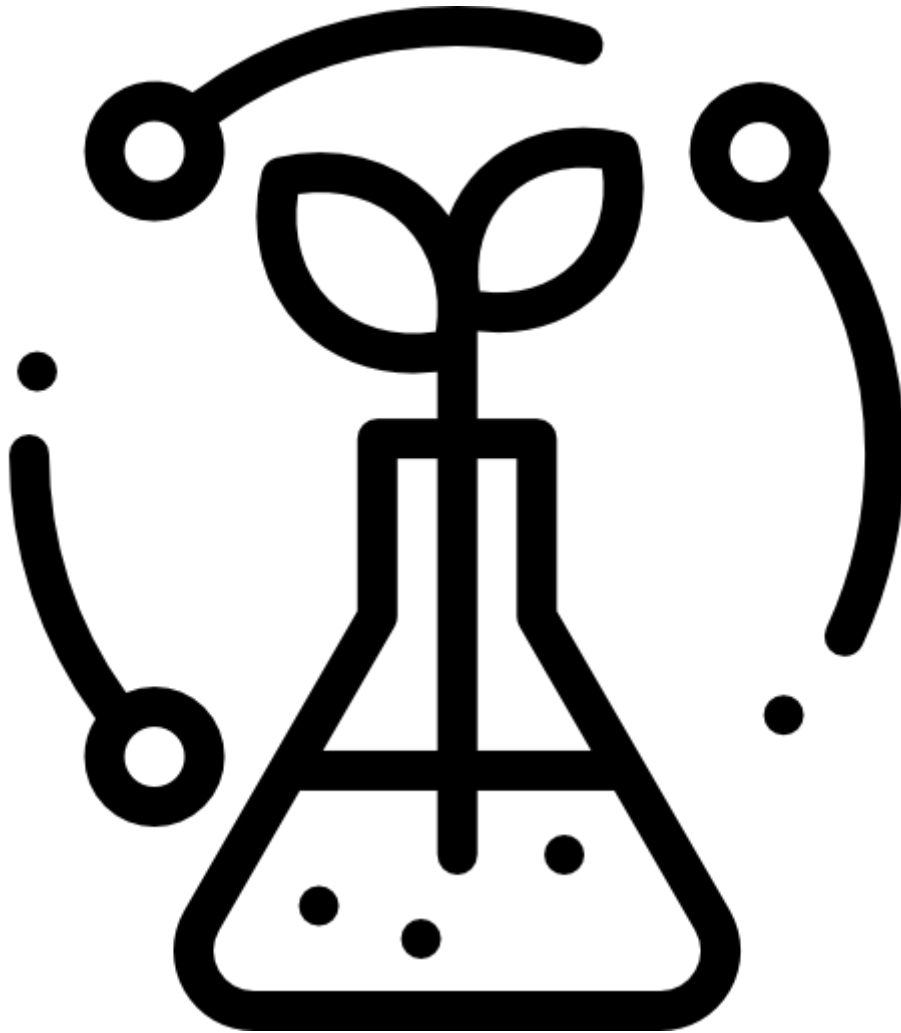


Name: _____

Group: _____

Year 10 Biology

Summer Work 2026



Contents

Instructions		Page 3
Checklist		Page 4
Week 1 Starting 20 th July	Cell division and Stem Cells	Page 5-6
Week 2 Starting 27 th July	Microscopy practical	Page 7-8
Week 3 Starting 3 rd August	Enzymes and digestion	Page 9-10
Week 4 Starting 10 th August	Plant tissue and transport	Page 11-12
Week 5 Starting 17 th August	Heart and circulatory system	Page 13-14
Week 6 Starting 24 th August	Osmosis required practical	Page 15-16

Year 11 September 2025

Week 7 Starting 31 st August	Immunity and vaccinations	Page 17-18
Week 8 Starting 7 th September	Photosynthesis	Page 19-20
Week 9 Starting 14 th September	Food test required practical	Page 21-22

Instructions

This booklet is designed to help you prepare for your first milestones in September and your internal exams in November.

Each week you will have a topic to review from paper 1. The activities should take **no more than 15 minutes**. Keep on top of your work and do not leave it all to the last week of the summer holiday.

For each week you will use the revision guides. Read through the relevant pages and use the QR codes for the relevant YouTube clips and SAM learning activity.

Each week starts with the revision guide pages, YouTube and SAM learning activities.

See example below.

