AQA

Please write clearly in block capitals.

Centre number | | | | | | Candidate number | | | | |

Surname _____

Forename(s) _____

Candidate signature _____

I declare this is my own work.

GCSE
COMBINED SCIENCE: TRILOGY

F

Foundation Tier
Biology Paper 1F

Time allowed: 1 hour 15 minutes

Materials

For this paper you must have:
- a ruler
- a scientific calculator.

Instructions
- Use black ink or black ball-point pen.
- Pencil should only be used for drawing.
- Fill in the boxes at the top of this page.
- Answer **all** questions in the spaces provided.
- If you need extra space for your answer(s), use the lined pages at the end of this book. Write the question number against your answer(s).
- Do all rough work in this book. Cross through any work you do not want to be marked.
- In all calculations, show clearly how you work out your answer.

For Examiner's Use	
Question	Mark
1	
2	
3	
4	
5	
6	
TOTAL	

Information
- The maximum mark for this paper is 70.
- The marks for questions are shown in brackets.
- You are expected to use a calculator where appropriate.
- You are reminded of the need for good English and clear presentation in your answers.

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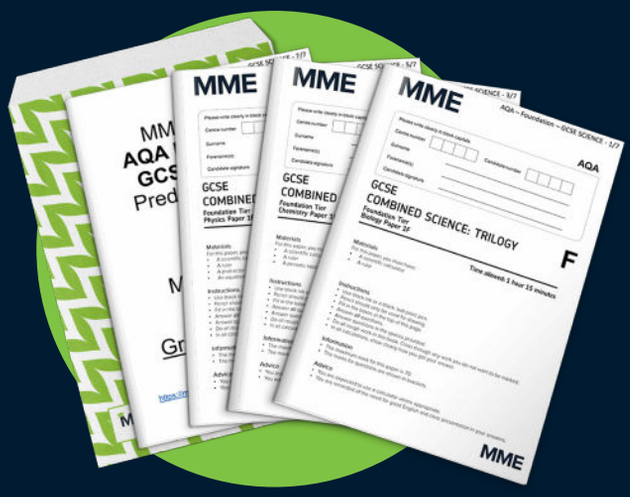
MME. Revision Products - GCSE Science



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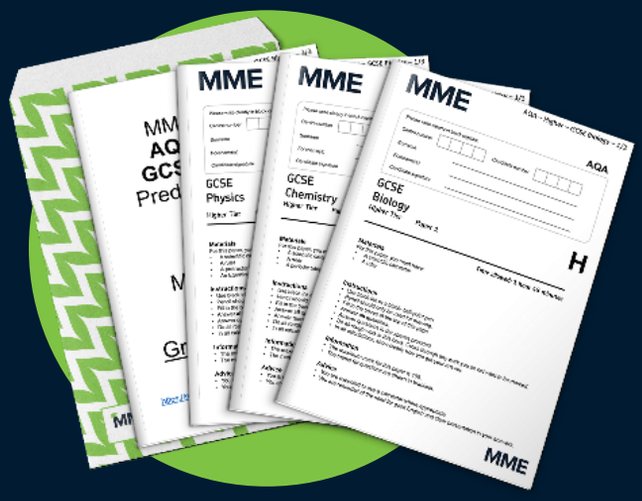

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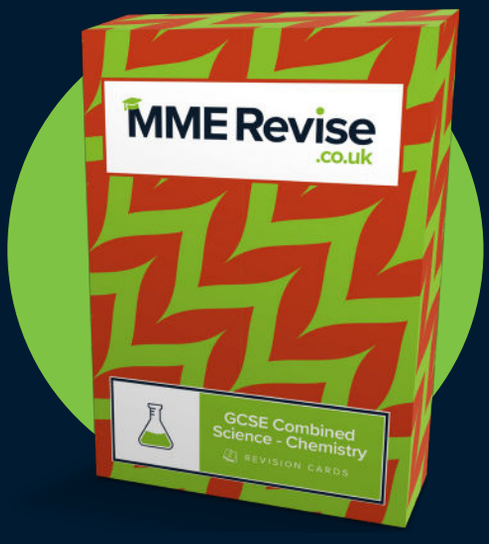

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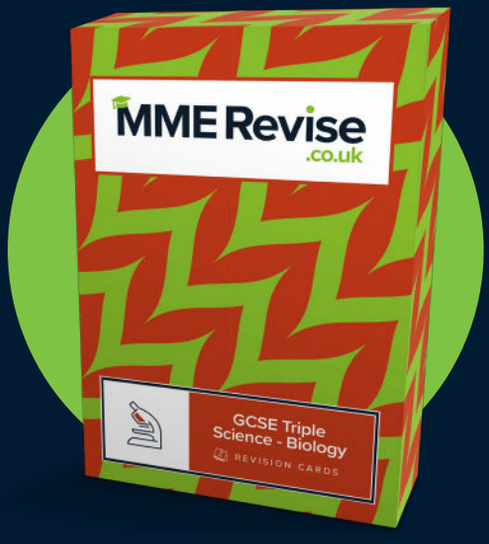

