11 The graph shows how the rate of photosynthesis of a plant changes with light intensity, at three different carbon dioxide concentrations. In each case the temperature is 15 °C.



What is the limiting factor for the rate of photosynthesis at point X on the graph?

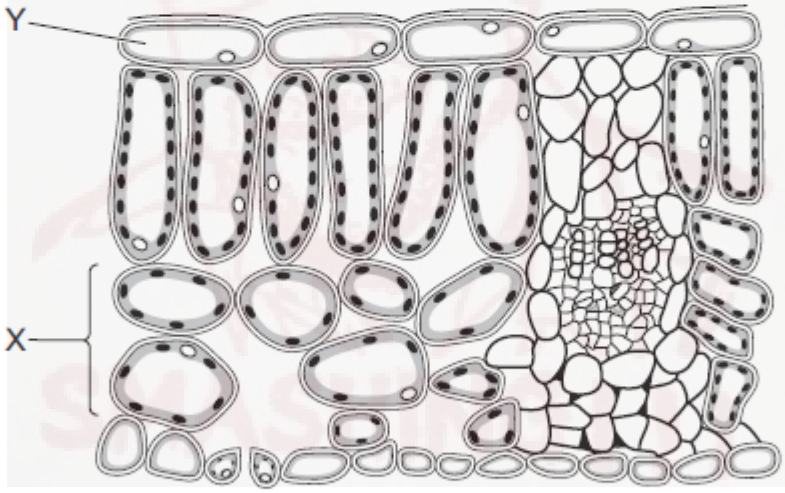
A carbon dioxide concentration

B light intensity

C surface area of the plant

D temperature

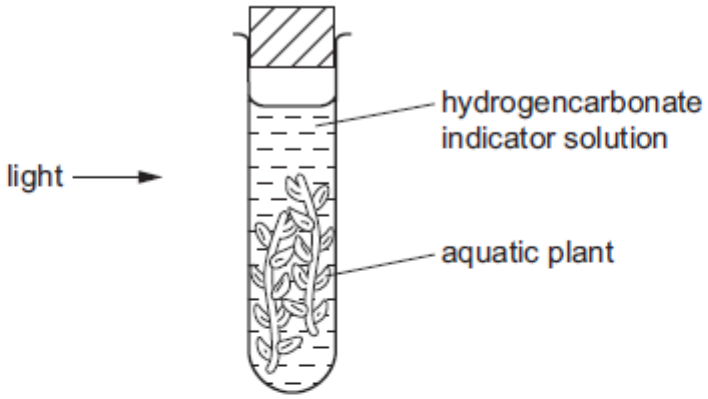
12 The diagram shows a section through a leaf.



Which row correctly identifies tissues X and Y?

	X	Y
A	palisade mesophyll	cuticle
B	palisade mesophyll	upper epidermis
C	spongy mesophyll	cuticle
D	spongy mesophyll	upper epidermis

10 An experiment is set up to investigate gas exchange in aquatic plants.



The hydrogencarbonate indicator solution is orange at the start.

Which colour is it after three hours?

A blue-black

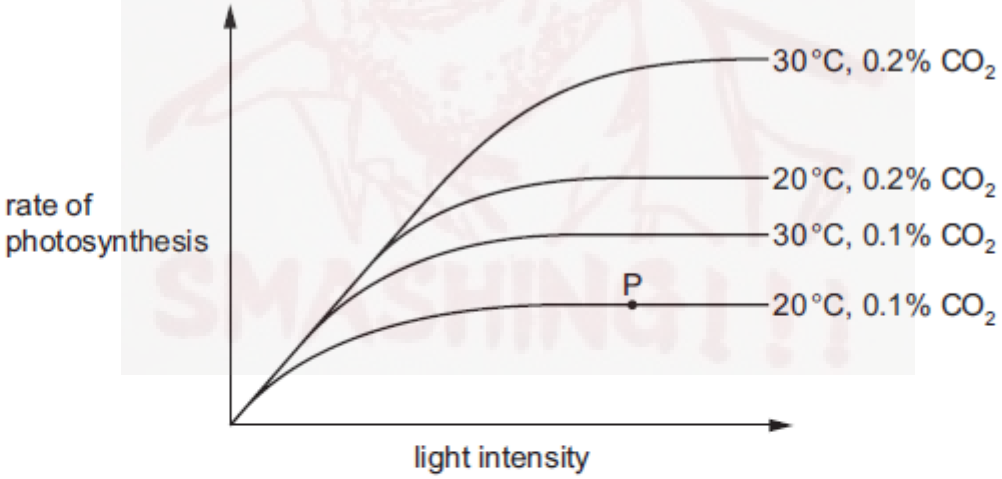
B orange

C purple

D yellow

11 The diagram shows how the rate of photosynthesis varies with light intensity.

The four curves show different conditions of temperature and carbon dioxide concentration.



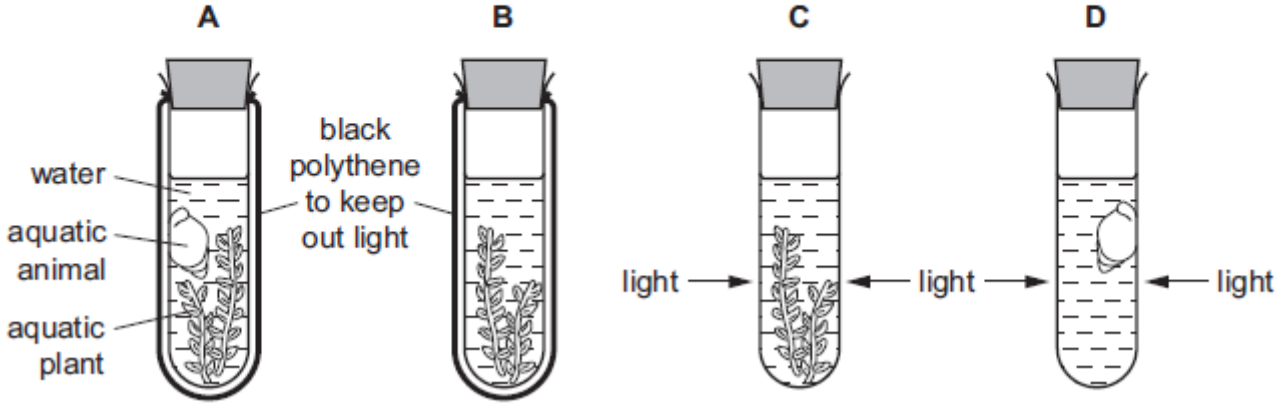
What limits the rate of photosynthesis at point P?

	light intensity	carbon dioxide concentration	temperature
A	✓	✓	✗
B	✓	✗	✗
C	✗	✓	✓
D	✗	✗	✓

key
✓ = yes
✗ = no

12 Four test-tubes are set up as shown.

Which test-tube contains the least carbon dioxide after one hour?



Bio 6 **Q# 90/** iGCSE Biology/2020/m/Paper 22/ www.SmashingScience.org :o)

12 A student drew a diagram to show the substances used and produced in photosynthesis in a leaf.

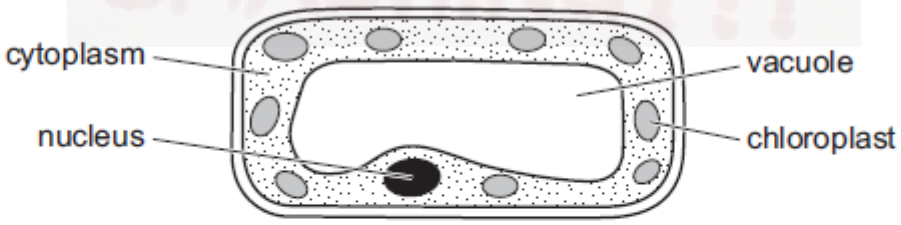
1 + 2 are used by the leaf

3 + 4 are produced by the leaf

Which row shows the correct labels for the diagram?

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

13 The diagram shows a type of plant cell.



In which tissue is this cell found?

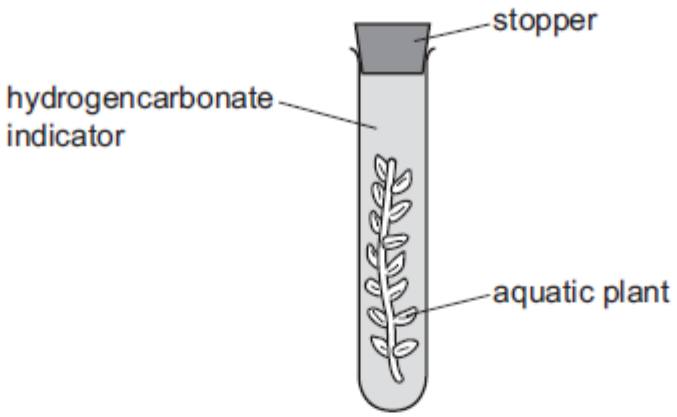
A leaf epidermis

B palisade mesophyll

C root epidermis

D xylem

10 Two sealed test-tubes containing aquatic plants and hydrogencarbonate indicator were set up.



The indicator in the sealed test-tubes shows the concentration of dissolved carbon dioxide present.

concentration of carbon dioxide	colour of indicator
low	red
medium	orange
high	yellow

One of the sealed test-tubes was kept in the light for 24 hours and one of the sealed test-tubes was kept in the dark for 24 hours.

The results are shown in the table.

test-tube kept in	start colour	end colour
light	orange	red
dark	orange	yellow

What is the correct explanation of what has taken place?

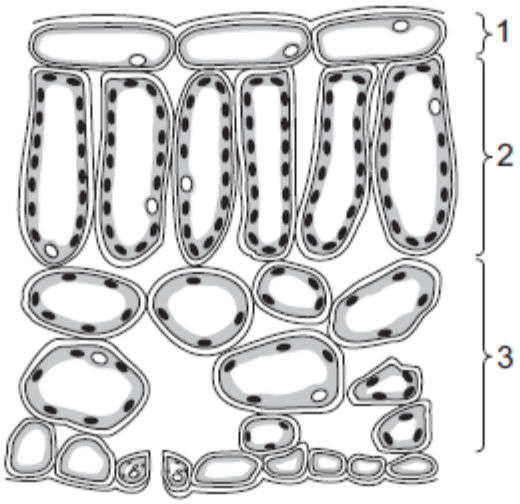
A Photosynthesis and respiration both occur in the light, but the rate of photosynthesis is higher.

B Photosynthesis occurs in the light, but respiration does not.

C Respiration can only occur when photosynthesis is not taking place.

D The amount of carbon dioxide used and produced in the light is equal.

11 The diagram shows a leaf as seen in cross-section under the microscope.



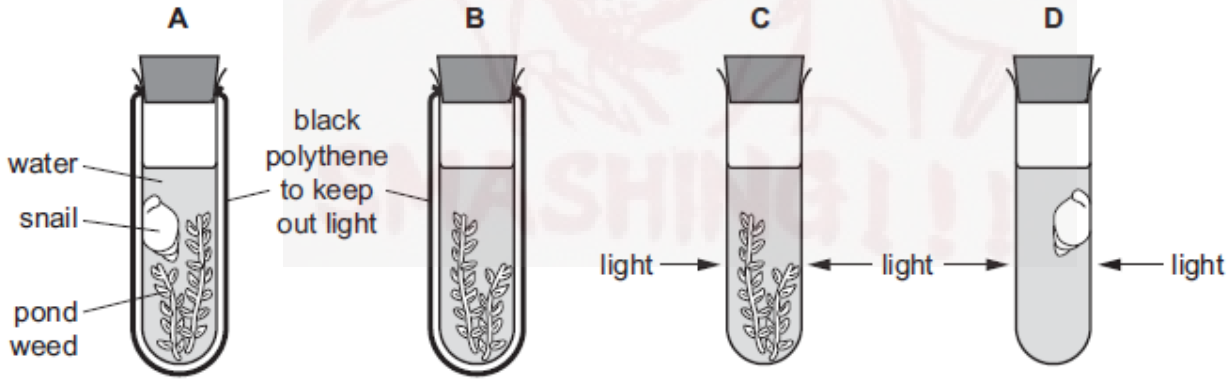
What are tissues 1, 2 and 3?

	1	2	3
A	epidermis	palisade mesophyll	spongy mesophyll
B	epidermis	spongy mesophyll	palisade mesophyll
C	palisade mesophyll	epidermis	spongy mesophyll
D	spongy mesophyll	palisade mesophyll	epidermis

Bio 6 **Q# 92/** iGCSE Biology/2019/s/Paper 21/ www.SmashingScience.org :o)

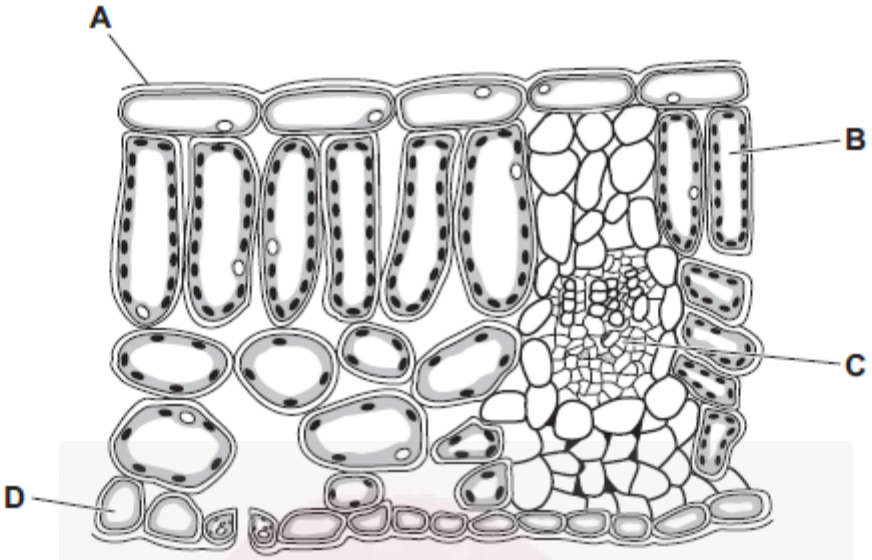
11 The diagram shows an experiment to investigate the balance between respiration and photosynthesis.

In which tube are photosynthesis and respiration taking place at the same time?



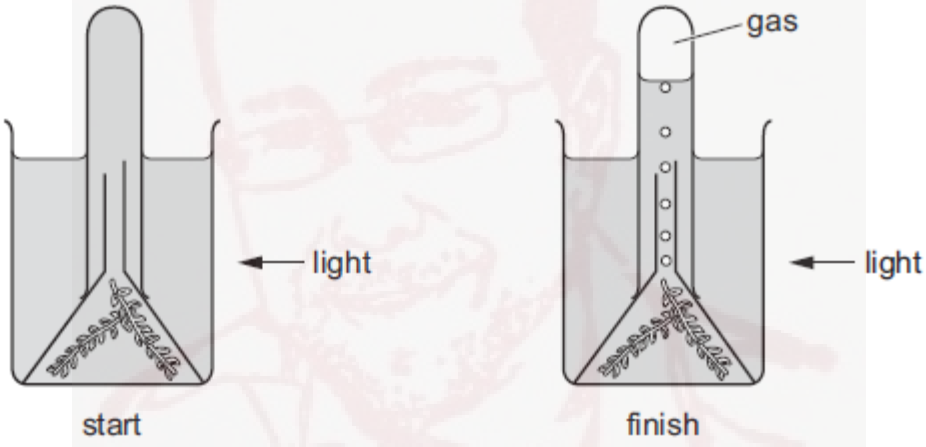
12 The diagram shows a cross-section of a leaf as seen under a microscope.

Which structure is a palisade mesophyll cell?



Bio 6 **Q# 93/** iGCSE Biology/2019/m/Paper 22/ www.SmashingScience.org :o)

12 The diagram shows an experiment to investigate photosynthesis.



What is the most abundant gas present at the top of the tube at the end of the experiment?

A carbon dioxide

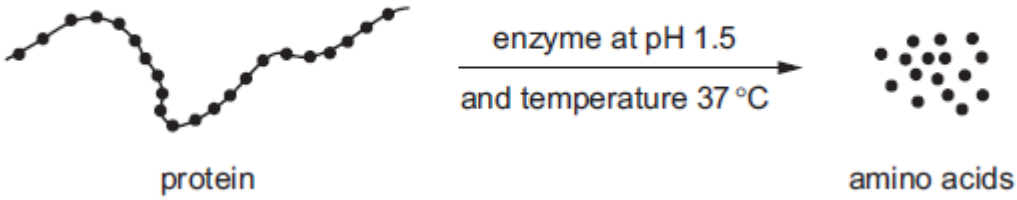
B methane

C sulfur dioxide

D oxygen

Bio 6 **Q# 94/** iGCSE Biology/2019/m/Paper 22/ www.SmashingScience.org :o)

10 The diagram shows the effect of an enzyme working in the human digestive system.



What would **reduce** the rate of production of amino acids?

A removing the amino acids as they are formed

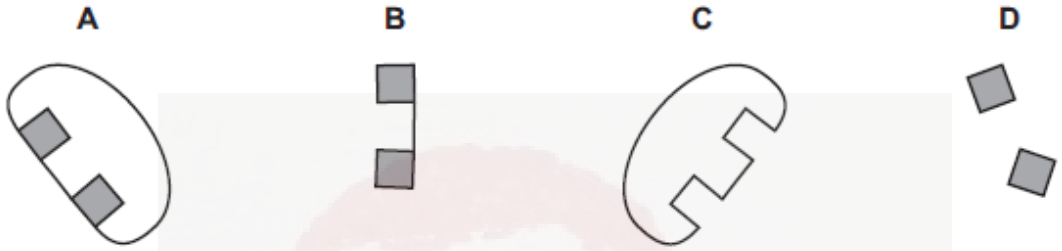
B increasing the amount of protein

C raising the temperature to 37.1 °C

D raising the pH to 7.5

11 The diagrams show molecules involved in the action of a digestive enzyme such as maltase.

Which is the substrate?

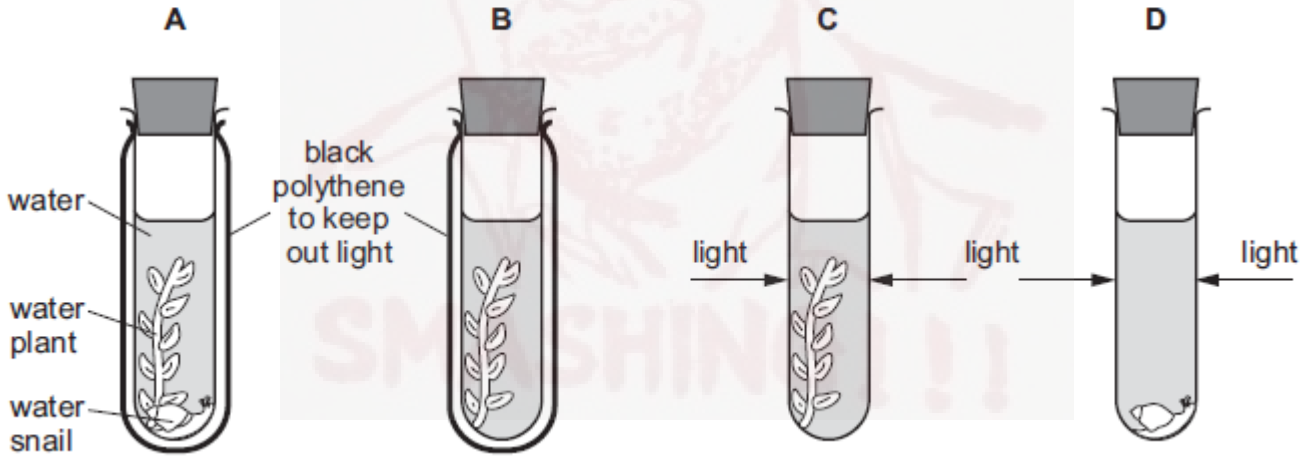


Bio 6 **Q# 95/** iGCSE Biology/2018/w/Paper 21/ www.SmashingScience.org :o)

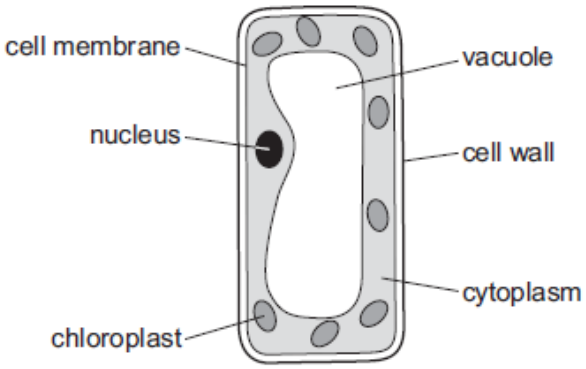
11 An experiment was carried out using the apparatus shown.

The carbon dioxide content of the water in each test-tube was measured at the start and again three hours later.

In which test-tube would there be a decrease in carbon dioxide content?



12 The diagram shows a plant cell.



Which type of cell is shown?

A cuticle cell

B epidermal cell

C palisade mesophyll cell

D spongy mesophyll cell

Bio 6 **Q# 96/** iGCSE Biology/2018/s/Paper 21/ www.SmashingScience.org :o)

11 The equation for photosynthesis is shown.

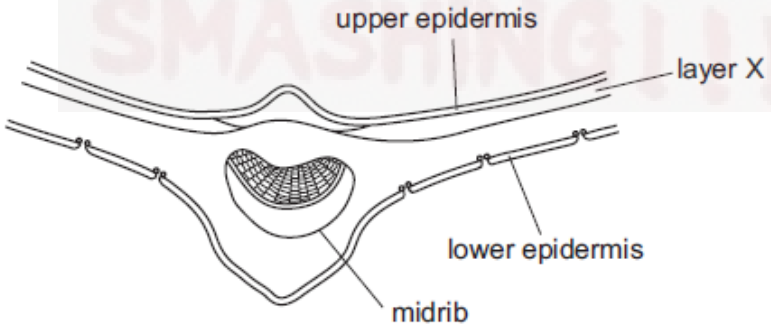
.....1..... + ...2..... → glucose + ...3.....

Which words correctly complete gaps 1, 2 and 3?

	1	2	3
A	carbon dioxide	light	oxygen
B	carbon dioxide	water	oxygen
C	oxygen	light	carbon dioxide
D	oxygen	water	carbon dioxide

Bio 6 **Q# 97/** iGCSE Biology/2018/m/Paper 22/ www.SmashingScience.org :o)

10 The diagram shows a cross-section of part of a leaf.



Which type of cell is found in layer X?

A **B** **C** **D**

11 Which molecule contains magnesium?

A chlorophyll

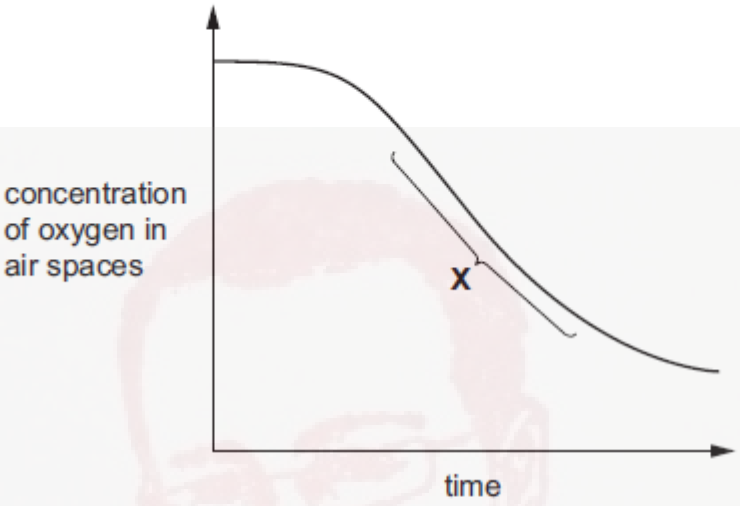
B fat

C glucose

D starch

Bio 6 **Q# 98/** iGCSE Biology/2017/w/Paper 21/ www.SmashingScience.org :o)

15 The graph shows the concentration of oxygen in the air spaces of a green leaf of a plant during a 12-hour period.



Which statement about carbon dioxide in the air spaces during time **X** is correct?

A Carbon dioxide is being produced because the rate of photosynthesis is greater than the rate of respiration.

B Carbon dioxide is being produced because the rate of respiration is greater than the rate of photosynthesis.

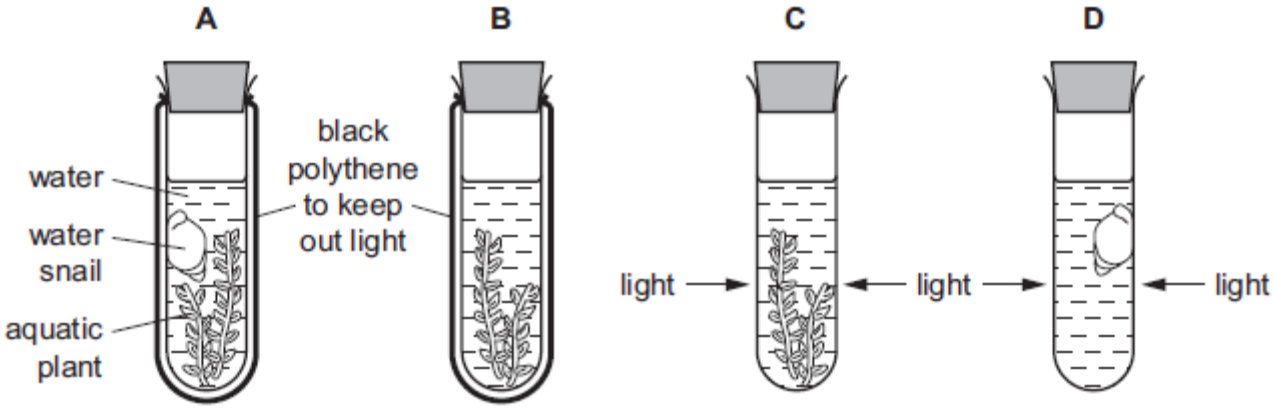
C Carbon dioxide is being used because the rate of photosynthesis is greater than the rate of respiration.

D Carbon dioxide is being used because the rate of respiration is greater than the rate of photosynthesis.

Bio 6 **Q# 99/** iGCSE Biology/2017/s/Paper 21/ www.SmashingScience.org :o)

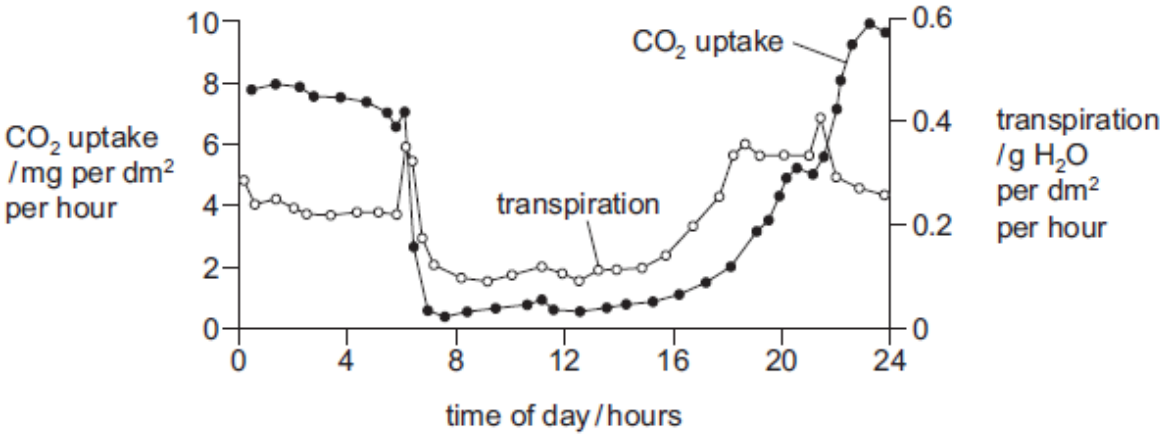
8 Four test-tubes are set up as shown.

Which test-tube contains the most carbon dioxide after one hour?



9 The graph shows daily carbon dioxide uptake and transpiration by the plant *Agave americana*.

The plant is adapted to live in very dry conditions.



What can be concluded from this graph?

A More stomata are closed during dark periods.

B More stomata are closed during light periods.

C There is no carbon dioxide uptake during dark periods.

D There is no water uptake during light periods.

10 In plants, which ions are used to make amino acids?

A magnesium

B nitrates

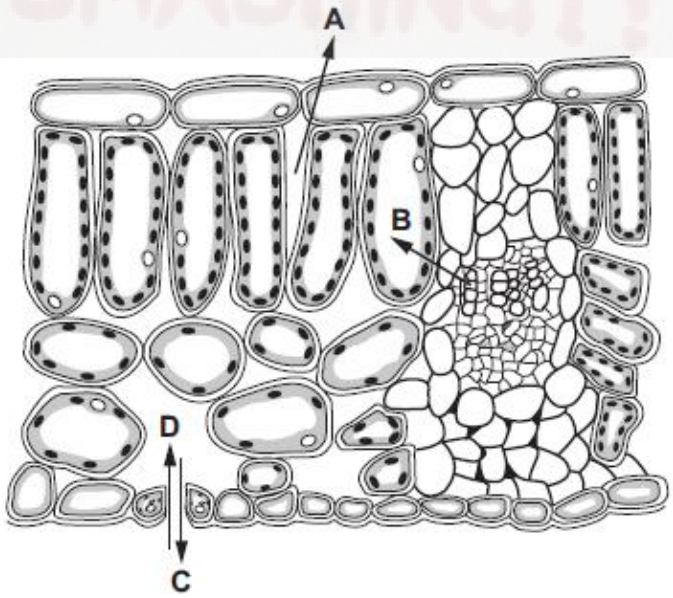
C phosphates

D potassium

Bio 6 **Q# 100/** iGCSE Biology/2017/m/Paper 22/ www.SmashingScience.org :o)

6 The diagram shows a section through a leaf.

Which arrow shows the direction of diffusion of carbon dioxide on a sunny day?



10 Which substances are used for photosynthesis?

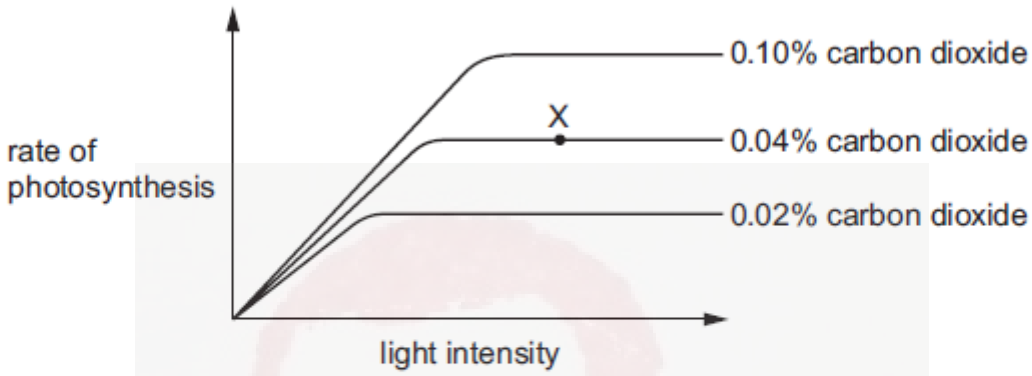
A carbon dioxide and glucose

B carbon dioxide and water

C glucose and oxygen

D glucose and water

24 The graph shows how the rate of photosynthesis of a plant changes with light intensity, at three different carbon dioxide concentrations. In each case the temperature is 15 °C.



What is the limiting factor for the rate of photosynthesis at point X on the graph?

A carbon dioxide concentration

B light intensity

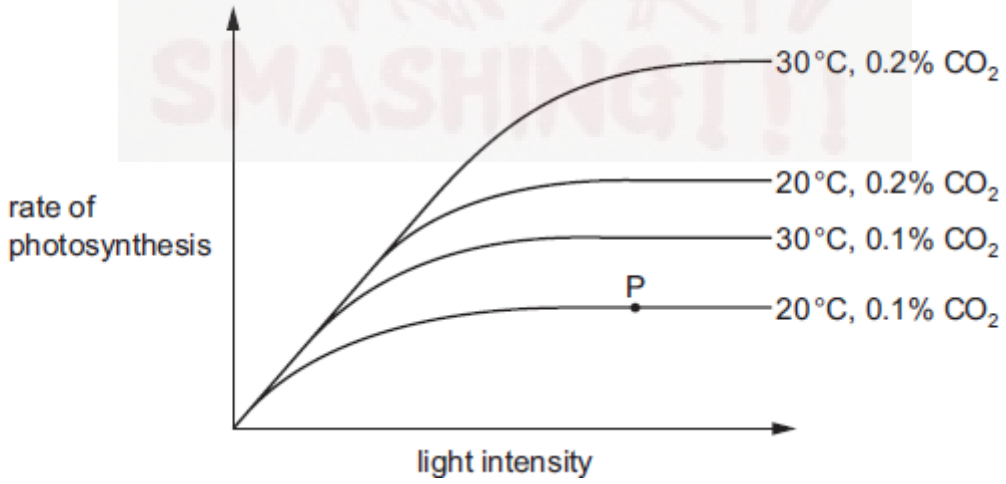
C surface area of the plant

D temperature

Bio 6 **Q# 101/** iGCSE Biology/2016/w/Paper 21/ www.SmashingScience.org :o)

9 The diagram shows how the rate of photosynthesis varies with light intensity.

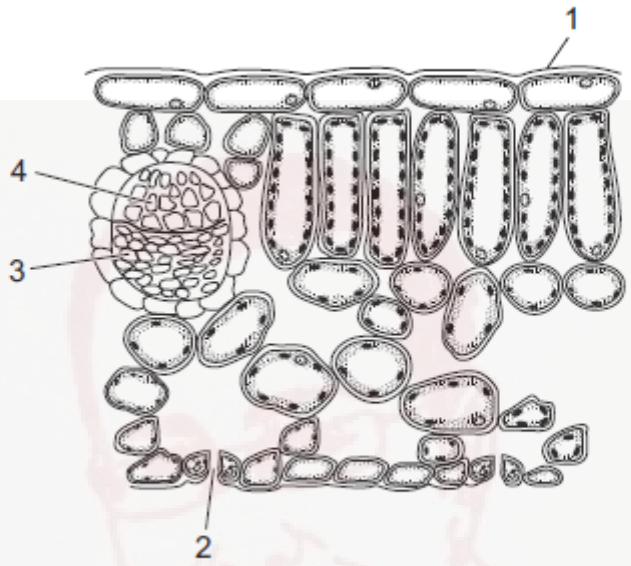
The four curves show different conditions of temperature and carbon dioxide concentration.



What limits the rate of photosynthesis at point P?

	light intensity	carbon dioxide concentration	temperature
A	✓	✓	✗
B	✓	✗	✗
C	✗	✓	✓
D	✗	✗	✓

10 The diagram shows part of a leaf in cross-section.



What shows the correct function of a numbered part?

	part	functions
A	1	photosynthesis
B	2	gaseous exchange
C	3	transport of water from the root
D	4	transport of sugars to the root

11 The roots of plants take up nitrates from the soil.

What are the nitrates used to make?

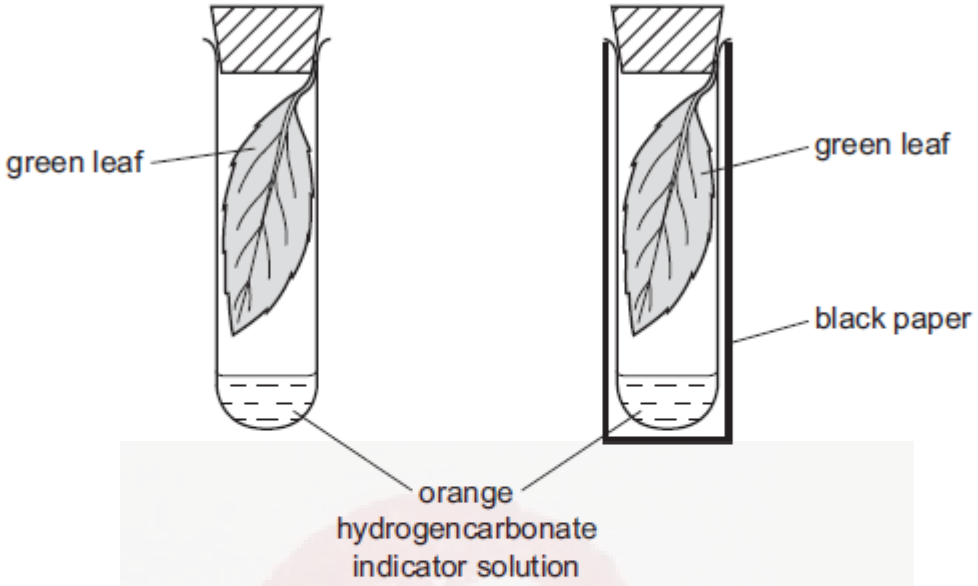
A fat

B glucose

C protein

D starch

12 Two similar leaves are set up in test-tubes as shown. One is exposed to light, while the other is kept in the dark.



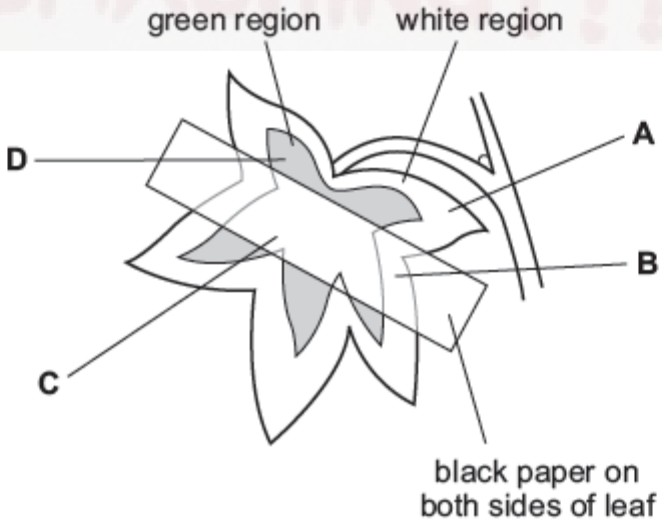
After a few hours, which colour would the hydrogencarbonate indicator solution be in each tube?

	light	dark
A	colourless	blue-black
B	purple	yellow
C	red	blue
D	yellow	purple

12 A plant with variegated leaves has the starch removed from its leaves by placing it in a da cupboard for 48 hours.

Black paper is then fixed on one leaf as shown and the plant is exposed to light.

After 24 hours, which part of the leaf contains starch?



Q# 104/ iGCSE Biology/2021/s/Paper 21/ www.SmashingScience.org :o)

11 Starch is digested by amylase in the mouth, but it is not digested in the stomach.

What is the reason for this?

A All starch digestion is completed in the mouth.

B The pH in the stomach is not suitable for the amylase to work.

C The starch does not stay in the stomach long enough to be digested.

D The temperature in the stomach is not suitable for the amylase to work.

Bio 7 **Q# 105/** iGCSE Biology/2021/s/Paper 21/ www.SmashingScience.org :o)

16 What are the products when proteins are broken down?

A amino acids

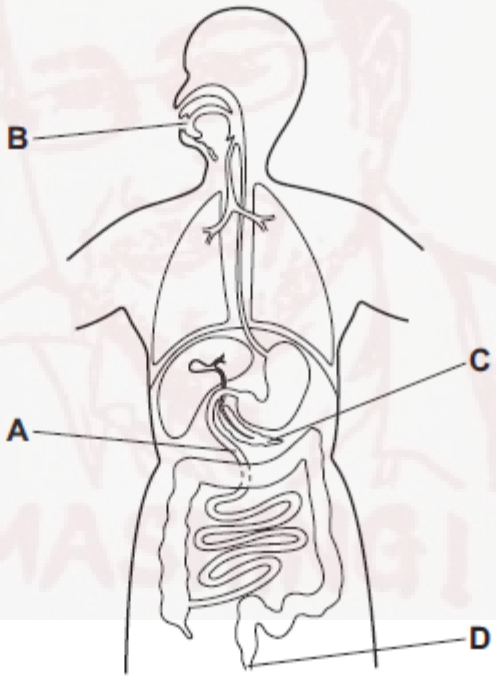
B fatty acids

C glycerol

D simple sugars

Bio 7 **Q# 106/** iGCSE Biology/2021/m/Paper 22/ www.SmashingScience.org :o)

14 Where does egestion take place?



15 The diagram shows a fat globule (P) in one part of the alimentary canal and the same fat globule (Q) as it appears in another part of the alimentary canal.

P

Q

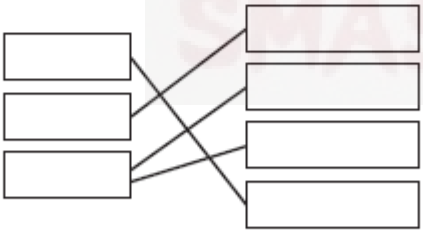
In which parts of the alimentary canal are P and Q found?

	P	Q
A	duodenum	stomach
B	ileum	oesophagus
C	oesophagus	ileum
D	rectum	ileum

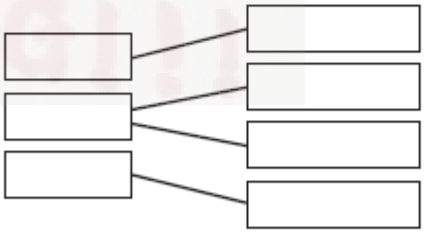
16 The diagram shows enzymes and the products of the reactions they catalyse.

Which diagram matches the enzymes with the correct products?

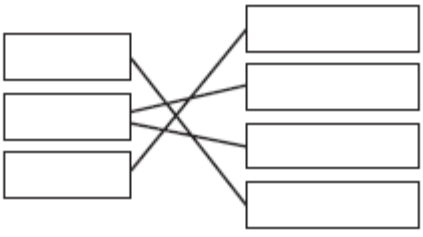
A



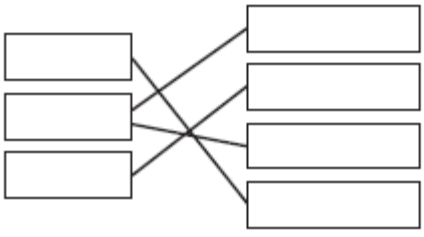
B



C



D



13 Which stage of nutrition takes place when food molecules become part of a body cell?

A absorption

B assimilation

C digestion

D ingestion

14 What is the definition of chemical digestion?

A Large insoluble molecules are changed into smaller soluble molecules.

B Large soluble molecules are changed into smaller soluble molecules.

C Small insoluble molecules and ions are passed through the wall of the small intestine.

D Small soluble molecules and ions are passed through the wall of the small intestine.

13 The activity of amylase is measured in four parts of the alimentary canal.

Which two parts have the most amylase activity?

A colon and duodenum

B colon and stomach

C mouth and duodenum

D stomach and mouth

14 Biological washing powder can be used to remove stains on clothing.

Which enzymes will remove stains caused by starch, fat and protein?

	amylase	lipase	trypsin
A	✓	✗	✗
B	✓	✓	✓
C	✗	✗	✓
D	✗	✓	✓

key

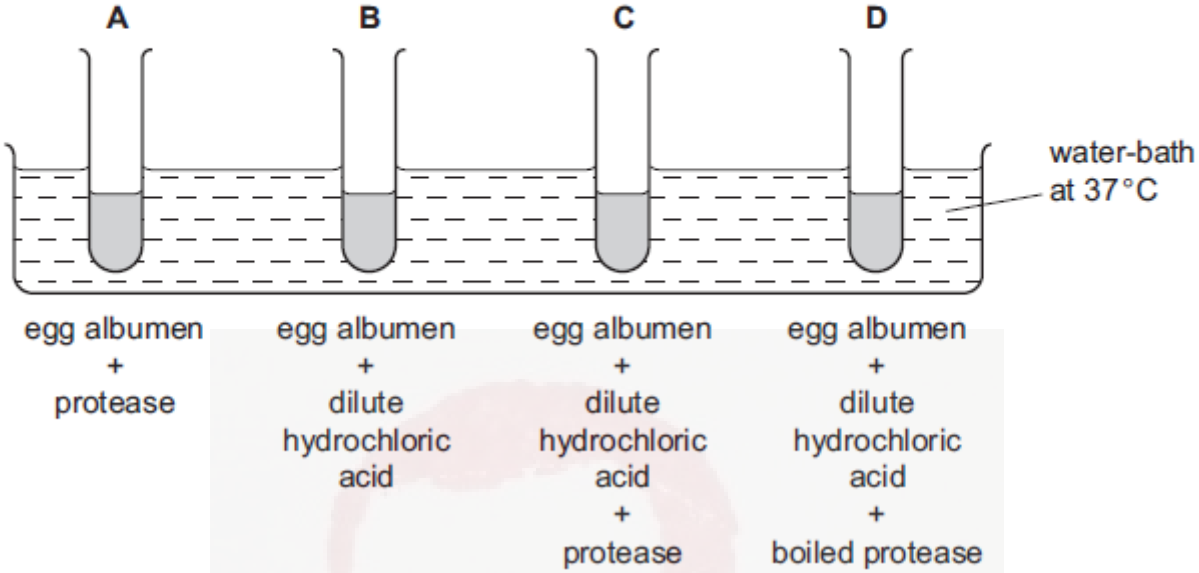
✓ = removes stain

✗ = does not remove stain

10 The diagram shows an experiment on the digestion of the protein in egg albumen by protease.

The protease was taken from a human stomach.

In which test-tube will the protein be digested most quickly?



14 The list shows some human health problems.

1 chronic obstructive pulmonary disease

2 constipation

3 coronary heart disease

4 obesity

Which problems can be caused by malnutrition?

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

16 Which food group is chemically digested in the mouth, passes through the stomach and continues to be broken down by chemical digestion in the small intestine?

A carbohydrates

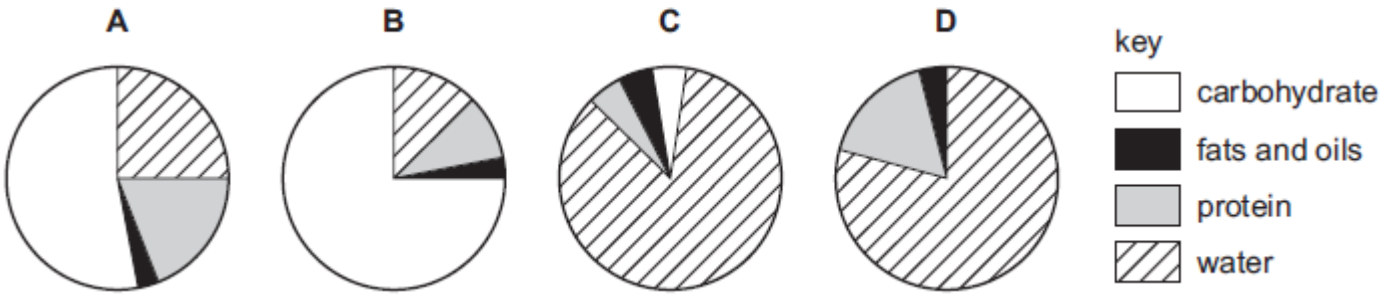
B mineral salts

C proteins

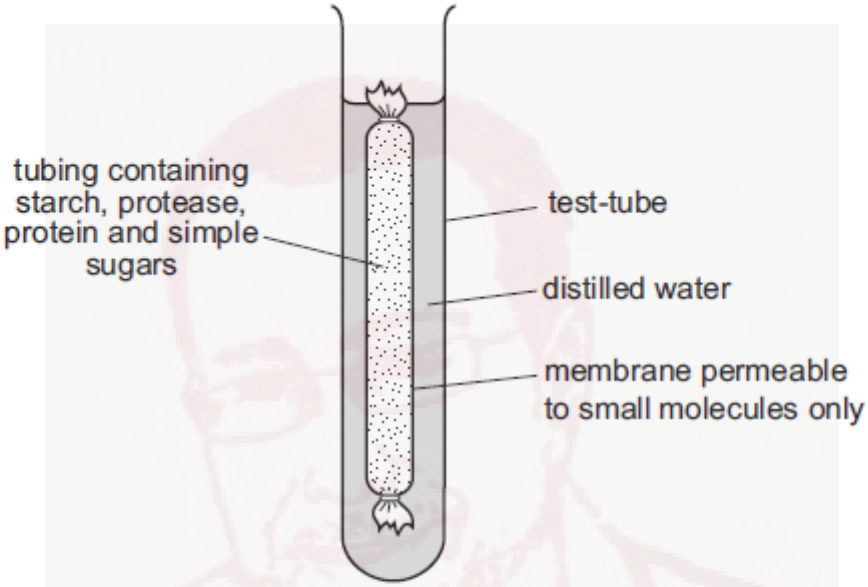
D vitamins

12 The pie charts show the composition of 100 g of four different foods.

Which food provides the most energy?



14 The diagram shows an experiment kept at room temperature.



What is present in the water surrounding the membrane after 45 minutes?