Revision guide pages	Combined Science: Trilogy Foundation Combined Science: Trilogy Higher GCSE Biology	15 + 16 15 + 16 15 + 20	Page number of section in the revision guide
YouTube Clip QR code	https://tinyurl.com/pmkjm87p https://tinyurl.com/muxc48kk	 	YouTube website and QR code for relevant topics
SAM learning QR Code	https://tinyurl.com/4w3bw6pu https://tinyurl.com/mrysbfjn	 	SAM learning activity on the topic to test your knowledge

Once you have reviewed the topic, complete the exam style questions.

DO NOT LOSE your booklet. When you return in **September you will be reviewing your answers** with your science teacher.

Checklist

Use the following table to track your progress through the activities. Tick the box when you have completed the tasks.

Week	Topics	YouTube	SAM Learning	Exam Questions
1	Cell division and stem cells			
2	Microscopy practical			
3	Enzymes and digestion			
4	Plant tissue and transport			
5	Heart and circulatory system			
6	Osmosis practical			
7	Immunity and vaccinations			
8	Photosynthesis			
9	Food test practical			

Week 1: 20th July 2026

Topic: Cell Division and stem cells

Revision guide pages	Combined Science: Trilogy Foundation Combined Science: Trilogy Higher GCSE Biology	8, 9 8, 9 7, 8	
YouTube Clip QR code	https://tinyurl.com/pmkjm87p https://tinyurl.com/muxc48kk	 	
SAM learning QR Code	https://tinyurl.com/4w3bw6pu https://tinyurl.com/mrysbfnj	 	

Answer the following questions

Q1. Stem cells can be collected from human embryos and from adult bone marrow. Stem cells can develop into different types of cell. The table gives information about using these two types of stem cell to treat patients.

Stem cells from human embryos	Stem cells from adult bone marrow
It costs £5000 to collect a few cells.	It costs £1000 to collect many cells.
There are ethical issues in using embryo stem cells.	Adults give permission for their own bone marrow to be collected.
The stem cells can develop into most other types of cell.	The stem cells can develop into only a few types of cell.
Each stem cell divides every 30 minutes.	Each stem cell divides every four hours.
There is a low chance of a patient's immune system rejecting the cells.	There is a high chance of a patient's immune system rejecting the cells.
More research is needed into the use of these stem cells.	Use of these stem cells is considered to be a safe procedure.

Scientists are planning a new way of treating a disease, using stem cells.

Use only the information above to answer these questions.

(a) Give three advantages of using stem cells from embryos instead of from adult bone marrow.

1. _____
2. _____
3. _____

(3)

(b) Give three advantages of using stem cells from adult bone marrow instead of from embryos.

1. _____
2. _____
3. _____

(3)

Q2. Muscle cells divide to form new muscle cells.

(a) Which two cell components are copied before the muscle cells start to divide? Tick two boxes.

Cytoplasm	☐
Mitochondria	☐
Plasmids	☐
Ribosomes	☐
Vacuole	☐

(2)

(b) Why do muscle cells need to divide by mitosis more often than most other cells? Tick (✓) one box.

To contract the muscles	☐
To repair the muscles	☐
To supply more oxygen to the muscles	☐
To transmit nerve impulses	☐

(1)

Mitosis is part of the cell cycle. The diagram below shows the percentage of time taken by each stage of a cell cycle.

(c) The cell cycle shown in the diagram takes 21 hours in total.

Cell division takes 5% of the total time. Calculate how many hours cell division takes.

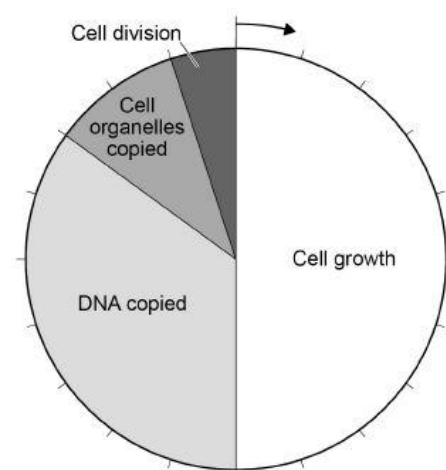
Time taken = _____ hours

(2)

(d) What percentage of time is spent copying DNA in the cell cycle shown in the diagram above?

Percentage = _____

(2)



Week 2: 27th July 2026

Topic: Required practical: Microscopy

Revision guide pages	Combined Science: Trilogy Foundation Combined Science: Trilogy Higher GCSE Biology	5, 6 5, 6 4, 5
YouTube Clip QR code	https://tinyurl.com/yjfapexx	
SAM learning QR Code	https://tinyurl.com/49d8t2dp	

Answer the following questions

This question is about cell structures.