GCSE Triple Science Revision Cards

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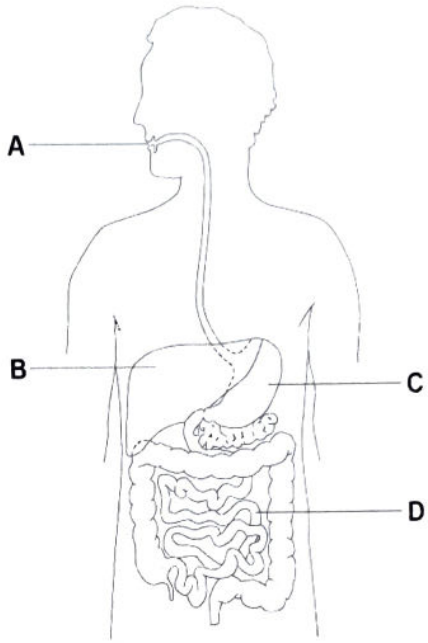
0 1 Foods are digested before they are absorbed into the blood.

Figure 1 shows organs in the human digestive system.

Figure 1



0 1 . 1 Which organ is the stomach?

[1 mark]

Tick (✓) **one** box.

A ☐ B ☐ C ☑ D ☐

0 1 . 2 What type of enzyme is produced in the stomach?

[1 mark]

Tick (✓) **one** box.

Carbohydrase ☐

Lipase ☐

Protease ☑

0 1 . 3 Which term describes the pH in the stomach?

Give **one** reason why the stomach is this pH.

[2 marks]

Tick (✓) **one** box.

Acidic ☑

Alkaline ☐

Neutral ☐

Reason The lining of the stomach produces hydrochloric acid.

0 1 . 4 Which organ produces bile?

[1 mark]

Tick (✓) **one** box.

Large intestine ☐

Liver ☑

Mouth ☐

Pancreas ☐

Question 1 continues on the next page

0 1 . 5 How does bile help in the digestion of foods?

[1 mark]

Tick (✓) **one** box.

It increases the surface area of fats. ✓

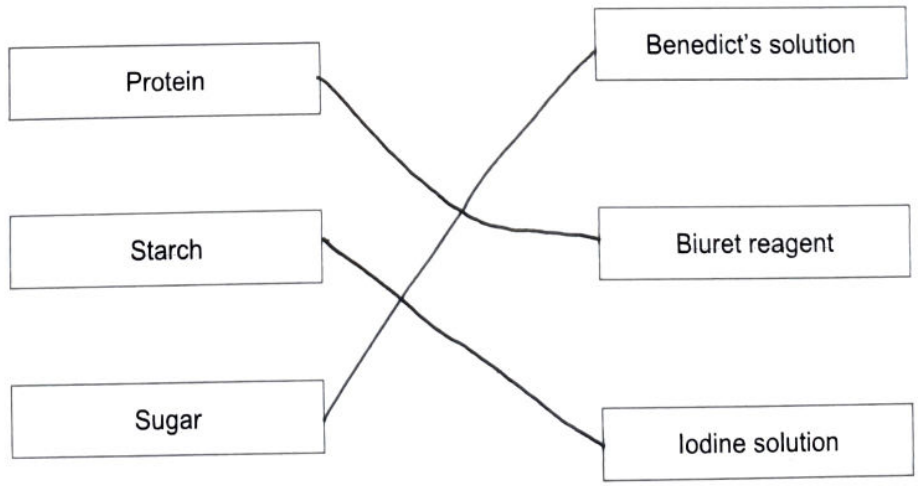
It is an enzyme that digests protein.

It makes the pH in the small intestine acidic.

A student tested different foods for the presence of protein, starch and sugar.

0 1 . 6 Draw **one** line from each food molecule to the reagent used to test for the food molecule.

[2 marks]



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0 1 . 7 Give **one** safety precaution a student should take when using Benedict's solution. **[1 mark]**

Wear goggles to prevent anything splashing into the eyes.

0 1 . 8 **Table 1** shows the results for one food sample.

Table 1

Test	Benedict's test	Biuret test	Iodine test
Colour after test	Red	Blue	Black

Which of the tests show positive results? **[1 mark]**

Tick (✓) **one** box.

All three tests ☐

Benedict's and Biuret tests only ☐

Benedict's and iodine tests only ☑

Biuret and iodine tests only ☐

0 1 . 9 Starch molecules are **not** absorbed into the blood from the digestive system.

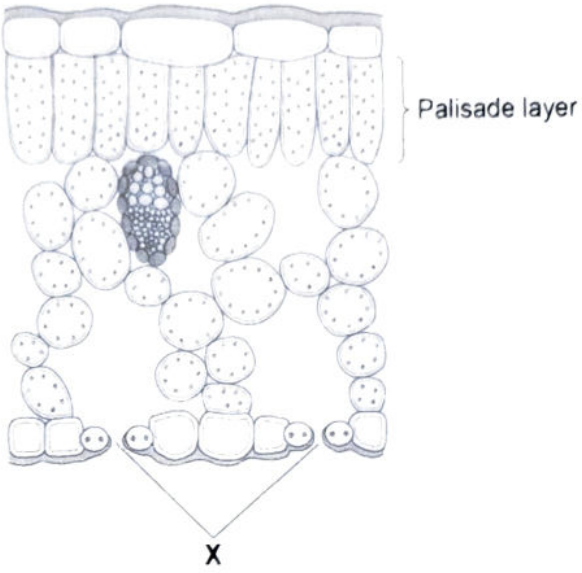
Give **one** reason why. **[1 mark]**

Starch is a large, insoluable molecule. If it cant dissolve it cannot be absorbed

11

0 2 **Figure 2** shows a section through a leaf.