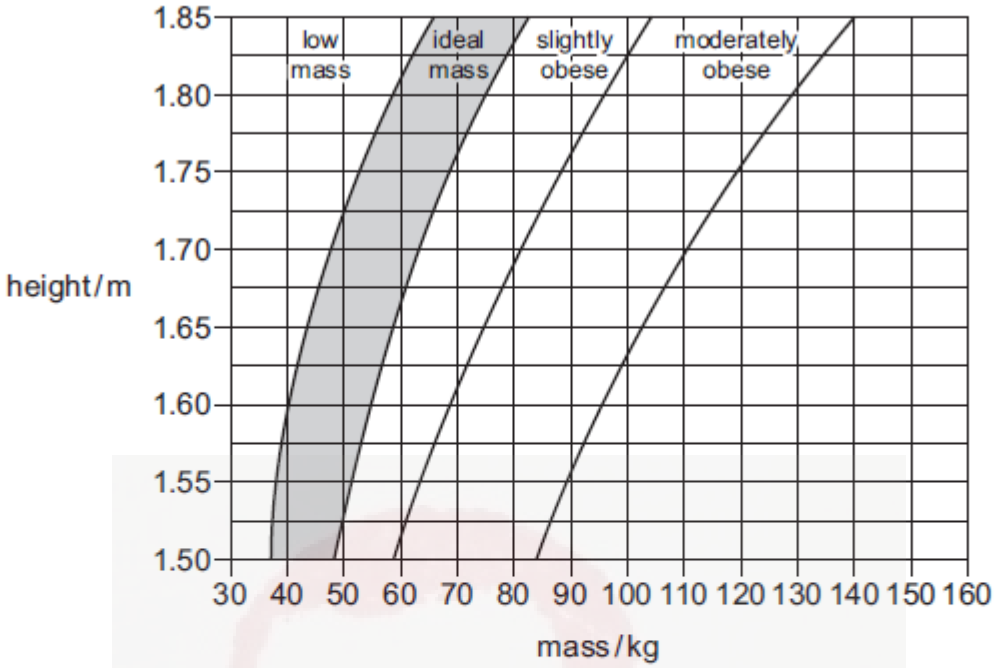
A amino acids and simple sugars

B protein and amino acids

C protein and simple sugars

D starch and simple sugars

13 The chart is used to find a person's recommended mass.



For the data provided about body mass and height, which person would benefit most from the introduction of a calorie-controlled diet and regular exercise?

	body mass /kg	height /m
A	40	1.55
B	50	1.75
C	70	1.80
D	90	1.75

15 A student investigates the breakdown of fats in milk by lipase. Four test-tubes labelled A to D are set up.

The table shows the contents of each test-tube.

In which test-tube will the contents become acidic most quickly?

	milk	bile	boiled lipase	lipase
A	✓	✓	✗	✓
B	✓	✓	✓	✗
C	✓	✗	✓	✗
D	✓	✗	✗	✓

key
✓ = present
✗ = absent

14 What is meant by chemical digestion?

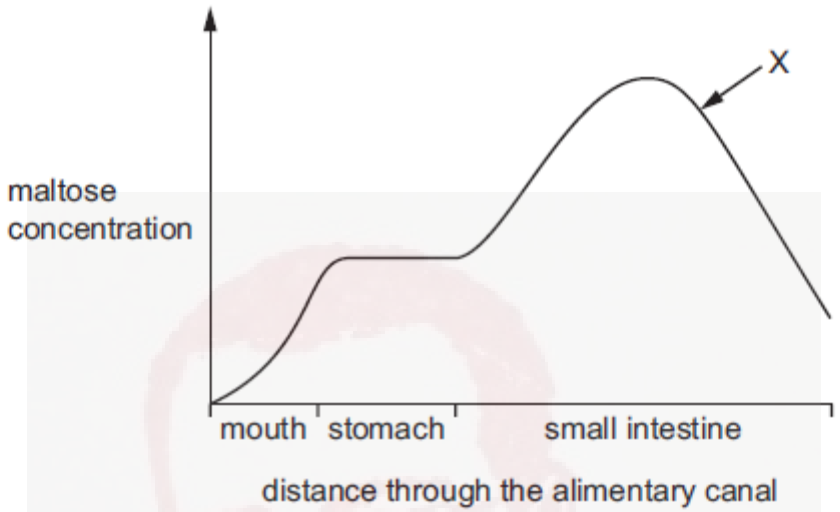
A Large insoluble molecules are broken down into small soluble molecules.

B Large soluble molecules are broken down into small insoluble molecules.

C Small insoluble molecules are built up into large soluble molecules.

D Small soluble molecules are built up into large insoluble molecules.

15 The graph shows the concentration of maltose in different parts of the alimentary canal.



What causes the change in concentration at X?

A absorption of maltose

B action of amylase

C action of maltase

D assimilation of maltose

13 What is the result of a diet lacking iron?

A bleeding gums

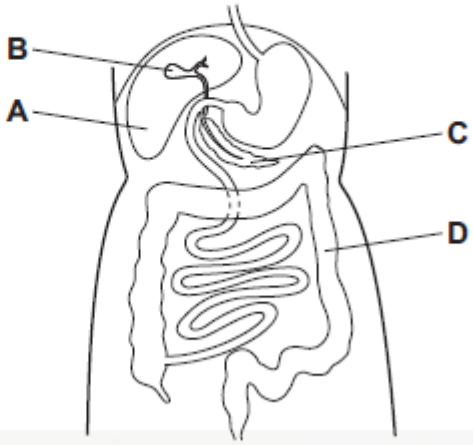
B poor wound healing

C reduced number of red blood cells

D weak bones and teeth

14 The diagram shows part of the alimentary canal.

Which structure produces lipase?



Bio 7 **Q# 115/** iGCSE Biology/2018/s/Paper 21/ www.SmashingScience.org :o)

12 What is the best source of vitamin C in a balanced diet?

A fish

B fruit

C meat

D rice

14 Which condition could be caused by a lack of iron?

A anaemia

B cholera

C scurvy

D diabetes

Bio 7 **Q# 116/** iGCSE Biology/2018/m/Paper 22/ www.SmashingScience.org :o)

12 In which part of the body of a mammal does mechanical digestion occur?

A gall bladder

B liver

C mouth

D pancreas

Bio 7 **Q# 117/** iGCSE Biology/2017/w/Paper 21/ www.SmashingScience.org :o)

16 What is a description of transpiration?

A exchange of gases between the leaf and the atmosphere

B loss of water vapour from the leaves and stems of a plant

C movement of water from the roots to the leaves

D movement of water through the cells of the leaf

12 What must be increased in the diet of a person suffering from constipation?

A fats

B fibre

C iron

D protein

13 Which disease can be caused by a deficiency of iron in the diet?

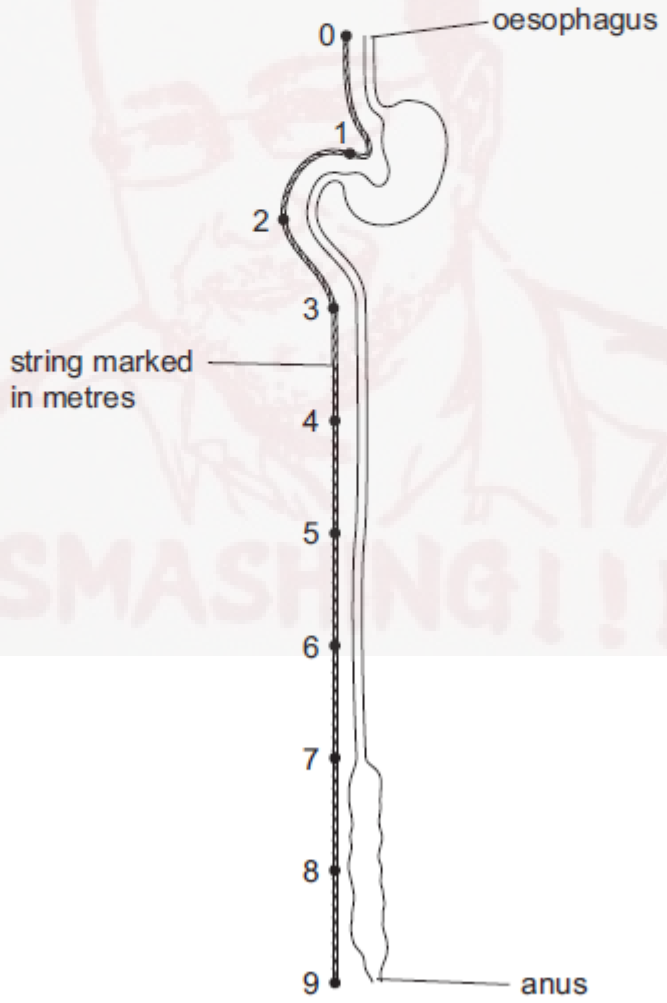
A anaemia

B kwashiorkor

C marasmus

D rickets

14 The diagram shows the human alimentary canal, with a string marked in metres beside it.



How long is the small intestine?

A 2 m **B** 6 m **C** 8 m **D** 9 m

11 The following symptoms can be caused by a dietary deficiency:

- bone pain
- dental problems
- fragile bones
- skeletal deformities

A lack of which nutrient is most likely to cause these symptoms?

A iron

B protein

C vitamin C

D vitamin D

12 Statements 1–4 describe stages in the development of cholera.

1 Chloride ions are secreted in the gut.

2 Osmosis causes water to move into the gut.

3 The infected person becomes dehydrated.

4 Toxins are produced by the pathogenic bacteria.

What is the correct sequence of the four stages?

A $1 \rightarrow 2 \rightarrow 3 \rightarrow 4$

B $1 \rightarrow 4 \rightarrow 3 \rightarrow 2$

C $4 \rightarrow 1 \rightarrow 2 \rightarrow 3$

D $4 \rightarrow 1 \rightarrow 3 \rightarrow 2$

13 The diagram shows a human tooth.

Which statement best describes the function of this tooth?

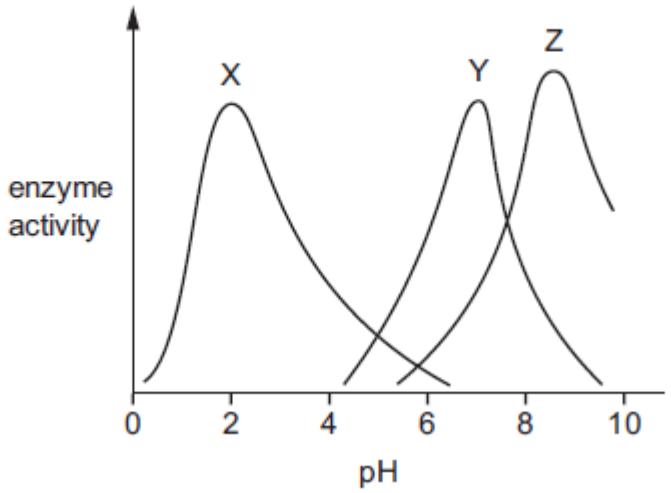
A It bites into food.

B It cuts food.

C It grinds food.

D It tears food.

14 The graph shows the effect of pH on the activity of three different enzymes.



The table shows the pH of different parts of the alimentary canal.

part of the alimentary canal	pH
mouth	7.0
stomach	2.0
small intestine	8.5

Which enzymes in the graph are likely to be protease enzymes?

A X, Y and Z **B** X and Z only **C** Y and Z only **D** Z only

Bio 7 **Q# 120/** iGCSE Biology/2017/m/Paper 22/ www.SmashingScience.org :o)

11 Which term is defined as the taking of substances into the body through the mouth?

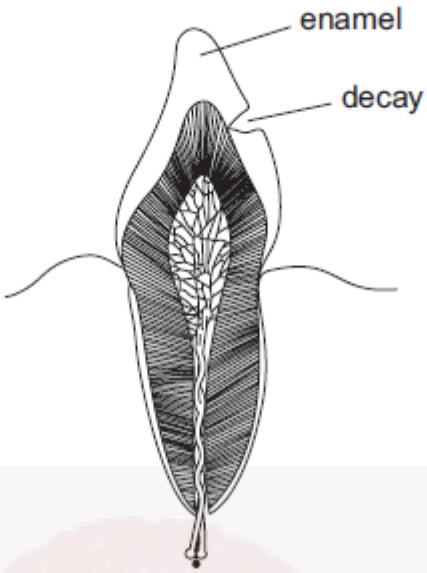
A absorption

B assimilation

C digestion

D ingestion

13 The diagram shows a tooth with signs of decay.



What has made the hole in the enamel of the tooth?

A acid

B saliva

C sugar

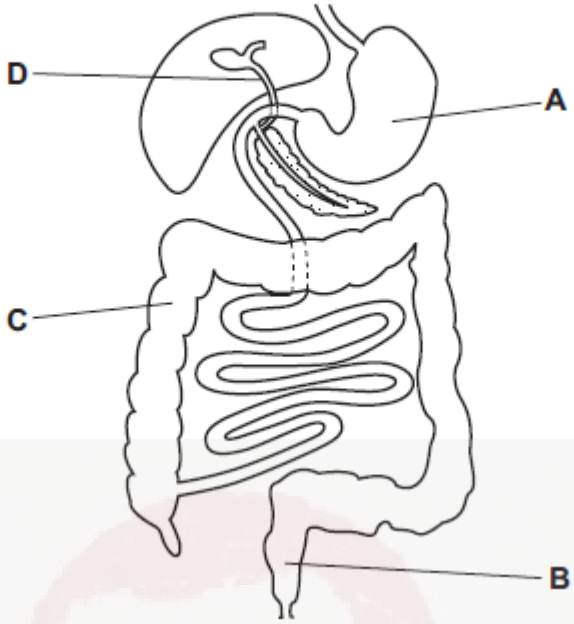
D toothpaste

12 Which diseases are caused by a lack of iron and a lack of vitamin D?

	lack of iron	lack of vitamin D
A	anaemia	soft bones
B	kwashiorkor	anaemia
C	kwashiorkor	soft bones
D	soft bones	anaemia

13 The diagram shows the human alimentary canal.

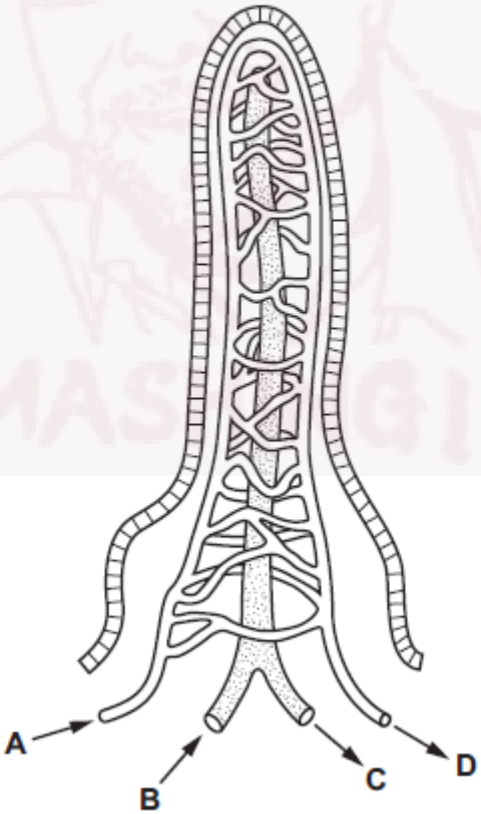
Which labelled part absorbs the most water?



Bio 7 **Q# 123/** iGCSE Biology/2016/s/Paper 21/ www.SmashingScience.org :o)

13 The diagram shows a villus. The arrows show the direction of flow within vessels associated with the villus.

Which vessel carries blood to the liver?



15 What is the function of bile?

A to acidify food entering the duodenum

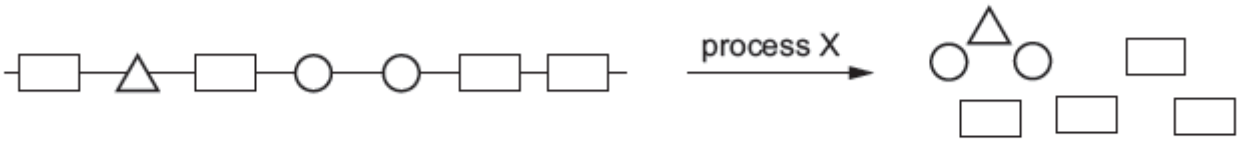
B to emulsify starch

C to increase the surface area of fats for digestion

D to provide enzymes for fat digestion

Bio 7 **Q# 124/** iGCSE Biology/2016/m/Paper 22/ www.SmashingScience.org :o)

9 The diagram shows a large food molecule changing into smaller molecules.



What is process X?

A absorption

B chewing

C digestion

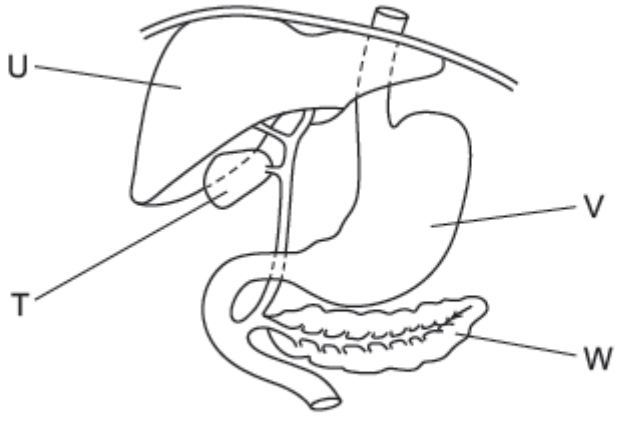
D secretion

11 The table shows the conditions in four test-tubes containing equal amounts of starch and saliva amylase.

In which test-tube is the starch broken down fastest?

	pH	temperature /°C
A	2	27
B	2	37
C	7	27
D	7	37

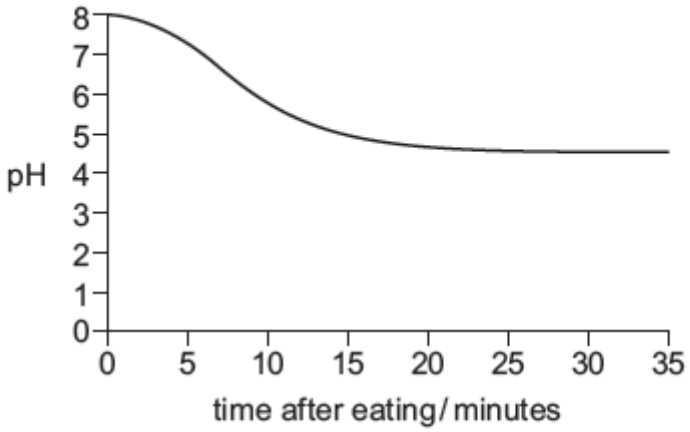
14 The diagram shows part of the alimentary canal and associated organs.



Which structures secrete enzymes that digest proteins?

A T and U **B** U and V **C** V and W **D** W and T

15 The graph shows pH changes in the mouth after eating.



Why is it a good idea to brush teeth after eating?

A Acidic conditions help bacteria to grow.

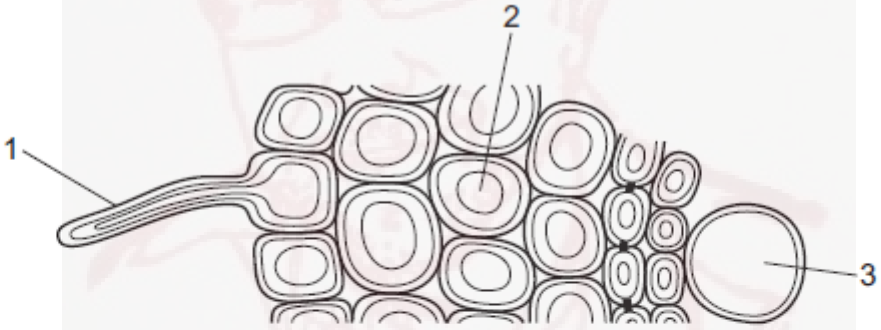
B Acids dissolve tooth enamel.

C Alkaline conditions help bacteria to grow.

D Alkalis dissolve tooth enamel.

Paper 2 Bio Topic# 8 **Q# 125/** iGCSE Biology/2021/s/Paper 21/ www.SmashingScience.org :o)

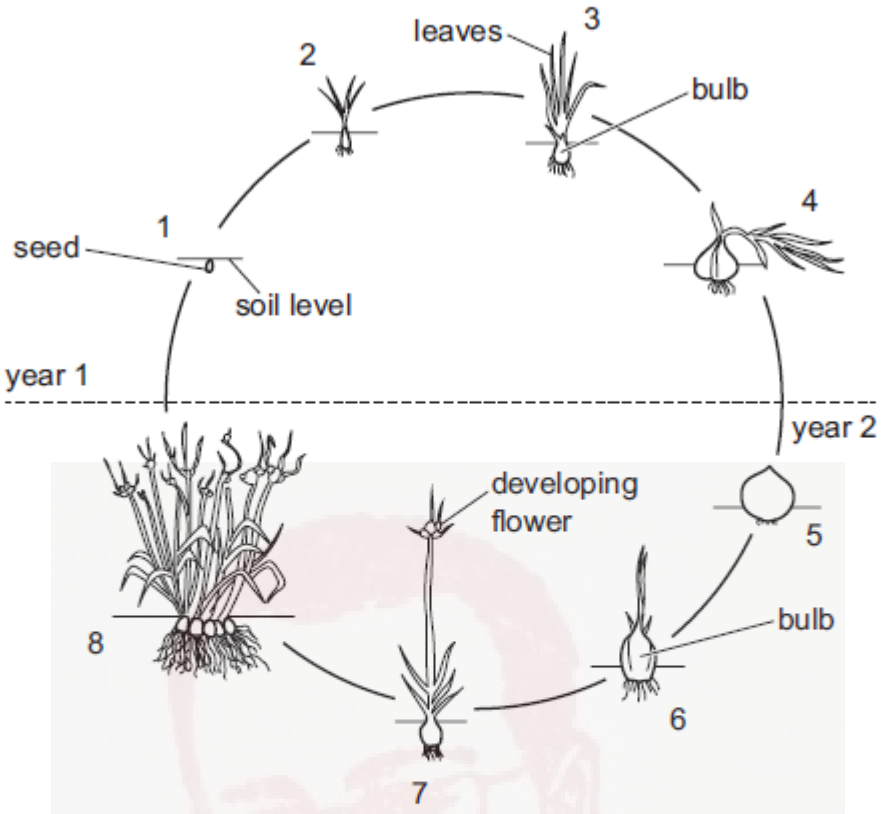
17 The diagram shows part of a cross-section of a root.



What are cells 1, 2 and 3?

	1	2	3
A	root cortex cell	root hair cell	mesophyll cell
B	root hair cell	root cortex cell	xylem
C	root hair cell	root cortex cell	mesophyll cell
D	root cortex cell	root hair cell	xylem

18 The diagram shows an onion plant that has been grown from a seed. Each onion plant takes two years to flower and produce more seeds.



What is the onion bulb acting as in stage 3 and in stage 6?

	stage 3	stage 6
A	sink	sink
B	sink	source
C	source	sink
D	source	source

Bio 8 **Q# 126/** iGCSE Biology/2021/m/Paper 22/ www.SmashingScience.org :o)

17 Which statement about a function of xylem tissue is correct?

A It carries glucose from the roots to the leaves.

B It helps to support stems and leaves.

C It is the only transport tissue in the plant.

D It carries water away from the leaves.

18 What is part of the definition of transpiration?

A the loss of water vapour from plant leaves by evaporation of water at the surfaces of the mesophyll cells

B the movement of molecules into the cells of the organism where they are used

C the movement of particles through a cell membrane from a region of lower concentration to a region of higher concentration

D the transport of mineral ions from the roots into the stem and leaves

15 In which order does water pass through these structures in a plant?

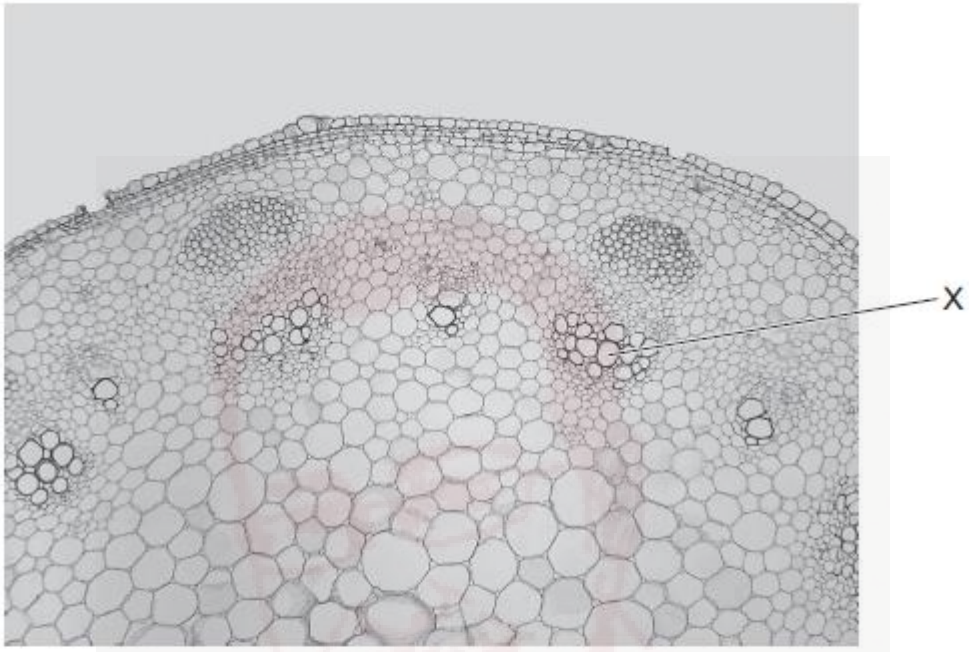
A mesophyll → root hair → xylem

B mesophyll → xylem → root hair

C root hair → mesophyll → xylem

D root hair → xylem → mesophyll

16 The photomicrograph shows a cross-section through a plant stem.

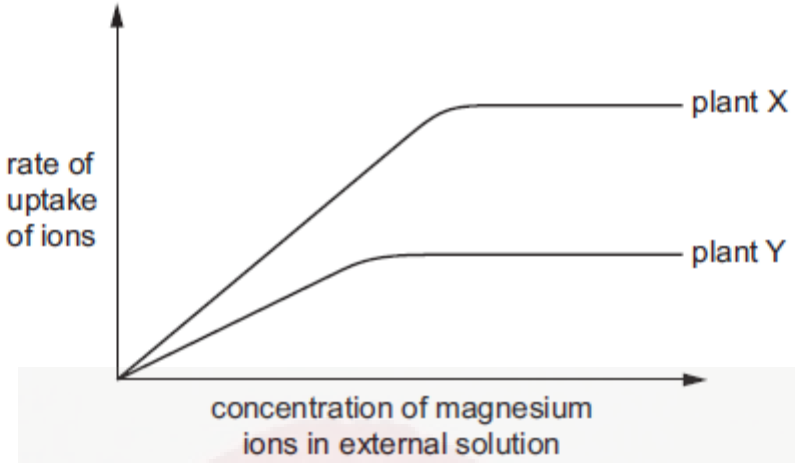


What is the name and function of the tissue labelled X?

	tissue	function
A	phloem	transports sugars
B	phloem	transports water and minerals
C	xylem	transports sugars
D	xylem	transports water and minerals

15 The graph shows the rate of uptake of magnesium ions by two similar plants, X and Y.

The roots of each plant were placed in a range of solutions. Each solution contained a different concentration of magnesium ions. All other conditions were kept constant.



What is a possible explanation for the difference in the results for the two plants?

A Plant Y has fewer protein molecules for magnesium ion transport in its cell membranes.

B Plant Y has a higher rate of respiration.

C Plant Y has more root hair cells.

D The root hair cells in plant Y have a lower water potential.

16 What will increase the rate of transpiration in a plant?

A an increase in the humidity of the atmosphere surrounding the leaf

B an increase in the surface area of the cell surfaces inside the leaf

C a decrease in the number of stomata present on the surface of the leaf

D a decrease in the temperature of the atmosphere surrounding the leaf

17 When stems with white flowers are cut and placed in a blue stain the petals turn blue.

Which tissue in the stem does the stain travel through to reach the petals?

A epidermis

B mesophyll

C phloem

D xylem

18 Which process releases water vapour into the atmosphere from the leaves of trees?

A active transport

B osmosis

C respiration

D transpiration

16 In plants, what is transported by translocation?

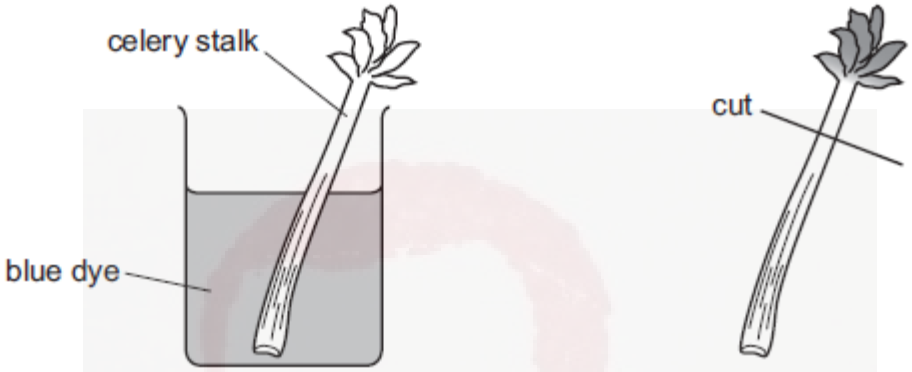
A glucagon

B glycogen

C starch

D sucrose

16 A celery stalk was placed into a beaker of blue dye. When the dye reached the leaves, the stalk was taken out and a section was cut, as shown in the diagram.



Which diagram shows the appearance of the cut end of the stalk?

A

B

C

D

17 The table shows the rate of water flow through a tree over a 12 hour period.

time of day	rate of flow / cm per hour
7:00	100
9:00	120
11:00	140
13:00	250
15:00	300
17:00	260
19:00	180

What conclusion can be drawn from the table?

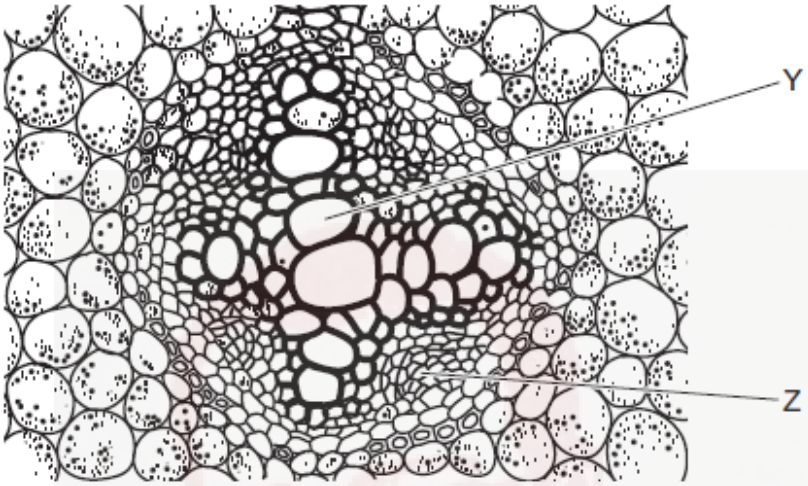
A Between 7:00 and 17:00 hours the rate of flow continuously increases.

B The greatest increase in rate of flow in a two-hour period is between 11:00 and 13:00 hours.

C Water does not flow up through a tree at night.

D Water flow is affected by humidity.

18 The diagram shows some of the transport tissues in a plant root.

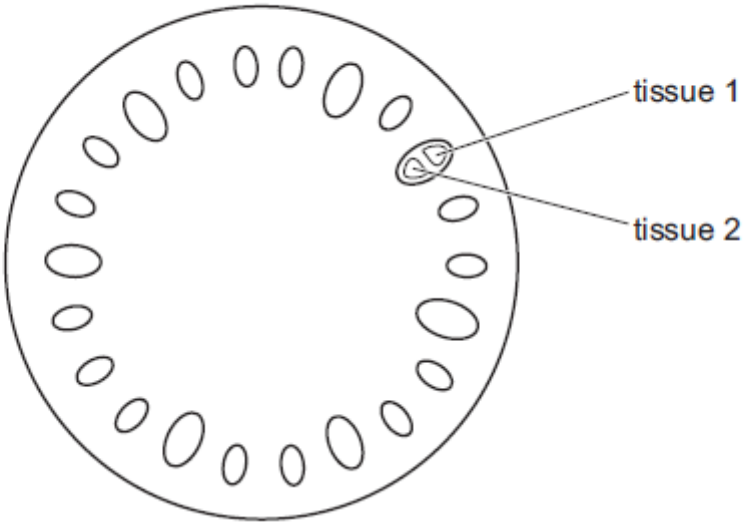


Which row about tissues Y and Z in the diagram is correct?

	tissue Y		tissue Z	
	name	transports	name	transports
A	phloem	mineral ions & water	xylem	sucrose
B	phloem	sucrose	xylem	mineral ions & water
C	xylem	mineral ions & water	phloem	sucrose
D	xylem	sucrose	phloem	mineral ions & water

Bio 8 **Q# 132/** iGCSE Biology/2019/m/Paper 22/ www.SmashingScience.org :o)

16 The diagram shows a cross-section through a plant stem.

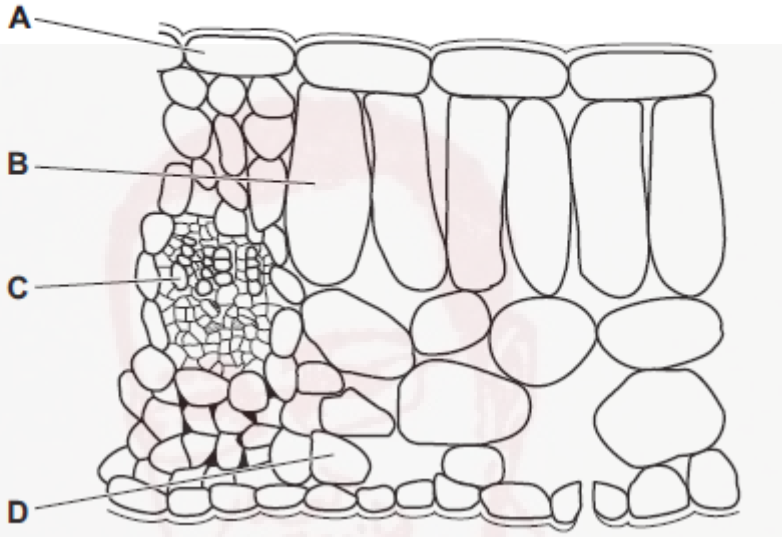


What are the functions of the two labelled tissues?

	tissue 1	tissue 2
A	transport only	support only
B	transport only	transport and support
C	transport and support	transport only
D	support only	transport only

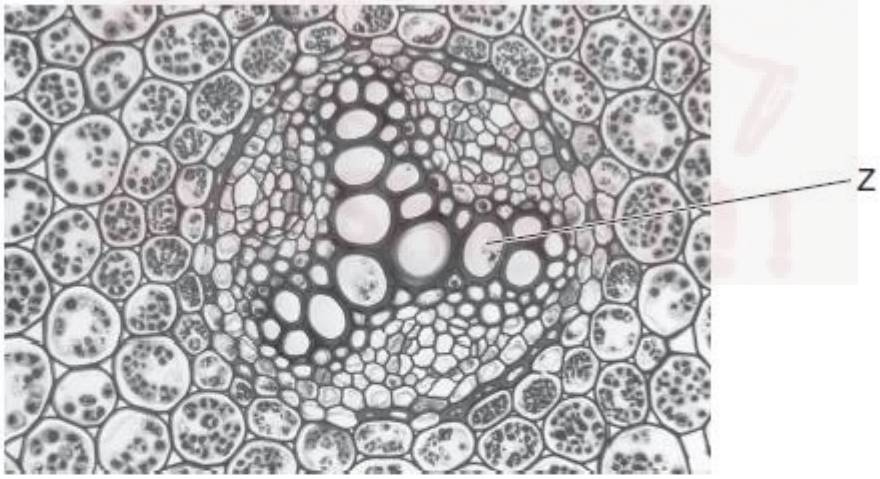
17 A leafy shoot is placed in a solution of a red dye.

After 30 minutes, which part of a leaf from this shoot will contain the red dye?



Bio 8 **Q# 133/** iGCSE Biology/2018/w/Paper 21/ www.SmashingScience.org :o)

15 The photomicrograph shows a cross-section through a buttercup root.



What is the function of the tissue labelled Z?

A site of photosynthesis

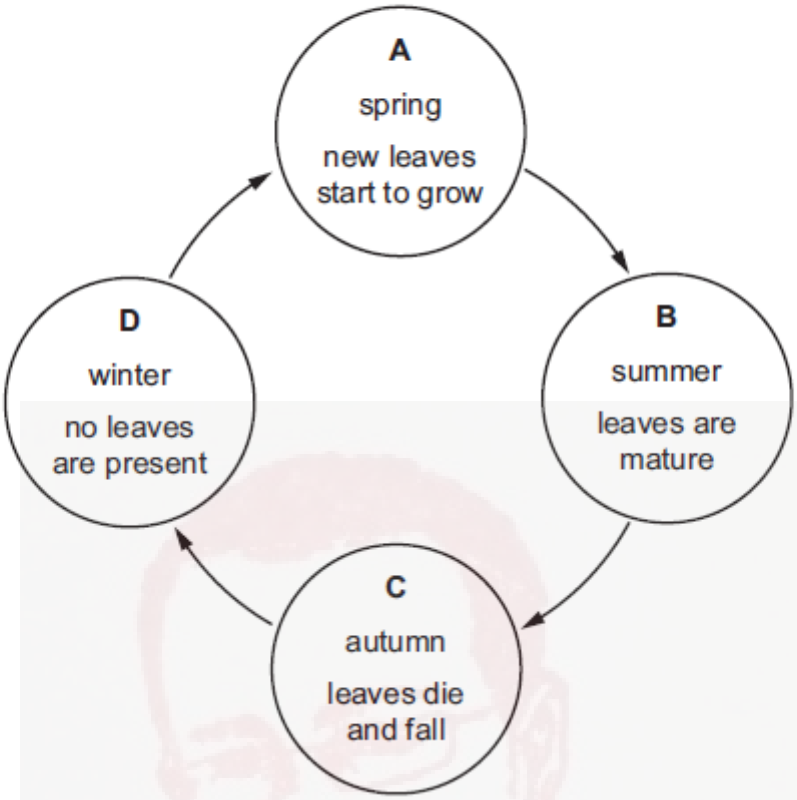
B site of respiration

C transport of sugars

D transport of water

16 Roots and leaves both act as a source and a sink for sucrose and amino acids at different times during the year.

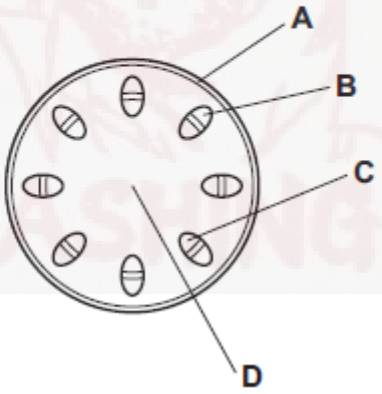
At which point in the year are the roots most active as a source?



Bio 8 **Q# 134/** iGCSE Biology/2018/s/Paper 21/ www.SmashingScience.org :o)

15 The diagram shows part of a section through a plant stem.

Which tissue transports water from the roots to the leaves?



16 Petroleum jelly is waterproof and transparent.

Covering the underside of the leaves of a plant with a thin layer of petroleum jelly will slow down the rate of water loss from the plant.

Which statement explains this?

A Plants absorb nutrients from the petroleum jelly.

B Plants absorb water from the petroleum jelly.

C Stomata are blocked by the petroleum jelly.

D The petroleum jelly stops photosynthesis.

Bio 8 **Q# 135/** iGCSE Biology/2018/m/Paper 22/ www.SmashingScience.org :o)

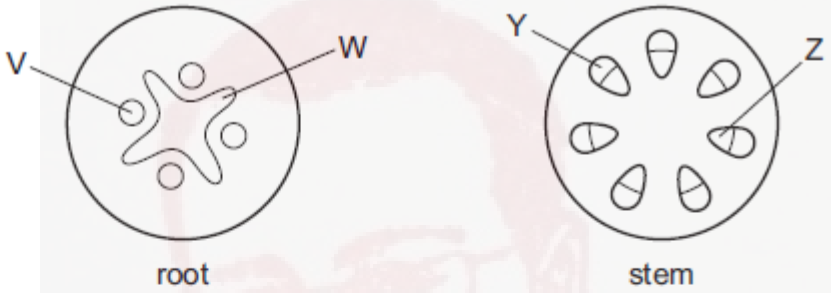
13 During growth, potato plants produce flowers and underground storage organs called tubers.

During this time, which parts of the plant act as sources and sinks for translocation?

	flowers	leaves	potato tubers
A	sink	sink	source
B	sink	source	sink
C	source	sink	source
D	source	source	sink

Bio 8 **Q# 136/** iGCSE Biology/2017/s/Paper 21/ www.SmashingScience.org :o)

15 The diagrams show cross-sections through a root and a stem.



Which labels are correct?

	V	W	Y	Z
A	phloem	xylem	xylem	phloem
B	phloem	xylem	phloem	xylem
C	xylem	phloem	xylem	phloem
D	xylem	phloem	phloem	xylem

16 Which processes are used by root hairs to take up ions and water?

	ion uptake	water uptake
A	active transport	osmosis
B	diffusion	active transport
C	osmosis	diffusion
D	osmosis	osmosis

17 Which of the following increases transpiration?

A air around the leaf with high humidity

B air molecules around the leaf with less kinetic energy

C an absence of light falling on the leaf

D water molecules in the leaf with more kinetic energy

Bio 8 **Q# 137/** iGCSE Biology/2017/m/Paper 22/ www.SmashingScience.org :o)

14 Which is a description of translocation?

A movement of amino acids and sucrose from sink to source

B movement of amino acids and sucrose from source to sink

C movement of water down a water potential gradient

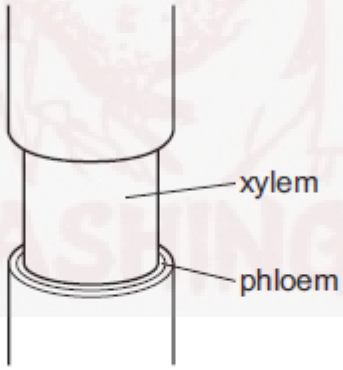
D movement of water up a water potential gradient

Bio 8 **Q# 138/** iGCSE Biology/2016/w/Paper 21/ www.SmashingScience.org :o)

5 What are the features of the cell walls in a xylem vessel?

	end wall	side wall
A	absent	thick
B	absent	thin
C	present	thick
D	present	thin

15 The diagram shows the stem of a plant. A strip of the outer tissue including the phloem has been removed.



How is transport in the plant affected?

A Amino acids and sugar cannot pass to the roots.

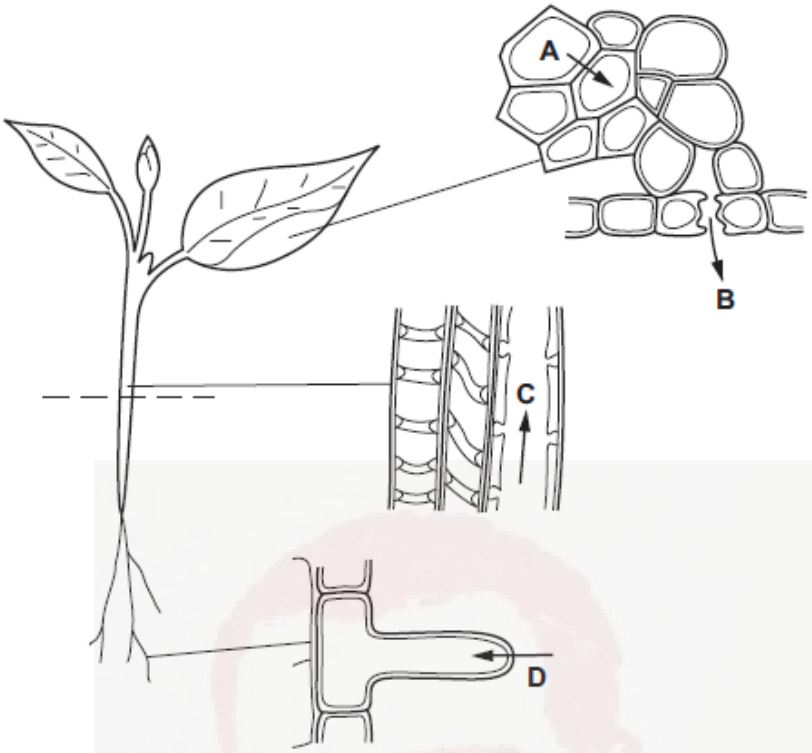
B Dissolved salts cannot pass to the leaves.

C Water cannot pass to the leaves.

D Water cannot pass to the roots.

16 The diagrams show stages in the passage of water through a plant.

Which arrow shows water moving in the form of water vapour?



17 Which substance is moved by translocation in a flowering plant?

A amino acid

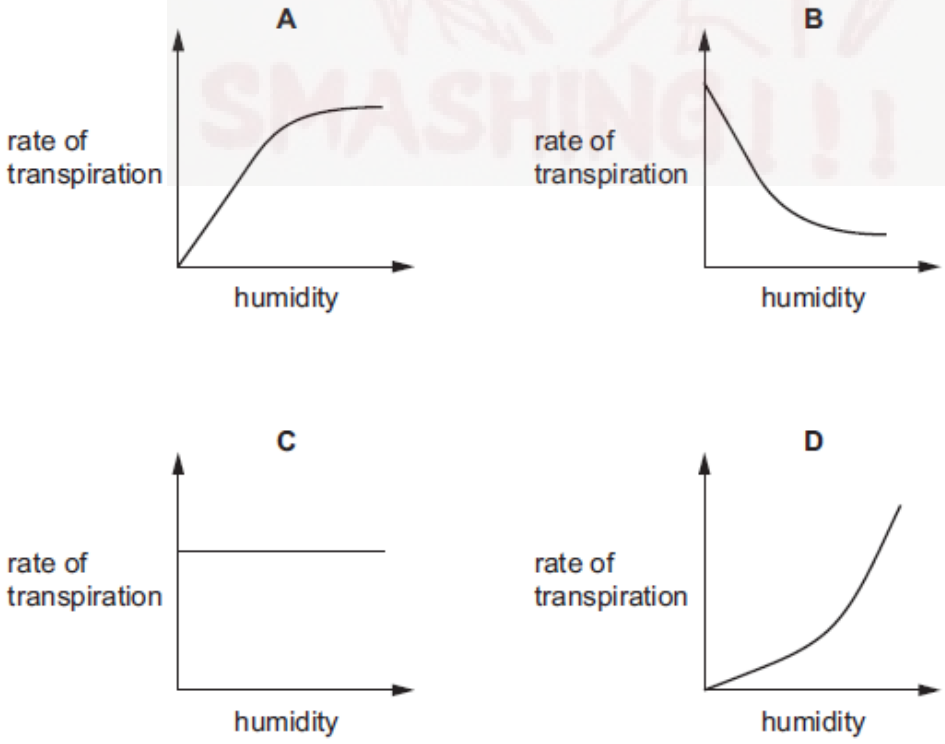
B cellulose

C fat

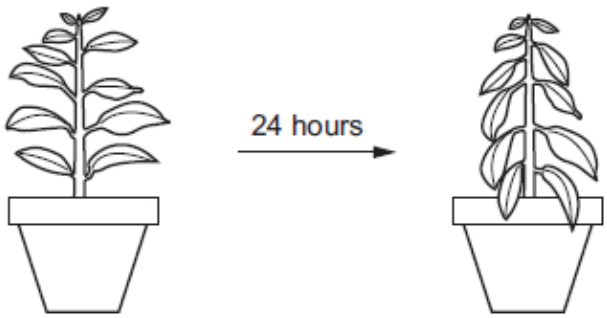
D starch

Bio 8 **Q# 139/** iGCSE Biology/2016/s/Paper 21/ www.SmashingScience.org :o)

16 Which graph shows most clearly what will happen to the rate of transpiration as humidity increases?



17 The diagram shows a potted plant and the same plant 24 hours later.



What causes the change in the appearance of the plant?

A Water loss is greater than water uptake.

B Water moves from the leaves to the stem.

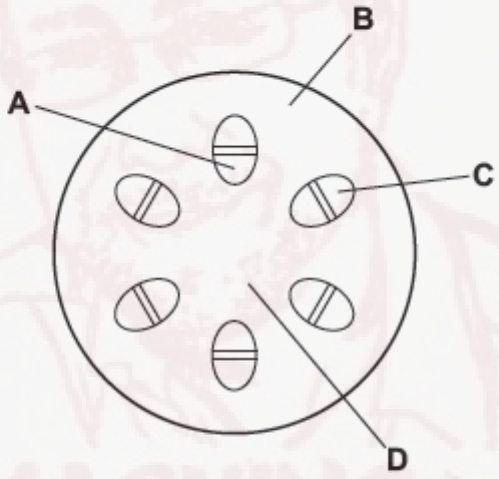
C Water uptake is equal to water loss.

D Water uptake is greater than water loss.

Bio 8 **Q# 140/** iGCSE Biology/2016/m/Paper 22/ www.SmashingScience.org :o)

16 The lower end of a plant stem is placed in water coloured with red dye. After three hours, the stem is cut as shown in the diagram.

Which labelled region is stained red?



17 By which process is water lost from a leaf?

A active transport

B diffusion

C osmosis

D photosynthesis

18 Which process is used to transport sucrose from the leaves of a plant to its flowers?

A diffusion

B osmosis

C translocation

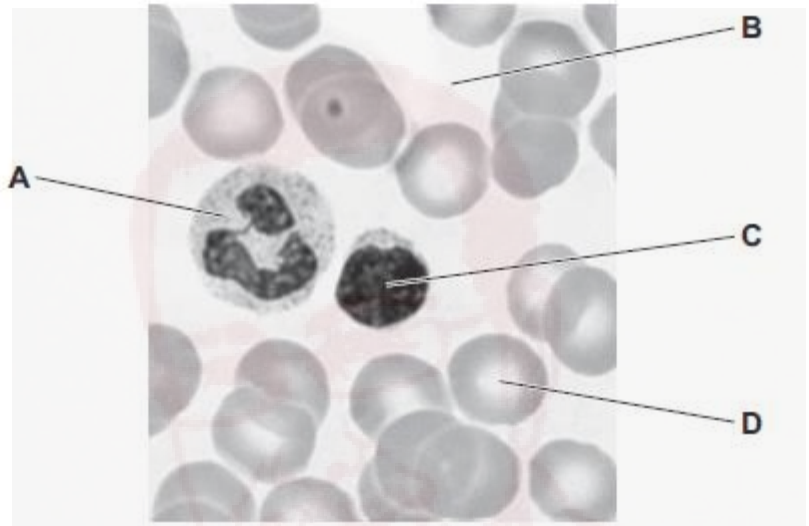
D transpiration

19 What are the main vessels carrying blood to and from the kidney?

	to kidney	from kidney
A	pulmonary artery	pulmonary vein
B	pulmonary vein	pulmonary artery
C	renal artery	renal vein
D	renal vein	renal artery

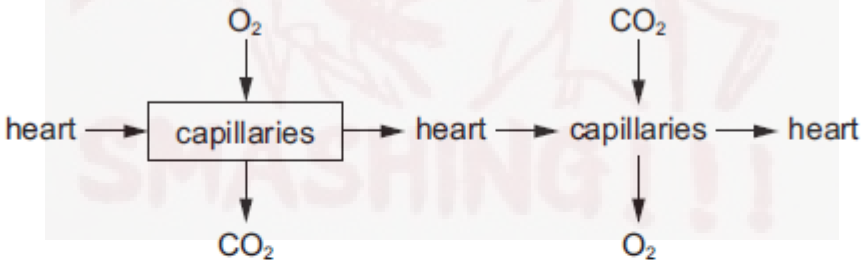
20 The photomicrograph shows human blood.