- (a) Draw one line from each cell structure to the type of cell where the structure is found.

Cell Structure

Type of cell where the structure is found

Nucleus

Prokaryotic cells

Permanent vacuole

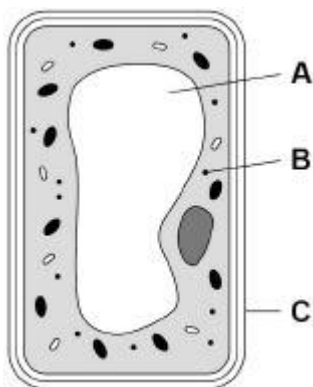
Plant cells only

Plasmid

Eukaryotic cells

(2)

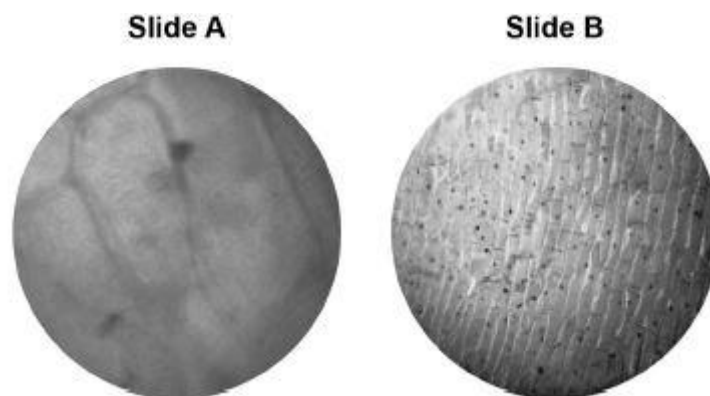
- (b) Figure below shows a plant cell. What are the names of structures A, B and C? Tick (✓) one box.



Structure A	Structure B	Structure C	
Chloroplast	Vacuole	Cell wall	☐
Nucleus	Chloroplast	Cell membrane	☐
Vacuole	Mitochondrion	Cell membrane	☐
Vacuole	Ribosome	Cell wall	☐

(1)

A student observed slides of onion cells using a microscope. Figure below shows two of the slides the student observed.



The cells on the slides are not clear to see.

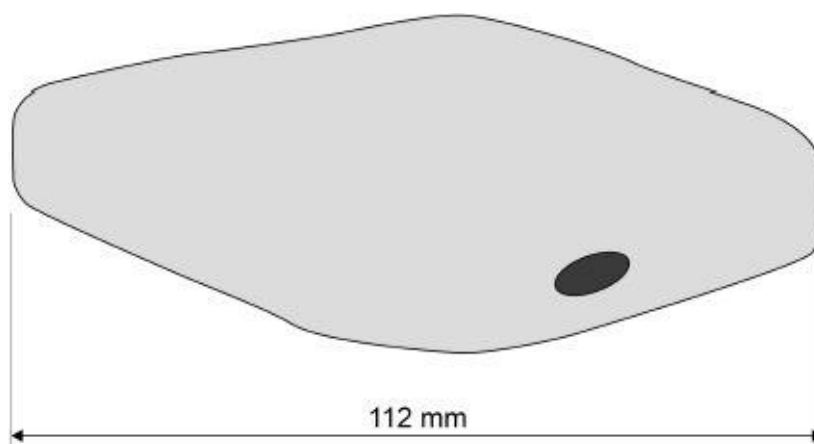
(c) Describe how the student should adjust the microscope to see the cells on Slide A more clearly.

(1)

(d) Describe how the student should adjust the microscope to see the cells on Slide B more clearly.

(2)

(e) The student made the necessary adjustments to get a clear image. Figure below shows the student's drawing of one of the cells.



The real length of the cell was 280 micrometres (μm). Calculate the magnification of the drawing.

Magnification = $\times$ _____

(3)

Week 3: 3rd August 2026

Topic: Enzymes and digestion

Revision guide pages	Combined Science: Trilogy Foundation Combined Science: Trilogy Higher GCSE Biology	20 20 23, 24
YouTube Clip QR code	https://tinyurl.com/4hafzvvm https://tinyurl.com/28tdwhp4	 
SAM learning QR Code	https://tinyurl.com/mr3d7eny https://tinyurl.com/ym5enk6t	 

Answer the following questions

Diagram shows the human digestive system.

- (a) Which organ in Figure 1 produces acid?