Figure 2



0 2 . 1 Give **one** way that the palisade layer is adapted for photosynthesis.

[1 mark]

They contain a large number of chloroplasts.

0 2 . 2 Gases pass into and out of the leaf through small pores in the surface of the leaf.

What are the small pores labelled **X** called?

[1 mark]

Tick (✓) **one** box.

- Guard cells ☐
- Stomata ☑
- Xylem vessels ☐

0 2 . 3 A student viewed a section of a leaf using a microscope.

The student measured the length of one of the palisade cells.

The cell image measured 28 mm in length when viewed at a magnification of ×400

Calculate the real length of the palisade cell in millimetres (mm).

Use the equation:

$$\text{real length} = \frac{\text{image length}}{\text{magnification}}$$

[3 marks]

real length = 28/400

= 0.07 mm

Real length = 0.07 mm

Convert the real length of the cell from millimetres to micrometres (μm).

1 mm = 1000 μm

0.07mm × 1000 = 70 μm

Real length = 70 μm

0 2 . 4 Carbon dioxide can move into and out of cells.

What is the process by which carbon dioxide can move into and out of cells?

[1 mark]

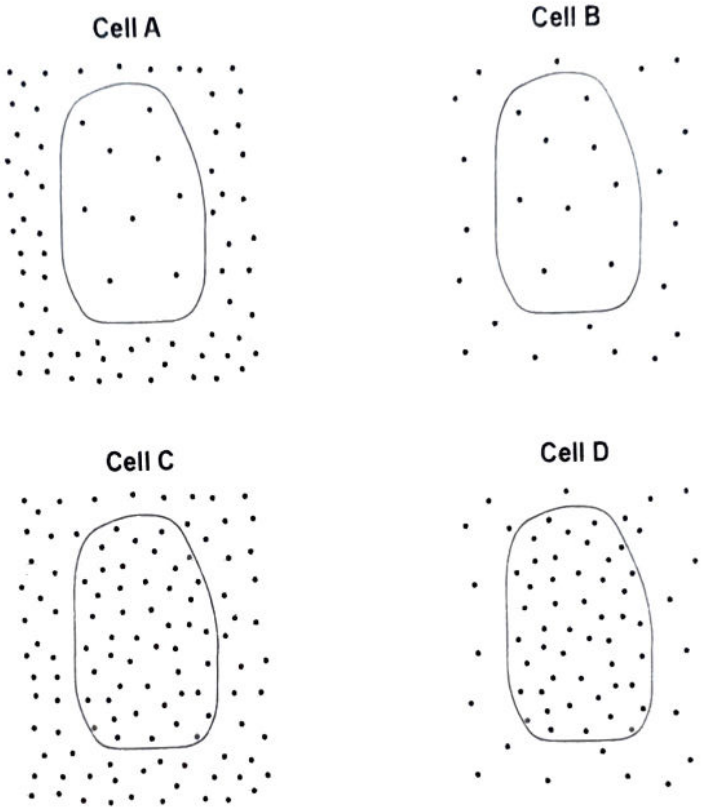
Tick (✓) **one** box.

- Active transport ☐
- Diffusion ☑
- Osmosis ☐

Figure 3 shows a diagram of four cells.

Each cell is surrounded by carbon dioxide molecules.

Figure 3



0 2 . 5 Which cell will carbon dioxide move into at the fastest rate?

Give a reason for your answer.

[2 marks]

Tick (✓) **one** box.

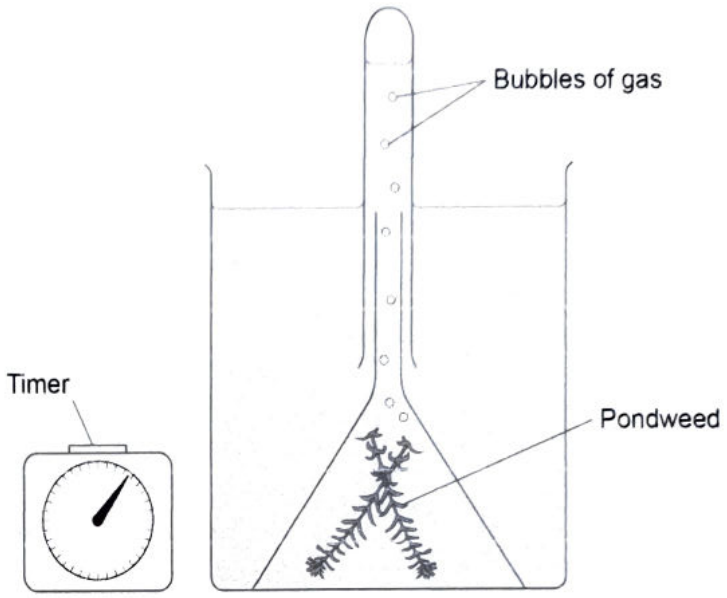
A ✓ B ☐ C ☐ D ☐

Reason Has the steepest gradient between the inside of the cell and the outside.