Which blood component makes antibodies?



Bio 9 **Q# 142/** iGCSE Biology/2021/m/Paper 22/ www.SmashingScience.org :o)

19 The diagram shows the circulation of blood in an organism.



In which part of the organism is the location of the capillaries in the box?

A fish body

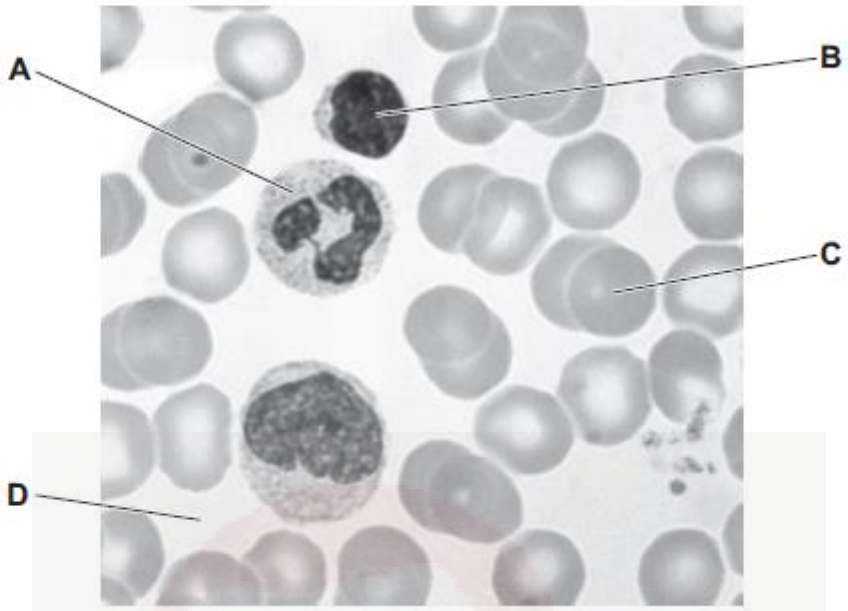
B fish gills

C mammalian lungs

D mammalian body

20 The photomicrograph shows human blood.

Which blood component can carry out the process of phagocytosis?



Bio 9 **Q# 143/** iGCSE Biology/2020/w/Paper 21/ www.SmashingScience.org :o)

17 The table shows some features of blood vessels.

Which row shows the features of a vein?

	direction of blood flow	size of the central hole (lumen)	thickness of wall
A	away from the heart	large	thick
B	away from the heart	small	thick
C	towards heart	small	thin
D	towards heart	large	thin

18 Where are valves found that prevent blood from flowing in the wrong direction?

A capillaries and arteries

B lungs and veins

C heart and capillaries

D heart and veins

Bio 9 **Q# 144/** iGCSE Biology/2020/s/Paper 21/ www.SmashingScience.org :o)

17 Which pathway is taken by blood in a fish?

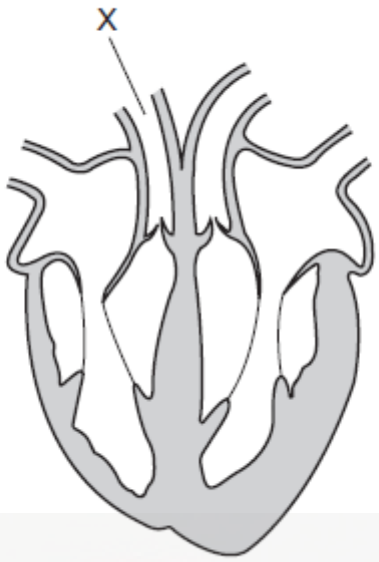
A gills → heart → body → gills

B body → gills → heart → body

C heart → gills → body → heart

D heart → body → gills → body

18 The diagram shows a section through the heart and its blood vessels.



Which row gives the vessel name and the direction of blood flow in vessel X?

	vessel name	direction of blood flow
A	aorta	towards the lungs
B	pulmonary artery	towards the lungs
C	pulmonary artery	away from the lungs
D	vena cava	away from the lungs

Bio 9 **Q# 145/** iGCSE Biology/2020/m/Paper 22/ www.SmashingScience.org :o)

19 Mammals have a double circulation.

Which shows the correct sequence for the movement of blood in a mammal?

A body → heart → lungs → heart

B body → lungs → body → heart

C heart → lungs → body → heart

D heart → body → lungs → heart

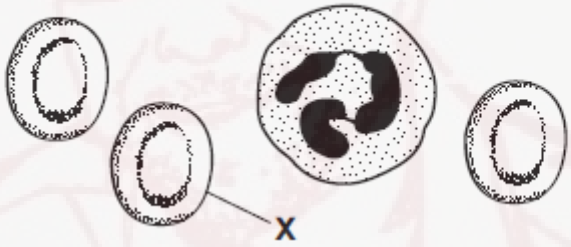
20 The diagram shows a section through a blood vessel.

Which type of blood vessel is shown, and in which direction does the blood flow?

	type of vessel	direction of flow
A	artery	P to Q
B	artery	Q to P
C	vein	P to Q
D	vein	Q to P

Bio 9 **Q# 146/** iGCSE Biology/2019/w/Paper 21/ www.SmashingScience.org :o)

17 The diagram shows human blood cells, as seen under a microscope.



What is the function of cell **X**?

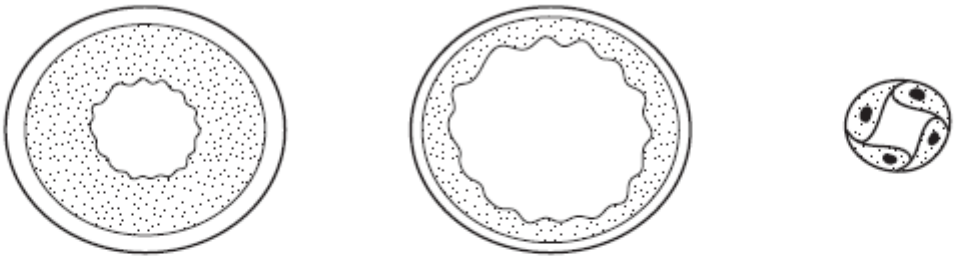
A to carry glucose

B to carry oxygen

C to defend against disease

D to make the blood clot

19 The diagram shows cross-sections through three types of blood vessel, **not** drawn to the same scale.

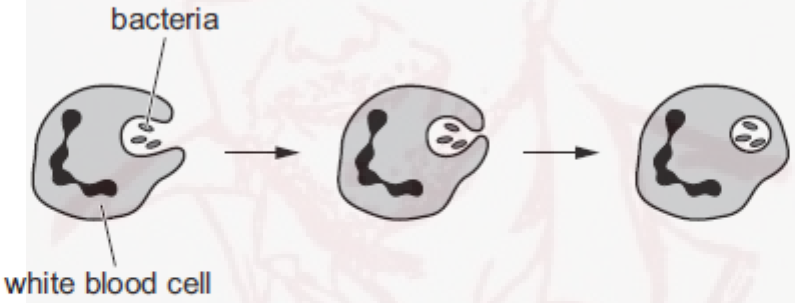


V W X

Which section is from a vein and which is from a capillary?

	vein	capillary
A	V	W
B	W	V
C	W	X
D	X	W

20 The diagram shows one way the body defends itself against pathogens.



What is the name of this defence mechanism?

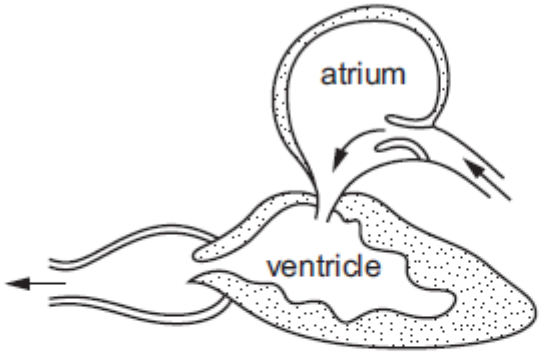
A antibody production

B egestion

C phagocytosis

D vaccination

18 The diagram shows a section through a fish heart and the direction of blood flow.



After leaving the heart, where will the blood flow to next?

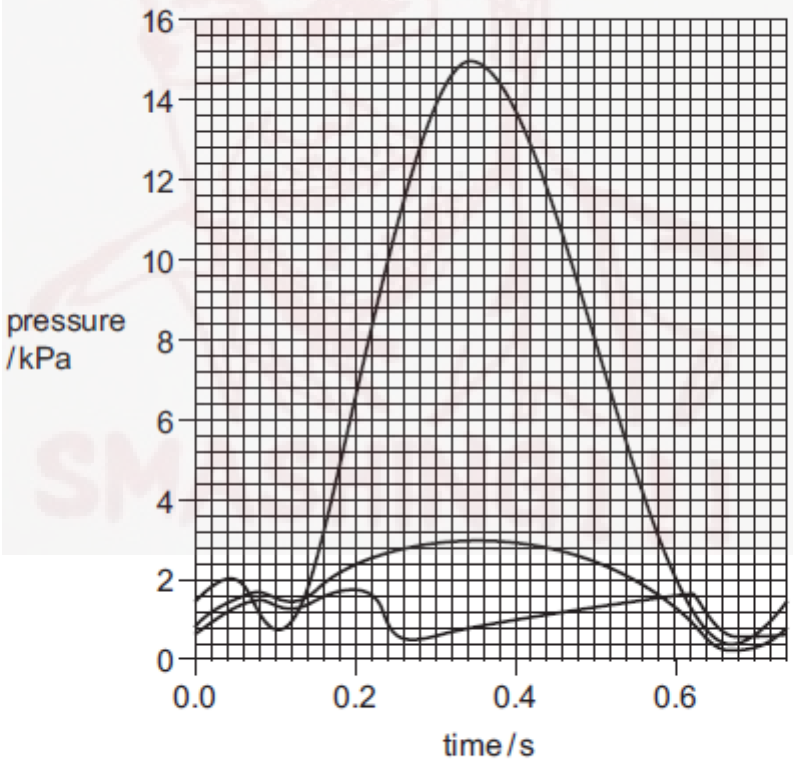
A eyes

B fins

C gills

D tail muscle

19 The graph shows pressure changes that take place in the right atrium, right ventricle and left ventricle of a human heart when the muscle walls contract and relax.

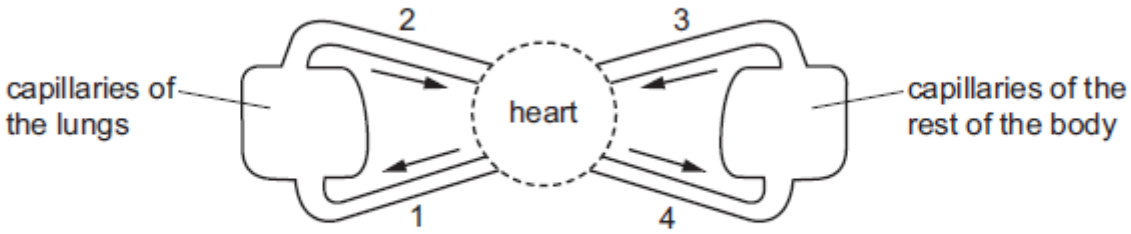


What is the pressure in the right ventricle when the left ventricle is at its maximum pressure?

A 0.4 kPa **B** 2.0 kPa **C** 3.0 kPa **D** 15.0 kPa

Bio 9 **Q# 149/** iGCSE Biology/2018/w/Paper 21/ www.SmashingScience.org :o)

17 The diagram shows a circulatory system.



Which vessels carry oxygenated blood?

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

18 What happens to the heart valves when the ventricles contract?

	atrioventricular valves	semilunar valves
A	valves close	valves close
B	valves close	valves open
C	valves open	valves close
D	valves open	valves open

Bio 9 **Q# 150/** iGCSE Biology/2018/s/Paper 21/ www.SmashingScience.org :o)

18 During the process of blood clotting, damage to blood vessels stimulates L, and M is converted to N.

What are L, M and N?

	L	M	N
A	fibrin	platelets	fibrinogen
B	fibrinogen	platelets	fibrin
C	platelets	fibrin	fibrinogen
D	platelets	fibrinogen	fibrin

Bio 9 **Q# 151/** iGCSE Biology/2018/m/Paper 22/ www.SmashingScience.org :o)

14 What is an advantage of a double circulatory system in mammals?

A Blood can flow down the body on the left and up the body on the right.

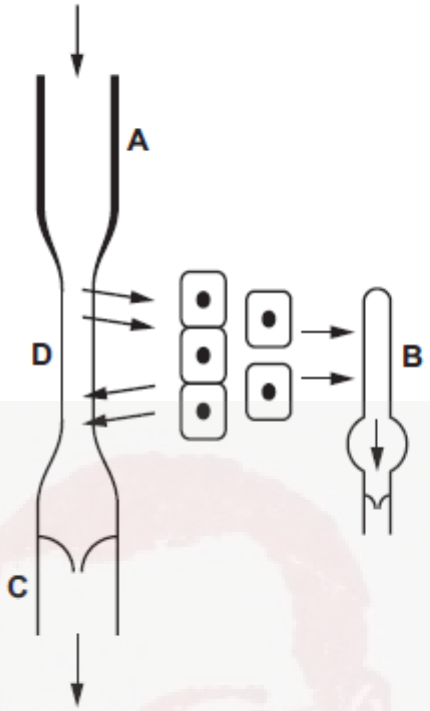
B Blood can flow more slowly along the circulatory system.

C Blood pressure stays the same throughout the circulatory system.

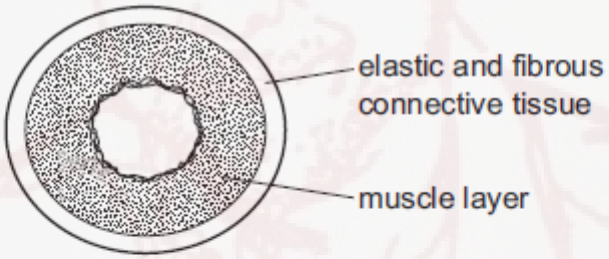
D Oxygenated and deoxygenated blood are kept separate.

17 The diagram shows the vessels associated with the flow of fluids to and from body cells.

Which is the lymph vessel?



18 The diagram shows a cross-section through a human blood vessel.



Which type of blood vessel does the diagram show?

A an artery

B a capillary

C a vein

D a ventricle

Bio 9 **Q# 153/** iGCSE Biology/2017/s/Paper 21/ www.SmashingScience.org :o)

18 The diagram shows a human blood cell.

What is its function?

A antibody production

B fibrinogen production

C oxygen transport

D phagocytosis

Bio 9 **Q# 154/** iGCSE Biology/2017/m/Paper 22/ www.SmashingScience.org :o)

15 Which is a function of the lymphatic system?

A deamination of amino acids

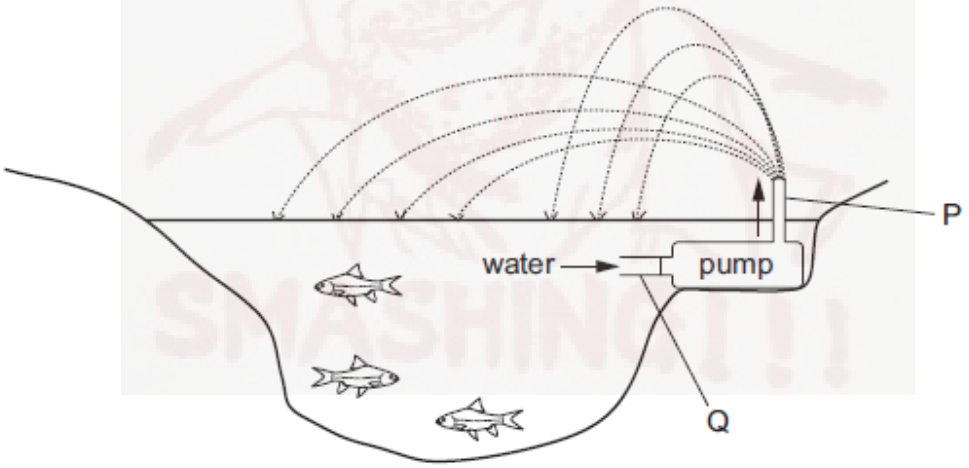
B production of lipase

C protection from infection

D transport of oxygen

Bio 9 **Q# 155/** iGCSE Biology/2016/w/Paper 21/ www.SmashingScience.org :o)

18 The diagram shows a garden pond with a fountain worked by a pump. The fountain brings oxygen from the air to fish in the pond.



The system can be compared with part of the human circulatory system. The pump is compared with the heart.

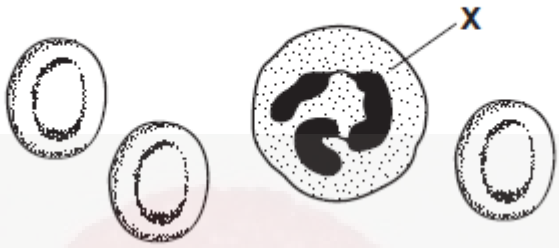
What are P and Q compared with?

	P	Q
A	aorta	pulmonary artery
B	pulmonary artery	vena cava
C	pulmonary vein	vena cava
D	vena cava	aorta

19 What happens when the left ventricle contracts?

	atrioventricular valves	semilunar valves
A	closed	closed
B	closed	open
C	open	closed
D	open	open

20 The diagram shows human blood cells, as seen under a microscope.



What is the function of cell **X**?

A to carry glucose

B to carry oxygen

C to defend against disease

D to make the blood clot

Bio 9 **Q# 156/** iGCSE Biology/2016/s/Paper 21/ www.SmashingScience.org :o)

14 What is **not** a result of cholera infection?

A intestinal blockage

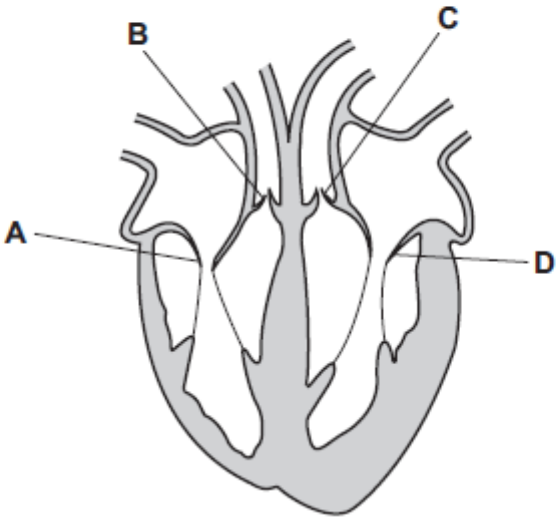
B loss of salts from blood

C severe dehydration of body tissues

D severe diarrhoea

18 The diagram shows a section through the human heart.

Which is the right atrioventricular valve?



19 What is the function of lymphocytes in the blood?

A antibody production

B blood clotting

C phagocytosis

D transport of hormones

Bio 9 **Q# 157/** iGCSE Biology/2016/m/Paper 22/ www.SmashingScience.org :o)

19 Which row shows the chambers of the heart, from those with the thickest walls to those with the thinnest walls?

	thickest →		thinnest
A	atria	left ventricle	right ventricle
B	atria	right ventricle	left ventricle
C	left ventricle	right ventricle	atria
D	right ventricle	left ventricle	atria

Paper 2 Bio Topic# 10 **Q# 158/** iGCSE Biology/2021/s/Paper 21/ www.SmashingScience.org :o)

15 Statements 1 to 4 describe stages in the development of cholera.

1 Chloride ions are secreted into the gut.

2 Osmosis causes water to move into the gut.

3 The infected person becomes dehydrated.

4 Toxins are produced by the pathogenic bacteria.

What is the correct sequence of the four stages?

A 1 → 2 → 3 → 4

B 1 → 4 → 3 → 2

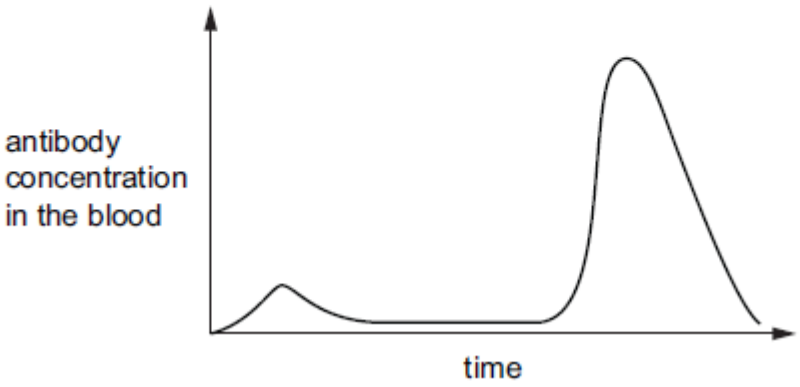
C 4 → 1 → 2 → 3

D 4 → 1 → 3 → 2

Bio 10 **Q# 159/** iGCSE Biology/2021/s/Paper 21/ www.SmashingScience.org :o)

21 A child is vaccinated against measles. After a period of time the child is infected with the measles virus.

The graph shows the concentration of measles antibodies in the child's bloodstream during this time.



Which statement is consistent with the information in the graph?

A After the vaccination, the child produced memory cells.

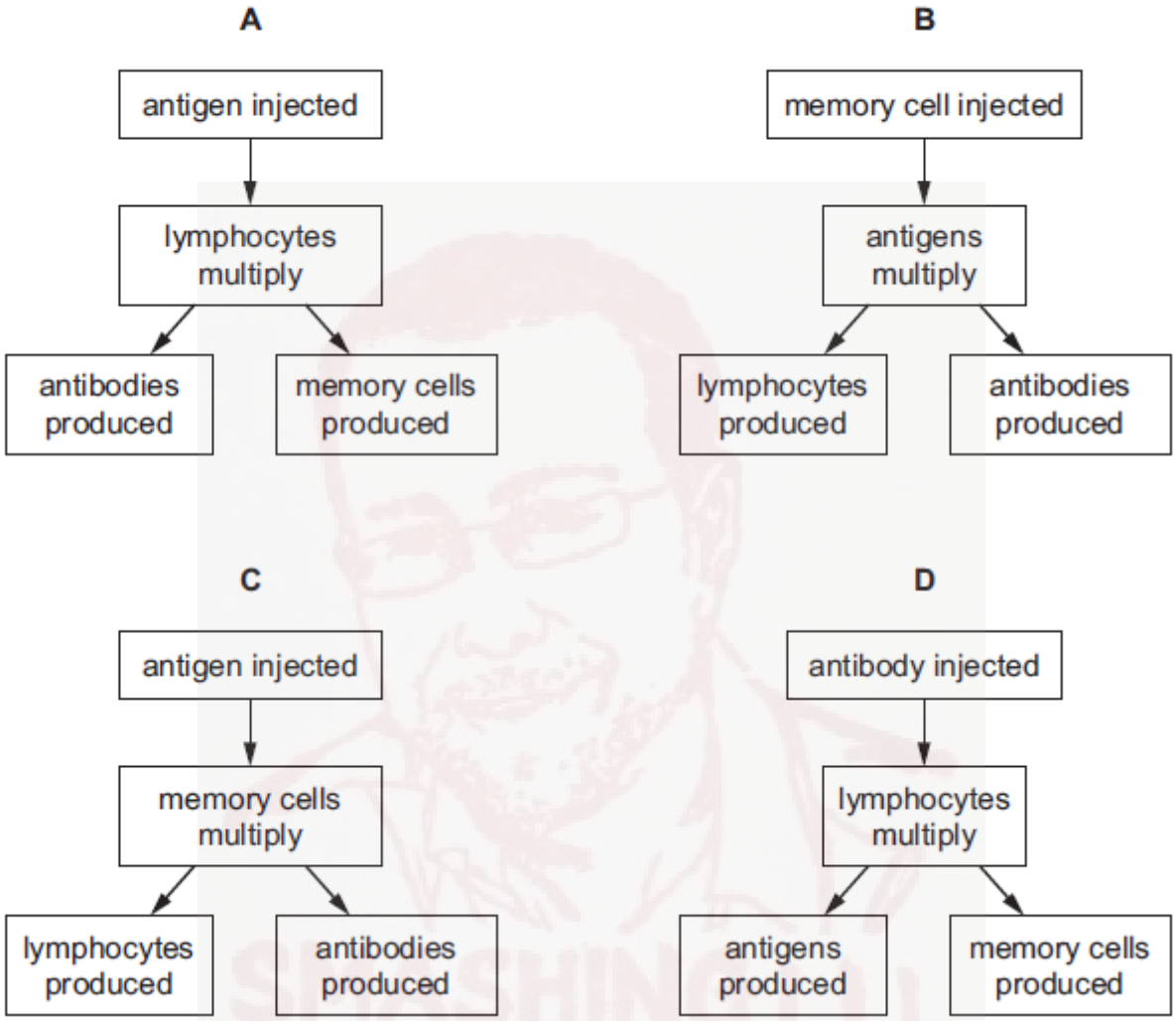
B The child had passive immunity against measles.

C The measles virus contains antibodies.

D The vaccination failed to protect the child against measles.

Bio 10 **Q# 160/** iGCSE Biology/2021/m/Paper 22/ www.SmashingScience.org :o)

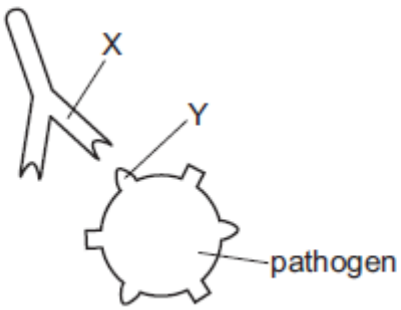
21 Which diagram shows how a vaccination can lead to long-term immunity?



Bio 10 **Q# 161/** iGCSE Biology/2020/s/Paper 21/ www.SmashingScience.org :o)

19 When a pathogen enters the blood, the immune system uses different mechanisms to destroy the pathogen.

The diagram shows one of these mechanisms.



Which row describes the structures involved?

	structure X	X is made by	structure Y
A	antigen	lymphocytes	antibody
B	antigen	phagocytes	antibody
C	antibody	lymphocytes	antigen
D	antibody	phagocytes	antigen

Bio 10 **Q# 162/** iGCSE Biology/2020/m/Paper 22/ www.SmashingScience.org :o)

15 Cholera infection can cause the following events:

1 cells lining the small intestine secrete chloride ions

2 cholera bacteria produce a toxin

3 chloride ions move into the small intestine

4 water from the blood moves into the small intestine by osmosis

5 water potential of fluid in the small intestine becomes lower.

Which sequence of events will cause diarrhoea?

A 1 → 3 → 2 → 4 → 5

B 2 → 1 → 3 → 5 → 4

C 3 → 1 → 4 → 5 → 2

D 2 → 3 → 1 → 4 → 5

21 The antibodies that give immunity to a disease can be acquired in the following different ways.

1 feeding on breast milk

2 infection by disease

3 vaccination

Which give active immunity?

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

31 What is a correct statement about lymphocytes?

A Lymphocytes engulf pathogens.

B Lymphocyte numbers can be reduced when a person is infected with HIV.

C Lymphocytes produce antigens.

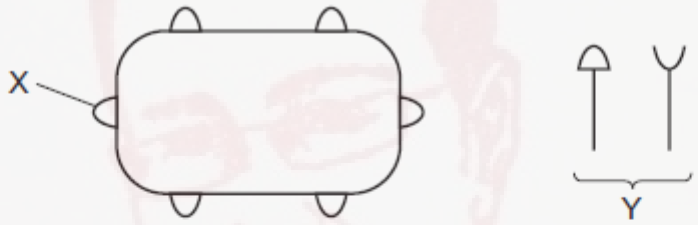
D Lymphocytes transport oxygen to different parts of the body.

14 The cholera bacterium produces toxins that cause chloride ions to be secreted into the small intestine.

How does this affect the water potential of blood in the intestinal capillaries and the intestinal contents?

	water potential	
	blood in capillaries	contents of small intestine
A	lowered	lowered
B	lowered	raised
C	raised	lowered
D	raised	raised

19 The diagram with the structure labelled X shows a bacterium with proteins on its surface. The diagram labelled Y shows proteins made by the human body.



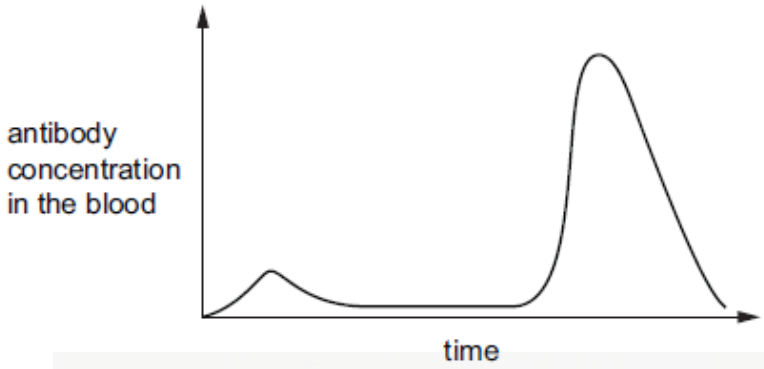
Which row shows the correct combination for destroying the bacterium?

	name of X	name of Y	correct shape of Y
A	antigen	antibody	
B	antibody	antigen	
C	antigen	antibody	
D	antibody	antigen	

Bio 10 **Q# 165/** iGCSE Biology/2018/s/Paper 21/ www.SmashingScience.org :o)

19 A child is vaccinated against measles. After a period of time the child is infected with the measles virus.

The graph shows the concentration of measles antibodies in the child's bloodstream during this time.



Which statement is consistent with the information in the graph?

A After the vaccination, the child produced memory cells.

B The child had passive immunity against measles.

C The measles virus contains antibodies.

D The vaccination failed to protect the child against measles.

Bio 10 **Q# 166/** iGCSE Biology/2018/m/Paper 22/ www.SmashingScience.org :o)

15 The body has defences to protect itself from diseases.

What is a mechanical barrier to diseases?

A hairs in the nose

B plasma

C stomach acid

D white blood cells

Bio 10 **Q# 167/** iGCSE Biology/2017/w/Paper 21/ www.SmashingScience.org :o)

19 Which are both chemical barriers to the transmission of pathogens?

A mucus and stomach acid

B mucus and white blood cells

C skin and hairs in the nose

D skin and stomach acid

Bio 10 **Q# 168/** iGCSE Biology/2017/w/Paper 21/ www.SmashingScience.org :o)

27 The immune system recognises pathogens and attacks them.

Which feature of pathogens triggers this response?

A antibodies

B antibiotics

C antigens

D memory cells

Bio 10 **Q# 169/** iGCSE Biology/2017/s/Paper 21/ www.SmashingScience.org :o)

19 What is a disease-causing organism called?

A antibody

B host

C pathogen

D phagocyte

Bio 10 **Q# 170/** iGCSE Biology/2017/m/Paper 22/ www.SmashingScience.org :o)

16 A hospital patient who is feeling unwell is given a blood test.

The results of the blood test show a very low level of platelets.

What effect will this have?

A The blood will be unable to transport nutrients, hormones and carbon dioxide.

B The blood will not be able to carry as much oxygen to the tissues as normal.

C There will be a greater risk of bleeding because the blood will take longer to clot.

D There will be a greater risk of infection because the blood cannot make antibodies.

Bio 10 **Q# 171/** iGCSE Biology/2016/w/Paper 21/ www.SmashingScience.org :o)

21 What is **not** a consequence of vaccination?

A Antigens trigger an immune response.

B Antibodies lock onto antigens.

C Memory cells are produced.

D Phagocytes produce antibodies.

Bio 10 **Q# 172/** iGCSE Biology/2016/w/Paper 21/ www.SmashingScience.org :o)

14 The cholera bacterium produces toxins that cause chloride ions to be secreted into the small intestine.

How does this affect the water potential of blood in the intestinal capillaries and the intestinal contents?

	water potential	
	blood in capillaries	contents of small intestine
A	lowered	lowered
B	lowered	raised
C	raised	lowered
D	raised	raised

Bio 10 **Q# 173/** iGCSE Biology/2016/s/Paper 21/ www.SmashingScience.org :o)

20 Which part of a pathogen is recognised by the immune system?

A active site

B antibiotic

C antibody

D antigen

Bio 10 **Q# 174/** iGCSE Biology/2016/m/Paper 22/ www.SmashingScience.org :o)

21 What happens when a child is vaccinated against tuberculosis?

	type of immunity	production of memory cells
A	active	no
B	active	yes
C	passive	no
D	passive	yes

Paper 2 Bio Topic# 11 **Q# 175/** iGCSE Biology/2021/s/Paper 21/ www.SmashingScience.org :o)

22 Which sequence of changes takes place when we breathe in?

A diaphragm contracts → volume of thorax increases → pressure in lungs decreases

B diaphragm contracts → volume of thorax increases → pressure in lungs increases

C diaphragm relaxes → volume of thorax increases → pressure in lungs decreases

D diaphragm relaxes → volume of thorax increases → pressure in lungs increases

Bio 11 **Q# 176/** iGCSE Biology/2021/m/Paper 22/ www.SmashingScience.org :o)

22 Air entering human lungs contains approximately 21% oxygen and 0.04% carbon dioxide.

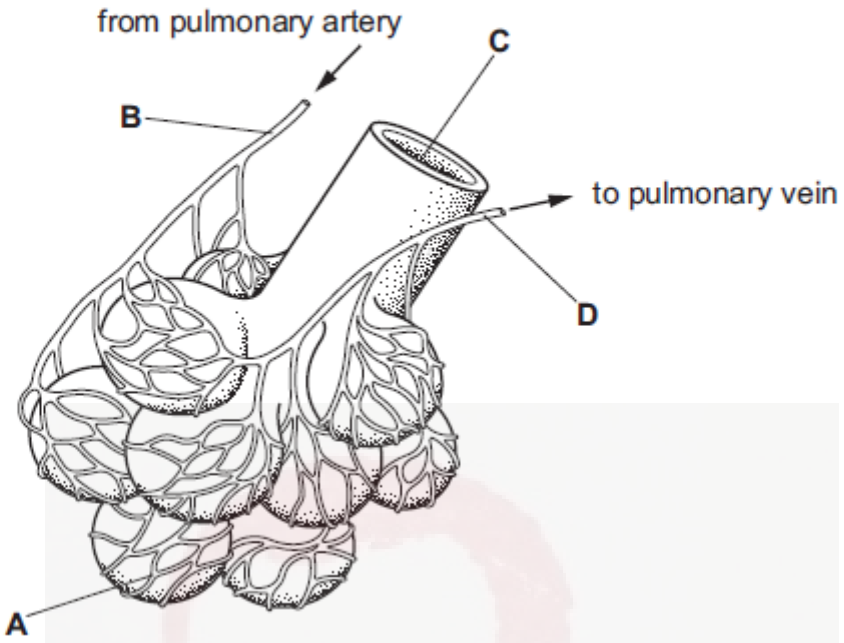
Which row shows the concentrations of these gases in air leaving the lungs?

	percentage of oxygen in expired air	percentage of carbon dioxide in expired air
A	4	21.0
B	12	4.0
C	16	4.0
D	20	0.4

Bio 11 **Q# 177/** iGCSE Biology/2020/w/Paper 21/ www.SmashingScience.org :o)

20 The diagram shows some of the structures in a human lung.

Where is the carbon dioxide concentration highest?



Bio 11 **Q# 178/** iGCSE Biology/2020/s/Paper 21/ www.SmashingScience.org :o)

20 What is the approximate percentage of oxygen contained in the air breathed out of the lungs?

A 0% **B** 4% **C** 16% **D** 20%

Bio 11 **Q# 179/** iGCSE Biology/2020/m/Paper 22/ www.SmashingScience.org :o)

22 During physical activity, what stimulates the brain to increase the breathing rate?

A decreased oxygen concentration in the blood

B decreased oxygen concentration in the lungs

C increased carbon dioxide concentration in the blood

D increased carbon dioxide concentration in the lungs

23 The table shows some of the changes that occur during breathing.

	from contracted to relaxed	from relaxed to contracted
diaphragm	P	X
external intercostal muscles	Q	Y
internal intercostal muscles	R	Z

Which changes occur to cause inspiration?

A P, Q and Z **B** X, Q and R **C** X, Y and R **D** X, Y and Z

15 What is an example of diffusion?

A dust particles being moved by ciliated cells in the trachea

B oxygen molecules moving into a red blood cell in the lungs

C pollen grains moving from anthers to stigmas in the wind

D red blood cells moving in a blood capillary in a muscle

19 Which row shows the approximate percentage of gases in expired air?

	percentage of carbon dioxide	percentage of oxygen
A	12	9
B	4	16
C	24	24
D	27	20

13 One of the symptoms of the disease cholera is diarrhoea. This is due to water loss by osmosis caused by the cholera toxin.

Cholera toxins result in

A secretion of chloride ions out of the small intestine lowering the water potential.

B secretion of chloride ions out of the small intestine raising the water potential.

C secretion of chloride ions into the small intestine lowering the water potential.

D secretion of chloride ions into the small intestine raising the water potential.

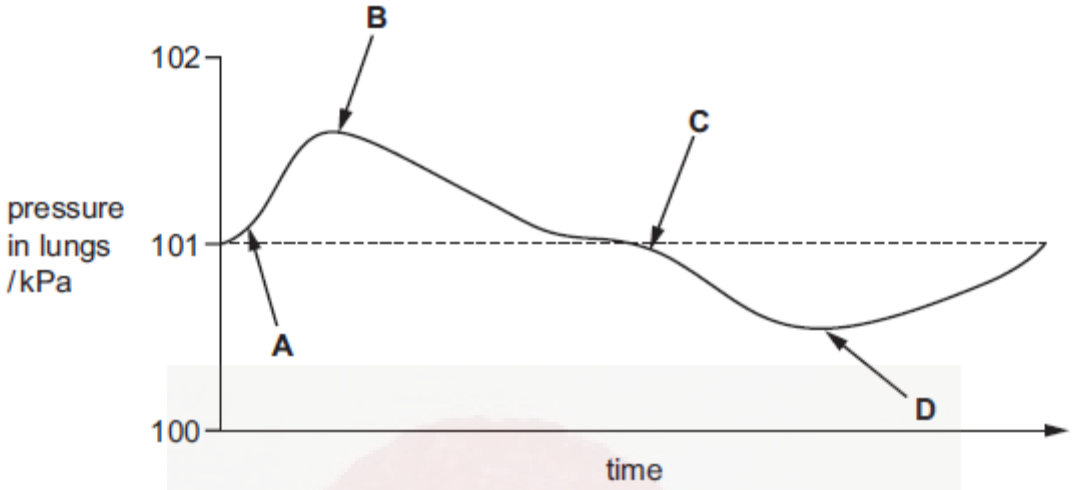
18 Which row describes the features of passive immunity?

	antibodies made	involves memory cells	effective period
A	no	no	short term
B	no	yes	short term
C	yes	no	long term
D	yes	yes	long term

Bio 11 **Q# 182/** iGCSE Biology/2019/s/Paper 21/ www.SmashingScience.org :o)

21 The diagram illustrates changes in air pressure taking place inside the lungs during a complete cycle of breathing. Atmospheric pressure is 101 kPa.

At which point on the diagram are the ribs beginning to be lowered?



Bio 11 **Q# 183/** iGCSE Biology/2019/m/Paper 22/ www.SmashingScience.org :o)

20 The body has different types of defences against pathogens.

1 antibodies

2 hairs in the nose

3 mucus

4 skin

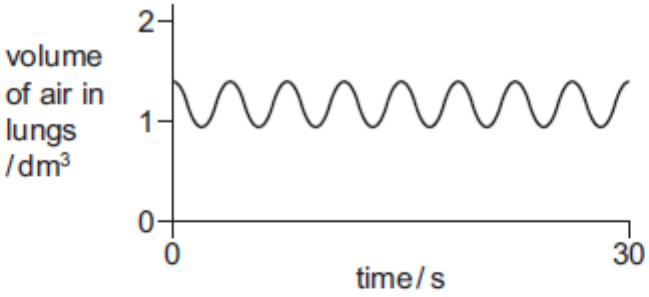
Which defences help to prevent pathogens reaching the alveoli when breathing in?

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

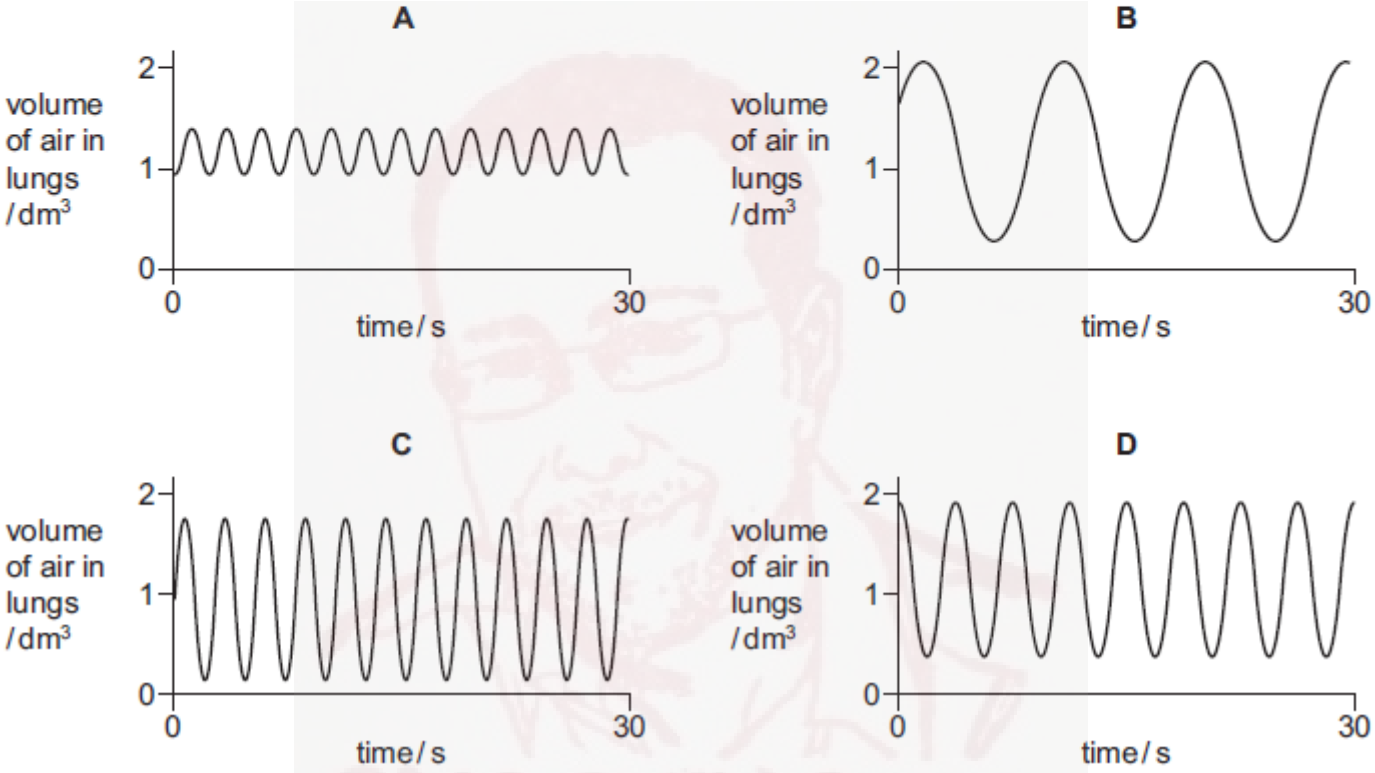
21 What are the approximate percentages of oxygen and carbon dioxide in inspired air?

	percentage of oxygen	percentage of carbon dioxide
A	16	4.00
B	16	8.00
C	20	0.04
D	20	4.00

20 The graph shows changes in the volume of air in the lungs of a person at rest, over a period of 30 seconds.



Which graph shows changes in the volume of air in the lungs of the same person immediately after they have done five minutes of vigorous exercise?



20 Muscles are responsible for the ventilation of the lungs during breathing.

Which row describes their action during the inspiration of air?

	diaphragm muscles	external intercostal muscles	internal intercostal muscles
A	contract	contract	relax
B	contract	relax	contract
C	relax	contract	relax
D	relax	relax	contract

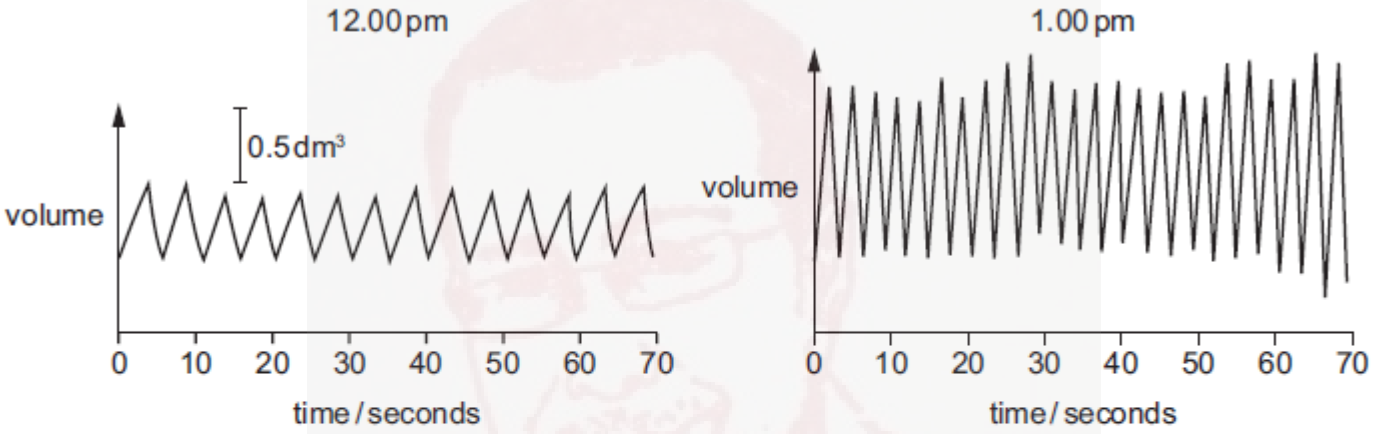
20 The table shows some of the changes that occur during breathing.

	from contracted to relaxed	from relaxed to contracted
diaphragm	P	X
external intercostals	Q	Y
internal intercostals	R	Z

Which changes occur to cause inspiration?

A P, Q and Z **B** X, Q and R **C** X, Y and R **D** X, Y and Z

37 The diagrams show the depth and rate of breathing in a person at 12.00 pm and 1.00 pm.



What happens to the person's breathing between 12.00 pm and 1.00 pm?

	depth of breathing	rate of breathing
A	decreases	decreases
B	decreases	increases
C	increases	decreases
D	increases	increases

20 Which is a function of the cartilage in the trachea?

A gas exchange

B prevents collapse of the trachea

C produces mucus

D traps bacteria

17 What is a common feature of both active and passive immunity?

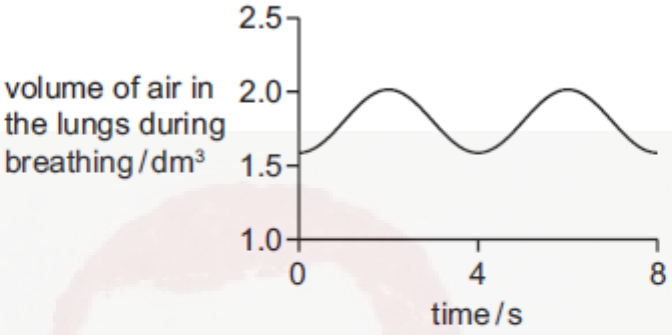
A They are acquired by vaccination.

B They are always short-term.

C They involve the activity of memory cells.

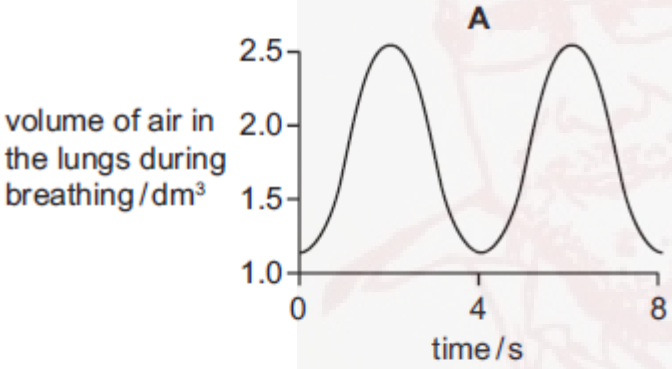
D They involve antibodies.

18 The graph shows the rate and depth of a person's breathing before exercise.

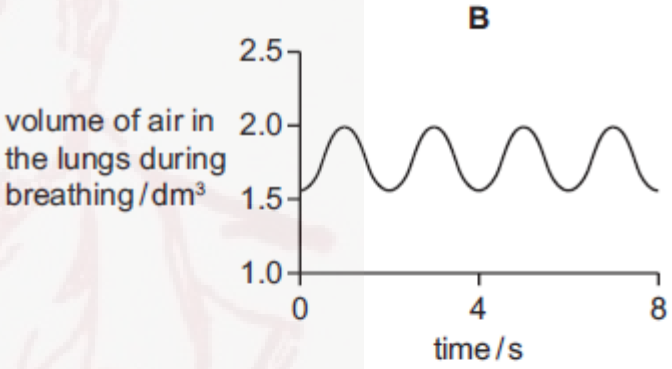


Which graph shows the rate and depth of breathing of the same person immediately after a period of exercise?