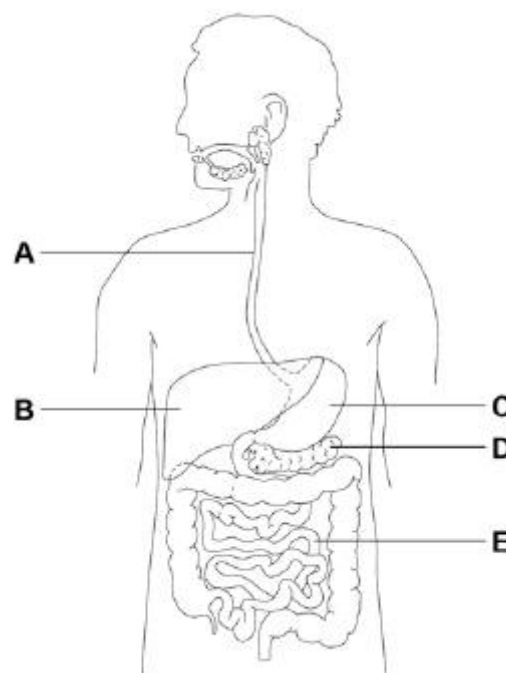
_____ (1)

- (b) Which organ in Figure 1 produces bile?

_____ (1)

- (c) Where in Figure 1 are digested foods absorbed into the blood?

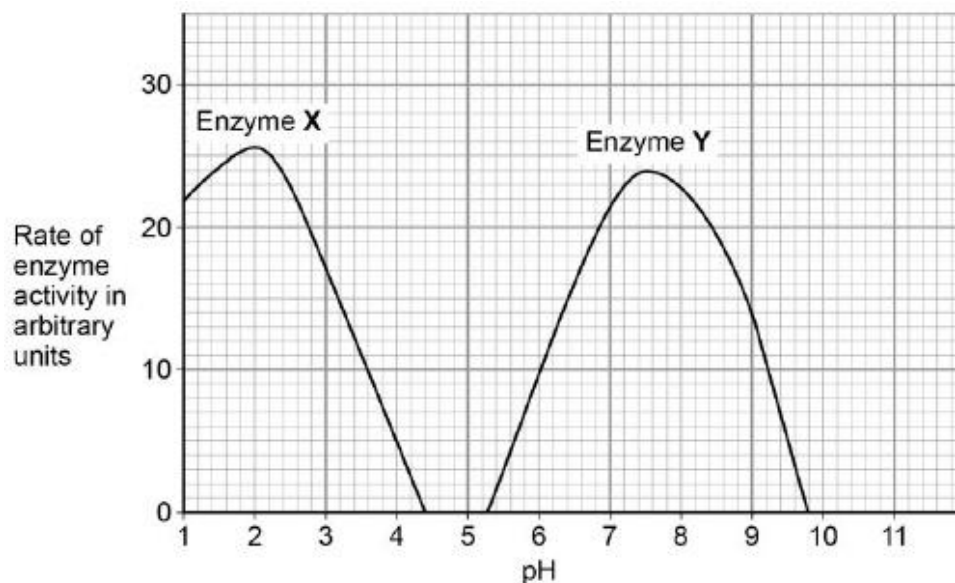
_____ (1)



- (d) Food molecules such as proteins cannot be absorbed unless they are digested. Give one reason why.

(1)

A scientist investigated the effect of pH on the activity of two protease enzymes. The graph below shows the results.

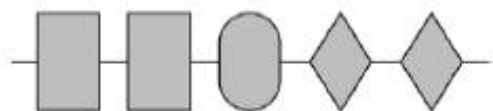
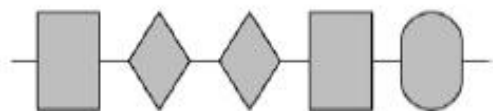
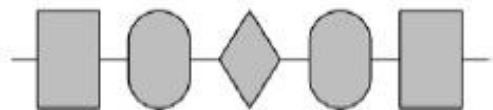


(e) What is the optimum pH for enzyme Y? _____ (1)

(f) The figure below shows a model of an enzyme molecule.



Which substrate fits the enzyme molecule above? Tick one box. (1)


☐

☐

☐

(g) The enzyme and substrate diagrams are used as a model for a theory of enzyme action. What is the name of this theory?