A student investigated the effect of different colours of light on the rate of photosynthesis.

Figure 4 shows some of the apparatus the student used.

Figure 4



The student placed the apparatus in blue light, then in green light and then in red light.

The student measured the rate of photosynthesis in each colour of light.

0 2 . 6 What **two** measurements should the student make to calculate the **rate** of photosynthesis?

[2 marks]

1 the number of bubbles produced

2 a fixed measure of time

Question 2 continues on the next page

0 2 . 7 Give **two** variables the student should keep the same in this investigation.

[2 marks]

1 the temperature of the water the pondweed is in.

2 the light intensity

Table 2 shows the results.

Table 2

Colour of light	Rate of photosynthesis in arbitrary units
Blue	9
Green	1
Red	8

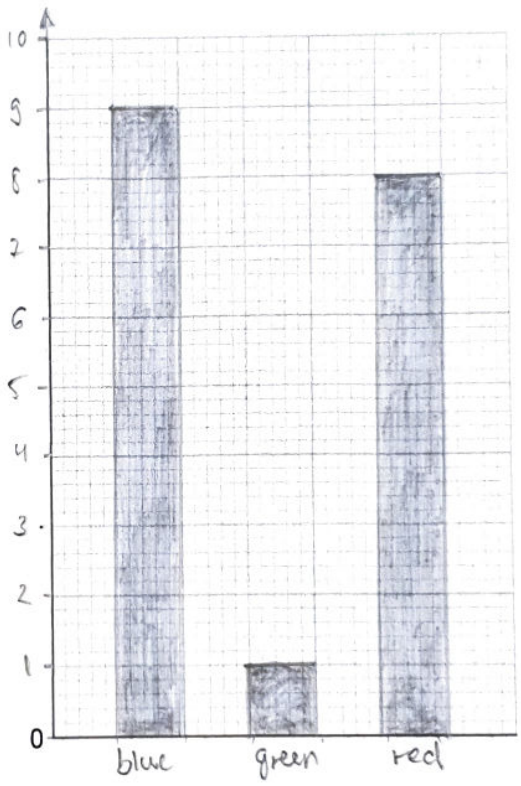
0 2 . 8 Complete **Figure 5**.

You should:

- label the y-axis
- use a suitable scale
- plot the data from **Table 2** as a bar chart
- label each bar.

[4 marks]

Figure 5



0 2 . 9 Look at **Table 2**.

What colour of light should be used to grow plants in a greenhouse?

[1 mark]

Tick (✓) **one** box.

Blue ✓ Green ☐ Red ☐

17

0 3 This question is about disease.

Rose black spot is a disease where black spots develop on the leaves of rose plants.

0 3 . 1 What type of pathogen causes rose black spot disease?

[1 mark]

Tick (✓) **one** box.

- Bacterium ☐
- Fungus ☑
- Protist ☐
- Virus ☐

0 3 . 2 Plants with rose black spot disease often have yellow leaves.

Suggest **one** reason why the leaves are yellow instead of green.

[1 mark]

The chlorophyll in the cells in the leaf have been broken down.

0 3 . 3 Explain why plants with yellow leaves grow slowly.

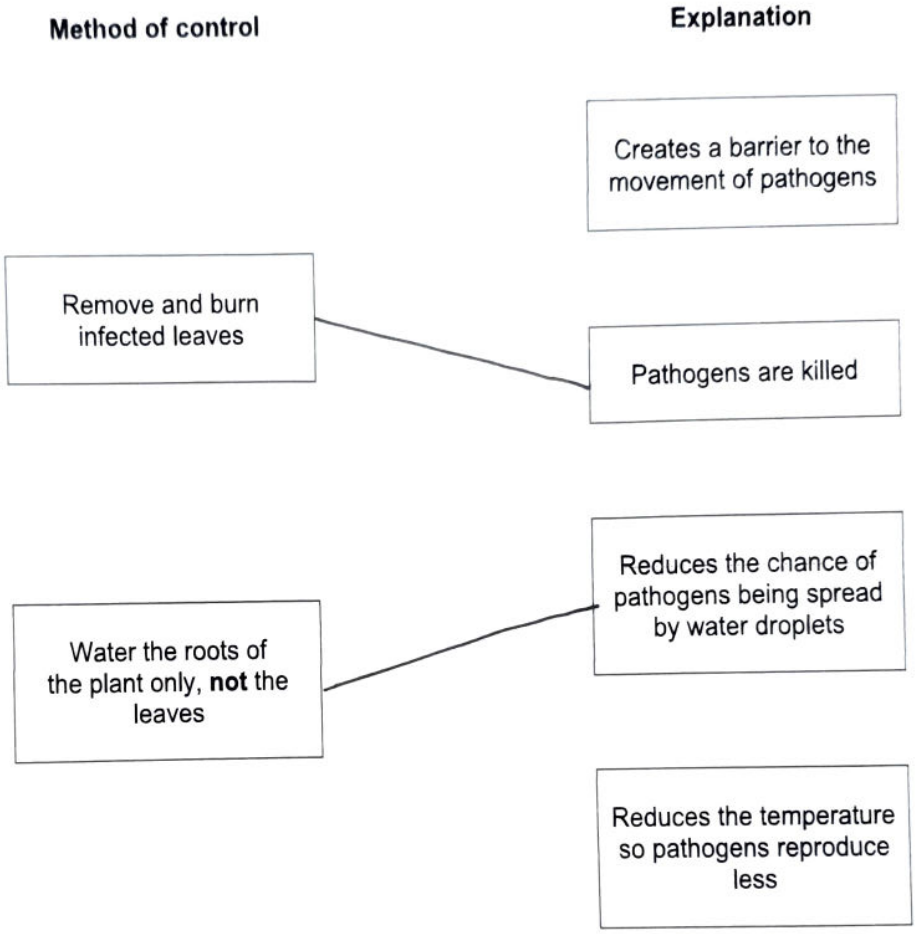
[2 marks]