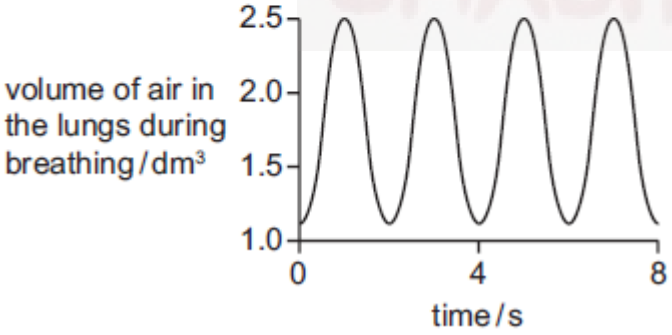
A



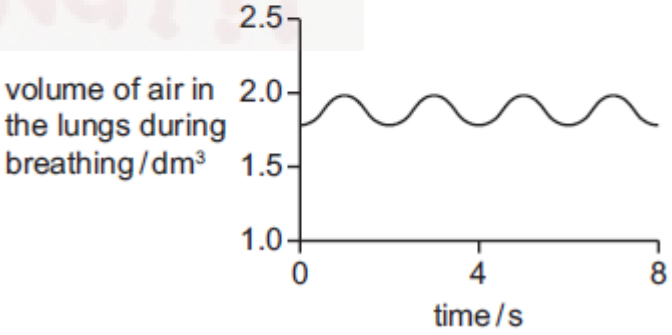
B



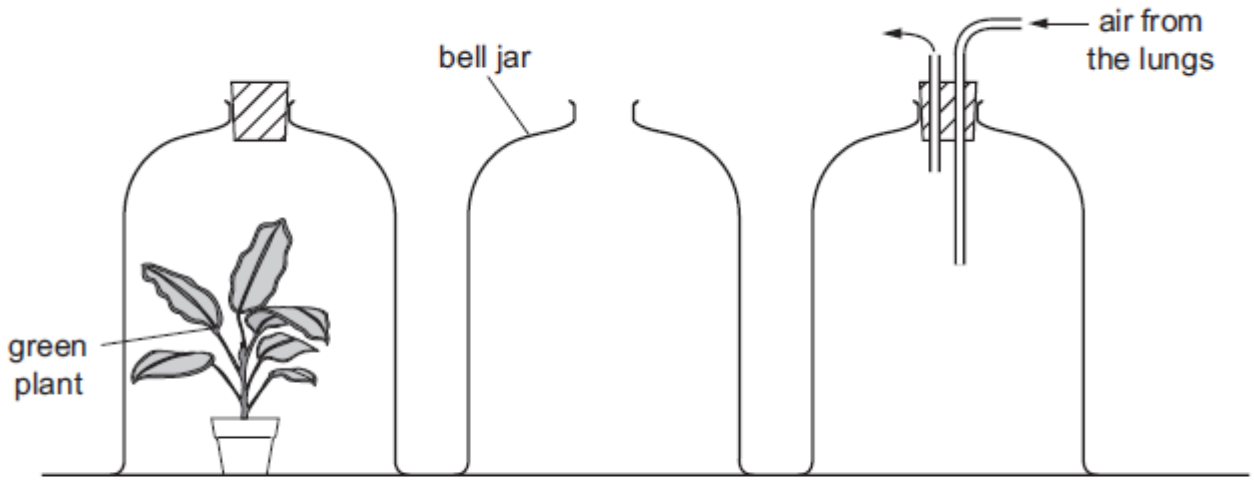
C



D



19 In an experiment, three glass bell jars were set up as shown in the diagram.



P	Q	R
left in sunlight for 8 hours	left open to the air for 8 hours	air breathed out by a student for 5 minutes

At the end of the experiment, which bell jar has the most oxygen and which has the least?

	most oxygen	least oxygen
A	P	Q
B	P	R
C	Q	P
D	R	P

Bio 11 **Q# 191/** iGCSE Biology/2016/w/Paper 21/ www.SmashingScience.org :o)

22 Which sequence of changes takes place when we breathe in?

A diaphragm contracts → volume of thorax increases → pressure in lungs decreases

B diaphragm contracts → volume of thorax increases → pressure in lungs increases

C diaphragm relaxes → volume of thorax increases → pressure in lungs decreases

D diaphragm relaxes → volume of thorax increases → pressure in lungs increases

Bio 11 **Q# 192/** iGCSE Biology/2016/s/Paper 21/ www.SmashingScience.org :o)

21 Compared with atmospheric air, air breathed out by a human contains

A less water vapour, less carbon dioxide.

B less water vapour, more carbon dioxide.

C more water vapour, less carbon dioxide.

D more water vapour, more carbon dioxide.

22 What describes the actions of the intercostal muscles and the diaphragm when we breathe out?

	external intercostal muscles	internal intercostal muscles	diaphragm
A	contract	relax	falls
B	contract	relax	rises
C	relax	contract	falls
D	relax	contract	rises

Bio 11 **Q# 193/** iGCSE Biology/2016/m/Paper 22/ www.SmashingScience.org :o)

22 What helps oxygen to be absorbed rapidly into the blood in the lungs?

A Air breathed in has less oxygen than air breathed out.

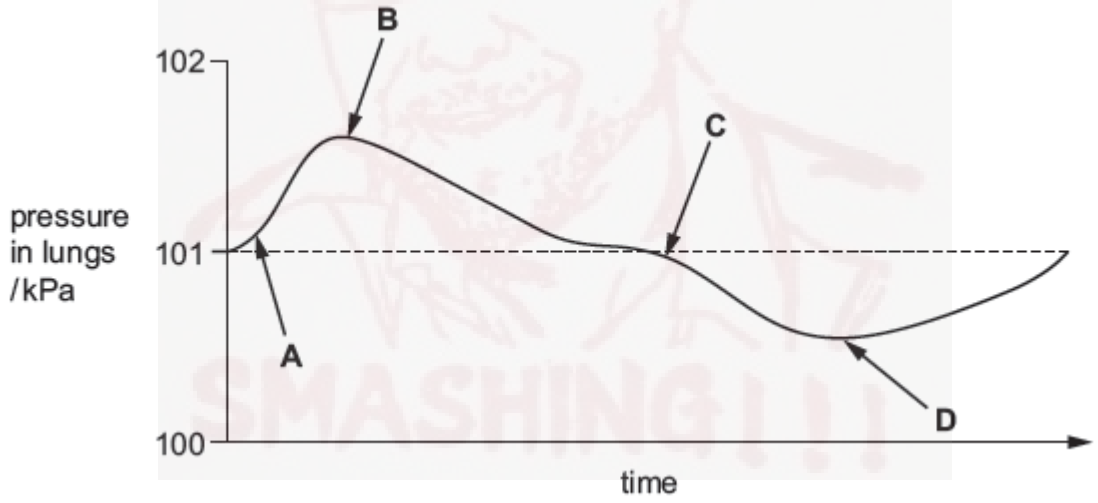
B Alveoli have thick walls and a large surface area.

C Alveoli have thin walls and a large surface area.

D The concentration of oxygen in the blood is higher than in the alveoli.

23 The diagram illustrates changes in air pressure taking place inside the lungs during a complete cycle of breathing. Atmospheric pressure is 101 kPa.

At which point on the diagram are the ribs beginning to be lowered?



Paper 2 Bio Topic# 12 **Q# 194/** iGCSE Biology/2021/s/Paper 21/ www.SmashingScience.org :o)

24 Which equation is aerobic respiration?

A $6CO_2 + 6H_2O \rightarrow 6C_6H_{12}O_6 + 6O_2$

B $6O_2 + 6CO_2 \rightarrow 6H_2O + C_6H_{12}O_6$

C $C_6H_{12}O_6 + 6O_2 \rightarrow 6CO_2 + 6H_2O$

D $C_6H_{12}O_6 \rightarrow 2C_2H_5OH + 2CO_2$

Bio 12 **Q# 195/** iGCSE Biology/2021/m/Paper 22/ www.SmashingScience.org :o)

23 After running a fast race a student had pains in their leg muscles.

The pain was caused by the build-up of a product of anaerobic respiration.

Which product caused the pain?

A carbon dioxide

B ethanol

C lactic acid

D water

Bio 12 **Q# 196/** iGCSE Biology/2020/w/Paper 21/ www.SmashingScience.org :o)

21 The list shows some processes that happen in the human body.

1 water enters cells by osmosis

2 muscles contract

3 impulses travel along neurones

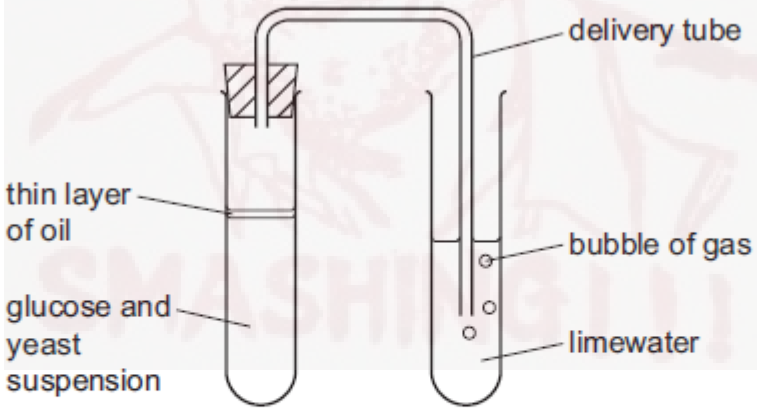
4 oxygen diffuses into cells

Which of these require energy released by respiration?

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

Bio 12 **Q# 197/** iGCSE Biology/2020/s/Paper 21/ www.SmashingScience.org :o)

21 The diagram shows an experiment to investigate the respiration of yeast. Oil prevents oxygen entering the glucose and yeast suspension.



If **no** oxygen is present in the glucose and yeast suspension, what will occur?

A Ethanol will be produced and the limewater will stay clear.

B Ethanol will be produced and the limewater will go cloudy.

C Lactic acid will be produced and the limewater will stay clear.

D Lactic acid will be produced and the limewater will go cloudy.

22 Which row correctly completes the balanced equation for aerobic respiration?

$$X + 6O_2 \rightarrow 6CO_2 + Y$$

	X	Y
A	$6C_6H_{12}O_6$	H_2O
B	$C_6H_{12}O_6$	$6H_2O$
C	$6H_2O$	$C_6H_{12}O_6$
D	$C_6H_{10}O_6$	$6H_2O$

Bio 12 **Q# 198/** iGCSE Biology/2020/m/Paper 22/ www.SmashingScience.org :o)

24 How many molecules of ethanol are released from the anaerobic respiration of one molecule of glucose?

A 1 **B** 2 **C** 4 **D** 6

Bio 12 **Q# 199/** iGCSE Biology/2019/w/Paper 21/ www.SmashingScience.org :o)

20 What is the correct equation for aerobic respiration?

A $6CO_2 + 6H_2O \rightarrow C_6H_{12}O_6 + 6O_2$

B $C_6H_{12}O_6 + 6CO_2 \rightarrow 6O_2 + 6H_2O$

C $C_6H_{12}O_6 + O_2 \rightarrow CO_2 + H_2O$

D $C_6H_{12}O_6 + 6O_2 \rightarrow 6CO_2 + 6H_2O$

21 Lactic acid builds up in the muscles during vigorous exercise.

During recovery, how is this lactic acid removed?

A aerobic respiration of lactic acid in the liver

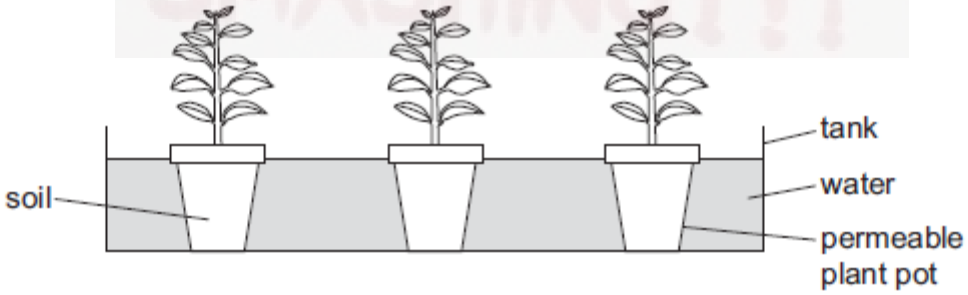
B anaerobic respiration of lactic acid in the muscles

C excretion of lactic acid by the lungs

D removal of lactic acid by the alimentary canal

Bio 12 **Q# 200/** iGCSE Biology/2019/s/Paper 21/ www.SmashingScience.org :o)

22 Potted plants are left for a week in a tank of water as shown.



Why do the plants die?

A The roots do not have enough oxygen.

B The roots do not have enough water.

C The roots have too much oxygen.

D The roots have too much carbon dioxide.

23 Which statement about both aerobic and anaerobic respiration is correct?

A They break down $C_6H_{12}O_6$.

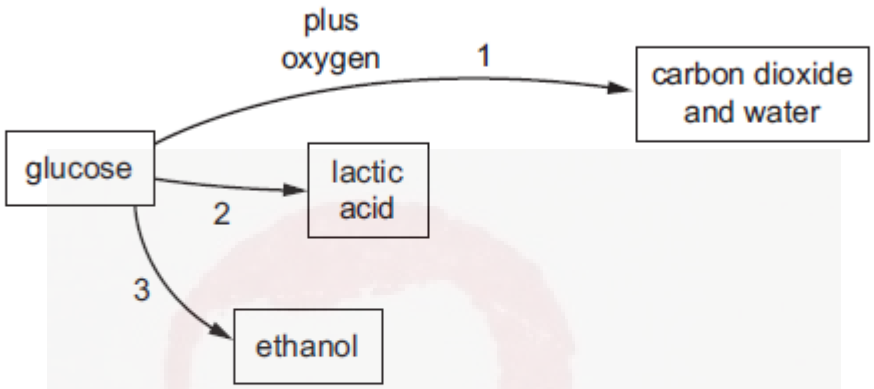
B They produce an oxygen debt.

C They use CO_2.

D They use O_2.

Bio 12 **Q# 201/** iGCSE Biology/2019/m/Paper 22/ www.SmashingScience.org :o)

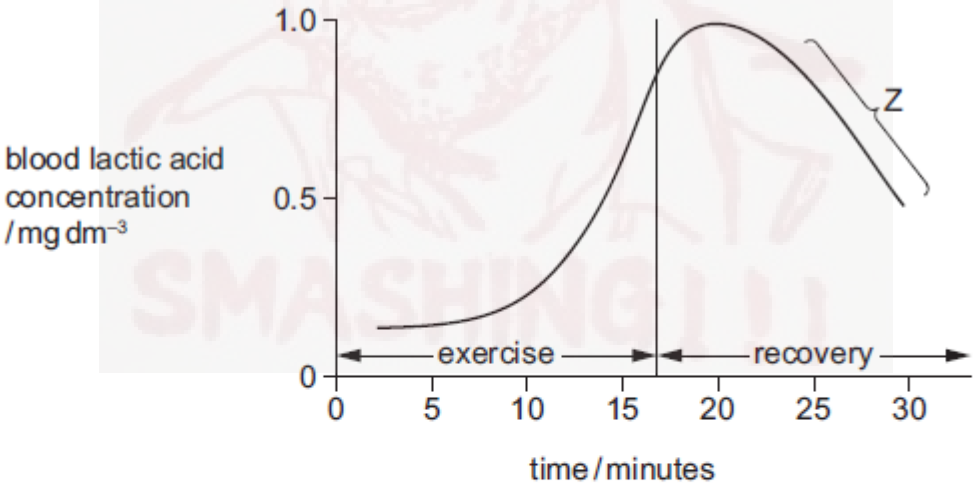
22 The flow diagram summarises three different ways that glucose can be broken down to release energy.



Which routes involve the action of enzymes?

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

23 The graph shows the lactic acid concentration in blood during and after exercise.



Which process accounts for the shape of the graph at Z?

A aerobic respiration of lactic acid in the kidney

B aerobic respiration of lactic acid in the liver

C anaerobic respiration of lactic acid in the kidney

D anaerobic respiration of lactic acid in the liver

Bio 12 **Q# 202/** iGCSE Biology/2018/w/Paper 21/ www.SmashingScience.org :o)

21 What is produced by anaerobic respiration in mammals?

A alcohol + carbon dioxide

B alcohol + oxygen

C lactic acid + carbon dioxide

D lactic acid

Bio 12 **Q# 203/** iGCSE Biology/2018/s/Paper 21/ www.SmashingScience.org :o)

21 Yeast is able to respire both aerobically and anaerobically.

Which statement describes the waste products of yeast respiration?

A Aerobic respiration produces alcohol as one of its waste products.

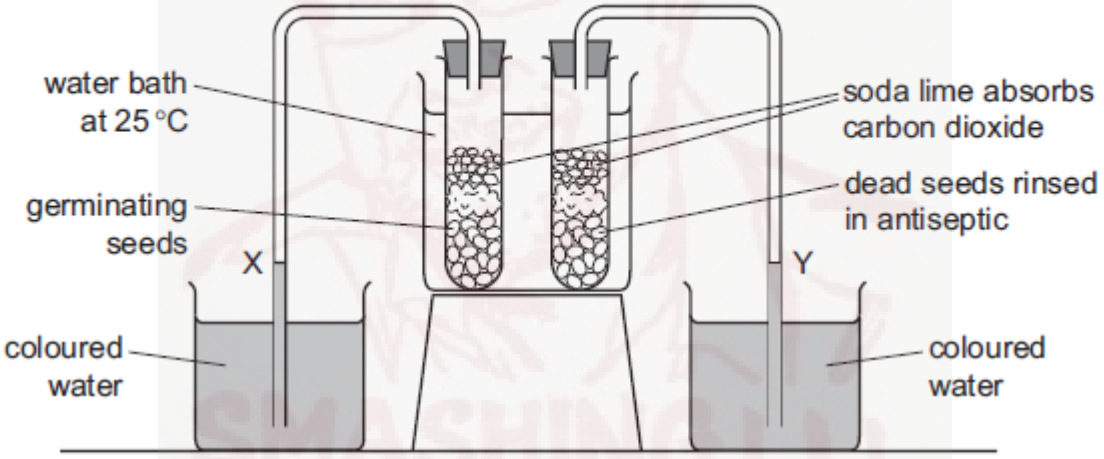
B Aerobic respiration produces three times as much carbon dioxide as anaerobic respiration from one molecule of glucose.

C Anaerobic respiration and aerobic respiration both produce the same amount of carbon dioxide from one molecule of glucose.

D Anaerobic respiration produces three times as much carbon dioxide as aerobic respiration from one molecule of glucose.

Bio 12 **Q# 204/** iGCSE Biology/2018/m/Paper 22/ www.SmashingScience.org :o)

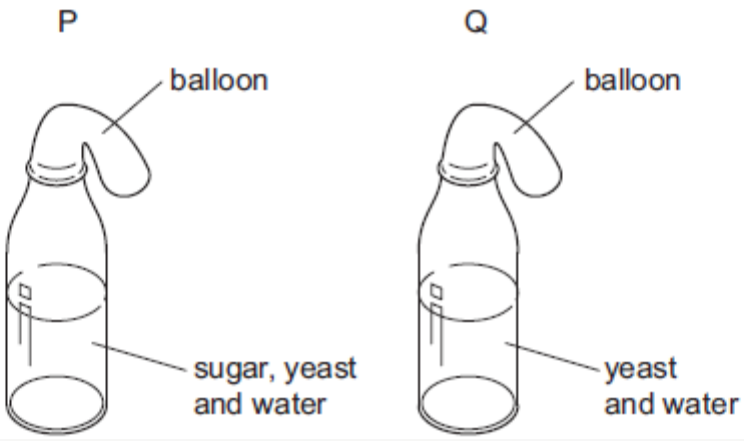
17 An experiment is set up to investigate the uptake of oxygen by germinating seeds.



What happens to the levels of the coloured water at X and Y?

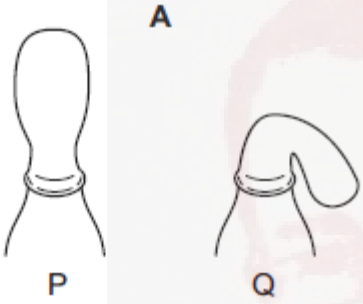
	X	Y
A	falls	rises
B	falls	unchanged
C	rises	falls
D	rises	unchanged

21 In an experiment to investigate anaerobic respiration, two bottles are set up in a warm room, as shown.

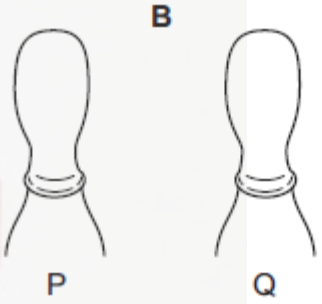


What would happen to each balloon after one day?

A

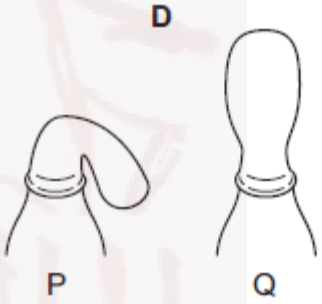


B

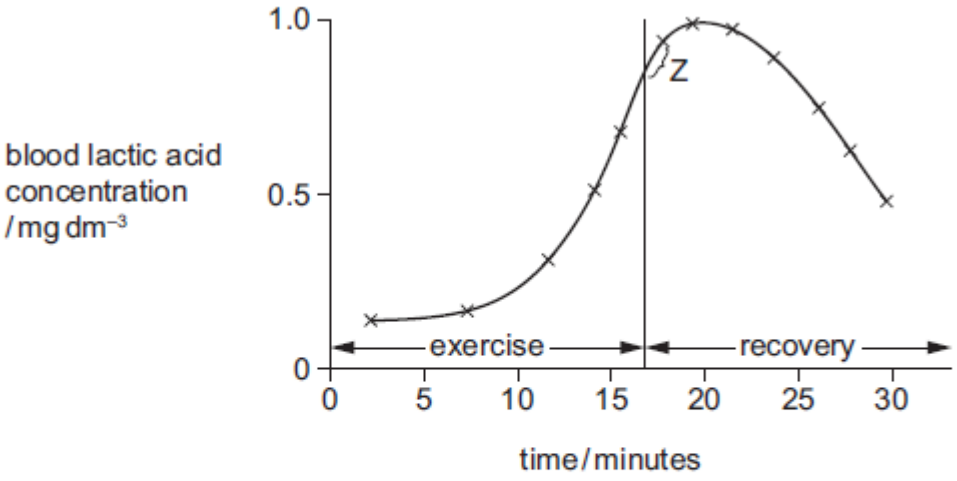


C

D



22 The graph shows the lactic acid concentration in blood during and after exercise.



The continuation of which process accounts for the shape of the graph at Z?

A deep breathing

B high heart rate

C high rate of breathing

D movement of lactic acid from the muscles

Bio 12 **Q# 206/** iGCSE Biology/2017/s/Paper 21/ www.SmashingScience.org :o)

21 Which is the equation for anaerobic respiration in yeast?

A $C_6H_{12}O_6 \rightarrow 2C_2H_5OH + 2CO_2$

B $C_6H_{12}O_6 + 6O_2 \rightarrow 6CO_2 + 6H_2O$

C $2CO_2 + 2C_2H_5OH \rightarrow C_6H_{12}O_6$

D $6CO_2 + 6H_2O \rightarrow C_6H_{12}O_6 + 6O_2$

Bio 12 **Q# 207/** iGCSE Biology/2017/m/Paper 22/ www.SmashingScience.org :o)

20 What are the products of anaerobic respiration in muscles?

A ethanol and carbon dioxide

B ethanol only

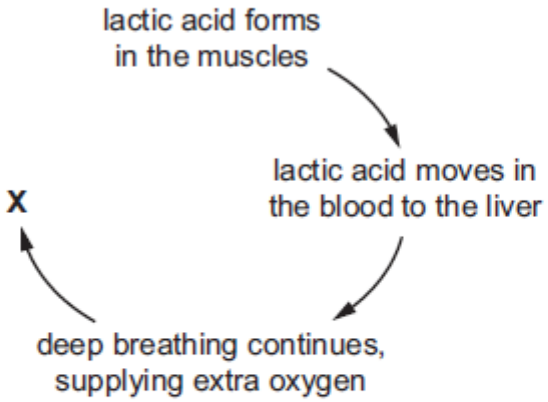
C lactic acid and carbon dioxide

D lactic acid only

Bio 12 **Q# 208/** iGCSE Biology/2016/w/Paper 21/ www.SmashingScience.org :o)

23 After a race, athletes experience oxygen debt.

The diagram shows how the oxygen debt is removed.



What happens at **X**?

A aerobic respiration of glucose

B aerobic respiration of lactic acid

C anaerobic respiration of glucose

D anaerobic respiration of lactic acid

Bio 12 **Q# 209/** iGCSE Biology/2016/s/Paper 21/ www.SmashingScience.org :o)

23 What is the word equation for aerobic respiration in plants?

A carbon dioxide + water → glucose + oxygen

B glucose + carbon dioxide → water + oxygen

C glucose + oxygen → carbon dioxide + water

D glucose + water → carbon dioxide + oxygen

Paper 2 Bio Topic# 13 **Q# 210/** iGCSE Biology/2021/s/Paper 21/ www.SmashingScience.org :o)

8 Which process is involved in the uptake of glucose by the epithelial cells of kidney tubules?

A active transport

B osmosis

C translocation

D transpiration

Bio 13 **Q# 211/** iGCSE Biology/2021/s/Paper 21/ www.SmashingScience.org :o)

25 Which statement about urea is correct?

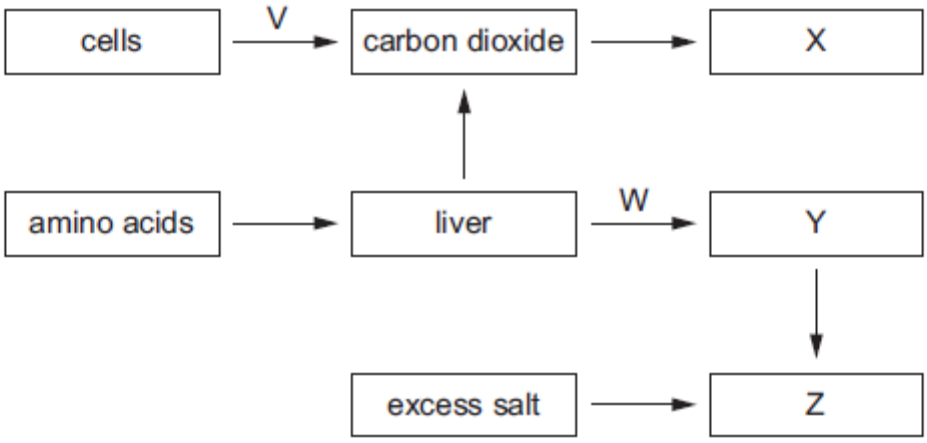
A Urea is formed from excess amino acids in the kidneys and excreted by the liver.

B Urea is formed from excess glucose in the liver and egested by the kidneys.

C Urea is formed from excess glucose in the kidneys and egested by the liver.

D Urea is formed from excess amino acids in the liver and excreted by the kidneys.

24 The diagram shows the production and excretion of materials from the human body.



What are V, W, X, Y and Z in the diagram?

	V	W	X	Y	Z
A	anaerobic respiration	deamination	kidneys	urea	lungs
B	anaerobic respiration	filtration	lungs	kidneys	urea
C	aerobic respiration	deamination	lungs	urea	kidneys
D	aerobic respiration	filtration	urea	lungs	kidneys

22 The table shows the composition of blood entering and leaving the liver and the kidneys.

Which row is correct?

	highest concentration of urea in the blood	lowest concentration of urea in the blood
A	entering kidneys	leaving liver
B	entering kidneys	entering liver
C	leaving kidneys	entering liver
D	leaving kidneys	leaving liver

23 In healthy people, which substance is completely reabsorbed into the blood from the kidney tubules?

A glucose

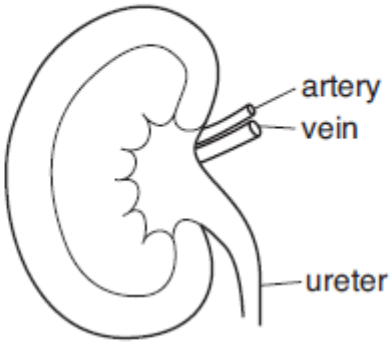
B salts

C urea

D water

Bio 13 **Q# 215/** iGCSE Biology/2020/m/Paper 22/ www.SmashingScience.org :o)

25 The diagram shows a kidney and its blood vessels.



In a healthy person, which structure(s) transport glucose?

A artery only

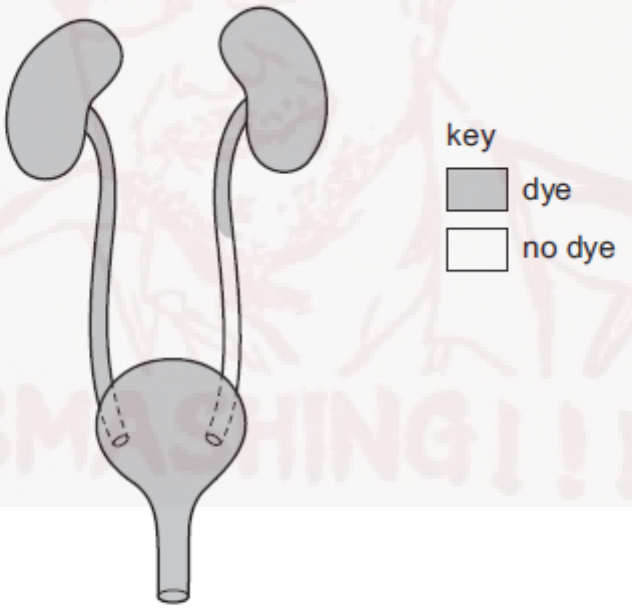
B artery and ureter

C artery and vein

D ureter and vein

Bio 13 **Q# 216/** iGCSE Biology/2019/w/Paper 21/ www.SmashingScience.org :o)

25 A patient has dye injected into the blood supply to his kidneys. The dye appears in his excretory system as shown.



Which part is blocked?

A the kidney

B the ureter

C the bladder

D the urethra

Bio 13 **Q# 217/** iGCSE Biology/2019/s/Paper 21/ www.SmashingScience.org :o)

25 What is a function of the liver?

A converting bile to urea

B converting urea to amino acids

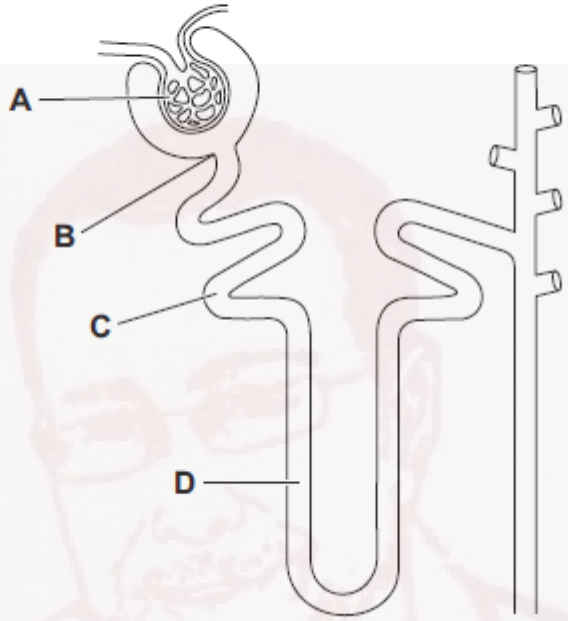
C deamination of amino acids

D deamination of carbon dioxide

Bio 13 **Q# 218/** iGCSE Biology/2019/m/Paper 22/ www.SmashingScience.org :o)

24 The diagram shows the structure of a kidney tubule.

Where does filtration occur?

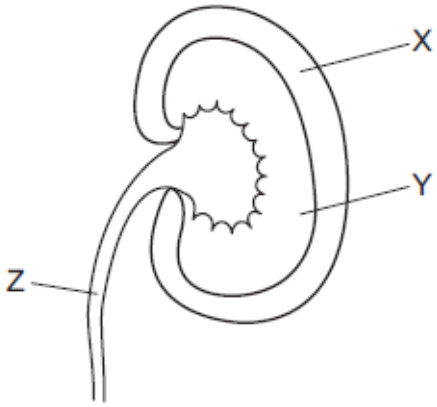


Bio 13 **Q# 219/** iGCSE Biology/2018/w/Paper 21/ www.SmashingScience.org :o)

22 Which row describes the functions of the bladder, kidneys and liver?

	production of urea	excretion of urea	storage of urine
A	liver	bladder	kidneys
B	bladder	kidneys	liver
C	liver	kidneys	bladder
D	kidneys	liver	bladder

18 The diagram shows a section of a kidney.



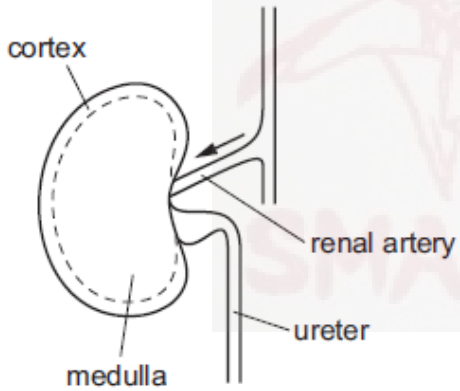
What are the correct labels?

	X	Y	Z
A	cortex	medulla	ureter
B	cortex	ureter	medulla
C	medulla	cortex	ureter
D	medulla	ureter	cortex

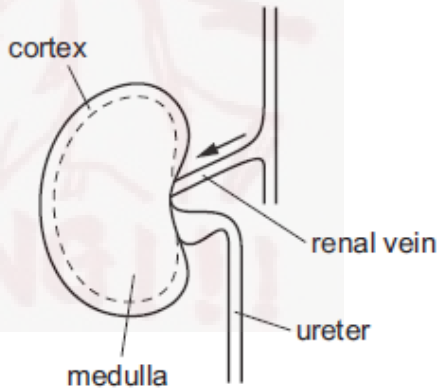
22 A longitudinal section of the kidney and some associated structures have been labelled.

Which labelling is correct?

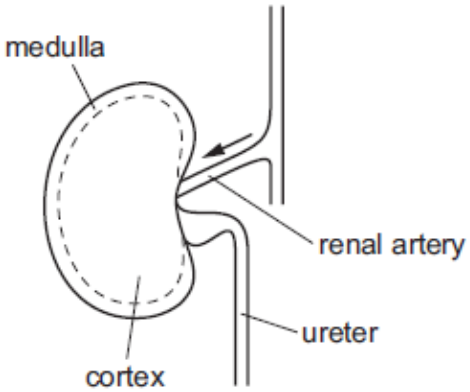
A



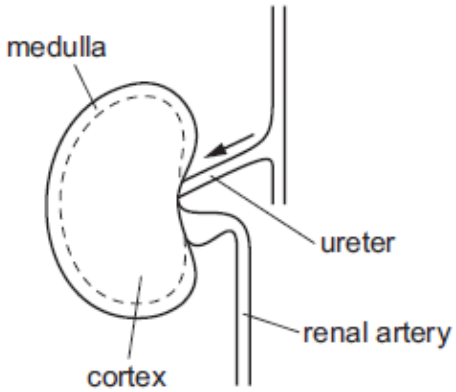
B



C



D



Bio 13 **Q# 222/** iGCSE Biology/2017/m/Paper 22/ www.SmashingScience.org :o)

21 Which substance remains in the blood as it passes through the kidney?

A protein

B salts

C urea

D water

Bio 13 **Q# 223/** iGCSE Biology/2016/w/Paper 21/ www.SmashingScience.org :o)

24 What happens as a result of deamination in the liver?

A Alcohol is broken down.

B Glycogen is stored.

C Glucose is produced.

D Urea is produced.

Bio 13 **Q# 224/** iGCSE Biology/2016/s/Paper 21/ www.SmashingScience.org :o)

24 An amino acid is deaminated. This is the removal of

A the carbon-containing part.

B the nitrogen-containing part.

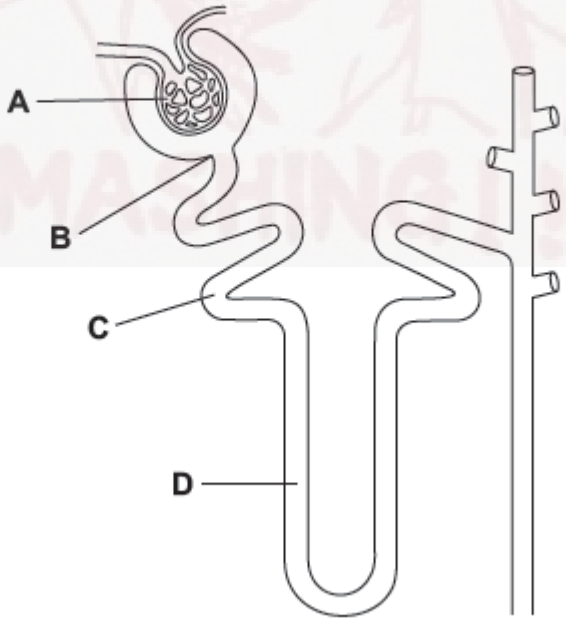
C the oxygen-containing part.

D the sulfur-containing part.

Bio 13 **Q# 225/** iGCSE Biology/2016/m/Paper 22/ www.SmashingScience.org :o)

24 The diagram shows the structure of a kidney tubule.

Where does filtration occur?



23 The list shows some processes that take place in a human body.

1 production of new red blood cells

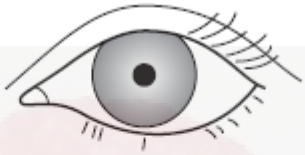
2 transmission of nerve impulses from the eyes to the brain

3 diffusion of gases into and out of the lungs

Which processes use energy released by respiration?

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

26 The diagram shows the appearance of an eye when in bright light.



bright light

Which row gives the correct states of the iris muscles in bright light?

	radial muscles	circular muscles
A	contracted	contracted
B	contracted	relaxed
C	relaxed	contracted
D	relaxed	relaxed

27 What is the effect of adrenaline on pulse rate and blood glucose concentration?

	pulse rate	blood glucose
A	decreases	decreases
B	decreases	increases
C	increases	decreases
D	increases	increases

28 Which statements about auxin are correct?

1 Auxin is made in all cells in plants.

2 Auxin causes cells to elongate.

3 Auxin moves between the cells by osmosis.

4 Auxin is unequally distributed.

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

25 What is a function of a synapse?

A to allow impulses to travel in both directions

B to ensure impulses travel in one direction

C to release vesicles into the synaptic gap

D to transport neurotransmitters by osmosis

26 Hormones and the nervous system both control our bodies.

Which statement about the control provided by our hormones is correct?

A fast response and long lasting

B fast response and short lived

C slow response and long lasting

D slow response and short lived

27 Auxin is a chemical produced by plants. It controls plant growth.

Which statement about auxin is correct?

A Auxin affects the cells only where it is made.

B Auxin is equally distributed in response to light from one direction.

C Auxin elongates the cells in the shoot tip.

D Auxin is made in the shoot tip.

23 Which is the correct sequence of structures through which a nerve impulse passes in a reflex arc?

A effector → motor neurone → relay neurone → sensory neurone → receptor

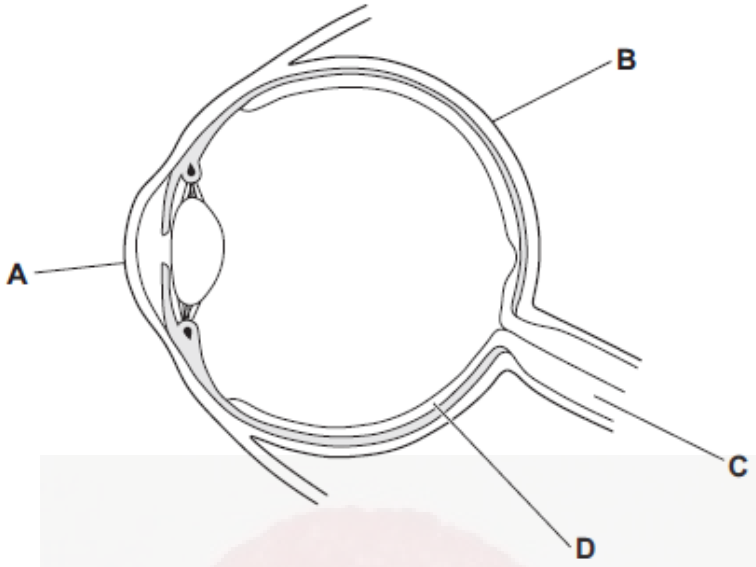
B effector → sensory neurone → relay neurone → motor neurone → receptor

C receptor → motor neurone → relay neurone → sensory neurone → effector

D receptor → sensory neurone → relay neurone → motor neurone → effector

24 The diagram shows an eye.

Which labelled part contains cells that are sensitive to light?



25 When hormones are secreted, they affect different parts of the body.

The table shows some features that are affected by four different hormones.

Which hormone is adrenaline?

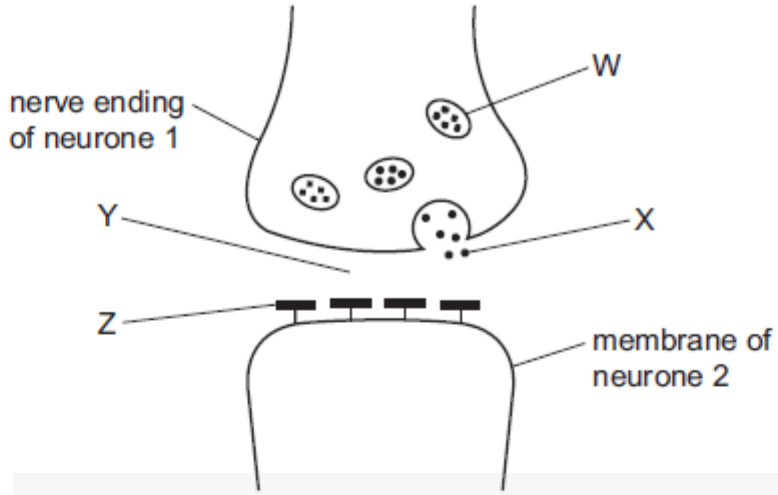
	feature				
	pulse rate	blood glucose concentration	pupil size	menstrual cycle	sperm production
A	✓	✓	✗	✗	✗
B	✗	✗	✗	✗	✓
C	✓	✓	✓	✗	✗
D	✗	✗	✗	✓	✗

key
✓ = affected by hormone
✗ = not affected by hormone

26 When the environment is hot, how do the arterioles in the skin and hair erector muscles react?

	arterioles	hair erector muscles
A	dilate	relax
B	dilate	contract
C	constrict	relax
D	constrict	contract

24 The diagram shows a synapse.



What are the labelled parts?

	W	X	Y	Z
A	synaptic cleft	neurotransmitter	vesicle	receptor
B	synaptic cleft	receptor	vesicle	neurotransmitter
C	vesicle	neurotransmitter	synaptic cleft	receptor
D	vesicle	receptor	synaptic cleft	neurotransmitter

25 Which row shows the actions needed for the eye to focus on a distant object?

	ciliary muscles	suspensory ligaments	lens becomes
A	contract	slacken	thicker
B	relax	slacken	thicker
C	contract	tighten	thinner
D	relax	tighten	thinner

26 The liver and the pancreas work together to control the concentration of glucose in the blood.

Which statement is correct?

A The liver converts the small molecule glucose to the large molecule glucagon.

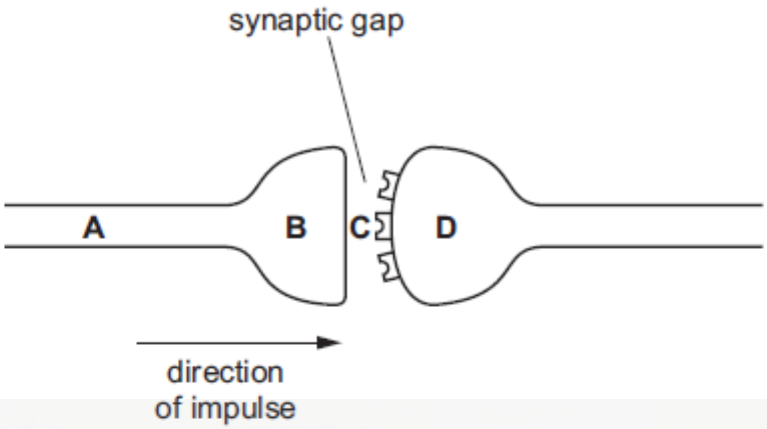
B The liver releases the hormone insulin when blood glucose levels are too high.

C The pancreas does not respond to an increase in blood glucose levels.

D The pancreas responds to a fall in blood glucose by increasing the release of the hormone glucagon.

26 The diagram shows a synapse.

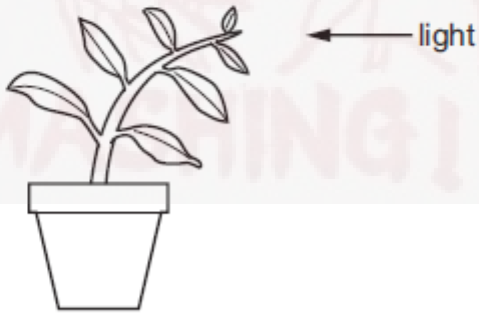
Where are vesicles containing neurotransmitter molecules found?



27 Which row shows the state of the ciliary muscles and suspensory ligaments, when the eye is focusing on a near object?

	ciliary muscles	suspensory ligaments
A	contracted	slack
B	contracted	tense
C	relaxed	slack
D	relaxed	tense

28 The diagram shows a shoot growing towards light.



Which statement about the role of auxin in phototropism is correct?

A Auxin will move to the dark side of the shoot and cause cells to elongate.

B Auxin will move to the dark side of the shoot and prevent cells from elongating.

C Auxin will move to the light side of the shoot and cause cells to elongate.

D Auxin will move to the light side of the shoot and prevent cells from elongating.

22 The neurones at synapses contain vesicles.

Which type of substance is found inside the vesicles?

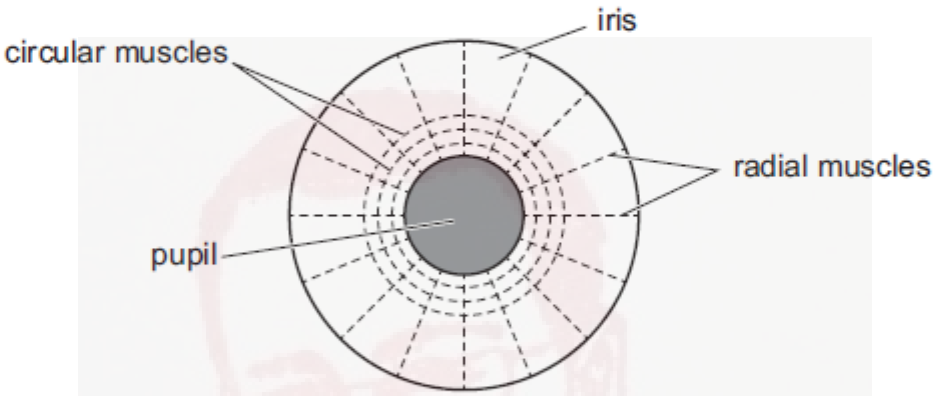
A enzyme

B chromosomes

C neurotransmitter

D steroid

23 The diagram shows the muscles that control the size of the pupil in an eye.



How do the muscles make the pupil smaller?

	circular muscles	radial muscles
A	contract	contract
B	contract	relax
C	relax	contract
D	relax	relax

24 More adrenaline is produced by the adrenal glands when a person is frightened.

This increase affects several parts of the body.

	change	increases	decreases
1	blood glucose concentration	✗	✓
2	heart rate	✓	✗
3	breathing rate and depth	✓	✗
4	dilation of pupil	✗	✓

key
✓ = yes
✗ = no

Which rows are correct?

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

24 The components of a reflex arc are shown in the flow diagram.

receptor → sensory neurone → synapse → relay neurone → synapse → motor neurone → effector

Which component is responsible for ensuring that the nerve impulses travel in one direction only?

A motor neurone

B receptor

C sensory neurone

D synapse

26 Which statement about light receptors in the retina of a normal human eye is correct?

A The cones only work in dim light.

B The rods are found in the fovea.

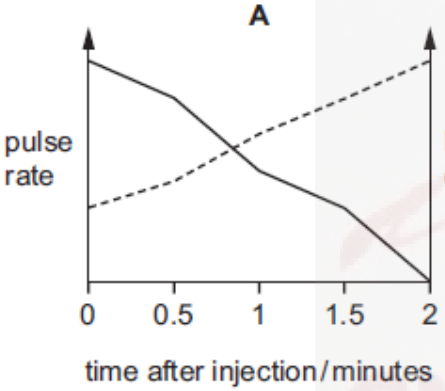
C There are three types of cone.

D There are three types of rod.

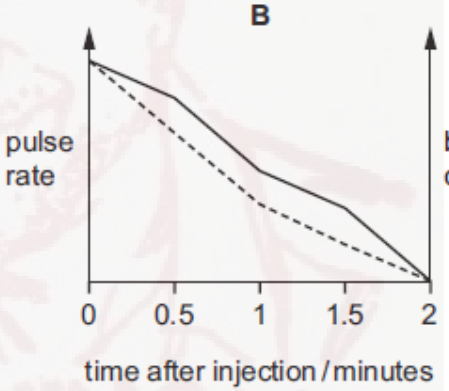
27 A patient is injected with adrenaline.

Which graph shows the expected changes to pulse rate and blood glucose concentration?

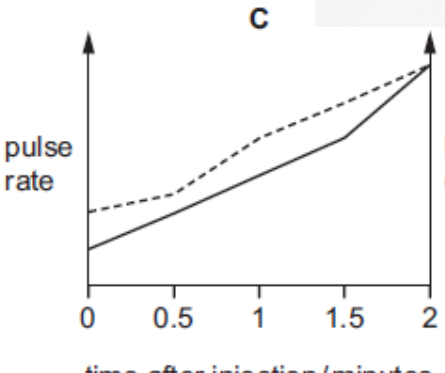
A



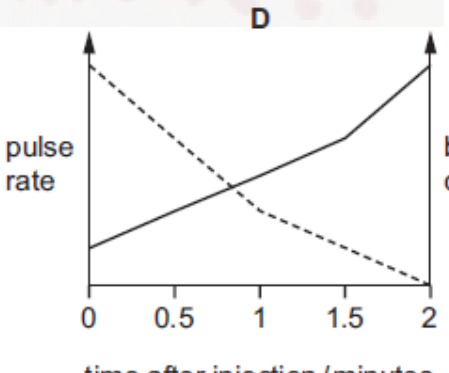
B



C



D



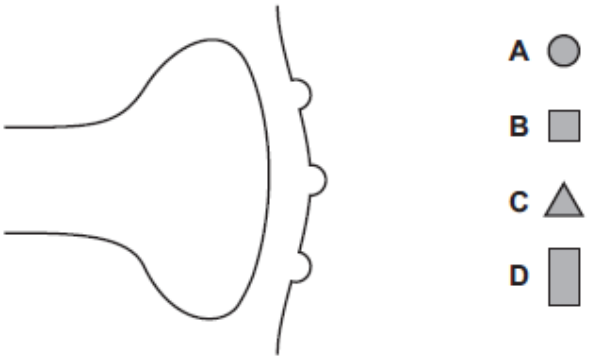
key

----- pulse rate

—— blood glucose concentration

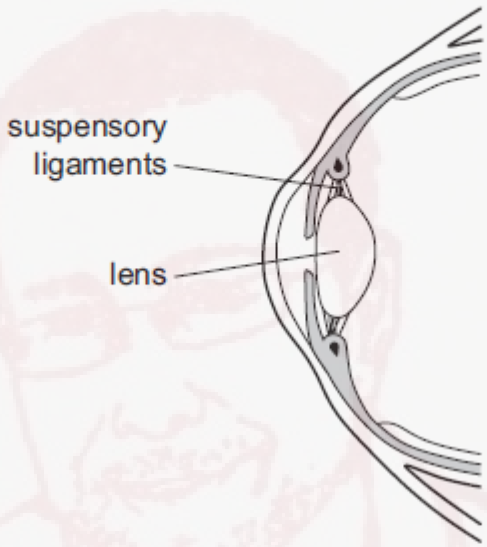
28 The diagram represents a synapse in the brain involved in the perception of pain.

Which labelled molecule represents heroin?



Bio 14 **Q# 234/** iGCSE Biology/2019/m/Paper 22/ www.SmashingScience.org :o)

25 The diagram shows a section through part of the human eye.



What takes place when a person looks at an object which is far away from their eye?

	suspensory ligaments	lens
A	slacken	becomes fatter
B	slacken	becomes thinner
C	tighten	becomes fatter
D	tighten	becomes thinner

26 Which statement about adrenaline is correct?

A Adrenaline causes the pupils to narrow.

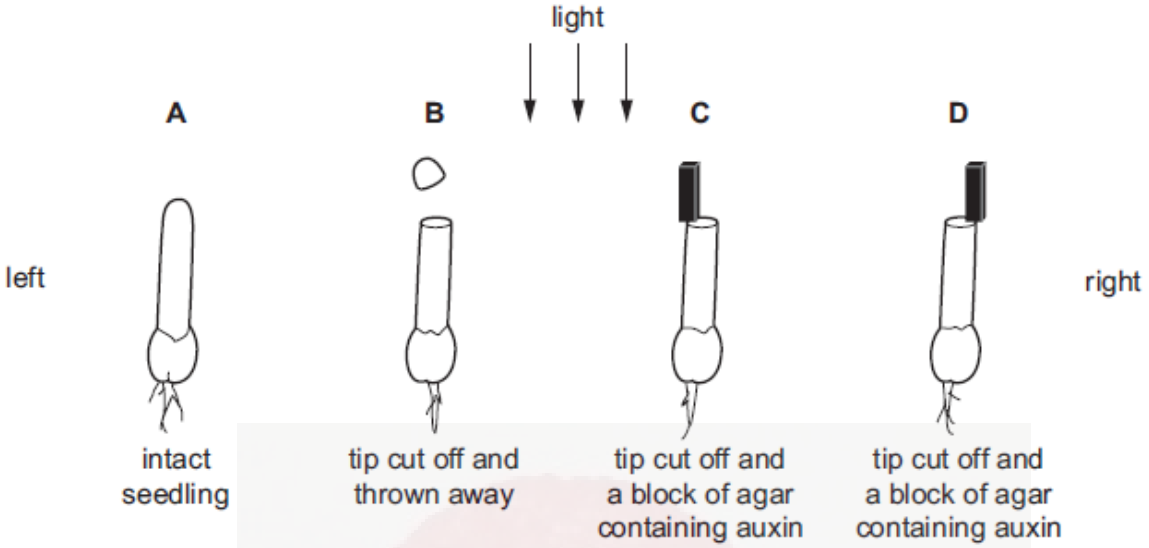
B Adrenaline increases blood glucose concentration.

C Adrenaline secretion increases when at rest.

D Adrenaline slows down the pulse rate.

27 The diagram shows an experiment on oat seedlings. All the seedlings are exposed to light from directly above.

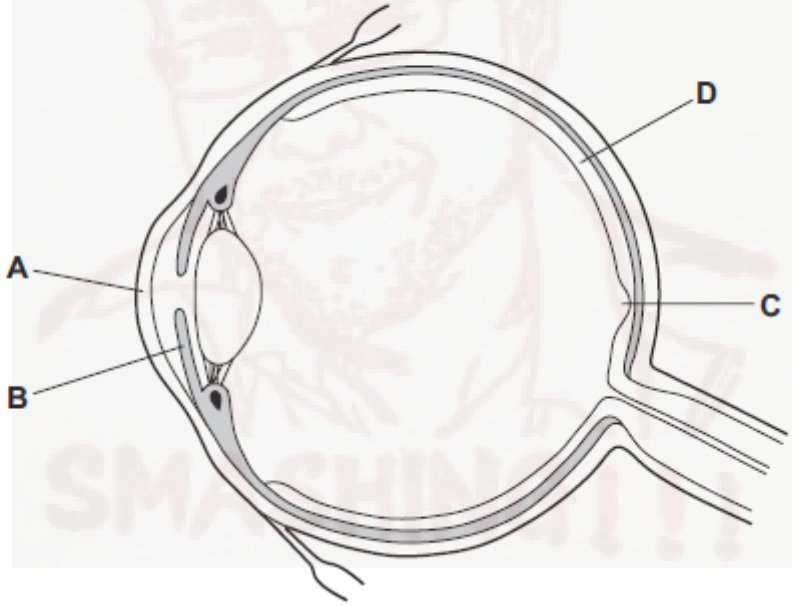
Which seedling will grow to the left?



Bio 14 **Q# 235/** iGCSE Biology/2018/w/Paper 21/ www.SmashingScience.org :o)

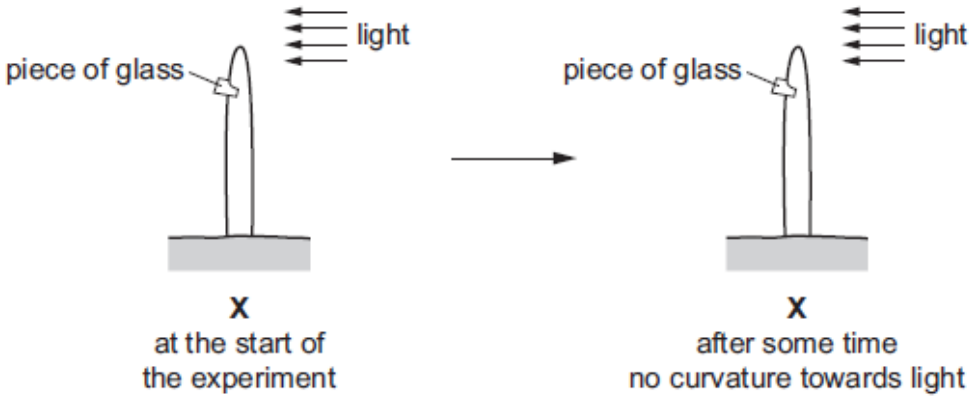
23 The diagram shows the structure of the eye.

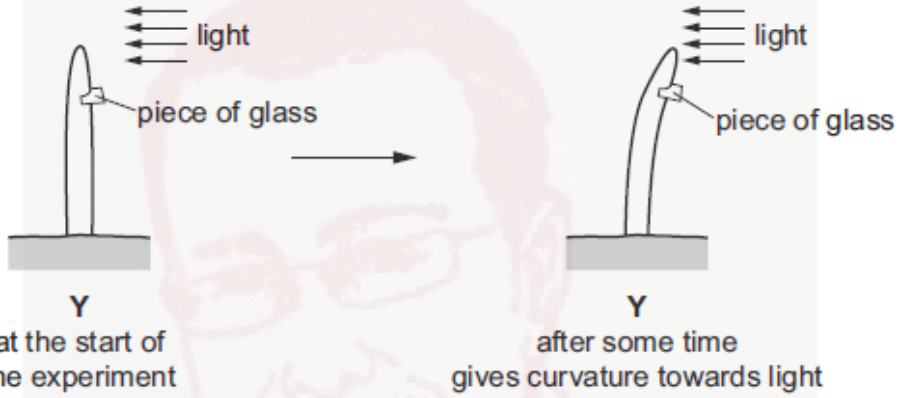
Which structure refracts light?



24 A student used two seedlings X and Y to investigate phototropism.

The diagram shows their investigation.





Which statement explains the difference in results between **X** and **Y**?

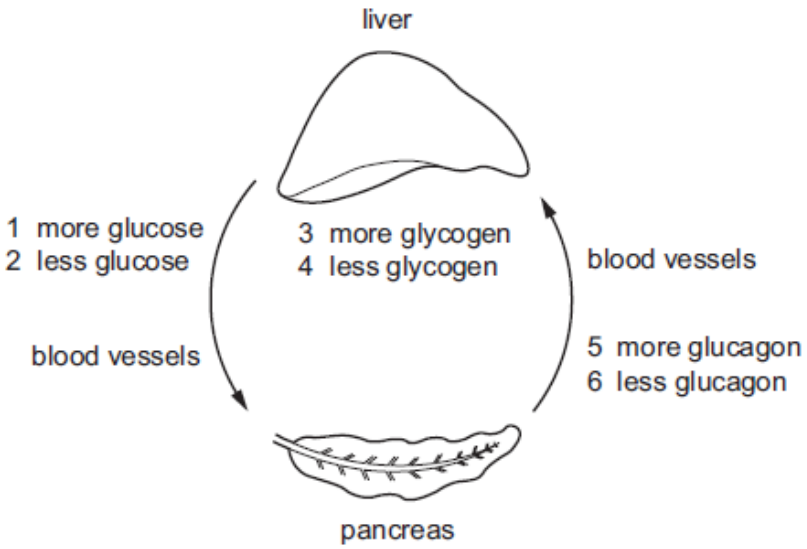
A The piece of glass destroyed the auxin on the shaded side of the seedling.

B The piece of glass destroyed the auxin on the side of the seedling facing the light.

C The piece of glass in **X** stopped the auxin travelling down the shaded side of the seedling.

D The piece of glass in **X** stopped the auxin travelling down the side of the seedling facing the light.

25 The diagram shows part of the mechanism that controls blood sugar concentration.



A person does one hour of exercise.

Starting with the pancreas, what is the sequence of events in which the hormone glucagon is involved?

A 5 → 3 → 2 **B** 5 → 4 → 1 **C** 6 → 3 → 1 **D** 6 → 4 → 2

23 Four processes occur when impulses cross a synapse.

P neurotransmitter diffuses across the gap

Q neurotransmitter binds with receptors

R impulse stimulates vesicles

S release of neurotransmitter

What is the correct sequence for these processes?

A P → R → Q → S

B R → P → Q → S

C R → S → P → Q

D S → Q → R → P

24 Which hormone is involved in the conversion of glucose to glycogen?

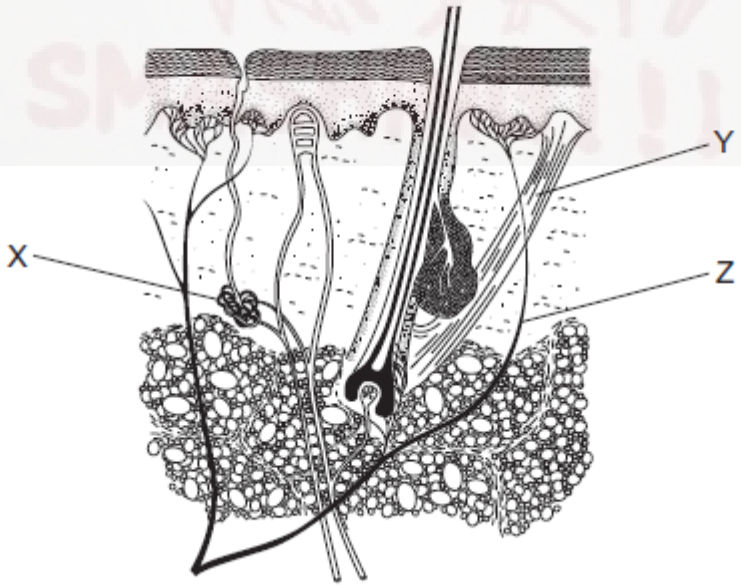
A adrenaline

B insulin

C oestrogen

D testosterone

25 The diagram shows the structure of human skin.

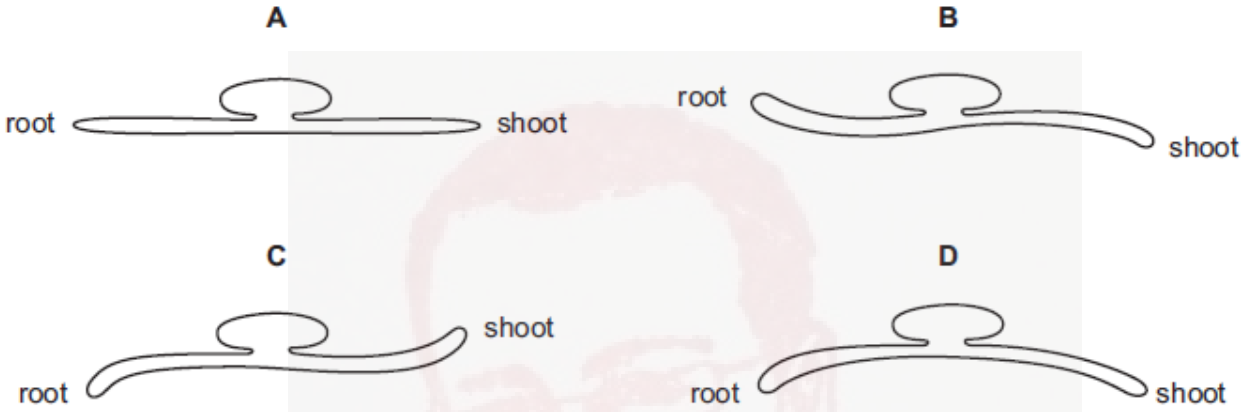


What are X, Y and Z?

	X	Y	Z
A	receptor	sensory neurone	sweat gland
B	sensory neurone	hair erector muscle	receptor
C	sweat gland	hair erector muscle	sensory neurone
D	sweat gland	receptor	blood vessel

26 A seedling was placed in a horizontal position.

Which diagram shows the result of the gravitropic responses in the seedling?



Bio 14 **Q# 237/** iGCSE Biology/2018/m/Paper 22/ www.SmashingScience.org :o)

16 During exercise, receptors detect a change in the blood and cause the breathing rate to increase.

What change do the receptors detect and where are they found in the body?

	change in blood	site of detection
A	carbon dioxide increases	brain
B	carbon dioxide increases	intercostal muscles
C	oxygen decreases	brain
D	oxygen decreases	intercostal muscles

19 A boy accidentally touches a very hot object and immediately takes his hand away.

In this reflex action, what is the effector?

A a heat receptor in his hand

B a motor neurone

C a muscle in his arm

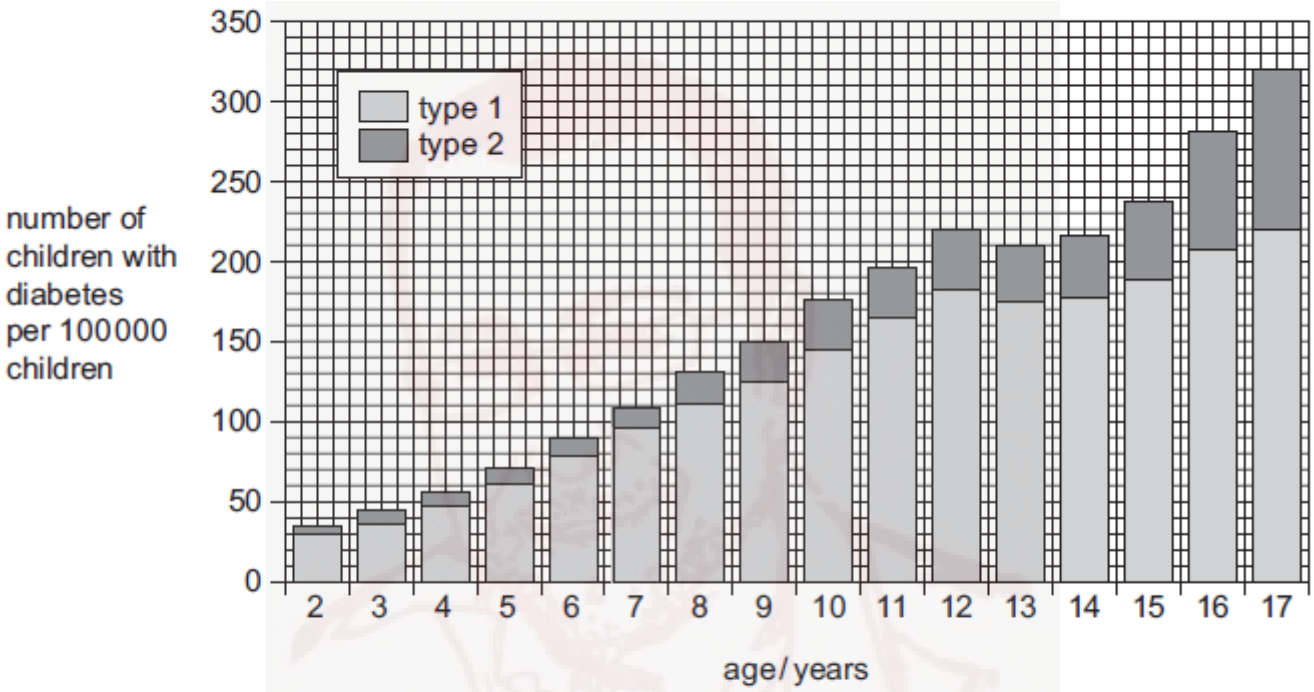
D the spinal cord

20 Which description of how the pupil of the eye gets smaller is correct?

	circular muscles	radial muscles
A	contract	contract
B	contract	relax
C	relax	contract
D	relax	relax

21 There are two types of diabetes, type 1 and type 2.

The graph shows the number of children with each type of diabetes per 100 000 children, in one country.



Which conclusion can be made from the graph?

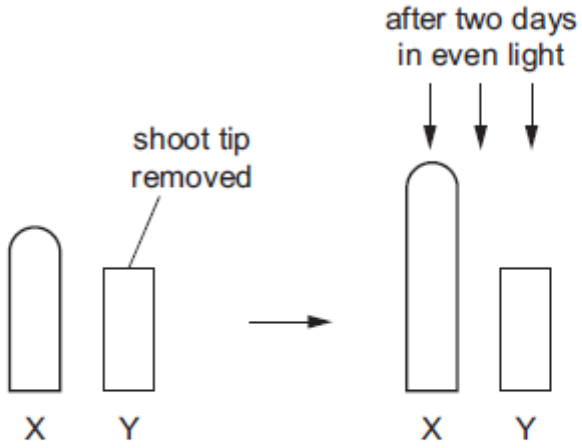
A 1.5% of 9-year-olds have diabetes.

B 31.3% of 17-year-olds with diabetes have type 2 diabetes.

C There are 10 more 12-year-olds in the country with diabetes than 13-year-olds.

D Type 2 diabetes will cause more health problems than type 1.

22 The diagram shows an experiment using wheat shoot tips to investigate plant growth.



Which statement is supported by the evidence provided by this experiment?

A Auxin moves through the plant by osmosis.

B Auxin is made in the shoot tip.

C Auxin is unequally distributed in response to light.

D Auxin inhibits cell elongation.

23 What is the most important function of sweating?

A to remove excess heat from the body

B to remove excess salts from the body

C to remove excess urea from the body

D to remove excess water from the body

24 Four effects of a specific hormone are listed.

- increased blood pressure
- increased blood glucose concentration
- increased rate of respiration
- reduced blood flow to the gut

What is this hormone?

A adrenaline

B glucagon

C insulin

D testosterone

25 The diagram shows a person sweating in hot weather.

What part is played by sweat glands during the process of sweating?

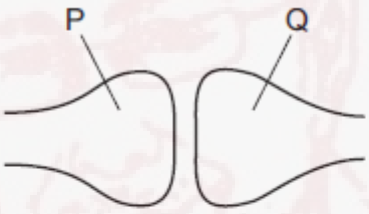
A effector

B receptor

C sense organ

D stimulus

26 The diagram shows a synapse in a reflex arc.



What are the identities of the two neurones and in which direction does the neurotransmitter pass?

	neurone P	neurone Q	direction of passage of neurotransmitter
A	motor	relay	P → Q
B	motor	sensory	P → Q
C	relay	motor	Q → P
D	relay	sensory	Q → P

Bio 14 **Q# 239/** iGCSE Biology/2017/s/Paper 21/ www.SmashingScience.org :o)

23 The steps to produce a reflex action where the hand is withdrawn from a hot object are shown.

1 Nerve impulses pass from the sensory neurone to the relay neurone.

2 Nerve impulses pass from motor neurone to the effector.

3 Nerve impulses pass from the receptor to the neurone.

What is the correct sequence of steps?

A 1 → 2 → 3 **B** 2 → 1 → 3 **C** 3 → 1 → 2 **D** 3 → 2 → 1

24 How many different kinds of cone receptor and rod receptor are there in the human retina?

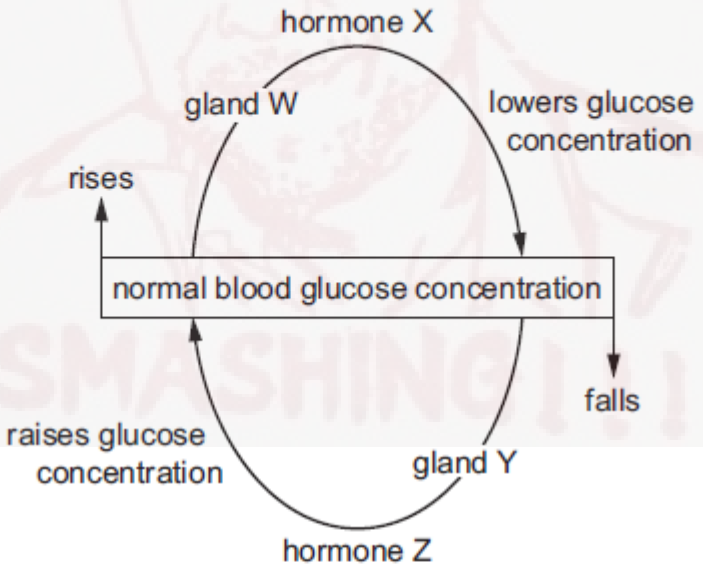
	types of cone receptor	types of rod receptor
A	1	1
B	1	3
C	3	1
D	3	3

25 What is the result of the release of adrenaline?

	blood glucose concentration	pulse rate
A	decreased	decreased
B	decreased	increased
C	increased	decreased
D	increased	increased

Bio 14 **Q# 240/** iGCSE Biology/2017/m/Paper 22/ www.SmashingScience.org :o)

22 The diagram shows the mechanisms that control the concentration of glucose in the blood.



Which row identifies the glands and hormones labelled W, X, Y and Z?

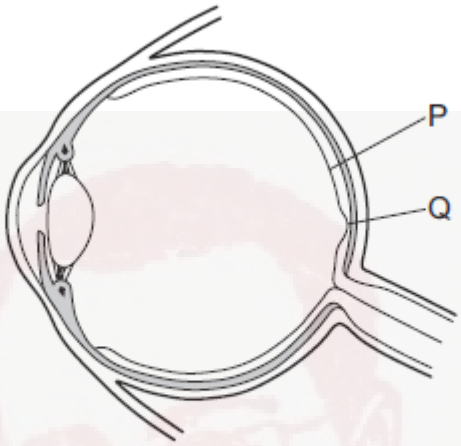
	gland W	hormone X	gland Y	hormone Z
A	adrenal gland	adrenaline	adrenal gland	glucagon
B	adrenal gland	adrenaline	pancreas	insulin
C	pancreas	glucagon	adrenal gland	insulin
D	pancreas	insulin	pancreas	glucagon

23 Which row shows the effects of increased adrenaline release?

	breathing rate	pulse rate	pupil
A	decreases	increases	widens
B	increases	decreases	widens
C	increases	increases	narrows
D	increases	increases	widens

Bio 14 **Q# 241/** iGCSE Biology/2016/w/Paper 21/ www.SmashingScience.org :o)

25 The diagram shows a section through a human eye.



Good colour vision is a result of a high concentration of which type of cells at which position?

A cones at P

B cones at Q

C rods at P

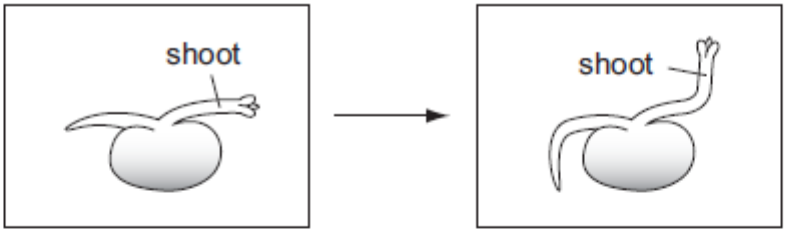
D rods at Q

26 When the blood glucose concentration is low, which hormone is released and which organ releases it?

	hormone	organ
A	glucagon	liver
B	glucagon	pancreas
C	insulin	liver
D	insulin	pancreas

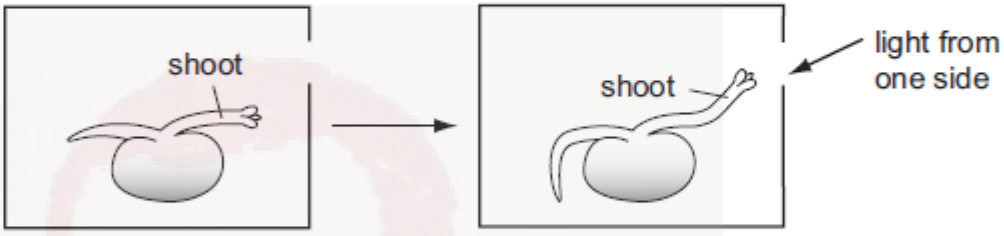
27 The diagram shows seedlings in two experiments on the tropic response of seedlings to gravity and light.

Experiment 1 — to show the effect of gravity



start of experiment in the dark — 3 days later

Experiment 2 — to show the effect of light



start of experiment — 3 days later

How have the seedlings responded?

	to gravity	to light
A	✓	✓
B	✓	✗
C	✗	✓
D	✗	✗

key
✓ = tropic response shown
✗ = no tropic response shown

Bio 14 **Q# 242/** iGCSE Biology/2016/s/Paper 21/ www.SmashingScience.org :o)

4 Which organelles are present in large numbers in cells that produce insulin?

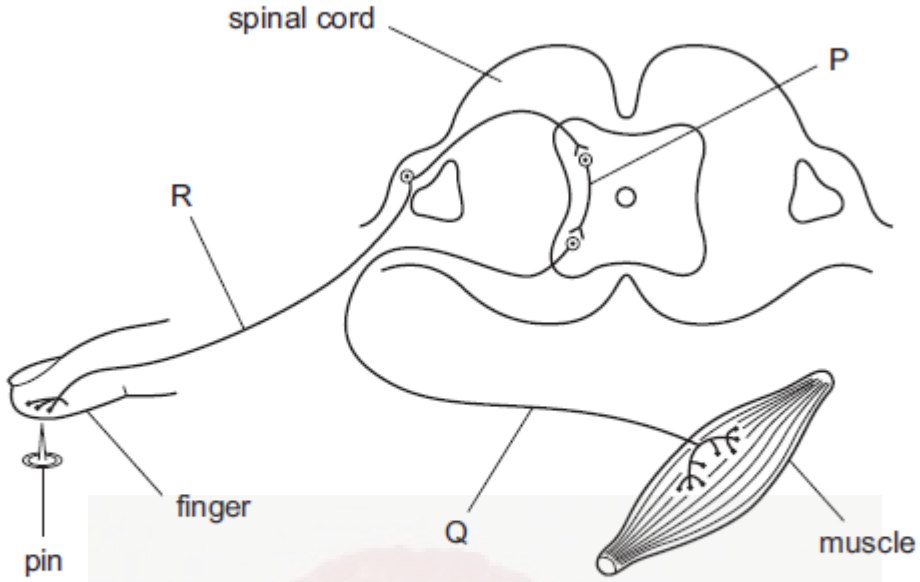
A nuclei and mitochondria

B ribosomes and mitochondria

C rough endoplasmic reticulum and cell walls

D vesicles and nuclei

25 The diagram represents a simple reflex arc.

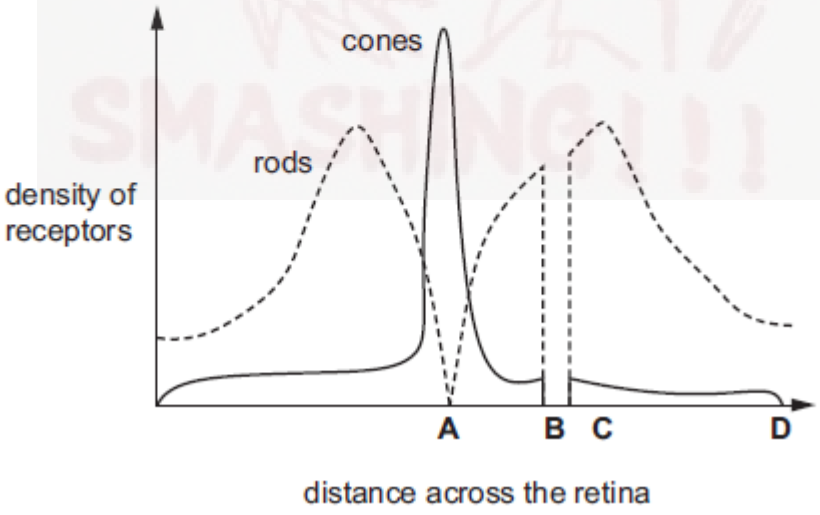


What is the sequence of nerve cells through which an impulse passes during a reflex action?

	first →		last
A	P	Q	R
B	Q	R	P
C	Q	P	R
D	R	P	Q

26 The diagram shows the density of rods and cones across a horizontal section of the retina.

What is the position of the optic nerve?



27 What are the effects of insulin and glucagon on the concentration of blood glucose?

	effect of insulin on blood glucose concentration	effect of glucagon on blood glucose concentration
A	decreases	decreases
B	decreases	increases
C	increases	decreases
D	increases	increases

Bio 14 **Q# 243/** iGCSE Biology/2016/m/Paper 22/ www.SmashingScience.org :o)

25 The fovea of the eye has three kinds of cones absorbing light of different colours.

Which row is correct?

	type of cone stimulated			
	red sensitive	blue sensitive	green sensitive	colour seen
A	no	yes	yes	red
B	yes	no	yes	blue
C	yes	yes	no	green
D	yes	yes	yes	white

26 A person eats a large bowl of rice.

What happens to the amounts of insulin, glucagon and glycogen in their body?

	insulin	glucagon	glycogen
A	decreases	decreases	increases
B	decreases	increases	decreases
C	increases	decreases	increases
D	increases	increases	decreases

27 What is **not** an effect of the hormone adrenaline?

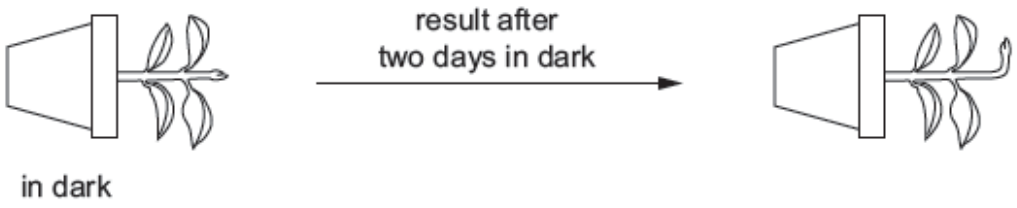
A decreased production of sweat

B dilated pupils

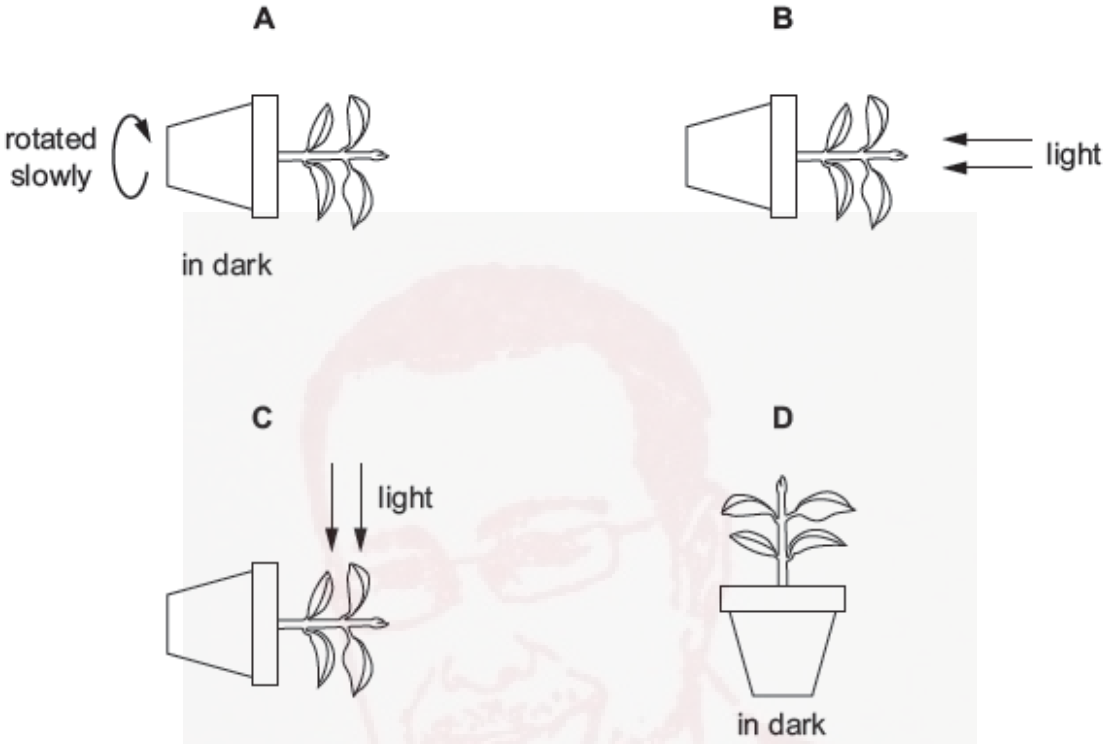
C increased blood glucose

D increased pulse rate

28 The diagram shows an experiment to investigate the response of a plant stem to gravity.



What is a suitable control for this experiment?



Paper 2 Bio Topic# 15 **Q# 244/** iGCSE Biology/2021/m/Paper 22/ www.SmashingScience.org :o)

28 How do some antibiotics kill bacteria?

A They damage the cell wall.

B They damage the endoplasmic reticulum.

C They damage the nucleus.

D They damage the protein coat.

Bio 15 **Q# 245/** iGCSE Biology/2020/s/Paper 21/ www.SmashingScience.org :o)

27 The statements are about the use of antibiotics.

1 using an antibiotic to prevent infection

2 using an antibiotic known to kill the bacteria causing an infection

3 using an antibiotic only when essential

4 using an antibiotic to treat a viral infection

Which practices will increase the chance of the development of antibiotic resistance in bacteria?

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

Bio 15 **Q# 246/** iGCSE Biology/2020/m/Paper 22/ www.SmashingScience.org :o)

29 Bacteria such as MRSA are resistant to several different antibiotics. Some suggested actions for reducing the development of antibiotic resistance in bacteria are listed.

1 Only use antibiotics when necessary.

2 Only use antibiotics on resistant bacteria.

3 Do not use antibiotics to treat viral infections.

Which of the suggested actions are correct?

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

Bio 15 **Q# 247/** iGCSE Biology/2019/w/Paper 21/ www.SmashingScience.org :o)

34 Some disease-causing bacteria survive treatment with an antibiotic.

Which statement about the surviving bacteria is correct?

A The antibiotic will work better on the next generation of bacteria.

B The bacteria have undergone a process of natural selection.

C The bacteria will now be resistant to all antibiotics.

D The resistance of the bacteria is a result of selective breeding.

Bio 15 **Q# 248/** iGCSE Biology/2019/m/Paper 22/ www.SmashingScience.org :o)

28 What type of organism is MRSA?

A bacterium

B fungus

C protoctist

D virus

Bio 15 **Q# 249/** iGCSE Biology/2019/m/Paper 22/ www.SmashingScience.org :o)

33 The development of antibiotic resistant bacteria is an example of

A artificial selection.

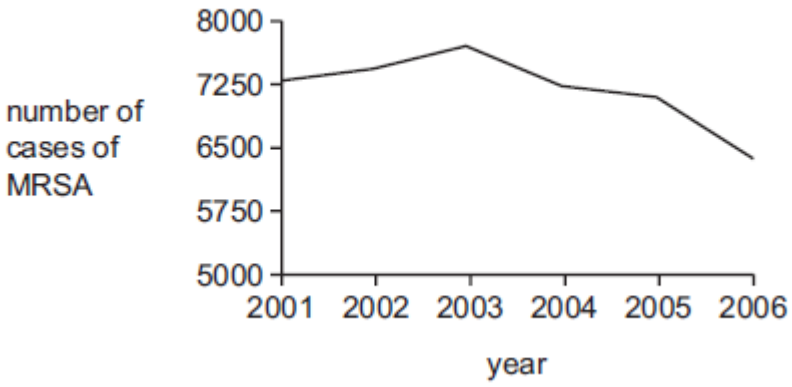
B genetic engineering.

C humans developing immunity to antibiotics.

D natural selection.

Bio 15 **Q# 250/** iGCSE Biology/2018/w/Paper 21/ www.SmashingScience.org :o)

26 The graph shows the number of cases of MRSA in one country between 2001 and 2006.



Between which years was the **greatest** change in the number of cases of MRSA seen?

A 2002 and 2003

B 2003 and 2004

C 2004 and 2005

D 2005 and 2006

Bio 15 **Q# 251/** iGCSE Biology/2018/w/Paper 21/ www.SmashingScience.org :o)

34 Over the last 30 years some antibiotics have become less effective in treating bacterial infection.

What is the reason for this?

A artificial selection

B asexual reproduction

C more effective new antibiotics

D natural selection

Bio 15 **Q# 252/** iGCSE Biology/2017/s/Paper 21/ www.SmashingScience.org :o)

35 The number of bacteria resistant to antibiotics is increasing.

What has contributed to this situation?

A choosing the antibiotic carefully to match the strain of bacterium

B not completing the course of prescribed antibiotics

C tracing, testing and treating people who have been in contact with the infected person

D using antibiotics only when essential

Bio 15 **Q# 253/** iGCSE Biology/2017/s/Paper 21/ www.SmashingScience.org :o)

26 Which statement about microorganisms is correct?

A Bacteria are killed by hydrochloric acid in the duodenum.

B Bacteria can become resistant to antibiotics.

C Bacterial infection and viruses are treated with antibiotics.

D Bacteria produce sugars that cause tooth decay.

Paper 2 Bio Topic# 16 **Q# 254/** iGCSE Biology/2021/s/Paper 21/ www.SmashingScience.org :o)

30 A zygote has ten chromosomes in its nucleus.

Which row shows the number of chromosomes in the cells of this species?

	body cells	sperm cells	embryo cells
A	5	5	10
B	5	10	20
C	10	5	10
D	10	10	20

31 How will the composition of a pregnant woman's blood change as it passes through the placenta?

	concentration of dissolved oxygen	concentration of urea
A	decreases	decreases
B	decreases	increases
C	increases	decreases
D	increases	increases

Bio 16 **Q# 255/** iGCSE Biology/2021/m/Paper 22/ www.SmashingScience.org :o)

29 Some statements about asexual reproduction are listed.

1 Offspring are genetically identical.

2 Offspring are genetically different.

3 Only one parent is required.

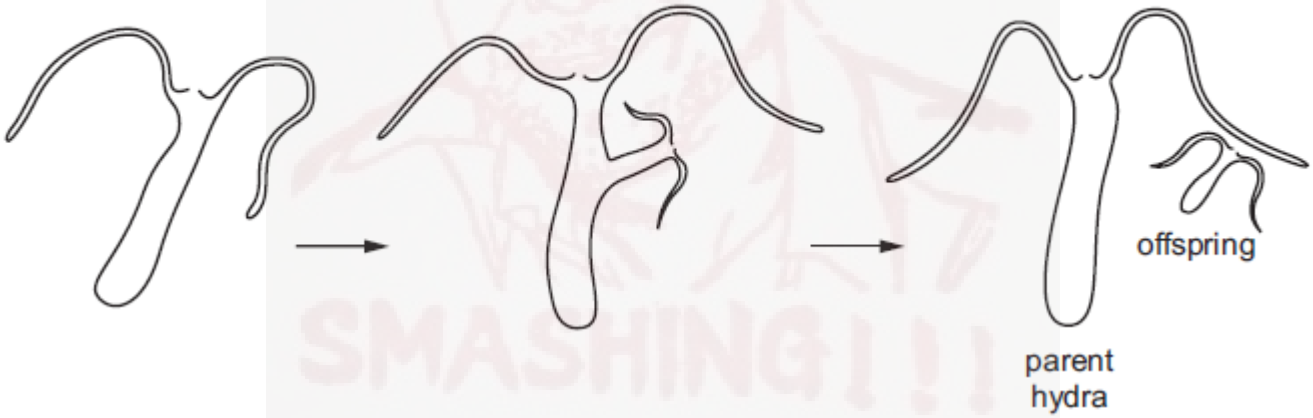
4 Two parents are required.

Which statements are correct?

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

Bio 16 **Q# 256/** iGCSE Biology/2020/w/Paper 21/ www.SmashingScience.org :o)

27 The diagram shows one parent *Hydra* growing and releasing an offspring from the side of its body.



Which row is correct?

	parent and offspring are genetically identical	involves asexual reproduction
A	✓	✓
B	✓	✗
C	✗	✓
D	✗	✗

key

✓ = yes

✗ = no

28 Which row describes self-pollination?

	pollen transferred from anther to stigma of		
	a different flower on the same plant	a flower on a different plant of the same species	same flower
A	✓	✓	✗
B	✓	✗	✓
C	✗	✗	✓
D	✗	✓	✓

key
✓ = yes
✗ = no

29 Which feature is only found in the male gamete?

A acrosome

B enzymes

C jelly coat

D mitochondria

Bio 16 **Q# 257/** iGCSE Biology/2020/s/Paper 21/ www.SmashingScience.org :o)

28 Which description of cross-pollination is correct?

A the transfer of pollen grains from the anther of one plant to the stigma on a different plant

B the transfer of pollen grains from the anther to the stigma on the same plant

C the transfer of pollen grains from the stigma of one plant to the anther on a different plant

D the transfer of pollen grains from the stigma to the anther on the same plant

29 The diagram shows a sperm cell.

Which part contains enzymes that digest the jelly coat of an egg cell?

30 Which cell contains a haploid nucleus?

A neurone

B sperm cell

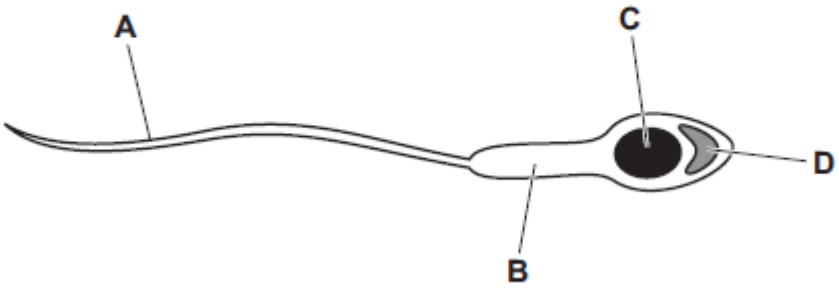
C skin cell

D red blood cell

Bio 16 **Q# 258/** iGCSE Biology/2020/m/Paper 22/ www.SmashingScience.org :o)

30 The diagram shows a sperm cell.

Which part contains mitochondria to release energy for movement?



Bio 16 **Q# 259/** iGCSE Biology/2019/w/Paper 21/ www.SmashingScience.org :o)

28 Which statement about the hormone FSH is correct?

A It stimulates ovulation.

B It stimulates ovulation and menstruation.

C It stimulates the maturation of follicles.

D It stimulates the maturation of follicles and menstruation.

Bio 16 **Q# 260/** iGCSE Biology/2019/s/Paper 21/ www.SmashingScience.org :o)

29 A human zygote is a diploid cell.

Which statement about human diploid cells is correct?

A They do not have a nucleus.

B They fuse to form gametes.

C The nucleus contains a single set of chromosomes.

D The nucleus contains two sets of chromosomes.

30 Which feature allows the sperm to dissolve the jelly coating of the egg cell?

A acrosome

B flagellum

C mitochondria

D nucleus

Bio 16 **Q# 261/** iGCSE Biology/2019/m/Paper 22/ www.SmashingScience.org :o)

39 What must always be available to allow seeds to germinate?

A carbon dioxide

B light

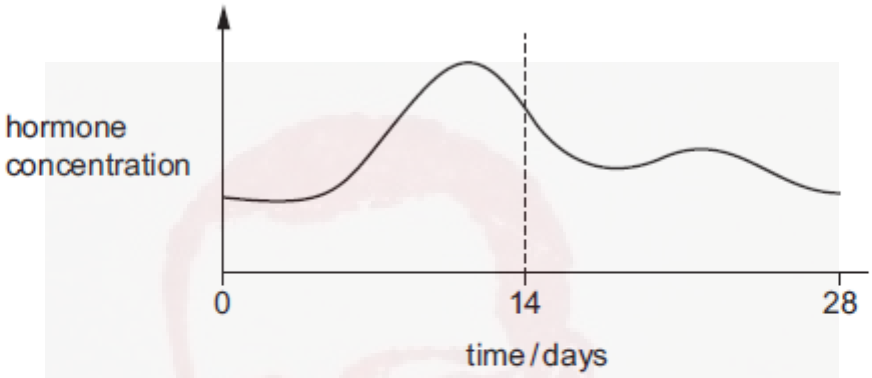
C mineral salts

D water

29 What describes the nuclei in human reproduction?

	egg	sperm	zygote
A	diploid	diploid	diploid
B	diploid	diploid	haploid
C	haploid	haploid	diploid
D	haploid	haploid	haploid

30 The graph shows a hormone that is involved in controlling the menstrual cycle.



What is the hormone?

A FSH

B LH

C oestrogen

D progesterone

27 Which row describes sexual reproduction?

	gamete nucleus	zygote nucleus	genetically different offspring produced
A	diploid	diploid	✗
B	diploid	haploid	✗
C	haploid	diploid	✓
D	haploid	haploid	✓

28 Which statement describes human male gametes?

A large, few and non-motile

B large, numerous and motile

C small, few and non-motile

D small, numerous and motile

29 Which organ secretes the most progesterone during pregnancy?

A adrenal gland

B ovary

C placenta

D uterus

Bio 16 **Q# 264/** iGCSE Biology/2018/s/Paper 21/ www.SmashingScience.org :o)

28 Specific grape varieties are maintained using stem cuttings from mature plants that are then planted and cultivated to produce grapes. This is an example of artificial asexual reproduction.

What is a disadvantage of using asexual reproduction to produce fruit?

A An outbreak of disease will affect the whole crop in the same way.

B Genetically identical fruit is produced relatively quickly.

C No pollination or pollinators are required.

D The characteristics of the grapes will vary between plants.

29 Which two statements are correct for the process of cross-pollination in plants?

1 increases potential for variation in offspring

2 pollen is transferred to a different flower on the same plant

3 reduces potential to respond to environmental change

4 pollen is transferred to a flower on a different plant of the same species

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

30 What is a function of the mitochondria in a sperm cell?

A penetrating the surface of the egg cell

B propelling the sperm towards the egg

C storing food energy

D supplying the energy for movement

Bio 16 **Q# 265/** iGCSE Biology/2018/s/Paper 21/ www.SmashingScience.org :o)

13 A young, active woman requires more of which constituent in her diet than a young, active man?

A fat

B iron

C protein

D vitamin C

Bio 16 **Q# 266/** iGCSE Biology/2018/m/Paper 22/ www.SmashingScience.org :o)

23 A wind-pollinated plant has which features?

A large anthers, coloured petals and produces nectar

B large petals, small anthers and a sticky stigma

C small petals, large anthers and a feathery stigma

D small petals, produces nectar and has a strong scent

24 Which describes a human male gamete?

	motile	relative size compared to female gamete	flagellum present
A	yes	larger	yes
B	yes	smaller	yes
C	no	smaller	no
D	no	larger	no

Bio 16 **Q# 267/** iGCSE Biology/2017/w/Paper 21/ www.SmashingScience.org :o)

28 Which environmental factor is **not** always a requirement for seed germination?

A light

B oxygen

C suitable temperature

D water

29 Which row shows the adaptive features of sperm cells?

	flagellum	jelly coat	mitochondria
A	absent	absent	present
B	absent	present	absent
C	present	absent	present
D	present	present	absent

Bio 16 **Q# 268/** iGCSE Biology/2017/s/Paper 21/ www.SmashingScience.org :o)

29 Which hormone is produced by cells in the placenta of a developing fetus?

A FSH

B LH

C testosterone

D progesterone

25 What is an advantage of asexual reproduction for a population of flowering plants in the wild?

A A disease is less likely to affect the whole population.