As they have less or no chlorophyll they are able to photosynthesise less or not at all. Plants need sugars to grow and these sugars are produced through photosynthesis.

0 3 . 4 The spread of rose black spot can be controlled using different methods.

Draw **one** line from each method of control to the explanation of how it works.

[2 marks]



Question 3 continues on the next page

0 3 . 5 Tobacco plants may become infected with a pathogen called TMV.

What type of pathogen is TMV?

[1 mark]

Tick (✓) **one** box.

- Bacterium ☐
- Fungus ☐
- Protist ☐
- Virus ☑

Malaria is a disease caused by a protist.

0 3 . 6 How is the malaria pathogen transferred to humans?

[1 mark]

Mosquito bites. As they bite one person who has malaria they can transfer it to another by biting them.

0 3 . 7 How can the spread of malaria pathogens be reduced?

[1 mark]

Tick (✓) **one** box.

- Avoid sexual contact ☐
- Cook food thoroughly ☐
- Drain water from swamps ☑
- Use a tissue when sneezing ☐

9

Turn over for the next question

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box

DO NOT WRITE ON THIS PAGE
ANSWER IN THE SPACES PROVIDED

0 4 Cigarette smoking is the main cause of cancer in the UK.

0 4 . 1 Mutations in cells cause cancer.

Where in a cell do mutations happen?

[1 mark]

Tick (✓) **one** box.

Cell membrane ☐

Cytoplasm ☐

Nucleus ☑

0 4 . 2 Why do some cancers develop into large tumours?

[1 mark]

Tick (✓) **one** box.

Cells never stop dividing ☑

Cell respiration is slowed down ☐

Enzyme activity is stopped ☐

Cigarette smoking has been linked to many different types of cancer.

0 4 . 3 Lung cancer is the most common type of cancer caused by smoking.

Suggest **one** reason why.

[1 mark]

chemicals are inhaled, such as tar and other potentially carcinogenic chemicals.

0 4 . 4 A person with lung cancer can develop secondary cancers in other parts of the body.

Describe how this can happen.

[1 mark]

Cancer cells can be transported to other parts of the body, by travelling in the blood stream.

0 4 . 5 Sometimes a person may need a lung transplant.

The National Health Service (NHS) will **not** offer a lung transplant to a person who smokes.

Suggest **one** reason why.

[1 mark]

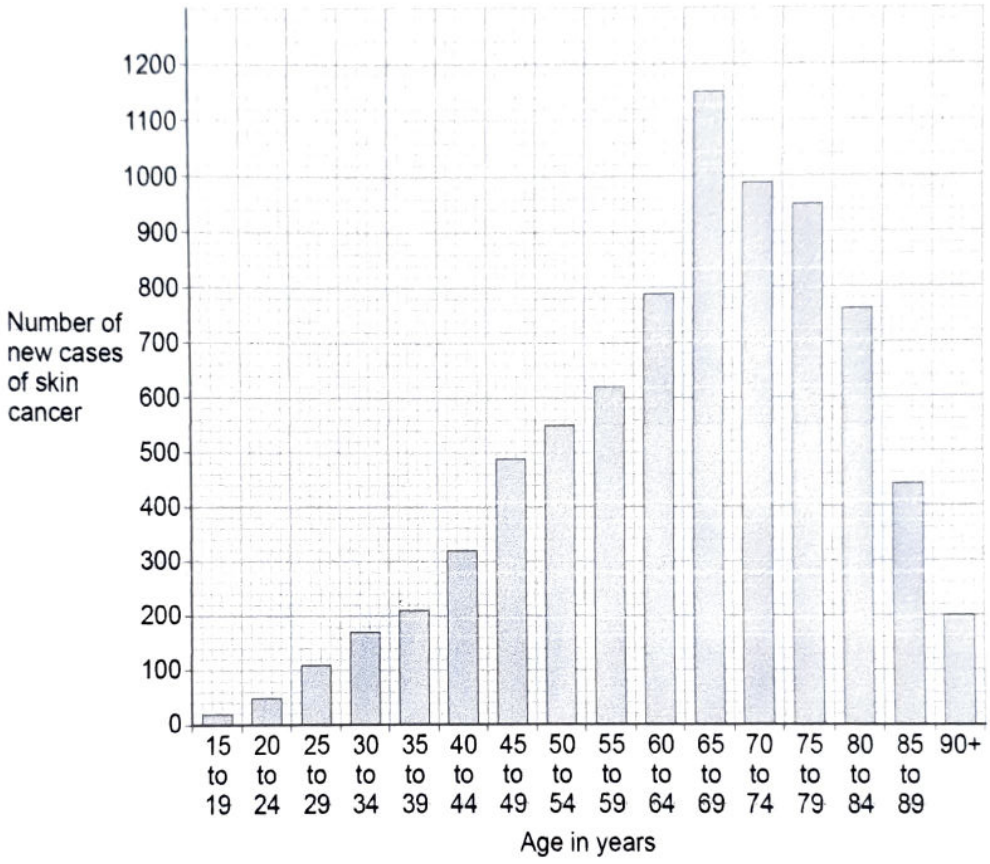
If they are still smoking that will also damage and potentially destroy the new transplanted lung.