B Large numbers of offspring can be produced quickly.

C Pollen can easily be transferred within the same flower.

D The offspring show genetic variety.

26 During sexual reproduction in plants, what will give rise to the greatest variation in the offspring?

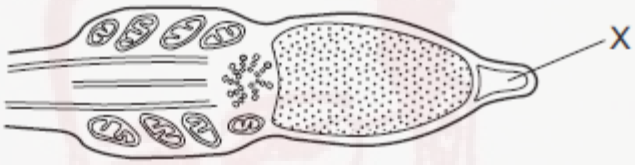
A All of the flowers on the same plant have male and female reproductive organs.

B The anthers and stigmas on the same plant mature at the same time of year.

C There are separate male and female flowers on the same plant.

D There are separate male and female plants.

27 The diagram shows the head of a sperm.



What is the function of structure X?

A It carries genetic information.

B It controls the activities of the sperm cell.

C It is involved in the digestion of the ovum cell membrane.

D It provides energy for movement.

29 The diagram represents the fusion of sperm and ovum at fertilisation.

Which description of cell X is correct?

A diploid gamete

B diploid zygote

C haploid gamete

D haploid zygote

28 When does fertilisation occur in humans?

A when an egg is released

B when implantation occurs

C when sperm and egg nuclei fuse

D when sperm are released

29 What is the function of the many mitochondria in a sperm cell?

A to help penetrate the egg cell

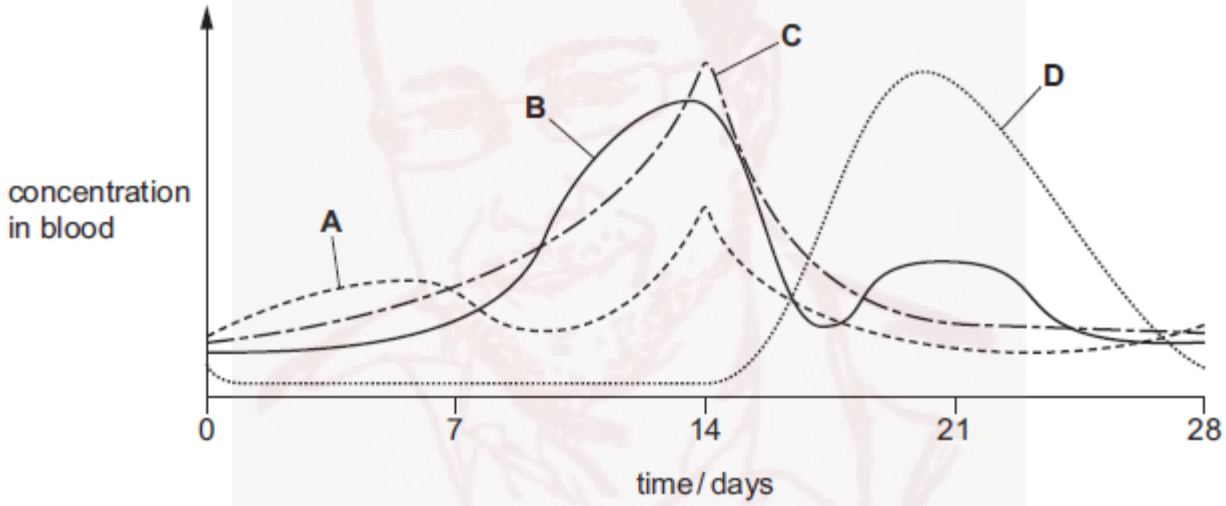
B to provide energy for movement

C to store food molecules

D to synthesise enzymes

30 The graph shows changes in the concentrations of four hormones during the menstrual cycle.

Which hormone is progesterone?

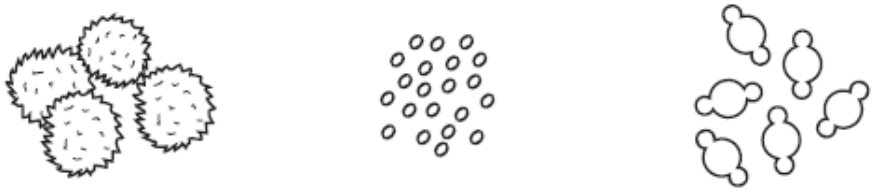


29 What are advantages of sexual and asexual reproduction?

	advantage of sexual reproduction	advantage of asexual reproduction
A	less population growth	only one parent required
B	more energy efficient	gametes can be transferred by environment
C	more genetic variation	faster
D	no transfer of gametes needed	does not compete with the parent for nutrients

30 The diagrams show pollen grains from three different species of plant as they appear under the microscope. The diagrams are all to the same scale.

1 2 3



Which pollen grains are involved in insect-pollination?

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

Bio 16 **Q# 272/** iGCSE Biology/2016/m/Paper 22/ www.SmashingScience.org :o)

30 Which hormone maintains the lining of the uterus during pregnancy?

A FSH

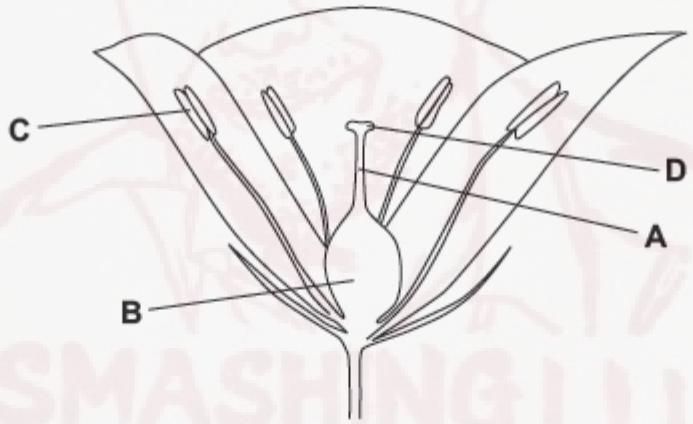
B oestrogen

C progesterone

D testosterone

31 The diagram shows a flower.

In which structure do seeds develop?



32 In sexual reproduction in humans, why are sperm cells produced in much greater numbers than egg cells?

A More than one sperm cell fertilises an egg.

B Sperm cells are small in size.

C Sperm cells live for only a short time.

D The chance of one sperm cell reaching an egg is very small.

32 What carries a copy of the gene to the cytoplasm to make a protein?

A alleles

B DNA molecules

C ribosomes

D mRNA molecules

33 Which statement about meiosis is correct?

A Daughter cells are genetically identical.

B The chromosome number changes from haploid to diploid.

C It is used to produce body cells.

D It allows the formation of new combinations of chromosomes.

34 Colour blindness is a characteristic that is sex-linked.

Which statement about colour blindness is correct?

A The gene for colour blindness is located on the Y chromosome and colour blindness is more common in males than in females.

B The gene for colour blindness is located on the X chromosome and colour blindness is more common in males than in females.

C The gene for colour blindness is located on the X chromosome and colour blindness is more common in females than in males.

D The gene for colour blindness is located on the Y chromosome and colour blindness is more common in females than in males.

Bio 17 **Q# 274/** iGCSE Biology/2021/m/Paper 22/ www.SmashingScience.org :o)

32 What is defined as 'a thread-like structure of DNA, carrying genetic information in the form of genes'?

A allele

B chromosome

C protein

D zygote

33 The statements describe steps in protein synthesis.

1 Copies of the gene are carried to the cytoplasm as mRNA molecules.

2 Each ribosome assembles amino acids into a protein molecule.

3 The gene coding for a protein is copied in the nucleus.

4 The mRNA molecules pass through ribosomes.

Which sequence of steps is correct?

A 1 → 2 → 4 → 3

B 1 → 3 → 2 → 4

C 3 → 1 → 4 → 2

D 3 → 4 → 2 → 1

34 A sunflower has 17 chromosomes in each pollen nucleus. These nuclei are produced by the process of ……1…… in the anthers. They are genetically ……2…… all the pollen nuclei produced by those anthers. After fertilisation the resulting zygote will have ……3…… chromosomes.

Which row correctly completes gaps 1, 2 and 3?

	1	2	3
A	meiosis	identical to	34
B	meiosis	different from	34
C	mitosis	identical to	17
D	mitosis	different from	34

19 The sequence of amino acids in antibodies enables them to complete which function?

A bind to a specific antigen

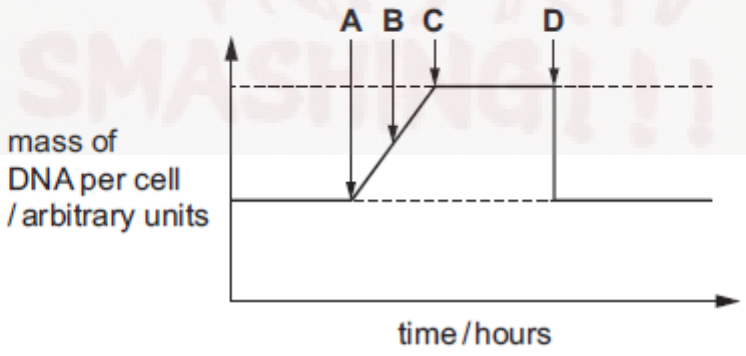
B bind to all pathogens

C perform phagocytosis

D confer passive immunity for all diseases

30 The graph shows how the mass of DNA changes during a mitotic cell division.

Where on the graph are two cells formed?



31 What happens during meiosis?

A A diploid cell divides to form diploid cells.

B A diploid cell divides to form haploid cells.

C A haploid cell divides to form diploid cells.

D A haploid cell divides to form haploid cells.

32 Red-green colour blindness is a condition that occurs more frequently in men than in women.

Which statement about this condition is correct?

A It can pass from father to son.

B It is a sex-linked characteristic.

C It shows co-dominance.

D The gene is on the Y chromosome.

Bio 17 **Q# 276/** iGCSE Biology/2020/s/Paper 21/ www.SmashingScience.org :o)

31 The diagram shows the chromosomes of four daughter cells produced by meiosis.

Which parent cell produced these cells?

A

B

C

D

32 When damaged tissues are repaired cells undergo division by

A meiosis to produce genetically identical cells.

B meiosis to produce genetically different cells.

C mitosis to produce genetically identical cells.

D mitosis to produce genetically different cells.

Bio 17 **Q# 277/** iGCSE Biology/2020/m/Paper 22/ www.SmashingScience.org :o)

32 The statements describe how a protein is made.

1 mRNA passes through a ribosome.

2 mRNA molecules carry a copy of the gene to the cytoplasm.

3 The gene coding for the protein is copied in the nucleus.

4 Ribosomes assemble amino acids into proteins.

What is the order of statements that correctly describes how a protein is made?

A 2 → 1 → 3 → 4

B 2 → 3 → 4 → 1

C 3 → 1 → 2 → 4

D 3 → 2 → 1 → 4

33 Which row shows the features of stem cells?

	type of cell	type of cell division involved
A	specialised	meiosis
B	specialised	mitosis
C	unspecialised	meiosis
D	unspecialised	mitosis

34 Which statement is a correct description of the role of meiosis?

A to create genetically identical daughter cells

B to halve the chromosome number in the daughter cells

C to create diploid daughter cells

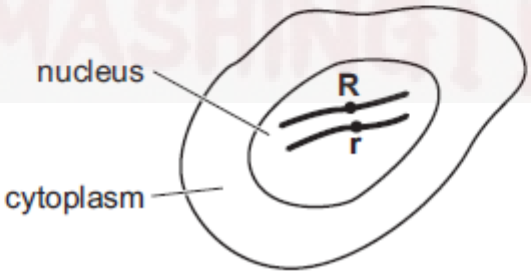
D to maintain the chromosome number in the daughter cells

Bio 17 **Q# 278/** iGCSE Biology/2019/w/Paper 21/ www.SmashingScience.org :o)

30 How many chromosomes are there in each of the human cells shown in the table?

	goblet cell	motor neurone	mature red blood cell	sperm
A	0	23	0	0
B	23	23	23	0
C	46	46	0	23
D	46	46	46	23

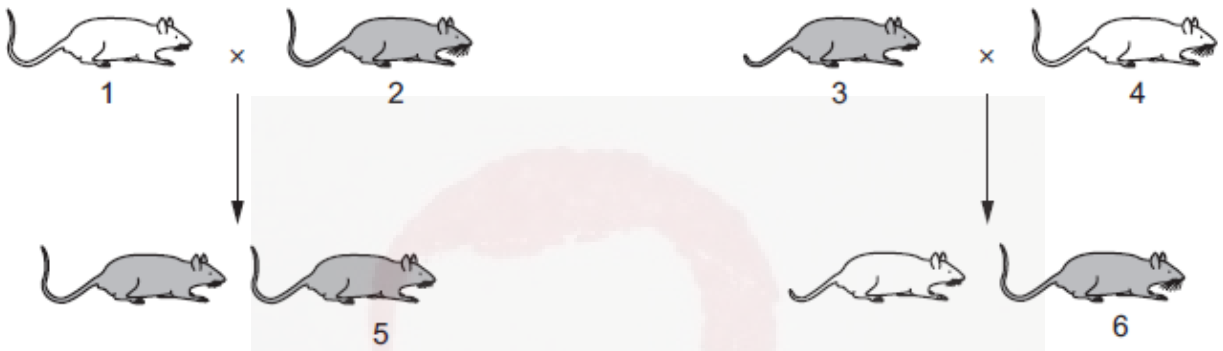
31 The diagram shows a diploid cell and alleles **R** and **r** on one pair of chromosomes.



When this cell divides by mitosis, which daughter cells will be produced?

	chromosome number	genotype
A	diploid	heterozygous
B	diploid	homozygous
C	haploid	heterozygous
D	haploid	homozygous

32 The diagram shows breeding rats where the allele for grey fur is dominant to white fur.

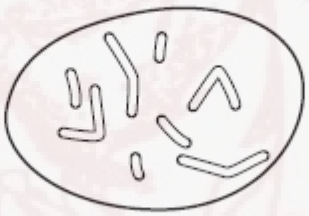


Which two individuals are definitely heterozygous for fur colour?

A 1 and 4 **B** 2 and 3 **C** 2 and 5 **D** 3 and 6

Bio 17 **Q# 279/** iGCSE Biology/2019/s/Paper 21/ www.SmashingScience.org :o)

32 The diagram shows the chromosomes in the nucleus of a cell that divides by mitosis.



Which diagram shows the chromosomes in the nucleus of one of the daughter cells produced?

A

B

C

D

33 What happens as a result of meiosis?

A Diploid cells are produced.

B Diploid and haploid cells are produced.

C Genetically identical cells are produced.

D Haploid cells are produced.

31 What happens as a result of mitosis?

	genetically identical cells produced	chromosome number is halved
A	✓	✓
B	✓	✗
C	✗	✓
D	✗	✗

key
✓ = yes
✗ = no

32 Which parents could produce offspring with blood group O?

A heterozygous father with blood group A and heterozygous mother with blood group B

B heterozygous father with blood group A and homozygous mother with blood group B

C homozygous father with blood group A and heterozygous mother with blood group B

D homozygous father with blood group A and homozygous mother with blood group O

30 What is the role of mRNA?

A assembles amino acids into protein molecules

B carries a copy of the gene out of the nucleus

C controls cell function by controlling the production of proteins

D duplicates chromosomes before mitosis

31 The diagram shows the formation of new diploid cells.

What do arrows X and Y represent?

	X	Y
A	duplication of chromosomes	meiosis
B	duplication of chromosomes	mitosis
C	meiosis	duplication of chromosomes
D	mitosis	duplication of chromosomes

32 A man marries a woman who has a different blood group from him. They have two children. The children have different blood groups from each other and different blood groups from their parents.

What are the genotypes of the parent's blood groups?

A I^AI^A and I^AI^B **B** I^AI^A and I^oI^o **C** I^AI^B and I^BI^B **D** I^AI^B and I^oI^o

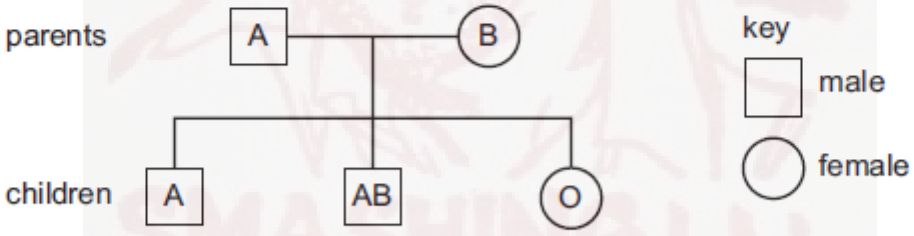
Bio 17 **Q# 282/** iGCSE Biology/2018/s/Paper 21/ www.SmashingScience.org :o)

31 The diagram shows the chromosomes in the nucleus of a body cell in an adult fruit fly.

What are the diploid and haploid number of chromosomes in the fruit fly?

	diploid	haploid
A	4	8
B	8	4
C	8	16
D	16	8

32 The diagram shows the phenotypes for blood groups in a family.



Which statement about the genotypes of the parents is correct?

A Both parents have alleles for blood group A and B.

B Both parents have the allele for blood group O.

C Only the father has the allele for blood group O.

D Only the mother has the allele for blood group O.

26 Which sex chromosomes in the egg and the sperm will produce a male child?

	sex chromosome in egg	sex chromosome in sperm
A	X	X
B	X	Y
C	Y	X
D	Y	Y

27 Cell division has the following functions.

1 asexual reproduction

2 growth

3 production of gametes

4 repair of damaged tissue

5 replacement of cells

Which functions are specific to mitosis?

A 1, 2, 3 and 4

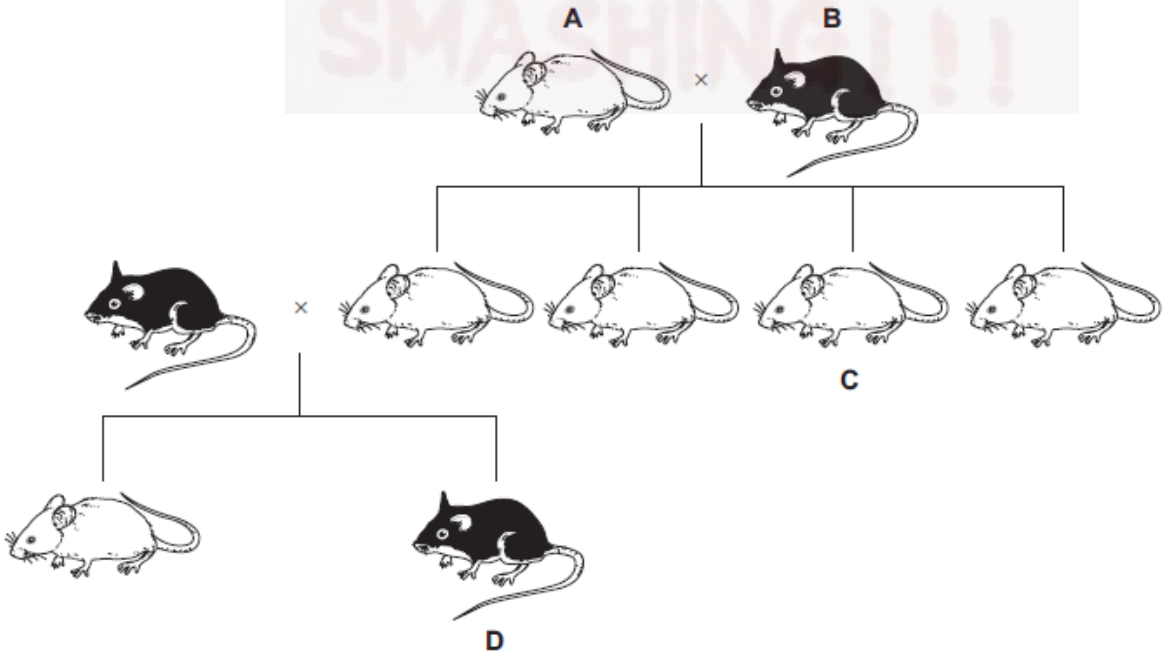
B 1, 2, 4 and 5

C 2, 3 and 4 only

D 3, 4 and 5 only

28 The chart shows the inheritance of fur colour in a small mammal.

If the allele for white fur is dominant, which animal **must** be heterozygous for the gene controlling fur colour?



30 In some mammals the allele for brown coat colour is dominant to the allele for white coat colour.

Which percentage of offspring will be white if a cross is made between two heterozygous mammals?

A 0% **B** 25% **C** 50% **D** 100%

31 Which term is defined as a length of DNA that codes for a protein?

A amino acid

B chromosome

C gene

D mutation

32 The following are involved in protein synthesis.

1 amino acids assembled in order

2 mRNA moves to the cytoplasm

3 mRNA passing through a ribosome

4 DNA in the nucleus

In which order do they become involved when proteins are made?

A 1 → 3 → 2 → 4

B 3 → 2 → 1 → 4

C 4 → 2 → 3 → 1

D 4 → 3 → 2 → 1

27 Dianthus flowers can be one of three different colours: red, pink or white.

A red flower is always homozygous and a white flower is always homozygous. Pink flowers are heterozygous.

If a red and a white flower are crossed, what percentage of the offspring will be pink?

A 0% **B** 25% **C** 75% **D** 100%

28 An alligator has 32 chromosomes in each of the cells of its nose.

How many chromosomes will an alligator zygote contain?

A 16 **B** 32 **C** 46 **D** 64

32 What are stem cells?

A specialised cells that divide by meiosis to produce daughter cells

B specialised cells that divide by mitosis to produce daughter cells

C unspecialised cells that divide by meiosis to produce daughter cells

D unspecialised cells that divide by mitosis to produce daughter cells

33 The list shows the diploid number of chromosomes of four organisms.

fruit fly	8
human	46
potato	48
garden pea	14

What is the correct chromosome number of a male sex cell in each of these organisms?

	fruit fly	human	potato	garden pea
A	4	23	24	7
B	4	46	12	7
C	8	46	48	14
D	16	92	96	28

30 A cell with 16 chromosomes divides twice by mitosis.

How many chromosomes does each of the resulting cells contain?

A 4 **B** 8 **C** 16 **D** 32

31 A man of genotype I^AI^o and woman of genotype I^BI^o have a child.

What is the chance that the child will have the same blood group as one of its parents?

A zero **B** 1 in 4 **C** 1 in 2 **D** 3 in 4

32 Which human phenotype is affected by environmental and genetic factors?

A blood group

B body size

C gender

D tongue rolling

Bio 17 **Q# 287/** iGCSE Biology/2016/w/Paper 21/ www.SmashingScience.org :o)

31 One parent has blood group A and the other parent has blood group B.

Their first child has blood group O.

What are the possible blood groups of their next child?

	group A	group B	group AB	group O
A	✓	✓	✓	✓
B	✓	✓	✓	✗
C	✓	✓	✗	✓
D	✗	✗	✓	✗

Bio 17 **Q# 288/** iGCSE Biology/2016/s/Paper 21/ www.SmashingScience.org :o)

31 What happens to the chromosome number after meiosis and after mitosis?

	meiosis	mitosis
A	halved	halved
B	halved	stays the same
C	stays the same	halved
D	stays the same	stays the same

32 In the inheritance of ABO blood groups, when two parents have the genotypes I^AI^A and I^AI^o, what is the blood group of their offspring?

A group A

B group AB

C group B

D group O

Bio 17 **Q# 289/** iGCSE Biology/2016/m/Paper 22/ www.SmashingScience.org :o)

33 What are alleles?

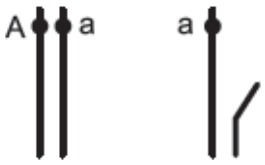
A a pair of chromosomes

B different versions of the same gene

C the total number of genes on one chromosome

D two genes side by side on the same chromosome

34 The diagram shows the sex chromosomes of a woman and of a man. Their genotypes for a recessive sex-linked condition are also shown.



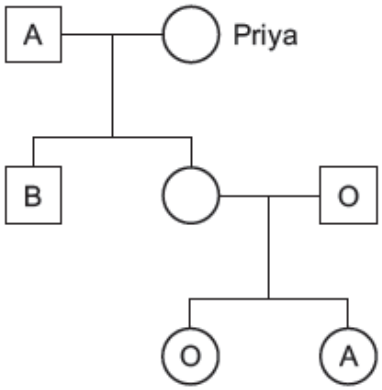
key

A is dominant
a is recessive

What are the chances that their daughter will show the sex-linked condition?

A 0% **B** 25% **C** 50% **D** 75%

35 The diagram shows the inheritance of ABO blood groups. The blood groups of some of the individuals are given.

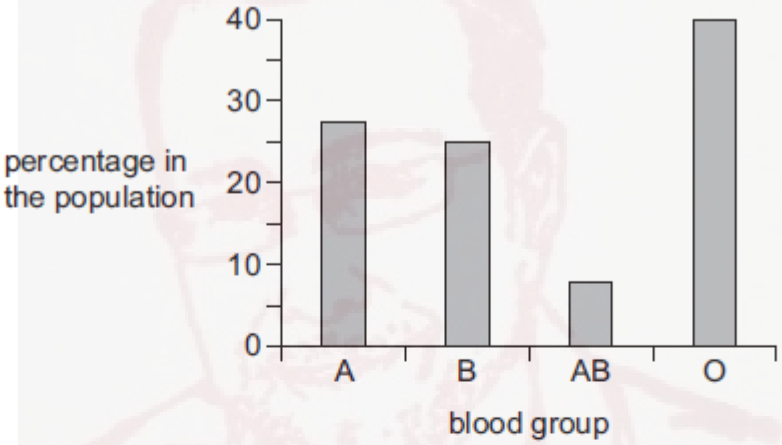


What could be Priya's genotype?

A I^AI^o **B** I^BI^B **C** I^BI^o **D** I^oI^o

Paper 2 Bio Topic# 18 **Q# 290/** iGCSE Biology/2021/s/Paper 21/ www.SmashingScience.org :o)

35 The graph shows the percentage of different blood groups in a human population.



Which type of variation is shown by human blood groups?

A continuous variation caused by genetic and environmental factors

B continuous variation caused by genetic factors only

C discontinuous variation caused by genetic and environmental factors

D discontinuous variation caused by genetic factors only

36 New strains of the crop plant wheat can be produced by cross-breeding disease resistant plants with those that give high yields of grain.

What is this an example of?

A natural selection

B artificial selection

C genetic engineering

D asexual reproduction

Bio 18 **Q# 291/** iGCSE Biology/2021/m/Paper 22/ www.SmashingScience.org :o)

35 A man heterozygous for the sickle cell anaemia allele, Hb^SHb^A, has children with a woman who is homozygous for the normal haemoglobin allele, Hb^AHb^A.

What is the probability that the first child will be resistant to malaria?

A 0.125 **B** 0.25 **C** 0.5 **D** 0.75

36 Which leaf feature is an adaptation of xerophytes to their environment?

A hairs surrounding stomata

B large internal hollow spaces

C large numbers of stomata

D thin cuticle on both surfaces

Bio 18 **Q# 292/** iGCSE Biology/2020/w/Paper 21/ www.SmashingScience.org :o)

34 The development of antibiotic resistance in bacteria is an example of which process?

A evolution by artificial selection

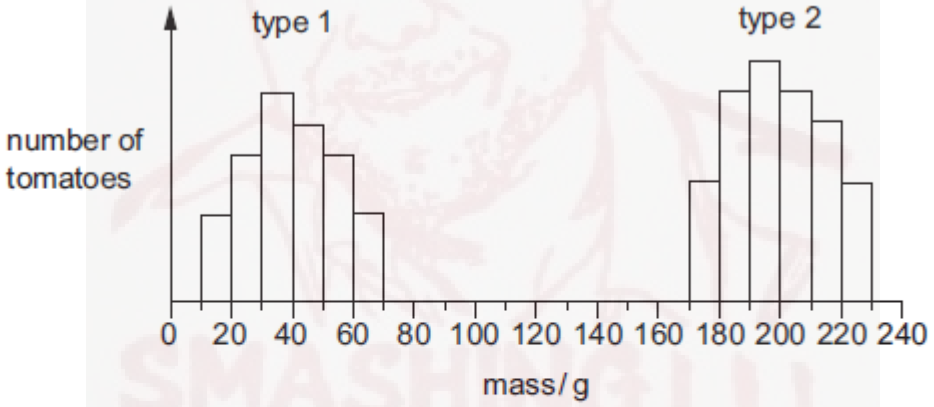
B evolution by natural selection

C variation due to genetic engineering

D variation due to asexual reproduction

Bio 18 **Q# 293/** iGCSE Biology/2020/s/Paper 21/ www.SmashingScience.org :o)

33 The graph shows the masses of two different types of tomato.



What can be concluded from the graph?

A Genes do not affect the mass of tomatoes.

B Type 1 tomatoes show continuous variation.

C Type 2 tomatoes are sometimes smaller than type 1 tomatoes.

D Type 2 tomatoes show discontinuous variation.

34 Which adaptation may be present in a xerophyte?

A leaves with small surface area and large numbers of stomata

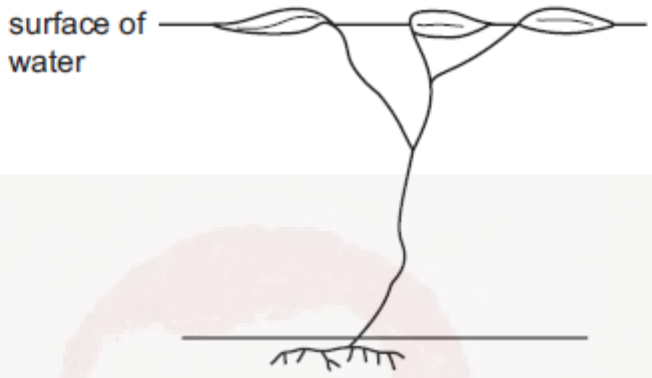
B little or no xylem tissue and leaves with large surface area

C stomatal hairs and rolled leaves

D thin or no cuticle and deep roots

Bio 18 **Q# 294/** iGCSE Biology/2019/w/Paper 21/ www.SmashingScience.org :o)

33 The diagram shows a hydrophyte in a lake.



Which statement about the leaves is correct?

A They cannot photosynthesise.

B They have a thick cuticle.

C They have large air spaces in the spongy mesophyll.

D They require many xylem vessels for support.

Bio 18 **Q# 295/** iGCSE Biology/2019/s/Paper 21/ www.SmashingScience.org :o)

35 Which statement describes how a species becomes adapted to its environment?

A Genetic similarities give rise to different genotypes which may have a reproductive advantage.

B Genetic variation gives rise to different phenotypes which may have a reproductive advantage.

C Phenotypic similarities give rise to different genotypes which may have a reproductive advantage.

D Phenotypic variation gives rise to different phenotypes which may have a reproductive advantage.

Bio 18 **Q# 296/** iGCSE Biology/2019/m/Paper 22/ www.SmashingScience.org :o)

34 What is the correct definition of a gene mutation?

A a change in the base sequence of DNA

B a change in the gene or chromosome

C a change in the number of amino acids

D a change in the number of chromosomes

Bio 18 **Q# 297/** iGCSE Biology/2018/s/Paper 21/ www.SmashingScience.org :o)

34 Which statement describes the relationship between evolution and natural selection?

A A change in the adaptive features of a population over time causes evolution, resulting in natural selection.

B Evolution causes a change in the adaptive features of a population over time, resulting in natural selection.

C Evolution causes natural selection, resulting in a change in the adaptive features of a population over time.

D Evolution is the change in the adaptive features of a population over time as a result of natural selection.

Bio 18 **Q# 298/** iGCSE Biology/2018/m/Paper 22/ www.SmashingScience.org :o)

30 Which feature helps a xerophyte survive in its environment?

A flat leaves with a large surface area

B no cuticle

C short roots

D sunken stomata

31 What is a feature of natural selection?

A It does not require a struggle for survival.

B It does not require variation in a population.

C It involves the selection of advantageous phenotypes.

D It involves the selection of disadvantageous genotypes.

Bio 18 **Q# 299/** iGCSE Biology/2017/w/Paper 21/ www.SmashingScience.org :o)

33 What makes tongue rolling an example of discontinuous variation?

A A person can roll their tongue only when they are young.

B There are many different types of tongue rollers.

C Tongue rolling has to be learnt.

D Tongue rolling is something that a person either can or cannot do.

35 Nitrogen in the air cannot be used by plants until it is in the form of nitrates.

Which two processes convert nitrogen from the air into nitrates?

A decomposition of faeces and nitrification

B denitrification and lightning

C nitrogen fixation by bacteria and denitrification

D nitrogen fixation by bacteria and lightning

Bio 18 **Q# 300/** iGCSE Biology/2017/m/Paper 22/ www.SmashingScience.org :o)

33 Which adaptation may be present in a xerophyte?

A leaves with small surface area and large numbers of stomata

B little or no xylem tissue and leaves with large surface area

C stomatal hairs and rolled leaves

D thin or no cuticle and deep roots

34 How does artificial selection differ from natural selection?

A Selection changes the characteristics of living things.

B Selection is based on genetic variation.

C Selection is not based on adaptation to their environment.

D Selection occurs over many generations.

Bio 18 **Q# 301/** iGCSE Biology/2016/w/Paper 21/ www.SmashingScience.org :o)

33 How do the leaves of hydrophytes differ from those of xerophytes?

A smaller stomata

B smaller total surface area

C stomata on the undersides of the leaves

D thinner cuticle

Bio 18 **Q# 302/** iGCSE Biology/2016/s/Paper 21/ www.SmashingScience.org :o)

34 The whole of an island's population of short-haired bumblebees is descended from just two parents. These were introduced from the mainland.

Which statement about the island's short-haired bumblebee population, compared with that of the mainland, is correct?

A The population is less in danger of collapsing from disease.

B The population is more able to adapt to environmental changes.

C The population shows more genetic variety.

D The population will adapt to environmental changes more slowly.

Bio 18 **Q# 303/** iGCSE Biology/2016/m/Paper 22/ www.SmashingScience.org :o)

36 What is **not** a feature of hydrophytes?

A large air spaces in the tissues

B leaves rolled up and covered with hairs

C leaves with stomata on the upper surface

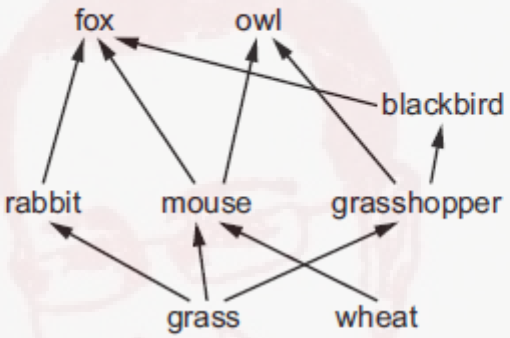
D roots and xylem reduced

37 The diagram shows the flow of energy.

Which form of energy is transferred at points 1 and 3 in the diagram?

	1	3
A	chemical	chemical
B	heat	light
C	light	chemical
D	light	heat

38 The diagram shows the feeding relationships in a food web.



Which organism may feed as both a secondary and a tertiary consumer?

A fox

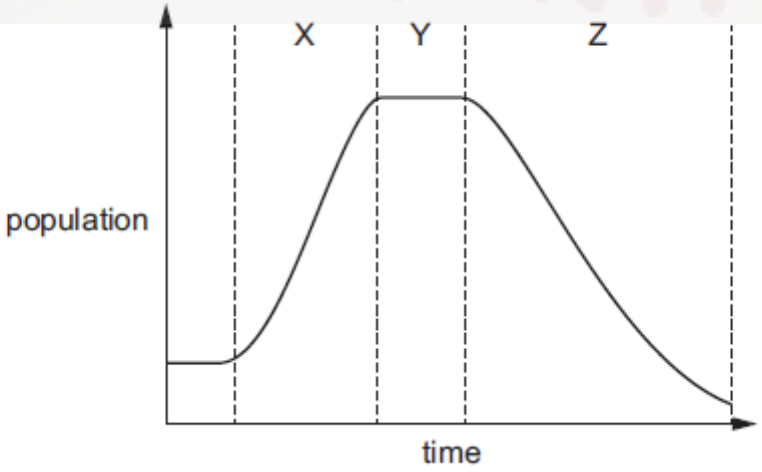
B owl

C blackbird

D rabbit

Bio 19 **Q# 305/** iGCSE Biology/2021/m/Paper 22/ www.SmashingScience.org :o)

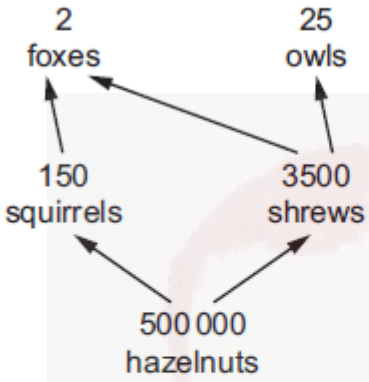
37 The graph shows the change in population of an organism over time in an ecosystem.



Which row correctly identifies each phase of the population graph?

	X	Y	Z
A	lag	exponential (log)	stationary
B	lag	stationary	death
C	exponential (log)	death	stationary
D	exponential (log)	stationary	death

35 The diagram contains information about the number and mass of organisms in a food web.



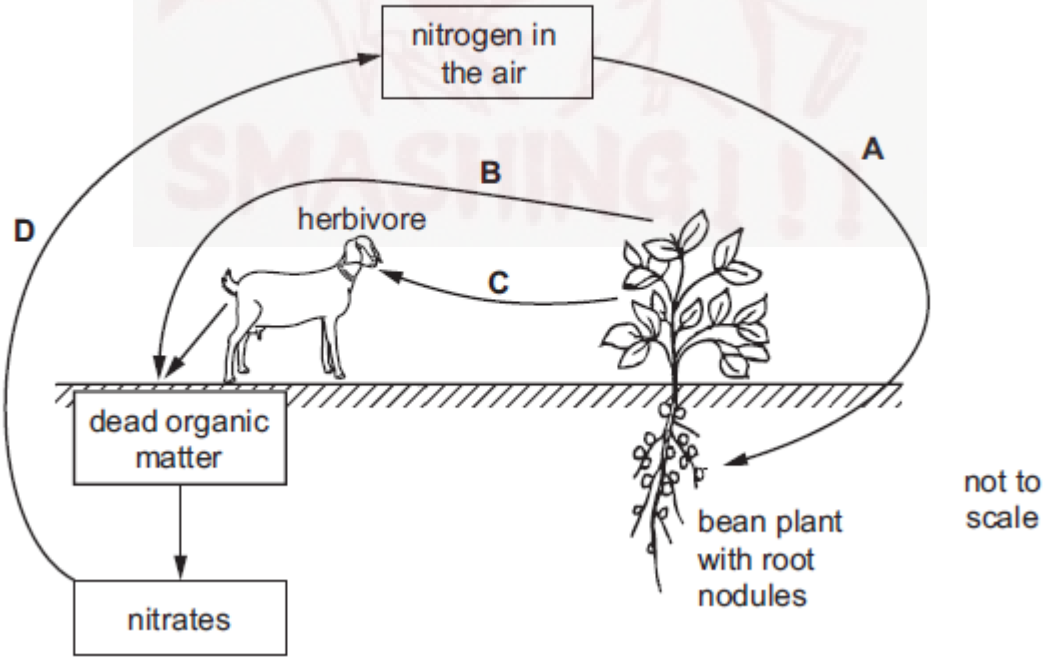
organism	average mass/g
fox	13 000
hazelnut	3
shrew	20
owl	600
squirrel	400

What is the total biomass of all the primary consumers in this food web?

A 130 kg **B** 420 kg **C** 3650 kg **D** 130 000 kg

36 The diagram shows some of the stages in the nitrogen cycle.

Which arrow represents the process of nitrogen fixation?



37 Which term is used to describe the phase of fastest growth in a population of bacteria?

A stationary

B lag

C exponential

D sigmoid

Bio 19 **Q# 307/** iGCSE Biology/2020/s/Paper 21/ www.SmashingScience.org :o)

35 The diagram shows a food chain in a rock pool.

seaweed → whelks → crabs → seagulls

What will happen if the number of secondary consumers increases?

There will be

A fewer crabs.

B fewer seagulls.

C fewer whelks.

D less seaweed.

36 What is defined as 'all of the populations of different species in an ecosystem'?

A community

B environment

C habitat

D trophic level

39 Which process in the nitrogen cycle is involved in the breakdown of amino acids in living organisms?

A deamination

B decomposition

C denitrification

D digestion

Bio 19 **Q# 308/** iGCSE Biology/2020/m/Paper 22/ www.SmashingScience.org :o)

36 The events listed may happen in a population.

1 Better adapted organisms survive.

2 Mutation results in variation.

3 Survivors pass on their alleles to the next generation.

4 There is a struggle for survival.

Which sequence may lead to evolution in the population?

A 1 → 2 → 3 → 4

B 2 → 4 → 1 → 3

C 3 → 2 → 4 → 1

D 4 → 1 → 2 → 3

37 Which row describes how energy flows through a biological system?

	type of energy		
	entering a biological system	transferred between organisms in a biological system	transferred from a biological system to the environment
A	chemical	heat	light
B	heat	chemical	heat
C	light	chemical	heat
D	light	heat	chemical

38 The diagram shows a food chain.

grass → mouse → owl

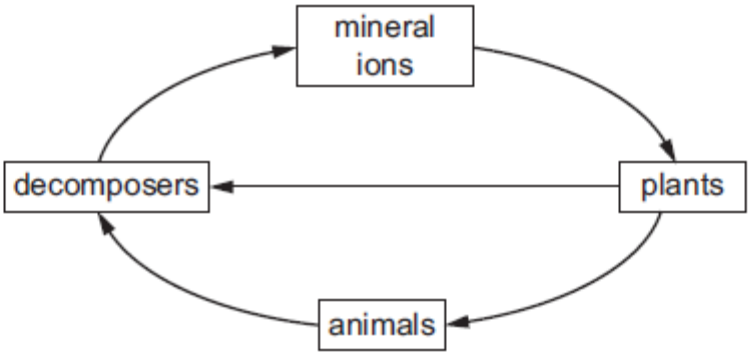
Which terms describe the position of the owl in this food chain?

	consumer	trophic level
A	secondary	second
B	secondary	third
C	tertiary	second
D	tertiary	third

35 Which row describes the energy flow into and through a food chain that starts with a plant?

	energy entering a food chain	energy transferred between organisms in a food chain
A	chemical	chemical
B	chemical	heat
C	light	chemical
D	light	heat

36 The diagram shows part of the nitrogen cycle.



What is one of the mineral ions?

A amino acids

B nitrate

C nitrogen

D protein

Bio 19 **Q# 310/** iGCSE Biology/2019/s/Paper 21/ www.SmashingScience.org :o)

36 Decomposers play an important role in the carbon cycle. They release carbon dioxide.

Which process is responsible for this?

A feeding

B fossilisation

C photosynthesis

D respiration

37 Which term describes a group of organisms of one species, living in the same area, at the same time?

A community

B ecosystem

C genus

D population

Bio 19 **Q# 311/** iGCSE Biology/2019/m/Paper 22/ www.SmashingScience.org :o)

35 Energy flows through a food chain.

In which form does the energy first enter the food chain?

A chemical

B heat

C kinetic

D light

36 Which organisms are responsible for removing nitrate ions from soil?

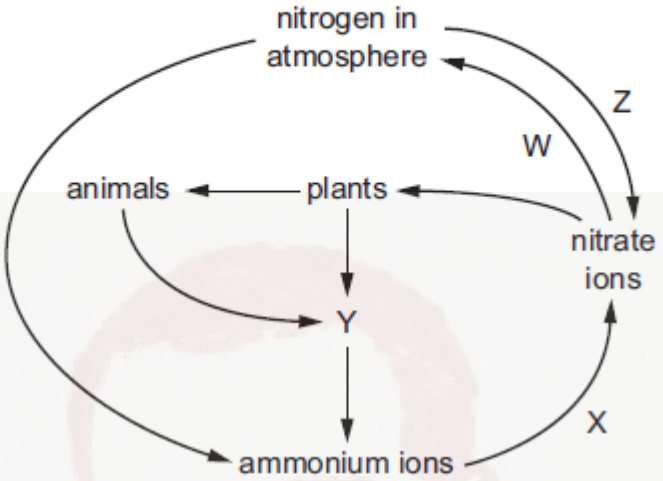
A denitrifying bacteria and nitrogen-fixing bacteria in root nodules

B denitrifying bacteria and plants

C nitrifying bacteria and plants

D nitrogen-fixing bacteria in root nodules

35 The diagram shows part of the nitrogen cycle.

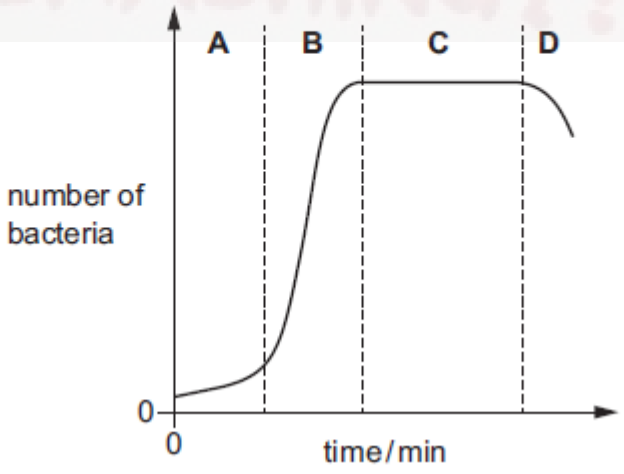


Which row correctly identifies the bacteria involved in processes W, X, Y and Z?

	W	X	Y	Z
A	denitrifying	decomposer	nitrifying	nitrogen-fixing
B	denitrifying	nitrifying	decomposer	nitrogen-fixing
C	nitrifying	decomposer	nitrogen-fixing	denitrifying
D	nitrogen-fixing	nitrifying	decomposer	denitrifying

36 The graph shows a bacteria population curve.

In which phase on the graph is the number of bacteria dying equal to the number dividing?



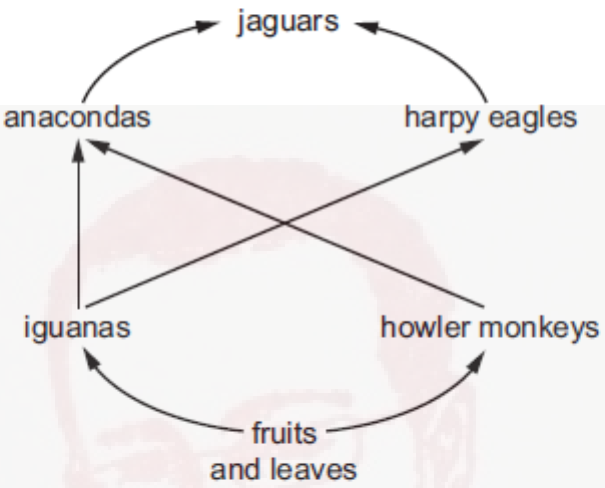
35 The diagram shows a food chain.

maize	→	locusts	→	lizards	→	snakes
10 000 kJ		1000 kJ		100 kJ		10 kJ

What is the efficiency of energy transfer between the maize and the lizards in this food chain?

A 0.01% **B** 0.1% **C** 1% **D** 10%

36 The diagram shows part of a food web from a rainforest.



In this food web, at which trophic level are the anacondas?

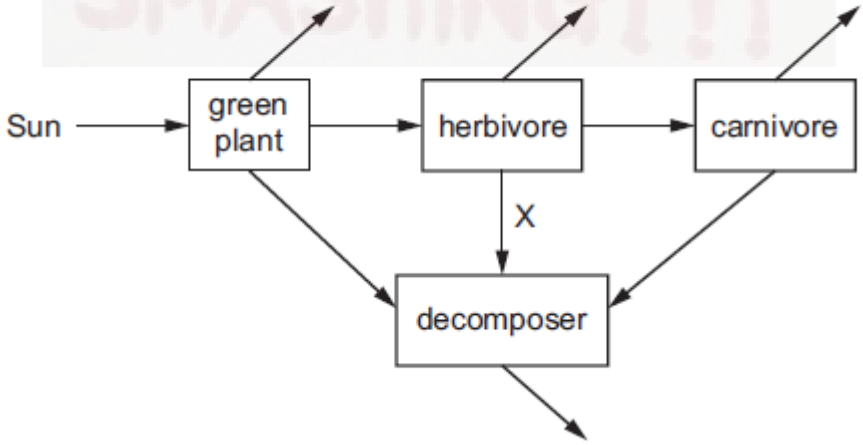
A primary consumers

B secondary consumers

C tertiary consumers

D quaternary consumers

32 The diagram shows energy flow through an ecosystem.



In what form is energy transferred at X?