Question 4 continues on the next page

Figure 6 shows data about skin cancer in males for different age groups in the UK.

The data shows the number of new cases of skin cancer in one year.

Figure 6



0 4 . 6 How many more new cases of skin cancer are there in males aged 40 to 44 than in males aged 15 to 19?

[1 mark]

Cases in 15-19: 20 320-20 = 300

Cases in 40-44: 320

Number of new cases = 300

0 4 . 7 There are no new cases of skin cancer diagnosed in males younger than 15 years of age.

Suggest **one** reason why.

[1 mark]

They have had very little exposure to ionising radiation, such as UV radiation

0 4 . 8 Give **one** conclusion from the data in **Figure 6**.

[1 mark]

Most new cases are from the age group 65-69 each year.

0 4 . 9 Survival rates for all types of cancers have improved over the last 20 years.

Suggest **two** reasons why.

[2 marks]

1 Improved screening allows earlier diagnosis

2 Improved treatment for patients allows higher survival rate

10

Turn over for the next question

There are no questions printed on this page

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box

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ANSWER IN THE SPACES PROVIDED

0 5 Bacteria can cause a variety of diseases in humans.

0 5 . 1 What are **two** similarities between a bacterial cell and an animal cell?

[2 marks]

Tick (✓) **two** boxes.

Both have a cell membrane. ✓

Both have a cell wall.

Both have a nucleus.

Both have cytoplasm. ✓

Both have plasmids.

0 5 . 2 Salmonella food poisoning is caused by bacteria in food.

Give **one** symptom of salmonella food poisoning.

Do **not** refer to vomiting or diarrhoea in your answer.

[1 mark]

fever fever

Question 5 continues on the next page

0 5 . 3 What is the name of the first antibiotic developed?

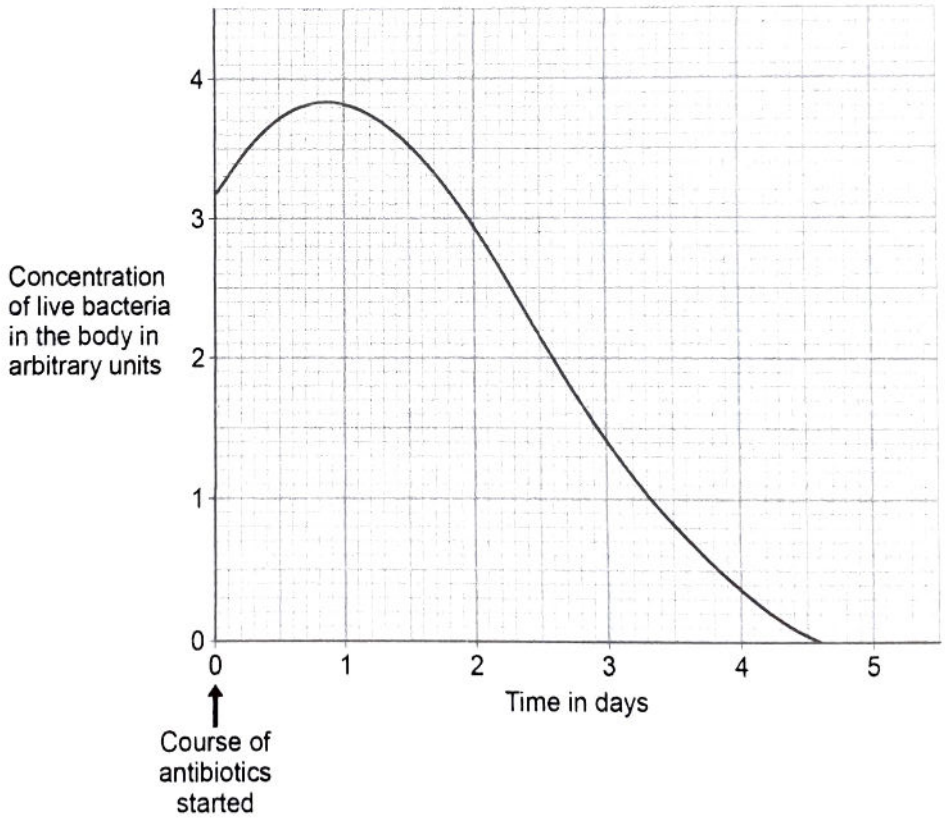
[1 mark]

penicillin

A child with a severe bacterial infection was given a course of antibiotics.

Figure 7 shows how the concentration of live bacteria in the child's body changed when taking the course of antibiotics.

Figure 7



0 5 . 4 The concentration of live bacteria in the body continued to increase after starting the course of antibiotics.

Suggest **one** reason why.

[1 mark]

There is a delay till the antibiotic takes effect and actually kills the bacteria.

0 5 . 5 After 3 days of taking the antibiotic:

- the child felt better
- there were still bacteria in the child's body.

Why did the child feel better?

[1 mark]

Tick (✓) **one** box.

Bacteria had become immune to the antibiotic. ☐

The child had become resistant to the bacteria. ☐

There were fewer toxins in the body than at day 0 ☑

0 5 . 6 Suggest why doctors do **not** give antibiotics to patients with minor infections.

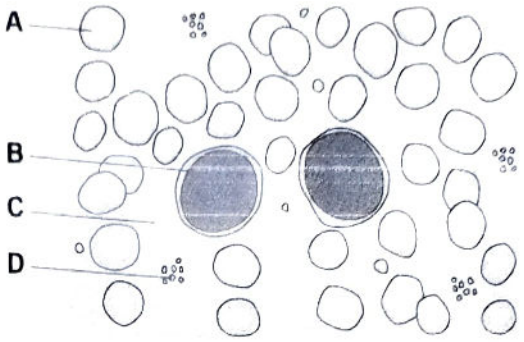
[1 mark]

To reduce the risk of an ~~coutb~~ antibiotic resistant strain from developing.

Question 5 continues on the next page

Figure 8 shows blood viewed using a microscope.

Figure 8



0 5 . 7 A vaccine will stimulate the production of antibodies.

Which part of the blood in **Figure 8** produces antibodies?

[1 mark]

Tick (✓) **one** box.

A ☐ B ☑ C ☐ D ☐

0 5 . 8 Which part of the blood in **Figure 8** starts the clotting process?

[1 mark]

Tick (✓) **one** box.

A ☐ B ☐ C ☐ D ☑

9

0 6 This question is about cell division.

0 6 . 1 Write the biological structures from the box in the correct order of size.

[1 mark]

cell	chromosome	gene	nucleus

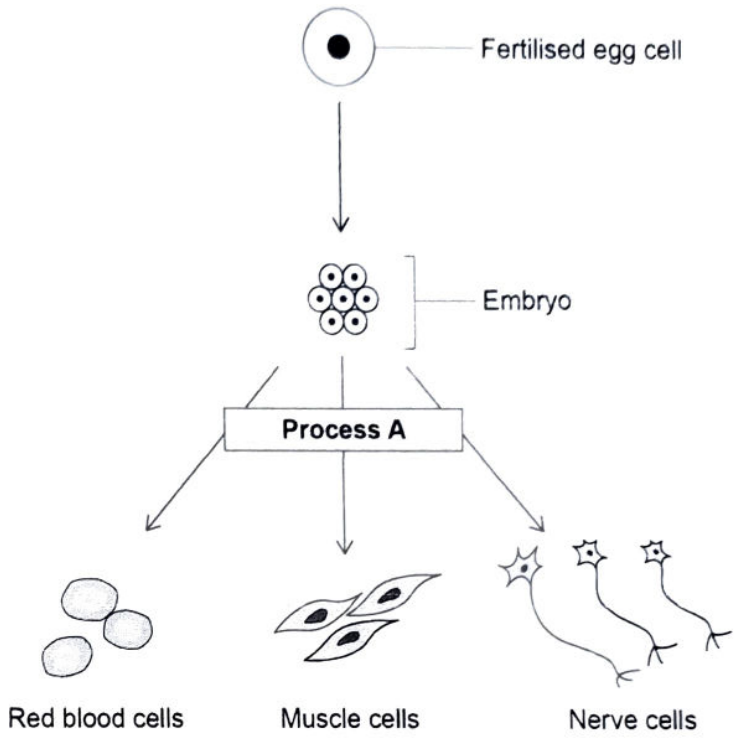
Smallest ↓ Largest

gene
chromosome
nucleus
cell

Question 6 continues on the next page

Figure 9 shows how a fertilised egg cell can produce specialised cells.

Figure 9



0 6 . 2 Name **Process A**.

[1 mark]

Differentiation

0 6 . 3 How many cell divisions are needed to form a 16-cell embryo from the original fertilised egg cell?

[1 mark]

1st 2nd 3rd 4th

1 → 2 → 4 → 8 → 16

Number of cell divisions = 4

0 6 . 4 In humans a fertilised egg cell contains 23 pairs of chromosomes.