A chemical

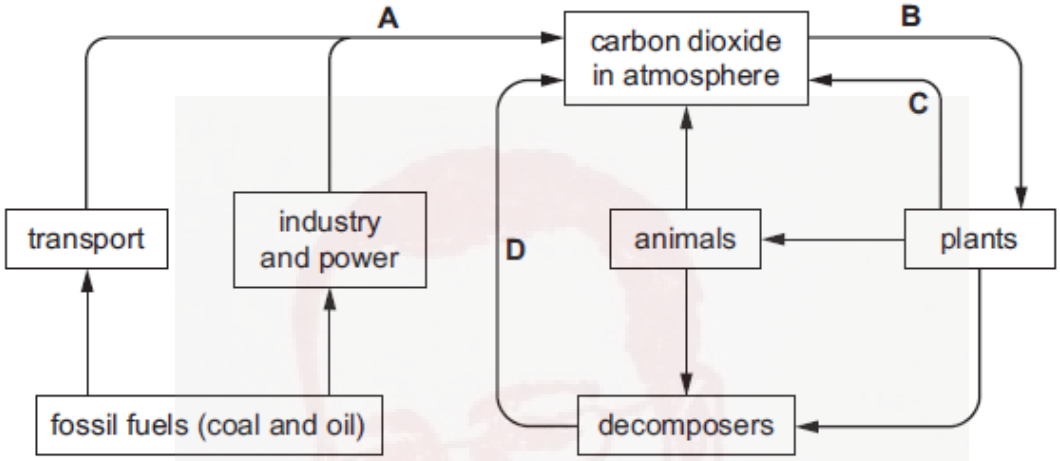
B heat

C kinetic

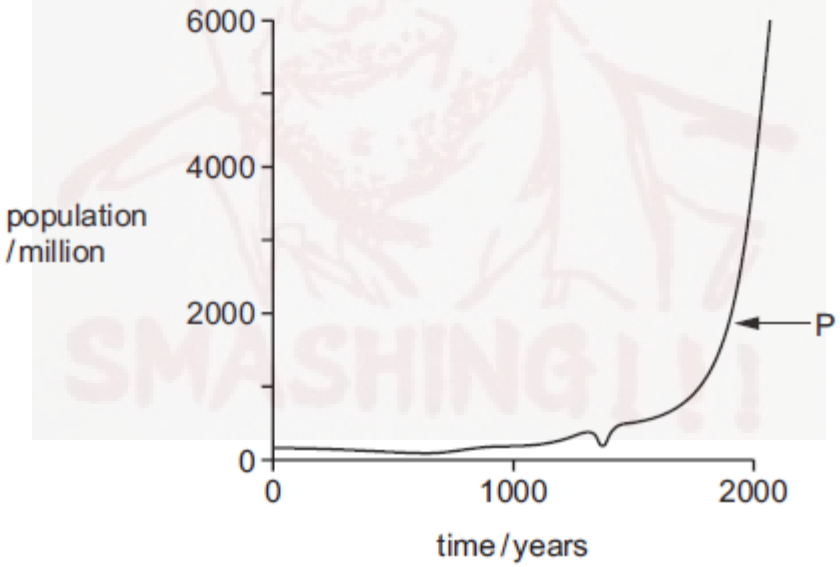
D light

33 The diagram shows part of the carbon cycle.

Which process reduces the carbon dioxide content of the atmosphere?



34 The graph shows the human population of the world for the last 2000 years.



What is the phase identified by P?

A death

B exponential (log)

C lag

D stationary

Bio 19 **Q# 315/** iGCSE Biology/2017/w/Paper 21/ www.SmashingScience.org :o)

36 What is shown by the widest block in a pyramid of numbers for a grassland ecosystem?

A all the consumers in the pyramid

B the carnivores in the pyramid

C the organisms at the top of the pyramid

D the producers in the pyramid

Bio 19 **Q# 316/** iGCSE Biology/2017/s/Paper 21/ www.SmashingScience.org :o)

34 Which of these is a population?

1 all the insects in a rainforest

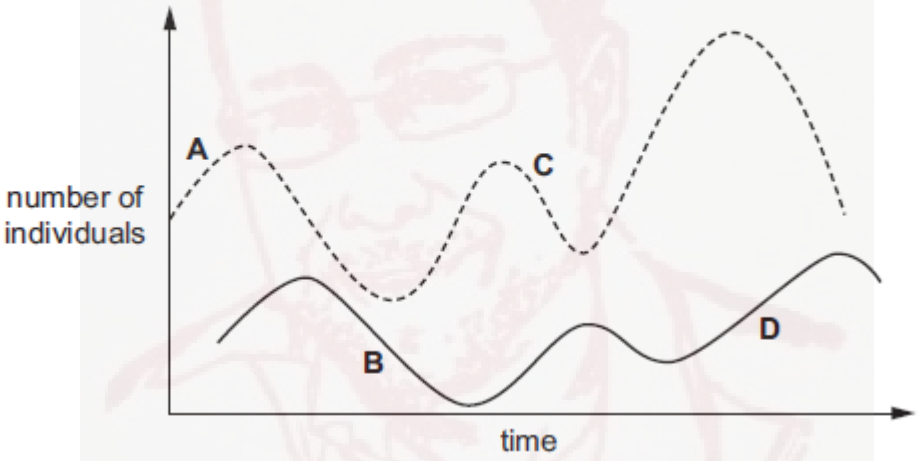
2 all the tigers in a rainforest

3 all the kapok trees in a rainforest

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

37 The graph shows the changes in the populations of predator and prey over a period of time.

Which point on the graph shows a decrease in predator population?



Bio 19 **Q# 317/** iGCSE Biology/2017/m/Paper 22/ www.SmashingScience.org :o)

35 The diagram shows the energy present in a food chain.

40 000 kJ		4000 kJ		400 kJ		40 kJ
photosynthesising phytoplankton	→	krill	→	herring	→	bass

What percentage of energy present in the producer is transferred to the secondary consumer?

A 0.01% **B** 0.1% **C** 1% **D** 10%

36 Which process results in the loss of nitrates from soils?

A deamination

B decomposition

C denitrification

D nitrification

37 During the exponential (log) phase of a sigmoid growth curve, which factor limits population growth?

A availability of food

B build-up of wastes

C presence of disease

D rate of reproduction

Bio 19 **Q# 318/** iGCSE Biology/2016/w/Paper 21/ www.SmashingScience.org :o)

7 Commercial fishermen use ice to store the fish that they catch.

How does the ice keep the fish fresh?

A Cells denature.

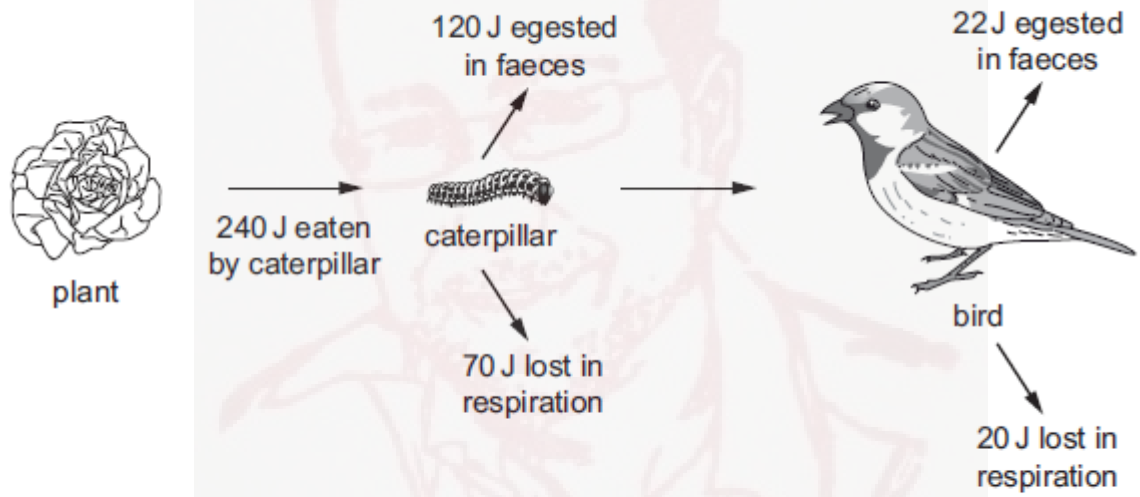
B Decomposer activity decreases.

C Decomposer activity increases.

D Proteins denature.

Bio 19 **Q# 319/** iGCSE Biology/2016/w/Paper 21/ www.SmashingScience.org :o)

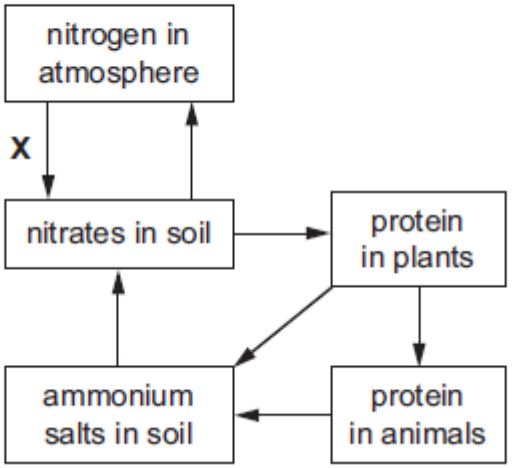
34 The diagram shows a food chain.



How much energy is transferred to the bird?

A 8 J **B** 42 J **C** 50 J **D** 240 J

35 The diagram shows part of the nitrogen cycle.



What could be responsible for process **X**?

A decomposers

B denitrifying bacteria

C lightning

D nitrifying bacteria

36 Which statement describes the effect of predation and disease on a population?

A They cause an exponential (log) increase in the population size.

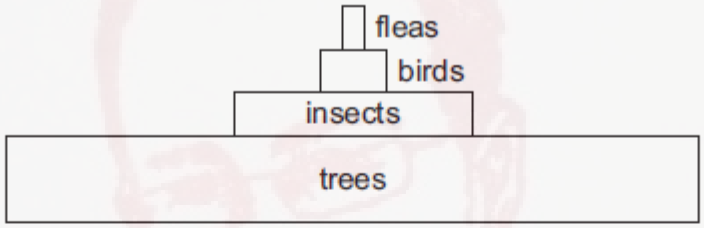
B They control the rate of growth of the population.

C They decrease the food supply available to the population.

D They reduce the lag phase of the population.

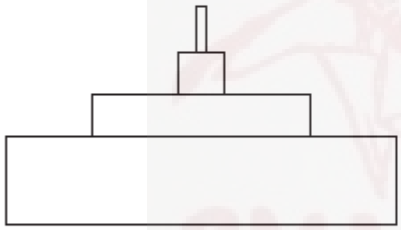
Bio 19 **Q# 320/** iGCSE Biology/2016/s/Paper 21/ www.SmashingScience.org :o)

35 The diagram shows a pyramid of biomass for a food chain in a woodland ecosystem.

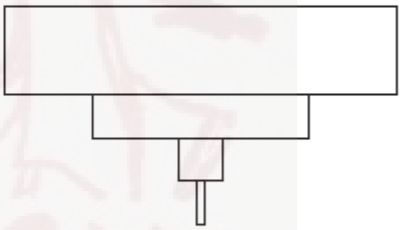


What is the pyramid of numbers for this food chain?

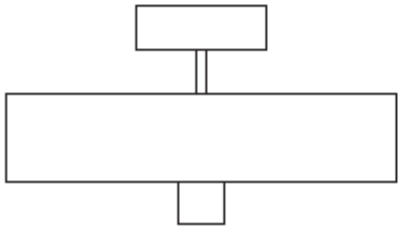
A



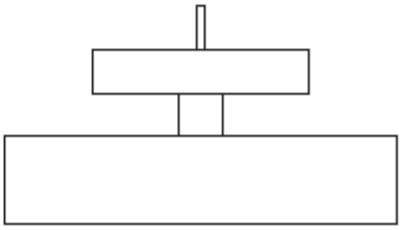
B



C

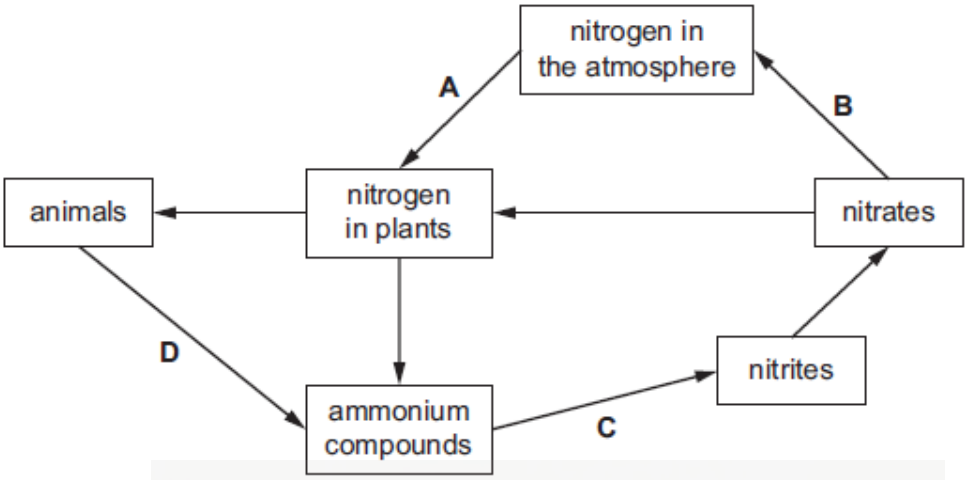


D

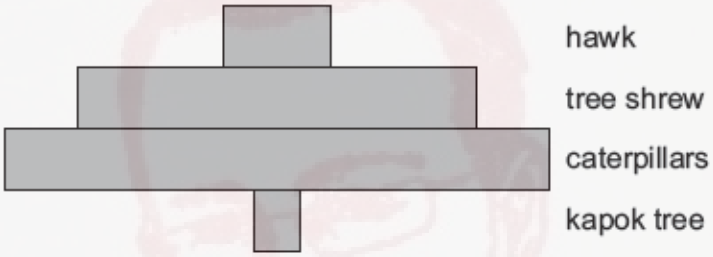


36 The diagram shows part of the nitrogen cycle.

At which stage is denitrification occurring?



37 The diagram shows a pyramid of numbers in a food chain.



What type of organism is the hawk?

A producer

B primary consumer

C quaternary consumer

D tertiary consumer

38 The diagram shows organisms feeding on a dead rat and one of the organisms which, in turn, feeds on them.

What is needed to complete the food chain?

A carnivore

B consumer

C predator

D producer

Paper 2 Bio Topic# 20 **Q# 322/** iGCSE Biology/2021/m/Paper 22/ www.SmashingScience.org :o)

39 When nitrates enter a lake they cause rapid growth of algae on the surface of the water. This causes the following changes in the lake:

1 The concentration of dissolved oxygen in the water decreases.

2 Fish and other aquatic animals die.

3 Aerobic respiration in decomposers increases.

4 Producers die and decomposition increases.

In which order do these changes occur?

A 1 → 2 → 4 → 3

B 3 → 1 → 2 → 4

C 4 → 2 → 3 → 1

D 4 → 3 → 1 → 2

40 The action of which type of bacteria would cause soil to be lacking in nitrates?

A aerobic

B denitrifying

C nitrifying

D nitrogen fixing

Bio 20 **Q# 323/** iGCSE Biology/2020/w/Paper 21/ www.SmashingScience.org :o)

40 The number of Atlantic bluefin tuna fish found in the Atlantic Ocean has significantly decreased in the last 50 years.

Which method would make the biggest improvement in the conservation of tuna fish stocks?

A decreasing the size of holes in fishing nets

B genetic engineering of tuna

C introducing fishing quotas

D selective breeding of tuna

Bio 20 **Q# 324/** iGCSE Biology/2020/s/Paper 21/ www.SmashingScience.org :o)

40 When a river is polluted by fertiliser, the following processes may occur.

1 increased aerobic respiration of decomposers

2 increased growth of producers

3 decreased oxygen concentration in the water

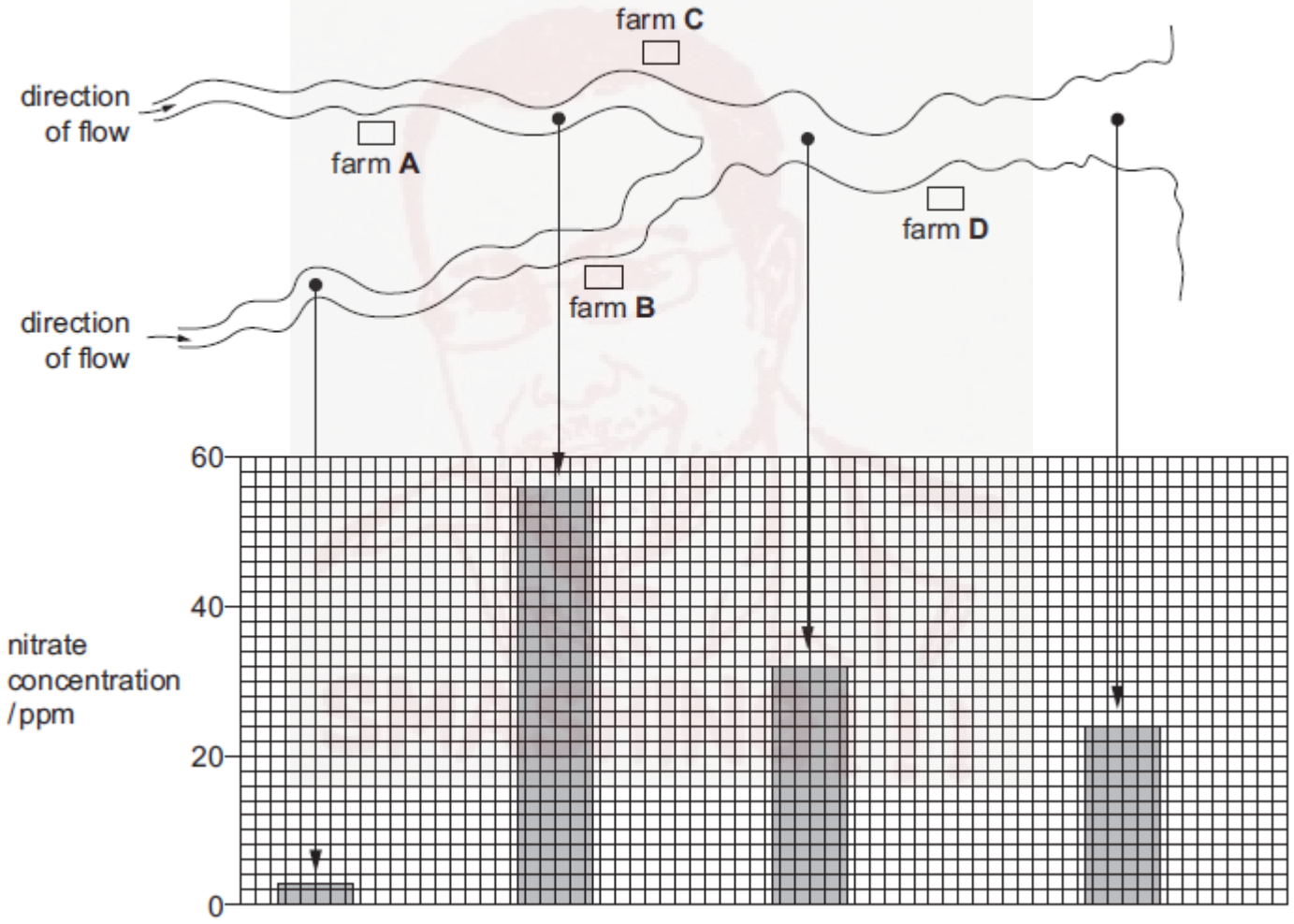
What is the correct sequence for these processes?

A 1 → 2 → 3 **B** 1 → 3 → 2 **C** 2 → 1 → 3 **D** 2 → 3 → 1

Bio 20 **Q# 325/** iGCSE Biology/2020/m/Paper 22/ www.SmashingScience.org :o)

40 The diagram shows the positions of four farms and the concentrations of nitrate at different points in a river.

Which farm is likely to have been using too much fertiliser on its land?



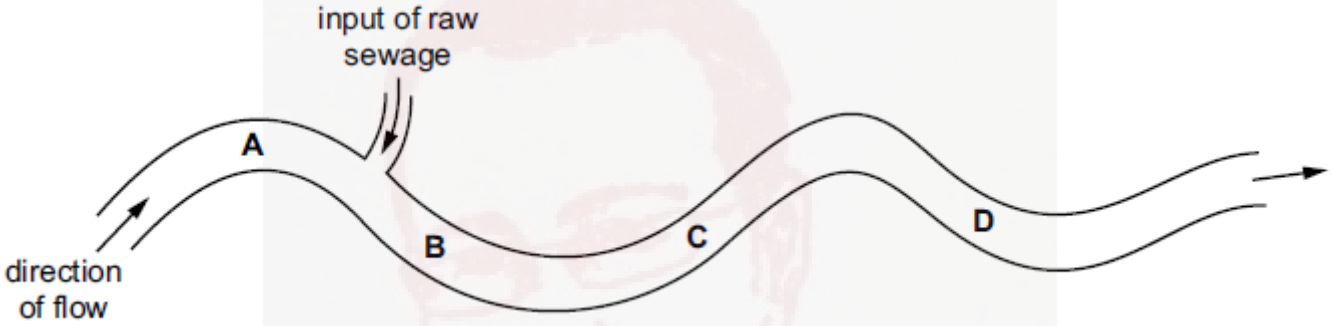
39 What are the possible effects of deforestation?

	loss of soil	flooding	decrease in atmospheric carbon dioxide
A	yes	yes	no
B	yes	no	yes
C	no	yes	no
D	no	no	yes

40 The bloodworm is an organism that is found in heavily polluted water.

The diagram shows where raw sewage flows into a river.

Where would there be fewest bloodworms?



39 What can be managed sustainably?

A taking coal from a coalfield

B taking gas from under the earth's surface

C taking oil from an oilfield

D taking wood from a woodland

40 Large areas of tropical forests have been cleared to grow monocultures of palm oil plants.

Which effect will this have on the ecosystem?

A The use of fossil fuels in the area will decrease.

B The use of pesticides in the area will decrease.

C The variety of species in the area will decrease.

D The variety of species in the area will increase.

Bio 20 **Q# 328/** iGCSE Biology/2019/m/Paper 22/ www.SmashingScience.org :o)

40 Which list correctly describes the sequence of events in the eutrophication of a river or lake?

A	B
1 decreased growth of plants	1 increased growth of plants
2 dead plants decompose	2 dead plants decompose
3 increase in anaerobic bacteria	3 increase in aerobic bacteria
4 decrease in dissolved oxygen	4 decrease in dissolved oxygen

C	D
1 decreased growth of plants	1 plants die
2 dead plants decompose	2 dead plants decompose
3 decrease in anaerobic bacteria	3 decrease in aerobic bacteria
4 increase in dissolved oxygen	4 increase in dissolved oxygen

Bio 20 **Q# 329/** iGCSE Biology/2018/w/Paper 21/ www.SmashingScience.org :o)

39 What is **least** likely to result from deforestation?

A increase in flooding

B increase in species

C loss of habitats

D loss of soil

40 Pieces of plastic between 1 μm and 1 mm in size are called microplastics. Microplastics are put into some face creams and are produced during clothing manufacture. They can now be found in increasing quantities in oceans all over the world.

As well as their small size, which other property of microplastics make them dangerous to living organisms?

A They are lightweight.

B They are non-biodegradable.

C They are non-reactive.

D They are toxic.

Bio 20 **Q# 330/** iGCSE Biology/2018/s/Paper 21/ www.SmashingScience.org :o)

39 Deforestation can have a negative impact on the environment.

Which statement about the negative impact of deforestation is correct?

A decreases the levels of carbon dioxide which can lead to reduced rates of photosynthesis

B decreases the amount of water flowing in local rivers so there is less flooding

C leads to soil loss so there is less fertile soil for the growth of crops in the area

D provides less land for the extraction of natural resources

40 When nitrates enter a lake they cause rapid growth of algae on the surface of the water. This causes the following changes in the lake:

1 a decrease in the concentration of dissolved oxygen in the water

2 fish and other aquatic animals die

3 an increase in aerobic respiration by decomposers

4 producers die and decomposition increases

In which order do these changes occur?

A 1 → 2 → 4 → 3

B 3 → 1 → 2 → 4

C 4 → 2 → 3 → 1

D 4 → 3 → 1 → 2

38 What is a major contributor to the problem of worldwide famine?

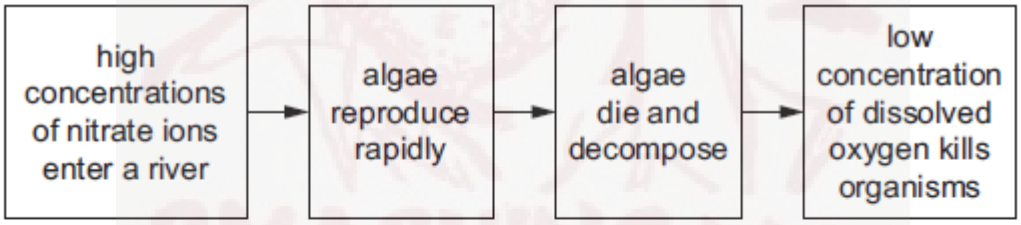
A equal distribution of food

B increasing population and life expectancy

C large-scale monoculture of crop plants

D use of herbicides and insecticides in farming

39 The flow diagram shows a process that can occur as a result of pollution in a river.



Which term describes the process shown in the flow diagram?

A aerobic respiration

B eutrophication

C nitrogen cycle

D photosynthesis

40 Which stage in the treatment of sewage removes large floating objects, such as plastic bags?

A aeration

B discharge

C screening

D sedimentation

39 What is **not** a reason for conservation programmes?

A to introduce new species

B to maintain nutrient cycles

C to maintain resources

D to protect vulnerable environments

40 Some examples of the waste products of human activity are discarded household rubbish, excess fertiliser, industrial chemicals and untreated sewage.

Which of these can **both** cause increased growth of aquatic plants?

A chemical waste and discarded household rubbish

B discarded household rubbish and excess fertiliser

C excess fertiliser and untreated sewage

D untreated sewage and chemical waste

36 The processes listed in 1–4 will affect the concentration of carbon dioxide in the atmosphere.

1 increased deforestation

2 increased forestation

3 decreased fossil fuel combustion

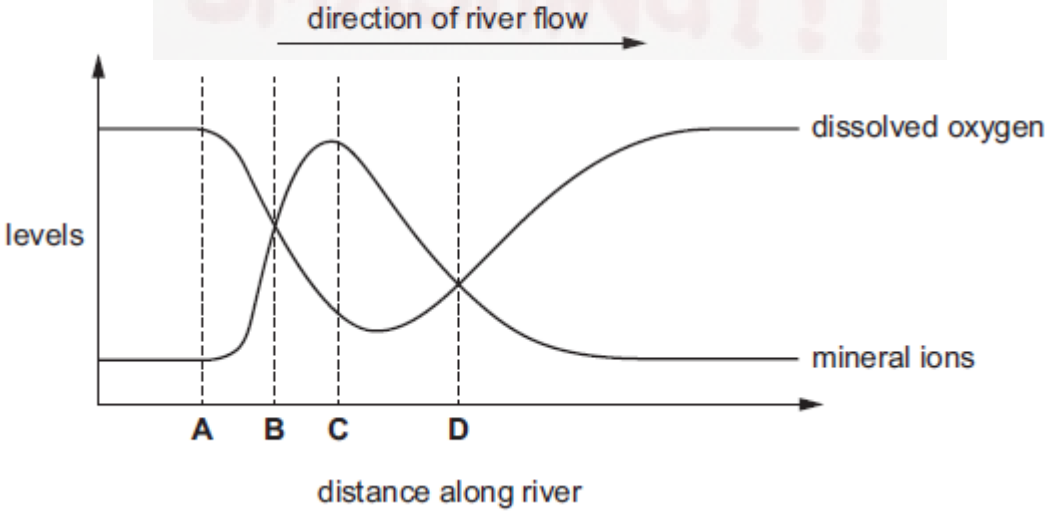
4 increased fossil fuel combustion

Which processes would increase the concentration of carbon dioxide in the atmosphere?

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

40 The graph shows the levels of dissolved oxygen and mineral ions in a river.

At which point does raw sewage enter the river?



39 How does cutting down trees contribute to the greenhouse effect?

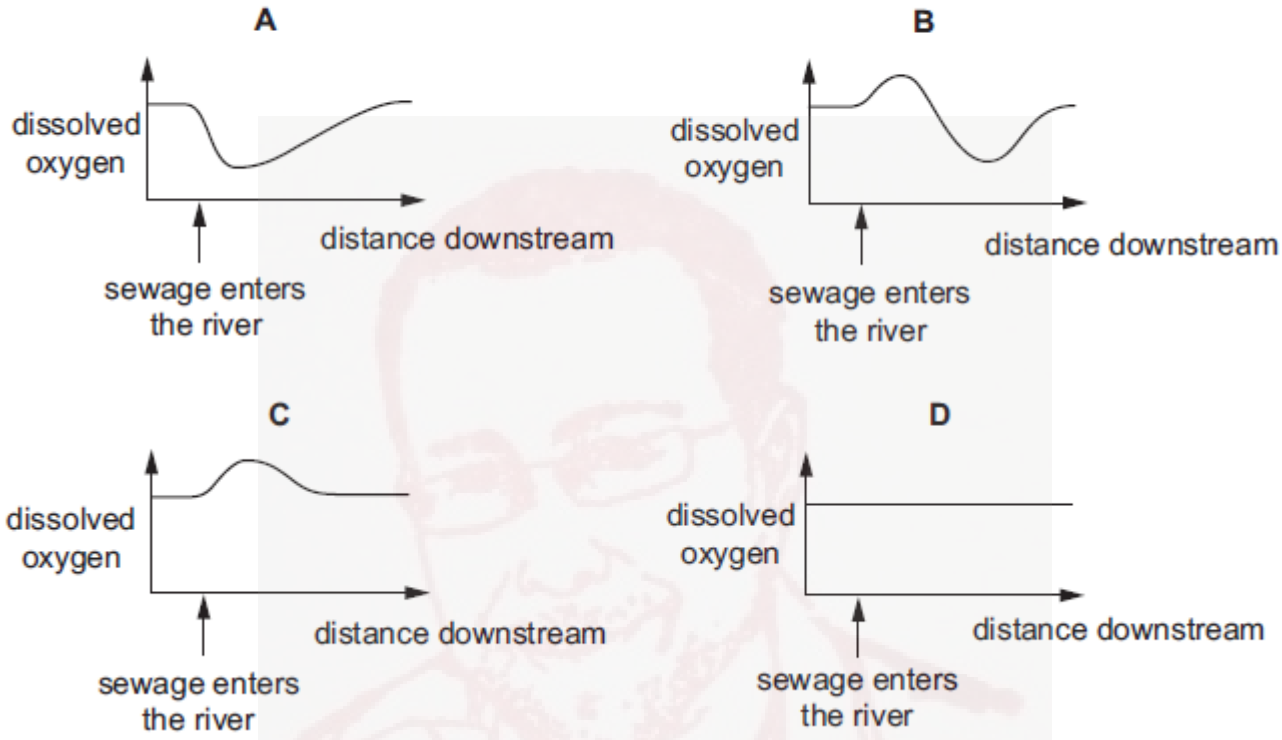
A There will be less carbon dioxide absorbed.

B There will be less oxygen absorbed.

C There will be less shade from trees.

D The soil will become dry.

40 Which graph shows the effect of pollution by untreated sewage on the amount of oxygen dissolved in a river?



40 What is **not** a reason for having conservation programmes?

A introducing species to new environments

B maintaining resources

C protecting vulnerable environments

D reducing extinction

39 Which effect is **least** likely to occur as a result of deforestation?

A an increase in biodiversity

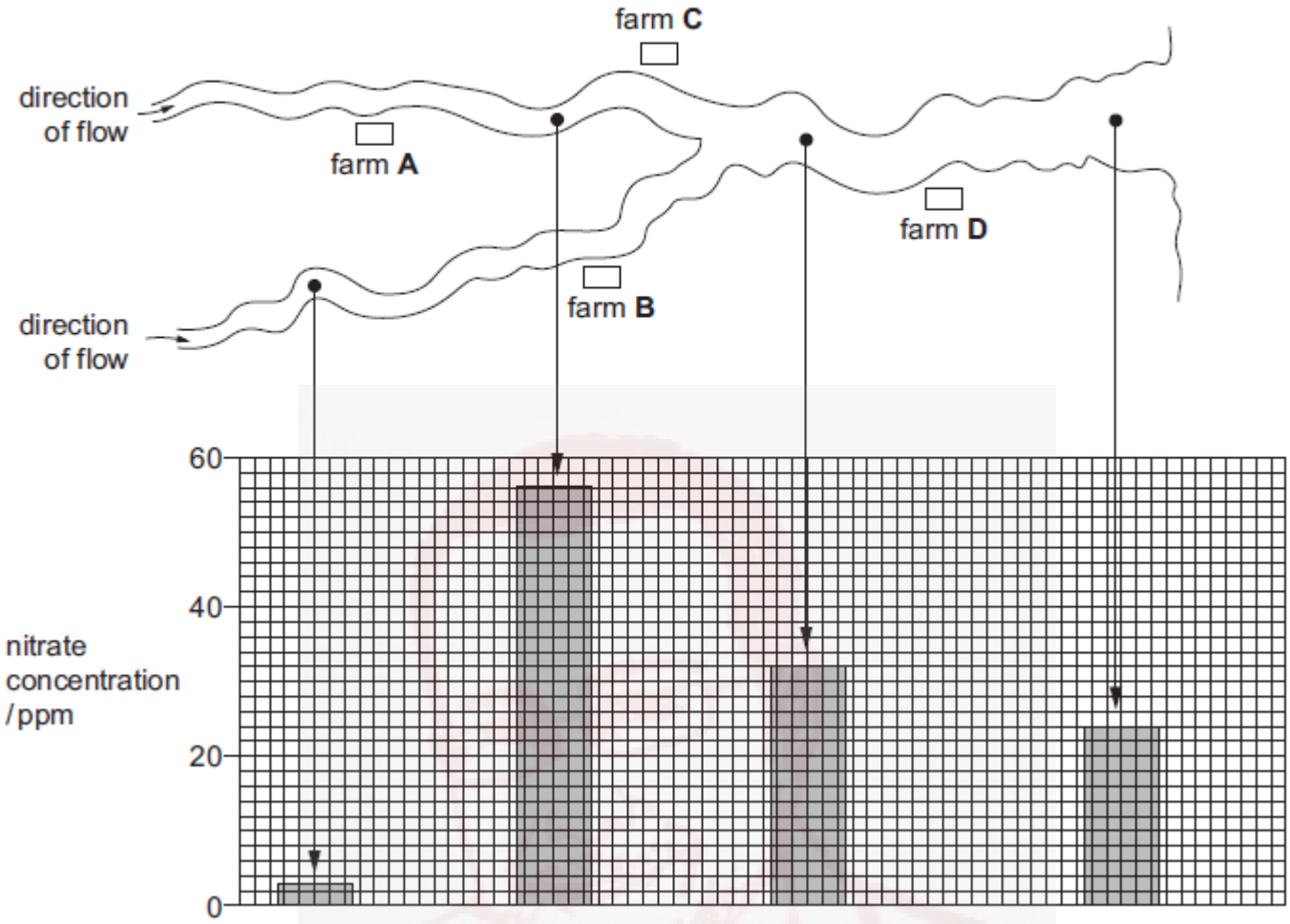
B an increase in soil erosion

C an increase in the level of carbon dioxide in the atmosphere

D an increased risk of flooding

40 The diagram shows the positions of four farms and the concentrations of nitrate at different points in a river.

Which farm is likely to have been using too much fertiliser on its land?



39 The diagram shows five stages in genetic engineering.

stage 1 The DNA making up a human gene is isolated using restriction enzymes.	stage 2 The DNA of a bacterial plasmid is cut open using restriction enzymes.	stage 3 The DNA of the human gene is inserted into the bacterial plasmid DNA.

stage 4 The plasmid containing the human gene is put back into a bacterium.	stage 5 The bacteria with the human gene divide and make the human protein.

Which stages involve the formation of sticky ends?

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

40 The careless use of nitrogenous fertiliser near rivers and lakes can cause eutrophication.

This results in the death of fish.

What is the direct cause of the death of the fish?

A Decomposers reduce the amount of dissolved oxygen in the water.

B Nitrates are toxic to plants.

C The rapid growth of producers uses up all the available nutrients.

D The sudden increase in the number of bacteria increases the spread of disease.

Paper 2 Bio Topic# 21 **Q# 338/** iGCSE Biology/2021/s/Paper 21/ www.SmashingScience.org :o)

39 Why are bacteria useful in genetic engineering?

A Their genetic code is different to other organisms.

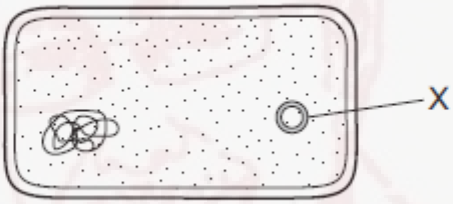
B They have cell walls.

C They have plasmids.

D They reproduce sexually.

Bio 21 **Q# 339/** iGCSE Biology/2021/m/Paper 22/ www.SmashingScience.org :o)

38 The diagram shows the structure of a bacterium.



The presence of structure X is one reason why bacteria are used in genetic engineering.

What is structure X?

A chloroplast

B mitochondrion

C nucleus

D plasmid

Bio 21 **Q# 340/** iGCSE Biology/2020/w/Paper 21/ www.SmashingScience.org :o)

38 Which are reasons why bacteria are often useful in biotechnology?

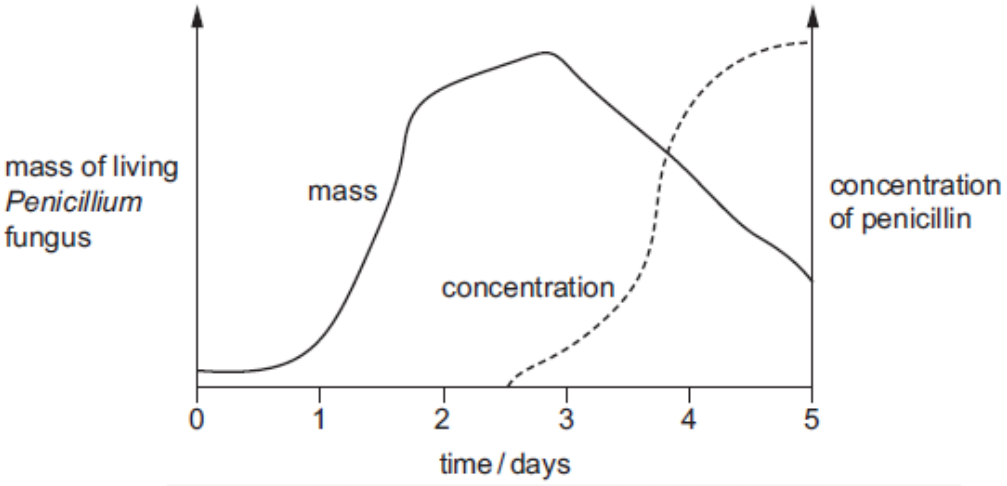
1 lack of ethical concerns over their manipulation and growth

2 they have the same genetic code as all other organisms

3 their DNA is located in a nucleus that can easily be altered with enzymes

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

39 Penicillin is produced in a fermenter by growing the fungus *Penicillium*. The graph shows how the mass of living *Penicillium* fungus and the concentration of penicillin changed over time.



When is the best time to collect the penicillin?

A at 1.5 days

B at 3 days

C at 3.5 days

D at 5 days

Bio 21

Q# 341/ iGCSE Biology/2020/s/Paper 21/ www.SmashingScience.org :o)

37 What is the role of anaerobic respiration in bread-making?

A to produce alcohol to flavour the bread

B to produce gas to make the bread rise

C to release enough energy to bake the bread

D to release enough lactic acid to kill the yeast

38 A crop plant has been genetically modified to make it resistant to herbicides.

Which is a possible disadvantage of introducing this new crop plant?

A Loss of weeds reduces competition.

B Some weeds might become resistant to the herbicide.

C The crop plant is unharmed and produces a higher yield.

D The new gene will appear in new generations of the crop.

Bio 21 **Q# 342/** iGCSE Biology/2020/m/Paper 22/ www.SmashingScience.org :o)

39 Which method is used to produce lactose-free milk?

A filtering milk to remove lactose

B heating milk to break down lactose

C using lactase to break down lactose

D using lipase to denature lactose

Bio 21 **Q# 343/** iGCSE Biology/2019/w/Paper 21/ www.SmashingScience.org :o)

37 Which part of a bacterial cell makes it useful in genetic engineering?

A cell wall

B cytoplasm

C flagellum

D plasmid

38 Which enzyme would be used in a biological washing powder?

A DNA ligase

B lactase

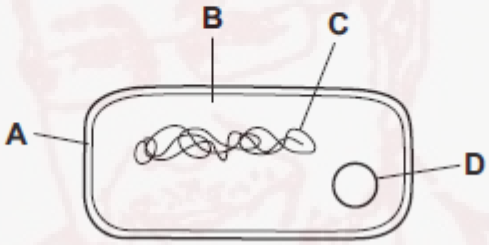
C pectinase

D protease

Bio 21 **Q# 344/** iGCSE Biology/2019/s/Paper 21/ www.SmashingScience.org :o)

38 The diagram shows a bacterial cell.

Which part of its structure is particularly useful in genetic engineering?



Bio 21 **Q# 345/** iGCSE Biology/2019/m/Paper 22/ www.SmashingScience.org :o)

37 What are **all** reasons why bacteria are useful in genetic engineering?

A They are very small. They do not need large containers. They have no mitochondria.

B They reproduce asexually. They can double their numbers in twenty minutes in good conditions. They have cell walls.

C They have the same genetic code as other organisms. They have plasmids. There is a lack of ethical concern about their use.

D Their DNA is not in a nucleus. They have a cell membrane. They have a large surface area to volume ratio.

38 Which statement describes the role of DNA ligase in genetic engineering?

A cuts open a bacterial plasmid

B joins the human gene to the plasmid

C inserts plasmid back into bacterium

D isolates a human gene

37 Bacteria are used in genetic engineering and biotechnology.

Bacteria are used because of the presence of which cell structure?

A cell membrane

B cell wall

C cytoplasm

D plasmids

38 What is an example of genetic engineering?

A using enzymes to make washing powders

B using pectinase to make fruit juice

C producing plants that have been given genes for resistance to insect pests

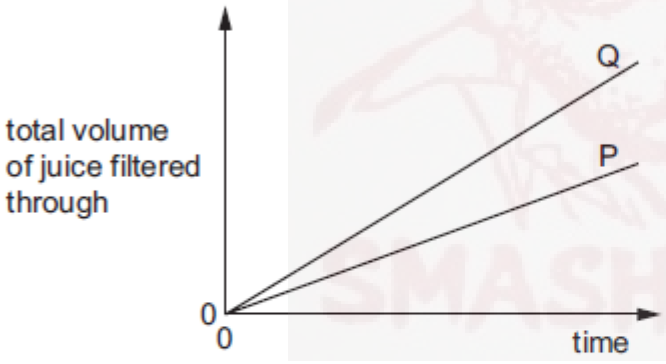
D using yeast to make bread

17 A student places two samples of crushed apple into two beakers, P and Q. The samples are of equal size. She adds 5 cm^3 of pectinase solution to beaker P and 5 cm^3 of water to beaker Q.

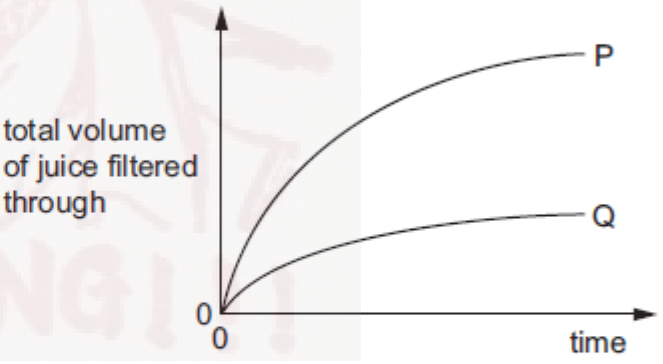
After five minutes, she places the samples of crushed apple into two different filter funnels, and measures the volume of juice filtering through from each sample over a period of 10 minutes.

Which graph shows her results?

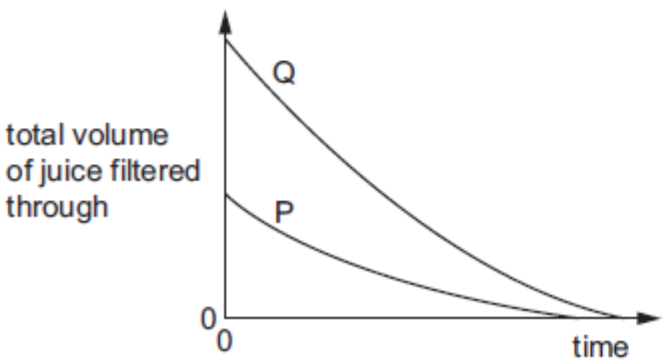
A



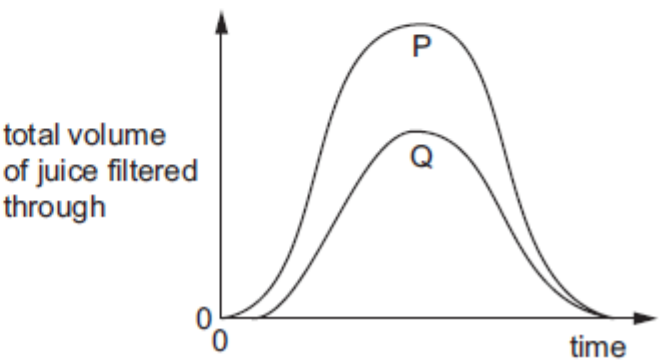
B



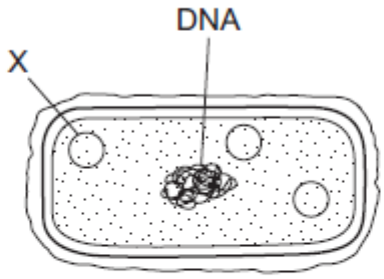
C



D



37 The diagram shows the structure of a bacterial cell.



The presence of structure X in the bacterial cell is one reason why bacteria are used in genetic engineering.

What is structure X?

A endoplasmic reticulum

B mitochondria

C plasmid

D ribosome

38 What does *Penicillium* need to grow in a fermenter?

	amino acids	carbohydrates	oxygen
A	✓	✓	✓
B	✓	✓	✗
C	✓	✗	✓
D	✗	✓	✓

35 Some of the characteristics of bacteria are listed.

1 can make complex molecules

2 can reproduce quickly

3 have cytoplasm

4 may cause diseases

Which characteristics make bacteria useful in biotechnology and genetic engineering?

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

36 What is a requirement for the production of penicillin in a fermenter?

A adding bubbles of nitrogen gas to mix the nutrients and *Penicillium*

B adding the required amount of sugar as a nutrient

C ensuring no oxygen enters the fermenter so only anaerobic respiration occurs

D maintaining a constant temperature of 95 °C to prevent other microorganisms growing

37 Human insulin can be produced in large quantities by modified *E. coli* bacteria.

Four of the steps in this production process are listed.

1 Insulin is removed from the bacterial culture.

2 An enzyme is used to cut out the insulin gene from a human chromosome.

3 The insulin gene is placed into the plasmid of the bacterium.

4 Bacteria with the insulin gene reproduce very rapidly.

What is the order of these steps?

A 1 → 2 → 3 → 4

B 1 → 3 → 4 → 2

C 2 → 3 → 4 → 1

D 4 → 1 → 2 → 3

Bio 21 **Q# 350/** iGCSE Biology/2017/w/Paper 21/ www.SmashingScience.org :o)

10 Which enzyme is used to produce clear apple juice?

A amylase

B lipase

C pectinase

D protease

Bio 21 **Q# 351/** iGCSE Biology/2017/w/Paper 21/ www.SmashingScience.org :o)

38 Ligase enzymes are used in genetic engineering to

A cut open plasmid DNA.

B insert plasmids into bacteria.

C isolate the DNA making up a human gene.

D join human DNA to plasmid DNA.

Bio 21 **Q# 352/** iGCSE Biology/2017/s/Paper 21/ www.SmashingScience.org :o)

38 Which is a reason for using bacteria in biotechnology?

A Bacteria are found inside the human body.

B Bacteria can become resistant to antibiotics.

C Bacteria can make complex molecules.

D Bacteria reproduce slowly.

39 Why is yeast used in breadmaking?

A to produce alcohol

B to produce carbon dioxide

C to use up oxygen

D to use up sugar

38 Genes are isolated from human DNA using ……1…… enzymes.

A bacterial plasmid is cut with the same enzyme forming ……2…… .

The human DNA is inserted into the bacterial plasmid using the enzyme ……3…… forming a ……4…… plasmid.

Which row correctly completes gaps 1, 2, 3 and 4?

	1	2	3	4
A	ligase	sticky ends	protease	restriction
B	recombinant	new DNA	ligase	daughter
C	restriction	daughter plasmids	ligase	diploid
D	restriction	sticky ends	ligase	recombinant

37 Which structures, found in bacteria, make them useful in genetic engineering?

A cell walls

B membranes

C plasmids

D mitochondria

38 Why is yeast used in bread-making?

A Aerobic respiration produces alcohol.

B Aerobic respiration produces lactic acid.

C Anaerobic respiration produces alcohol.

D Anaerobic respiration produces carbon dioxide.

39 An advantage of some genetically modified crop plants is that they will **not**

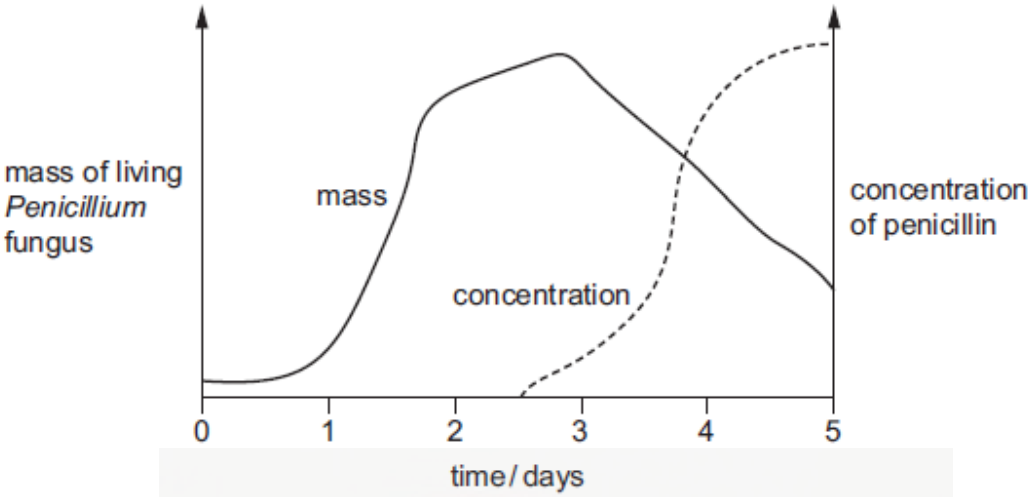
A be affected by herbicides.