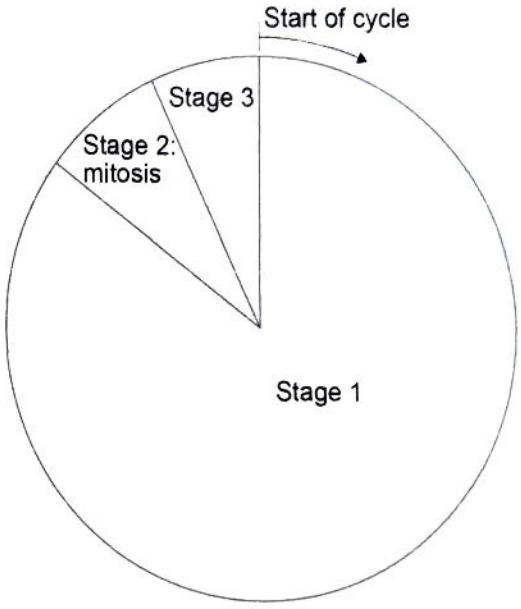
How many chromosomes will there be in each of the embryo cells?

[1 mark]

23 + 2 = 46

0 6 . 5 **Figure 10** represents a cell cycle for a human embryonic cell.

Figure 10



Describe **one** change in the cell that occurs during **each** of the stages of the cell cycle.

[3 marks]

Stage 1 The cell grows in size and replicates sub-cellular structures like ribosomes.

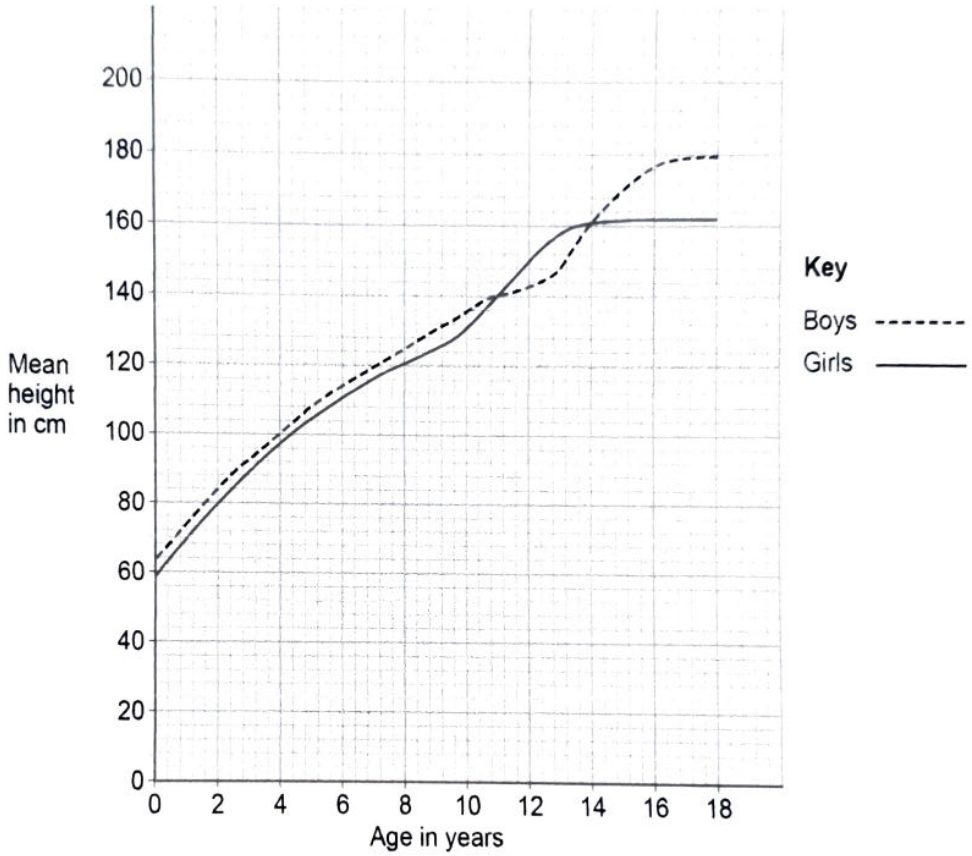
Stage 2 The chromosomes are pulled apart to different poles of the cell.

Stage 3 The cytoplasm divides and the cell membrane divides, forming 2 new cells.

Cell division is important in the growth of multicellular organisms.

0 6 . 6 **Figure 11** shows the mean height of boys and of girls from birth to age 18 years.

Figure 11



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Compare the growth of boys with the growth of girls.

Use data from **Figure 11** in your answer.

[6 marks]

Up until the age of 11 boys tend to be taller than girls, by about 4 - 5 cm. Both boys and girls grow roughly at a similar rate in height ~~until~~ until age 11.

At age 11 girls hit a growth spur and overtake boys in height till age 14. At about age 13-14 girls growth stabalises and settles around 160 cm mean height, not increasing any further.

Boys only hit their growth spur around age 12 or 13. They overtake girls once again in heigh around age 14. They grow at an increased rate till age 16, after which their heigh also stabalises around 180 cm mean height.

0 6 . 7 Give **one** way that cell division by mitosis is important in **fully grown** animals.

[1 mark]

To repair tissues that get damaged.

14

END OF QUESTIONS