B need carbon dioxide.

C need magnesium ions.

D need water.

37 Penicillin is produced in a fermenter by growing the fungus *Penicillium*. The graph shows how the mass of living *Penicillium* fungus and the concentration of penicillin changed over time.



When is the best time to collect the penicillin?

A at 1.5 days

B at 3 days

C at 3.5 days

D at 5 days

38 A gene for insulin is taken from a human cell and placed in a bacterium.

The bacterium can then make human insulin.

What is this process called?

A artificial selection

B genetic engineering

C heterozygous inheritance

D natural selection

39 The diagram shows five stages in genetic engineering.

stage 1 The DNA making up a human gene is isolated using restriction enzymes.	stage 2 The DNA of a bacterial plasmid is cut open using restriction enzymes.	stage 3 The DNA of the human gene is inserted into the bacterial plasmid DNA.

stage 4 The plasmid containing the human gene is put back into a bacterium.	stage 5 The bacteria with the human gene divide and make the human protein.

Which stages involve the formation of sticky ends?

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

Paper 2 Mark Scheme

Bio 1 **Q# 1/** iGCSE Biology/2021/s/Paper 21/ www.SmashingScience.org :o)

1	D
2	A
3	D

Bio 1 **Q# 2/** iGCSE Biology/2021/m/Paper 22/ www.SmashingScience.org :o)

1	D
2	D
3	C

Bio 1 **Q# 3/** iGCSE Biology/2020/w/Paper 21/ www.SmashingScience.org :o)

1	D
2	B

Bio 1 **Q# 4/** iGCSE Biology/2020/s/Paper 21/ www.SmashingScience.org :o)

1	D
2	A

Bio 1 **Q# 5/** iGCSE Biology/2020/m/Paper 22/ www.SmashingScience.org :o)

1	B
2	B
3	B

Bio 1 **Q# 6/** iGCSE Biology/2019/w/Paper 21/ www.SmashingScience.org :o)

1	D
2	B
3	C

Bio 1 **Q# 7/** iGCSE Biology/2019/s/Paper 21/ www.SmashingScience.org :o)

1	B
2	C

Bio 1 **Q# 8/** iGCSE Biology/2019/m/Paper 22/ www.SmashingScience.org :o)

1	C
2	A

Bio 1 **Q# 9/** iGCSE Biology/2018/w/Paper 21/ www.SmashingScience.org :o)

1	D
2	B

Bio 1 **Q# 10/** iGCSE Biology/2018/s/Paper 21/ www.SmashingScience.org :o)

1	A
2	B
3	C
4	D

Bio 1 **Q# 11/** iGCSE Biology/2018/m/Paper 22/ www.SmashingScience.org :o)

1	B
2	D
3	D

Bio 1 **Q# 12/** iGCSE Biology/2017/w/Paper 21/ www.SmashingScience.org :o)

1	D
2	A

Bio 1 **Q# 13/** iGCSE Biology/2017/s/Paper 21/ www.SmashingScience.org :o)

1	B

Bio 1 **Q# 14/** iGCSE Biology/2017/m/Paper 22/ www.SmashingScience.org :o)

1	C
2	B
3	C

Bio 1 **Q# 15/** iGCSE Biology/2016/w/Paper 21/ www.SmashingScience.org :o)

1	**D**
2	**B**
3	**D**

Bio 1 **Q# 16/** iGCSE Biology/2016/s/Paper 21/ www.SmashingScience.org :o)

1	**C**
2	**C**
3	**C**

Bio 1 **Q# 17/** iGCSE Biology/2016/m/Paper 22/ www.SmashingScience.org :o)

1	**C**
2	**D**

Bio 2 **Q# 18/** iGCSE Biology/2021/s/Paper 21/ www.SmashingScience.org :o)

4	C
5	C
6	B

Bio 2 **Q# 19/** iGCSE Biology/2021/m/Paper 22/ www.SmashingScience.org :o)

4	C
5	C
6	D

Bio 2 **Q# 20/** iGCSE Biology/2020/w/Paper 21/ www.SmashingScience.org :o)

3	D
4	C

Bio 2 **Q# 21/** iGCSE Biology/2020/s/Paper 21/ www.SmashingScience.org :o)

3	D
4	A

Bio 2 **Q# 22/** iGCSE Biology/2020/m/Paper 22/ www.SmashingScience.org :o)

4	D
5	B
6	A

Bio 2 **Q# 23/** iGCSE Biology/2019/w/Paper 21/ www.SmashingScience.org :o)

4	C
5	C

Bio 2 **Q# 24/** iGCSE Biology/2019/s/Paper 21/ www.SmashingScience.org :o)

3	B
4	B
5	B

Bio 2 **Q# 25/** iGCSE Biology/2019/m/Paper 22/ www.SmashingScience.org :o)

3	D
4	C
5	C
6	B

Bio 2 **Q# 26/** iGCSE Biology/2018/w/Paper 21/ www.SmashingScience.org :o)

3	A
4	B

Bio 2 **Q# 27/** iGCSE Biology/2018/s/Paper 21/ www.SmashingScience.org :o)

22	D

Bio 2 **Q# 28/** iGCSE Biology/2018/s/Paper 21/ www.SmashingScience.org :o)

5	B
6	B

Bio 2 **Q# 29/** iGCSE Biology/2018/m/Paper 22/ www.SmashingScience.org :o)

4	A
5	B

Bio 2 **Q# 30/** iGCSE Biology/2017/w/Paper 21/ www.SmashingScience.org :o)

3	C
4	B
11	D

Bio 2 **Q# 31/** iGCSE Biology/2017/s/Paper 21/ www.SmashingScience.org :o)

2	C
3	C
4	B

Bio 2 **Q# 32/** iGCSE Biology/2017/m/Paper 22/ www.SmashingScience.org :o)

4	D
5	C

Bio 2 **Q# 33/** iGCSE Biology/2016/w/Paper 21/ www.SmashingScience.org :o)

4 **B**

Bio 2 **Q# 34/** iGCSE Biology/2016/s/Paper 21/ www.SmashingScience.org :o)

5 **B**

Bio 2 **Q# 35/** iGCSE Biology/2016/s/Paper 21/ www.SmashingScience.org :o)

33 **B**

Bio 2 **Q# 36/** iGCSE Biology/2016/m/Paper 22/ www.SmashingScience.org :o)

3 **D**

4 **B**

Bio 3 **Q# 37/** iGCSE Biology/2021/s/Paper 21/ www.SmashingScience.org :o)

7	B

Bio 3 **Q# 38/** iGCSE Biology/2021/m/Paper 22/ www.SmashingScience.org :o)

7	A
8	D

Bio 3 **Q# 39/** iGCSE Biology/2020/w/Paper 21/ www.SmashingScience.org :o)

5	A
6	D

Bio 3 **Q# 40/** iGCSE Biology/2020/s/Paper 21/ www.SmashingScience.org :o)

5	A
6	B

Bio 3 **Q# 41/** iGCSE Biology/2020/m/Paper 22/ www.SmashingScience.org :o)

7	B
8	A

Bio 3 **Q# 42/** iGCSE Biology/2019/w/Paper 21/ www.SmashingScience.org :o)

6	A
7	B

Bio 3 **Q# 43/** iGCSE Biology/2019/s/Paper 21/ www.SmashingScience.org :o)

6	C
7	D

Bio 3 **Q# 44/** iGCSE Biology/2019/m/Paper 22/ www.SmashingScience.org :o)

7	A
8	C

Bio 3 **Q# 45/** iGCSE Biology/2018/w/Paper 21/ www.SmashingScience.org :o)

5	B
6	D

Bio 3 **Q# 46/** iGCSE Biology/2018/s/Paper 21/ www.SmashingScience.org :o)

7	A
8	B

Bio 3 **Q# 47/** iGCSE Biology/2018/m/Paper 22/ www.SmashingScience.org :o)

6	D
7	B

Bio 3 **Q# 48/** iGCSE Biology/2017/w/Paper 21/ www.SmashingScience.org :o)

5	C
6	B

Bio 3 **Q# 49/** iGCSE Biology/2017/s/Paper 21/ www.SmashingScience.org :o)

5	C

Bio 3 **Q# 50/** iGCSE Biology/2017/m/Paper 22/ www.SmashingScience.org :o)

7	C

Bio 3 **Q# 51/** iGCSE Biology/2016/w/Paper 21/ www.SmashingScience.org :o)

6	**C**

Bio 3 **Q# 52/** iGCSE Biology/2016/s/Paper 21/ www.SmashingScience.org :o)

6	**B**
7	**B**

Bio 3 **Q# 53/** iGCSE Biology/2016/m/Paper 22/ www.SmashingScience.org :o)

5	**D**
6	**B**
7	**A**

Bio 4 **Q# 54/** iGCSE Biology/2021/s/Paper 21/ www.SmashingScience.org :o)

9	C

Bio 4 **Q# 55/** iGCSE Biology/2021/s/Paper 21/ www.SmashingScience.org :o)

10	D

Bio 4 **Q# 56/** iGCSE Biology/2021/m/Paper 22/ www.SmashingScience.org :o)

9	B

Bio 4 **Q# 57/** iGCSE Biology/2020/w/Paper 21/ www.SmashingScience.org :o)

7	A
8	B

Bio 4 **Q# 58/** iGCSE Biology/2020/s/Paper 21/ www.SmashingScience.org :o)

7	B
8	B

Bio 4 **Q# 59/** iGCSE Biology/2019/w/Paper 21/ www.SmashingScience.org :o)

8	A

Bio 4 **Q# 60/** iGCSE Biology/2019/s/Paper 21/ www.SmashingScience.org :o)

8	C
9	C

Bio 4 **Q# 61/** iGCSE Biology/2018/w/Paper 21/ www.SmashingScience.org :o)

7	D
8	B

Bio 4 **Q# 62/** iGCSE Biology/2018/s/Paper 21/ www.SmashingScience.org :o)

9	C

Bio 4 **Q# 63/** iGCSE Biology/2018/m/Paper 22/ www.SmashingScience.org :o)

8	A

Bio 4 **Q# 64/** iGCSE Biology/2017/s/Paper 21/ www.SmashingScience.org :o)

6	B

Bio 4 **Q# 65/** iGCSE Biology/2017/m/Paper 22/ www.SmashingScience.org :o)

8	C

Bio 4 **Q# 66/** iGCSE Biology/2016/s/Paper 21/ www.SmashingScience.org :o)

8	**B**
9	**C**

Bio 4 **Q# 67/** iGCSE Biology/2016/m/Paper 22/ www.SmashingScience.org :o)

8	**B**

Paper 2 Mark Scheme Bio 5 Q# 68

iGCSE Biology/2021/s/Paper 21/

12	D

Bio 5 **Q# 69/** iGCSE Biology/2021/m/Paper 22/ www.SmashingScience.org :o)

10	B
11	B

Bio 5 **Q# 70/** iGCSE Biology/2020/w/Paper 21/ www.SmashingScience.org :o)

9	D
10	D

Bio 5 **Q# 71/** iGCSE Biology/2020/s/Paper 21/ www.SmashingScience.org :o)

9	D

Bio 5 **Q# 72/** iGCSE Biology/2020/m/Paper 22/ www.SmashingScience.org :o)

9	C

Bio 5 **Q# 73/** iGCSE Biology/2020/m/Paper 22/ www.SmashingScience.org :o)

11	C

Bio 5 **Q# 74/** iGCSE Biology/2019/w/Paper 21/ www.SmashingScience.org :o)

8	A

Bio 5 **Q# 75/** iGCSE Biology/2019/s/Paper 21/ www.SmashingScience.org :o)

10	C

Bio 5 **Q# 76/** iGCSE Biology/2019/m/Paper 22/ www.SmashingScience.org :o)

9	A

Bio 5 **Q# 77/** iGCSE Biology/2018/w/Paper 21/ www.SmashingScience.org :o)

9	D
10	A

Bio 5 **Q# 78/** iGCSE Biology/2018/s/Paper 21/ www.SmashingScience.org :o)

10	A

Bio 5 **Q# 79/** iGCSE Biology/2018/m/Paper 22/ www.SmashingScience.org :o)

9	D

Bio 5 **Q# 80/** iGCSE Biology/2017/w/Paper 21/ www.SmashingScience.org :o)

7	D
8	B
9	D

Bio 5 **Q# 81/** iGCSE Biology/2017/s/Paper 21/ www.SmashingScience.org :o)

7	D

Bio 5 **Q# 82/** iGCSE Biology/2017/m/Paper 22/ www.SmashingScience.org :o)

9	A

Bio 5 **Q# 83/** iGCSE Biology/2016/w/Paper 21/ www.SmashingScience.org :o)

8	**A**

Bio 5 **Q# 84/** iGCSE Biology/2016/s/Paper 21/ www.SmashingScience.org :o)

10	**A**
11	**C**

Bio 5 **Q# 85/** iGCSE Biology/2016/m/Paper 22/ www.SmashingScience.org :o)

10	**D**

Bio 6 **Q# 86/** iGCSE Biology/2021/s/Paper 21/ www.SmashingScience.org :o)

13	A
14	B

Bio 6 **Q# 87/** iGCSE Biology/2021/m/Paper 22/ www.SmashingScience.org :o)

12	D
13	C

Bio 6 **Q# 88/** iGCSE Biology/2020/w/Paper 21/ www.SmashingScience.org :o)

11	A
12	D

Bio 6 **Q# 89/** iGCSE Biology/2020/s/Paper 21/ www.SmashingScience.org :o)

10	C
11	C
12	C

Bio 6 **Q# 90/** iGCSE Biology/2020/m/Paper 22/ www.SmashingScience.org :o)

12	B
13	B

Bio 6 **Q# 91/** iGCSE Biology/2019/w/Paper 21/ www.SmashingScience.org :o)

10	A
11	A

Bio 6 **Q# 92/** iGCSE Biology/2019/s/Paper 21/ www.SmashingScience.org :o)

11	C
12	B

Bio 6 **Q# 93/** iGCSE Biology/2019/m/Paper 22/ www.SmashingScience.org :o)

12	D

Bio 6 **Q# 94/** iGCSE Biology/2019/m/Paper 22/ www.SmashingScience.org :o)

10	D
11	B

Bio 6 **Q# 95/** iGCSE Biology/2018/w/Paper 21/ www.SmashingScience.org :o)

11	C
12	C

Bio 6 **Q# 96/** iGCSE Biology/2018/s/Paper 21/ www.SmashingScience.org :o)

11	B

Bio 6 **Q# 97/** iGCSE Biology/2018/m/Paper 22/ www.SmashingScience.org :o)

10	A
11	A

Bio 6 **Q# 98/** iGCSE Biology/2017/w/Paper 21/ www.SmashingScience.org :o)

15	B

Bio 6 **Q# 99/** iGCSE Biology/2017/s/Paper 21/ www.SmashingScience.org :o)

8	A
9	B
10	B

Bio 6 **Q# 100/** iGCSE Biology/2017/m/Paper 22/ www.SmashingScience.org :o)

6	D
10	B
24	A

Bio 6 **Q# 101/** iGCSE Biology/2016/w/Paper 21/ www.SmashingScience.org :o)

9	**C**
10	**B**
11	**C**

Bio 6 **Q# 102/** iGCSE Biology/2016/s/Paper 21/ www.SmashingScience.org :o)

12	**B**

Bio 6 **Q# 103/** iGCSE Biology/2016/m/Paper 22/ www.SmashingScience.org :o)

12	**D**

Bio 7 **Q# 104/** iGCSE Biology/2021/s/Paper 21/

11	B

Bio 7 **Q# 105/** iGCSE Biology/2021/s/Paper 21/ www.SmashingScience.org :o)

16	A

Bio 7 **Q# 106/** iGCSE Biology/2021/m/Paper 22/ www.SmashingScience.org :o)

14	D
15	C
16	C

Bio 7 **Q# 107/** iGCSE Biology/2020/w/Paper 21/ www.SmashingScience.org :o)

13	B
14	A

Bio 7 **Q# 108/** iGCSE Biology/2020/s/Paper 21/ www.SmashingScience.org :o)

13	C
14	B

Bio 7 **Q# 109/** iGCSE Biology/2020/m/Paper 22/ www.SmashingScience.org :o)

10	C
14	C
16	A

Bio 7 **Q# 110/** iGCSE Biology/2019/w/Paper 21/ www.SmashingScience.org :o)

12	B
14	A

Bio 7 **Q# 111/** iGCSE Biology/2019/s/Paper 21/ www.SmashingScience.org :o)

13	D

Bio 7 **Q# 112/** iGCSE Biology/2019/s/Paper 21/ www.SmashingScience.org :o)

15	A

Bio 7 **Q# 113/** iGCSE Biology/2019/m/Paper 22/ www.SmashingScience.org :o)

14	A
15	C

Bio 7 **Q# 114/** iGCSE Biology/2018/w/Paper 21/ www.SmashingScience.org :o)

13	C
14	C

Bio 7 **Q# 115/** iGCSE Biology/2018/s/Paper 21/ www.SmashingScience.org :o)

12	B
14	A

Bio 7 **Q# 116/** iGCSE Biology/2018/m/Paper 22/ www.SmashingScience.org :o)

12	C

Bio 7 **Q# 117/** iGCSE Biology/2017/w/Paper 21/ www.SmashingScience.org :o)

16	B

Bio 7 **Q# 118/** iGCSE Biology/2017/w/Paper 21/ www.SmashingScience.org :o)

12	B
13	A
14	B

Bio 7 **Q# 119/** iGCSE Biology/2017/s/Paper 21/ www.SmashingScience.org :o)

11	D
12	C
13	C
14	B

Bio 7 **Q# 120/** iGCSE Biology/2017/m/Paper 22/ www.SmashingScience.org :o)

11	D

Bio 7 **Q# 121/** iGCSE Biology/2017/m/Paper 22/ www.SmashingScience.org :o)

13	A

Bio 7 **Q# 122/** iGCSE Biology/2016/w/Paper 21/ www.SmashingScience.org :o)

12	**A**
13	**C**

Bio 7 **Q# 123/** iGCSE Biology/2016/s/Paper 21/ www.SmashingScience.org :o)

13	**D**
15	**C**

Bio 7 **Q# 124/** iGCSE Biology/2016/m/Paper 22/ www.SmashingScience.org :o)

9	**C**
11	**D**
14	**C**
15	**B**

Bio 8 **Q# 125/** iGCSE Biology/2021/s/Paper 21/ www.SmashingScience.org :o)

17	B
18	B

Bio 8 **Q# 126/** iGCSE Biology/2021/m/Paper 22/ www.SmashingScience.org :o)

17	B
18	A

Bio 8 **Q# 127/** iGCSE Biology/2020/w/Paper 21/ www.SmashingScience.org :o)

15	D
16	D

Bio 8 **Q# 128/** iGCSE Biology/2020/s/Paper 21/ www.SmashingScience.org :o)

15	A
16	B

Bio 8 **Q# 129/** iGCSE Biology/2020/m/Paper 22/ www.SmashingScience.org :o)

17	D
18	D

Bio 8 **Q# 130/** iGCSE Biology/2019/w/Paper 21/ www.SmashingScience.org :o)

16	D

Bio 8 **Q# 131/** iGCSE Biology/2019/s/Paper 21/ www.SmashingScience.org :o)

16	B
17	B
18	C

Bio 8 **Q# 132/** iGCSE Biology/2019/m/Paper 22/ www.SmashingScience.org :o)

16	B
17	C

Bio 8 **Q# 133/** iGCSE Biology/2018/w/Paper 21/ www.SmashingScience.org :o)

15	D
16	A

Bio 8 **Q# 134/** iGCSE Biology/2018/s/Paper 21/ www.SmashingScience.org :o)

11	B

Bio 8 **Q# 135/** iGCSE Biology/2018/m/Paper 22/ www.SmashingScience.org :o)

13	B

Bio 8 **Q# 136/** iGCSE Biology/2017/s/Paper 21/ www.SmashingScience.org :o)

15	B
16	A
17	D

Bio 8 **Q# 137/** iGCSE Biology/2017/m/Paper 22/ www.SmashingScience.org :o)

14	B

Bio 8 **Q# 138/** iGCSE Biology/2016/w/Paper 21/ www.SmashingScience.org :o)

5	**A**
15	**A**
16	**B**
17	**A**

Bio 8 **Q# 139/** iGCSE Biology/2016/s/Paper 21/ www.SmashingScience.org :o)

16	**B**
17	**A**

Bio 8 **Q# 140/** iGCSE Biology/2016/m/Paper 22/ www.SmashingScience.org :o)

16	**A**
17	**B**
18	**C**

Bio 9 **Q# 141/** iGCSE Biology/2021/s/Paper 21/ www.SmashingScience.org :o)

19	C
20	C

Bio 9 **Q# 142/** iGCSE Biology/2021/m/Paper 22/ www.SmashingScience.org :o)

19	C
20	A

Bio 9 **Q# 143/** iGCSE Biology/2020/w/Paper 21/ www.SmashingScience.org :o)

17	D
18	D

Bio 9 **Q# 144/** iGCSE Biology/2020/s/Paper 21/ www.SmashingScience.org :o)

17	C
18	B

Bio 9 **Q# 145/** iGCSE Biology/2020/m/Paper 22/ www.SmashingScience.org :o)

19	A
20	D

Bio 9 **Q# 146/** iGCSE Biology/2019/w/Paper 21/ www.SmashingScience.org :o)

17	B

Bio 9 **Q# 147/** iGCSE Biology/2019/s/Paper 21/ www.SmashingScience.org :o)

19	C
20	C

Bio 9 **Q# 148/** iGCSE Biology/2019/m/Paper 22/ www.SmashingScience.org :o)

18	C
19	C

Bio 9 **Q# 149/** iGCSE Biology/2018/w/Paper 21/ www.SmashingScience.org :o)

17	D
18	B

Bio 9 **Q# 150/** iGCSE Biology/2018/s/Paper 21/ www.SmashingScience.org :o)

11	B

Bio 9 **Q# 151/** iGCSE Biology/2018/m/Paper 22/ www.SmashingScience.org :o)

14	D

Bio 9 **Q# 152/** iGCSE Biology/2017/w/Paper 21/ www.SmashingScience.org :o)

17	B
18	A

Bio 9 **Q# 153/** iGCSE Biology/2017/s/Paper 21/ www.SmashingScience.org :o)

18	D

Bio 9 **Q# 154/** iGCSE Biology/2017/m/Paper 22/ www.SmashingScience.org :o)

15	C

Bio 9 **Q# 155/** iGCSE Biology/2016/w/Paper 21/ www.SmashingScience.org :o)

18	**B**
19	**B**
20	**C**

Bio 9 **Q# 156/** iGCSE Biology/2016/s/Paper 21/ www.SmashingScience.org :o)

14	**A**
18	**A**
19	**A**

Bio 9 **Q# 157/** iGCSE Biology/2016/m/Paper 22/ www.SmashingScience.org :o)

19	**C**

Paper 2 Mark Scheme Bio 10 Q# 158

/ iGCSE Biology/2021/s/Paper 21/ www.SmashingScience.org :o)

15	C

Bio 10 **Q# 159/** iGCSE Biology/2021/s/Paper 21/

21	A

Bio 10 **Q# 160/** iGCSE Biology/2021/m/Paper 22/

21	A

Bio 10 **Q# 161/** iGCSE Biology/2020/s/Paper 21/ www.SmashingScience.org :o)

19	C

Bio 10 **Q# 162/** iGCSE Biology/2020/m/Paper 22/ www.SmashingScience.org :o)

15	B
21	C
31	B

Bio 10 **Q# 163/** iGCSE Biology/2019/s/Paper 21/ www.SmashingScience.org :o)

14	C

Bio 10 **Q# 164/** iGCSE Biology/2018/w/Paper 21/ www.SmashingScience.org :o)

19	A

Bio 10 **Q# 165/** iGCSE Biology/2018/s/Paper 21/ www.SmashingScience.org :o)

19	A

Bio 10 **Q# 166/** iGCSE Biology/2018/m/Paper 22/ www.SmashingScience.org :o)

15	A

Bio 10 **Q# 167/** iGCSE Biology/2017/w/Paper 21/ www.SmashingScience.org :o)

19	A

Bio 10 **Q# 168/** iGCSE Biology/2017/w/Paper 21/ www.SmashingScience.org :o)

27	C

Bio 10 **Q# 169/** iGCSE Biology/2017/s/Paper 21/ www.SmashingScience.org :o)

19	C

Bio 10 **Q# 170/** iGCSE Biology/2017/m/Paper 22/ www.SmashingScience.org :o)

16	C

Bio 10 **Q# 171/** iGCSE Biology/2016/w/Paper 21/ www.SmashingScience.org :o)

21	**D**

Bio 10 **Q# 172/** iGCSE Biology/2016/w/Paper 21/ www.SmashingScience.org :o)

14	**C**

Bio 10 **Q# 173/** iGCSE Biology/2016/s/Paper 21/ www.SmashingScience.org :o)

20	**D**

Bio 10 **Q# 174/** iGCSE Biology/2016/m/Paper 22/ www.SmashingScience.org :o)

21	**B**

Bio 11 **Q# 175/** iGCSE Biology/2021/s/Paper 21/ www.SmashingScience.org :o)

22	A

Bio 11 **Q# 176/** iGCSE Biology/2021/m/Paper 22/ www.SmashingScience.org :o)

22	C

Bio 11 **Q# 177/** iGCSE Biology/2020/w/Paper 21/ www.SmashingScience.org :o)

20	B

Bio 11 **Q# 178/** iGCSE Biology/2020/s/Paper 21/ www.SmashingScience.org :o)

20	C

Bio 11 **Q# 179/** iGCSE Biology/2020/m/Paper 22/ www.SmashingScience.org :o)

21	C
22	C

Bio 11 **Q# 180/** iGCSE Biology/2019/w/Paper 21/ www.SmashingScience.org :o)

14	A
19	B

Bio 11 **Q# 181/** iGCSE Biology/2019/w/Paper 21/ www.SmashingScience.org :o)

13	C
18	A

Bio 11 **Q# 182/** iGCSE Biology/2019/s/Paper 21/ www.SmashingScience.org :o)

21	A

Bio 11 **Q# 183/** iGCSE Biology/2019/m/Paper 22/ www.SmashingScience.org :o)

20	C
21	C

Bio 11 **Q# 184/** iGCSE Biology/2018/w/Paper 21/ www.SmashingScience.org :o)

20	C

Bio 11 **Q# 185/** iGCSE Biology/2018/s/Paper 21/ www.SmashingScience.org :o)

20	A

Bio 11 **Q# 186/** iGCSE Biology/2017/w/Paper 21/ www.SmashingScience.org :o)

19	A

Bio 11 **Q# 187/** iGCSE Biology/2017/w/Paper 21/ www.SmashingScience.org :o)

37	D

Bio 11 **Q# 188/** iGCSE Biology/2017/s/Paper 21/ www.SmashingScience.org :o)

20	B

Bio 11 **Q# 189/** iGCSE Biology/2017/m/Paper 22/ www.SmashingScience.org :o)

17	D

Bio 11 **Q# 190/** iGCSE Biology/2017/m/Paper 22/ www.SmashingScience.org :o)

18	C
19	B

Bio 11 **Q# 191/** iGCSE Biology/2016/w/Paper 21/ www.SmashingScience.org :o)

22	**A**

Bio 11 **Q# 192/** iGCSE Biology/2016/s/Paper 21/ www.SmashingScience.org :o)

21	**D**
22	**D**

Bio 11 **Q# 193/** iGCSE Biology/2016/m/Paper 22/ www.SmashingScience.org :o)

22	**C**
23	**A**

Bio 12 **Q# 194/** iGCSE Biology/2021/s/Paper 21/ www.SmashingScience.org :o)

24	C

Bio 12 **Q# 195/** iGCSE Biology/2021/m/Paper 22/ www.SmashingScience.org :o)

23	C

Bio 12 **Q# 196/** iGCSE Biology/2020/w/Paper 21/

21	C

Bio 12 **Q# 197/** iGCSE Biology/2020/s/Paper 21/

21	B
22	B

Bio 12 **Q# 198/** iGCSE Biology/2020/m/Paper 22/ www.SmashingScience.org :o)

24	B

Bio 12 **Q# 199/** iGCSE Biology/2019/w/Paper 21/ www.SmashingScience.org :o)

20	D
21	A

Bio 12 **Q# 200/** iGCSE Biology/2019/s/Paper 21/ www.SmashingScience.org :o)

22	A
23	A

Bio 12 **Q# 201/** iGCSE Biology/2019/m/Paper 22/ www.SmashingScience.org :o)

22	D
23	B

Bio 12 **Q# 202/** iGCSE Biology/2018/w/Paper 21/ www.SmashingScience.org :o)

21	D

Bio 12 **Q# 203/** iGCSE Biology/2018/s/Paper 21/ www.SmashingScience.org :o)

21	B

Bio 12 **Q# 204/** iGCSE Biology/2018/m/Paper 22/ www.SmashingScience.org :o)

17	D

Bio 12 **Q# 205/** iGCSE Biology/2017/w/Paper 21/ www.SmashingScience.org :o)

21	A
22	D

Bio 12 **Q# 206/** iGCSE Biology/2017/s/Paper 21/ www.SmashingScience.org :o)

21	A

Bio 12 **Q# 207/** iGCSE Biology/2017/m/Paper 22/ www.SmashingScience.org :o)

20	D

Bio 12 **Q# 208/** iGCSE Biology/2016/w/Paper 21/ www.SmashingScience.org :o)

23 **B**

Bio 12 **Q# 209/** iGCSE Biology/2016/s/Paper 21/ www.SmashingScience.org :o)

23 **C**

Bio 13 **Q# 210/** iGCSE Biology/2021/s/Paper 21/ www.SmashingScience.org :o)

8	A

Bio 13 **Q# 211/** iGCSE Biology/2021/s/Paper 21/ www.SmashingScience.org :o)

25	D

Bio 13 **Q# 212/** iGCSE Biology/2021/m/Paper 22/ www.SmashingScience.org :o)

24	C

Bio 13 **Q# 213/** iGCSE Biology/2020/w/Paper 21/ www.SmashingScience.org :o)

22	B

Bio 13 **Q# 214/** iGCSE Biology/2020/s/Paper 21/

23	A

Bio 13 **Q# 215/** iGCSE Biology/2020/m/Paper 22/ www.SmashingScience.org :o)

25	C

Bio 13 **Q# 216/** iGCSE Biology/2019/w/Paper 21/ www.SmashingScience.org :o)

25	B

Bio 13 **Q# 217/** iGCSE Biology/2019/s/Paper 21/ www.SmashingScience.org :o)

25	C

Bio 13 **Q# 218/** iGCSE Biology/2019/m/Paper 22/ www.SmashingScience.org :o)

24	A

Bio 13 **Q# 219/** iGCSE Biology/2018/w/Paper 21/ www.SmashingScience.org :o)

22	C

Bio 13 **Q# 220/** iGCSE Biology/2018/m/Paper 22/ www.SmashingScience.org :o)

18	A

Bio 13 **Q# 221/** iGCSE Biology/2017/s/Paper 21/ www.SmashingScience.org :o)

22	A

Bio 13 **Q# 222/** iGCSE Biology/2017/m/Paper 22/ www.SmashingScience.org :o)

21	A

Bio 13 **Q# 223/** iGCSE Biology/2016/w/Paper 21/ www.SmashingScience.org :o)

24 **D**

Bio 13 **Q# 224/** iGCSE Biology/2016/s/Paper 21/ www.SmashingScience.org :o)

24 **B**

Bio 13 **Q# 225/** iGCSE Biology/2016/m/Paper 22/ www.SmashingScience.org :o)

24 **A**

Paper 2 Mark Scheme Bio 14 Q# 226

/ iGCSE Biology/2021/s/Paper 21/ www.SmashingScience.org :o)

23	A

Bio 14 **Q# 227/** iGCSE Biology/2021/s/Paper 21/ www.SmashingScience.org :o)

26	C
27	D
28	D

Bio 14 **Q# 228/** iGCSE Biology/2021/m/Paper 22/ www.SmashingScience.org :o)

25	B
26	C
27	D

Bio 14 **Q# 229/** iGCSE Biology/2020/w/Paper 21/ www.SmashingScience.org :o)

23	D
24	D
25	C
26	A

Bio 14 **Q# 230/** iGCSE Biology/2020/s/Paper 21/ www.SmashingScience.org :o)

C

Bio 14 **Q# 231/** iGCSE Biology/2020/m/Paper 22/ www.SmashingScience.org :o)

26	B
27	A
28	A

Bio 14 **Q# 232/** iGCSE Biology/2019/w/Paper 21/ www.SmashingScience.org :o)

22	C
23	B
24	C

Bio 14 **Q# 233/** iGCSE Biology/2019/s/Paper 21/ www.SmashingScience.org :o)

24	D
26	C
27	C
28	A

Bio 14 **Q# 234/** iGCSE Biology/2019/m/Paper 22/ www.SmashingScience.org :o)

25	D
26	B
27	D

Bio 14 **Q# 235/** iGCSE Biology/2018/w/Paper 21/ www.SmashingScience.org :o)

23	A
24	C
25	B

Bio 14 **Q# 236/** iGCSE Biology/2018/s/Paper 21/ www.SmashingScience.org :o)

23	C
24	B
25	C
26	C

Bio 14 **Q# 237/** iGCSE Biology/2018/m/Paper 22/ www.SmashingScience.org :o)

16	A
19	C
20	B
21	B
22	B

Bio 14 **Q# 238/** iGCSE Biology/2017/w/Paper 21/ www.SmashingScience.org :o)

23	A
24	A
25	A
26	D

Bio 14 **Q# 239/** iGCSE Biology/2017/s/Paper 21/ www.SmashingScience.org :o)

23	C
24	C
25	D

Bio 14 **Q# 240/** iGCSE Biology/2017/m/Paper 22/ www.SmashingScience.org :o)

22	D
23	D

Bio 14 **Q# 241/** iGCSE Biology/2016/w/Paper 21/ www.SmashingScience.org :o)

25	**B**
26	**B**
27	**A**

Bio 14 **Q# 242/** iGCSE Biology/2016/s/Paper 21/ www.SmashingScience.org :o)

4	**B**
25	**D**
26	**B**
27	**B**

Bio 14 **Q# 243/** iGCSE Biology/2016/m/Paper 22/ www.SmashingScience.org :o)

25	**D**
26	**C**
27	**A**
28	**A**

Bio 15 **Q# 244/** iGCSE Biology/2021/m/Paper 22/ www.SmashingScience.org :o)

28	A

Bio 15 **Q# 245/** iGCSE Biology/2020/s/Paper 21/ www.SmashingScience.org :o)

27	B

Bio 15 **Q# 246/** iGCSE Biology/2020/m/Paper 22/ www.SmashingScience.org :o)

29	C

Bio 15 **Q# 247/** iGCSE Biology/2019/w/Paper 21/ www.SmashingScience.org :o)

34	B

Bio 15 **Q# 248/** iGCSE Biology/2019/m/Paper 22/ www.SmashingScience.org :o)

28	A

Bio 15 **Q# 249/** iGCSE Biology/2019/m/Paper 22/ www.SmashingScience.org :o)

33	D

Bio 15 **Q# 250/** iGCSE Biology/2018/w/Paper 21/ www.SmashingScience.org :o)

26	D

Bio 15 **Q# 251/** iGCSE Biology/2018/w/Paper 21/ www.SmashingScience.org :o)

34	D

Bio 15 **Q# 252/** iGCSE Biology/2017/s/Paper 21/ www.SmashingScience.org :o)
B

Bio 15 **Q# 253/** iGCSE Biology/2017/s/Paper 21/ www.SmashingScience.org :o)

26	B

Bio 16 **Q# 254/** iGCSE Biology/2021/s/Paper 21/ www.SmashingScience.org :o)

30	C
31	B

Bio 16 **Q# 255/** iGCSE Biology/2021/m/Paper 22/

29	A

Bio 16 **Q# 256/** iGCSE Biology/2020/w/Paper 21/

27	A
28	B
29	A

Bio 16 **Q# 257/** iGCSE Biology/2020/s/Paper 21/ www.SmashingScience.org :o)

28	A
29	D
30	B

Bio 16 **Q# 258/** iGCSE Biology/2020/m/Paper 22/ www.SmashingScience.org :o)

30	B

Bio 16 **Q# 259/** iGCSE Biology/2019/w/Paper 21/ www.SmashingScience.org :o)

28	C

Bio 16 **Q# 260/** iGCSE Biology/2019/s/Paper 21/ www.SmashingScience.org :o)

29	D
30	A

Bio 16 **Q# 261/** iGCSE Biology/2019/m/Paper 22/ www.SmashingScience.org :o)

39	D

Bio 16 **Q# 262/** iGCSE Biology/2019/m/Paper 22/ www.SmashingScience.org :o)

29	C
30	C

Bio 16 **Q# 263/** iGCSE Biology/2018/w/Paper 21/ www.SmashingScience.org :o)

27	C
28	D
29	C

Bio 16 **Q# 264/** iGCSE Biology/2018/s/Paper 21/ www.SmashingScience.org :o)

28	A
29	B
30	D

Bio 16 **Q# 265/** iGCSE Biology/2018/s/Paper 21/ www.SmashingScience.org :o)

13	B

Bio 16 **Q# 266/** iGCSE Biology/2018/m/Paper 22/ www.SmashingScience.org :o)

23	C
24	B

Bio 16 **Q# 267/** iGCSE Biology/2017/w/Paper 21/ www.SmashingScience.org :o)

28	A
29	C

Bio 16 **Q# 268/** iGCSE Biology/2017/s/Paper 21/ www.SmashingScience.org :o)

29	D

Bio 16 **Q# 269/** iGCSE Biology/2017/m/Paper 22/ www.SmashingScience.org :o)

25	B
26	D
27	C
29	B

Bio 16 **Q# 270/** iGCSE Biology/2016/w/Paper 21/ www.SmashingScience.org :o)

28	**C**
29	**B**
30	**D**

Bio 16 **Q# 271/** iGCSE Biology/2016/s/Paper 21/ www.SmashingScience.org :o)

29	**C**
30	**B**

Bio 16 **Q# 272/** iGCSE Biology/2016/m/Paper 22/ www.SmashingScience.org :o)

30	**C**
31	**B**
32	**D**

Bio 17 **Q# 273/** iGCSE Biology/2021/s/Paper 21/ www.SmashingScience.org :o)

32	D
33	D
34	B

Bio 17 **Q# 274/** iGCSE Biology/2021/m/Paper 22/ www.SmashingScience.org :o)

32	B
33	C
34	B

Bio 17 **Q# 275/** iGCSE Biology/2020/w/Paper 21/ www.SmashingScience.org :o)

19	A
30	D
31	B
32	B

Bio 17 **Q# 276/** iGCSE Biology/2020/s/Paper 21/ www.SmashingScience.org :o)

31	B
32	C

Bio 17 **Q# 277/** iGCSE Biology/2020/m/Paper 22/ www.SmashingScience.org :o)

32	D
33	D
34	B

Bio 17 **Q# 278/** iGCSE Biology/2019/w/Paper 21/ www.SmashingScience.org :o)

30	C
31	A
32	D

Bio 17 **Q# 279/** iGCSE Biology/2019/s/Paper 21/ www.SmashingScience.org :o)

32	C
33	D

Bio 17 **Q# 280/** iGCSE Biology/2019/m/Paper 22/ www.SmashingScience.org :o)

31	B
32	A

Bio 17 **Q# 281/** iGCSE Biology/2018/w/Paper 21/ www.SmashingScience.org :o)

30	B
31	B
32	D

Bio 17 **Q# 282/** iGCSE Biology/2018/s/Paper 21/ www.SmashingScience.org :o)

31	B
32	B

Bio 17 **Q# 283/** iGCSE Biology/2018/m/Paper 22/ www.SmashingScience.org :o)

26	B
27	B
28	C

Bio 17 **Q# 284/** iGCSE Biology/2017/w/Paper 21/ www.SmashingScience.org :o)

30	B
31	C
32	C

Bio 17 **Q# 285/** iGCSE Biology/2017/s/Paper 21/ www.SmashingScience.org :o)

27	D
28	B
32	D
33	A

Bio 17 **Q# 286/** iGCSE Biology/2017/m/Paper 22/ www.SmashingScience.org :o)

30	C
31	C
32	B

Bio 17 **Q# 287/** iGCSE Biology/2016/w/Paper 21/ www.SmashingScience.org :o)

31	**A**

Bio 17 **Q# 288/** iGCSE Biology/2016/s/Paper 21/ www.SmashingScience.org :o)

31	**B**
32	**A**

Bio 17 **Q# 289/** iGCSE Biology/2016/m/Paper 22/ www.SmashingScience.org :o)

33	**B**
34	**C**
35	**C**

Paper 2 Mark Scheme Bio 18 Q# 290/

iGCSE Biology/2021/s/Paper 21/www.SmashingScience.org :o)

35	D
36	B

Bio 18 **Q# 291/** iGCSE Biology/2021/m/Paper 22/ www.SmashingScience.org :o)

35	C
36	A

Bio 18 **Q# 292/** iGCSE Biology/2020/w/Paper 21/ www.SmashingScience.org :o)

34	B

Bio 18 **Q# 293/** iGCSE Biology/2020/s/Paper 21/ www.SmashingScience.org :o)

33	B
34	C

Bio 18 **Q# 294/** iGCSE Biology/2019/w/Paper 21/ www.SmashingScience.org :o)

33	C

Bio 18 **Q# 295/** iGCSE Biology/2019/s/Paper 21/ www.SmashingScience.org :o)

35	B

Bio 18 **Q# 296/** iGCSE Biology/2019/m/Paper 22/ www.SmashingScience.org :o)

34	A

Bio 18 **Q# 297/** iGCSE Biology/2018/s/Paper 21/ www.SmashingScience.org :o)

34	D

Bio 18 **Q# 298/** iGCSE Biology/2018/m/Paper 22/ www.SmashingScience.org :o)

30	D
31	C

Bio 18 **Q# 299/** iGCSE Biology/2017/w/Paper 21/ www.SmashingScience.org :o)

33	D
34	B

Bio 18 **Q# 300/** iGCSE Biology/2017/m/Paper 22/ www.SmashingScience.org :o)

33	C
34	C

Bio 18 **Q# 301/** iGCSE Biology/2016/w/Paper 21/ www.SmashingScience.org :o)

34	**C**

Bio 18 **Q# 302/** iGCSE Biology/2016/s/Paper 21/ www.SmashingScience.org :o)

34	**D**

Bio 18 **Q# 303/** iGCSE Biology/2016/m/Paper 22/ www.SmashingScience.org :o)

36	**B**

Bio 19 **Q# 304/** iGCSE Biology/2021/s/Paper 21/ www.SmashingScience.org :o)

37	C
38	A

Bio 19 **Q# 305/** iGCSE Biology/2021/m/Paper 22/ www.SmashingScience.org :o)

37	D
38	D
39	D
40	B

Bio 19 **Q# 306/** iGCSE Biology/2020/w/Paper 21/ www.SmashingScience.org :o)

35	A
36	A
37	C

Bio 19 **Q# 307/** iGCSE Biology/2020/s/Paper 21/ www.SmashingScience.org :o)

35	C
36	A
39	A

Bio 19 **Q# 308/** iGCSE Biology/2020/m/Paper 22/ www.SmashingScience.org :o)

36	B
37	C
38	B

Bio 19 **Q# 309/** iGCSE Biology/2019/w/Paper 21/ www.SmashingScience.org :o)

35	C
36	B

Bio 19 **Q# 310/** iGCSE Biology/2019/s/Paper 21/ www.SmashingScience.org :o)

36	D
37	D

Bio 19 **Q# 311/** iGCSE Biology/2019/m/Paper 22/ www.SmashingScience.org :o)

35	D
36	B

Bio 19 **Q# 312/** iGCSE Biology/2018/w/Paper 21/ www.SmashingScience.org :o)

35	B
36	C

Bio 19 **Q# 313/** iGCSE Biology/2018/s/Paper 21/ www.SmashingScience.org :o)

35	C
36	B

Bio 19 **Q# 314/** iGCSE Biology/2018/m/Paper 22/ www.SmashingScience.org :o)

32	A
33	B
34	B

Bio 19 **Q# 315/** iGCSE Biology/2017/w/Paper 21/ www.SmashingScience.org :o)

36	D

Bio 19 **Q# 316/** iGCSE Biology/2017/s/Paper 21/ www.SmashingScience.org :o)

34	D
37	B

Bio 19 **Q# 317/** iGCSE Biology/2017/m/Paper 22/ www.SmashingScience.org :o)

35	C
36	C
37	D

Bio 19 **Q# 318/** iGCSE Biology/2016/w/Paper 21/ www.SmashingScience.org :o)

7	**B**

Bio 19 **Q# 319/** iGCSE Biology/2016/w/Paper 21/ www.SmashingScience.org :o)

34	**C**
35	**C**
36	**B**

Bio 19 **Q# 320/** iGCSE Biology/2016/s/Paper 21/ www.SmashingScience.org :o)

35	**C**
36	**B**

Bio 19 **Q# 321/** iGCSE Biology/2016/m/Paper 22/ www.SmashingScience.org :o)

37	**D**
38	**D**

Bio 20 **Q# 322/** iGCSE Biology/2021/m/Paper 22/ www.SmashingScience.org :o)

39	D
40	B

Bio 20 **Q# 323/** iGCSE Biology/2020/w/Paper 21/ www.SmashingScience.org :o)

40	C

Bio 20 **Q# 324/** iGCSE Biology/2020/s/Paper 21/ www.SmashingScience.org :o)

40	C

Bio 20 **Q# 325/** iGCSE Biology/2020/m/Paper 22/ www.SmashingScience.org :o)

40	A

Bio 20 **Q# 326/** iGCSE Biology/2019/w/Paper 21/ www.SmashingScience.org :o)

39	A
40	A

Bio 20 **Q# 327/** iGCSE Biology/2019/s/Paper 21/ www.SmashingScience.org :o)

39	D
40	C

Bio 20 **Q# 328/** iGCSE Biology/2019/m/Paper 22/ www.SmashingScience.org :o)

40	B

Bio 20 **Q# 329/** iGCSE Biology/2018/w/Paper 21/ www.SmashingScience.org :o)

39	B
40	B

Bio 20 **Q# 330/** iGCSE Biology/2018/s/Paper 21/ www.SmashingScience.org :o)

39	C
40	D

Bio 20 **Q# 331/** iGCSE Biology/2018/m/Paper 22/ www.SmashingScience.org :o)

38	B
39	B
40	C

Bio 20 **Q# 332/** iGCSE Biology/2017/w/Paper 21/ www.SmashingScience.org :o)

39	A
40	C

Bio 20 **Q# 333/** iGCSE Biology/2017/s/Paper 21/ www.SmashingScience.org :o)

Q36: D

Q40: A

Bio 20 **Q# 334/** iGCSE Biology/2017/m/Paper 22/ www.SmashingScience.org :o)

39	A
40	A

Bio 20 **Q# 335/** iGCSE Biology/2016/w/Paper 21/ www.SmashingScience.org :o)

40	**A**

Bio 20 **Q# 336/** iGCSE Biology/2016/s/Paper 21/ www.SmashingScience.org :o)

37	**D**
38	**B**

Bio 20 **Q# 337/** iGCSE Biology/2016/m/Paper 22/ www.SmashingScience.org :o)

39: B

40: A

Bio 21 **Q# 338/** iGCSE Biology/2021/s/Paper 21/ www.SmashingScience.org :o)

39	C

Bio 21 **Q# 339/** iGCSE Biology/2021/m/Paper 22/ www.SmashingScience.org :o)

38	D

Bio 21 **Q# 340/** iGCSE Biology/2020/w/Paper 21/ www.SmashingScience.org :o)

38	A
39	D

Bio 21 **Q# 341/** iGCSE Biology/2020/s/Paper 21/ www.SmashingScience.org :o)

37	B
38	B
39	A
40	C

Bio 21 **Q# 342/** iGCSE Biology/2020/m/Paper 22/ www.SmashingScience.org :o)

39	C

Bio 21 **Q# 343/** iGCSE Biology/2019/w/Paper 21/ www.SmashingScience.org :o)

37	D
38	D

Bio 21 **Q# 344/** iGCSE Biology/2019/s/Paper 21/ www.SmashingScience.org :o)

38	D

Bio 21 **Q# 345/** iGCSE Biology/2019/m/Paper 22/ www.SmashingScience.org :o)

37	C
38	B

Bio 21 **Q# 346/** iGCSE Biology/2018/w/Paper 21/ www.SmashingScience.org :o)

37	D
38	C

Bio 21 **Q# 347/** iGCSE Biology/2018/s/Paper 21/ www.SmashingScience.org :o)

17	B

Bio 21 **Q# 348/** iGCSE Biology/2018/s/Paper 21/ www.SmashingScience.org :o)

37	C
38	A

Bio 21 **Q# 349/** iGCSE Biology/2018/m/Paper 22/ www.SmashingScience.org :o)

35	B
36	B
37	C

Bio 21 **Q# 350/** iGCSE Biology/2017/w/Paper 21/ www.SmashingScience.org :o)

10	C

Bio 21 **Q# 351/** iGCSE Biology/2017/w/Paper 21/ www.SmashingScience.org :o)

38	D

Bio 21 **Q# 352/** iGCSE Biology/2017/s/Paper 21/ www.SmashingScience.org :o)

38: C

37: B

Bio 21 **Q# 353/** iGCSE Biology/2017/m/Paper 22/ www.SmashingScience.org :o)

38	D

Bio 21 **Q# 354/** iGCSE Biology/2016/w/Paper 21/ www.SmashingScience.org :o)

37	**C**
38	**D**
39	**A**

Bio 21 **Q# 355/** iGCSE Biology/2016/s/Paper 21/ www.SmashingScience.org :o)

37	**D**
38	**B**

Bio 21 **Q# 356/** iGCSE Biology/2016/m/Paper 22/ www.SmashingScience.org :o)

39: B