_____ (1)

Week 4: 10th August 2026

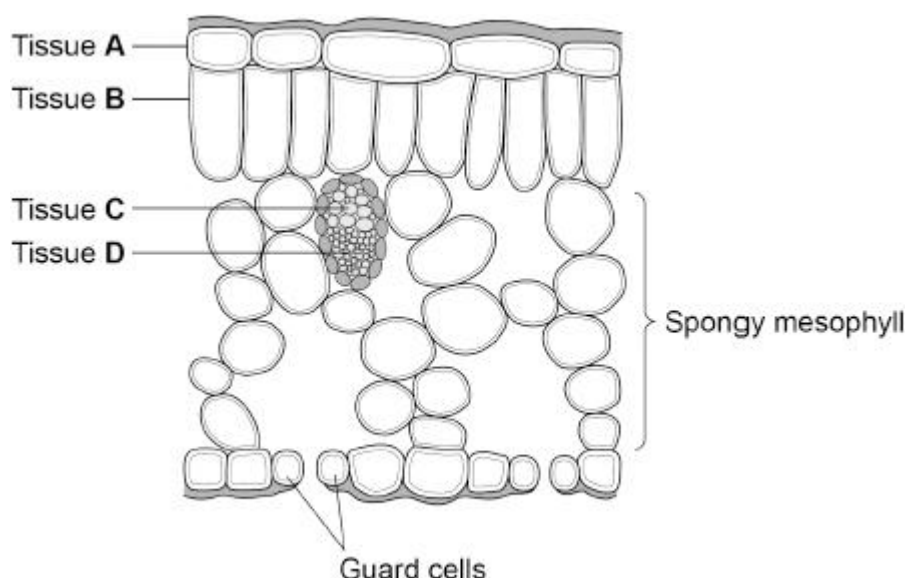
Topic: Plant tissues and transport

Revision guide pages	Combined Science: Trilogy Foundation Combined Science: Trilogy Higher GCSE Biology	32, 33, 34 33, 34, 35 36, 37, 38
YouTube Clip QR code	https://tinyurl.com/msd8xhvpv https://tinyurl.com/4t4f6cmv	 
SAM learning QR Code	https://tinyurl.com/2k6p7re6 https://tinyurl.com/2s458mzj	 

Answer the following questions

A leaf is a plant organ.

Figure opposite shows tissues in a leaf.



(a) Which tissue is the epidermis? _____ (1)

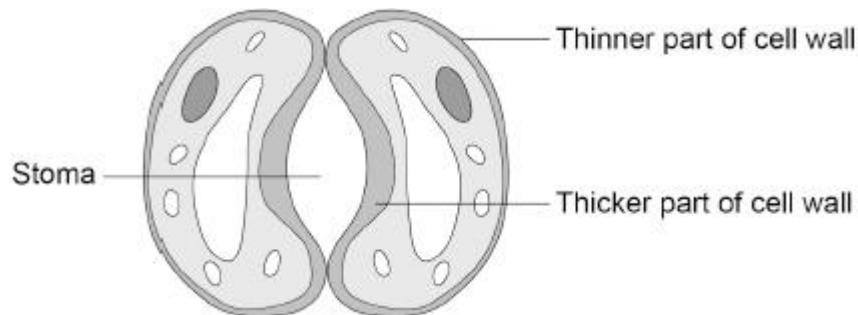
(b) Explain how the spongy mesophyll is adapted for its function. Use **Figure 1**.

(3)

(c) The xylem is adapted to transport water through a plant. Explain **one** way that xylem is adapted for its function.

(2)

(d) **Figure below** shows a pair of guard cells around a stoma.



During the day, glucose is made in the guard cells. Describe how an increase in glucose concentration in the guard cells causes the stoma to open.

(2)

Phloem is involved in a process called translocation.

(e) What is translocation?

(1)

(f) Explain why translocation is important to plants.

(2)

Week 5: 17th August 2026

Topic: Heart and circulatory system

Revision guide pages	Combined Science: Trilogy Foundation Combined Science: Trilogy Higher GCSE Biology	23, 24, 25 24, 25, 26 27, 28, 29
YouTube Clip QR code	https://tinyurl.com/5dbswydf	
SAM learning QR Code	https://tinyurl.com/y9mh8wus	

Answer the following questions

Q1. Figure opposite shows a human heart.

(a) The vena cava carries blood into the heart from the body.

Which blood vessel in **Figure 1** is the vena cava?

_____ (1)

(b) Which chamber of the heart pumps blood to the body?

_____ (1)

(c) What is the name of the blood vessel that carries blood to the heart muscle?

_____ (1)

The heart and some blood vessels contain valves.

(d) Which type of blood vessel has valves? _____ (1)

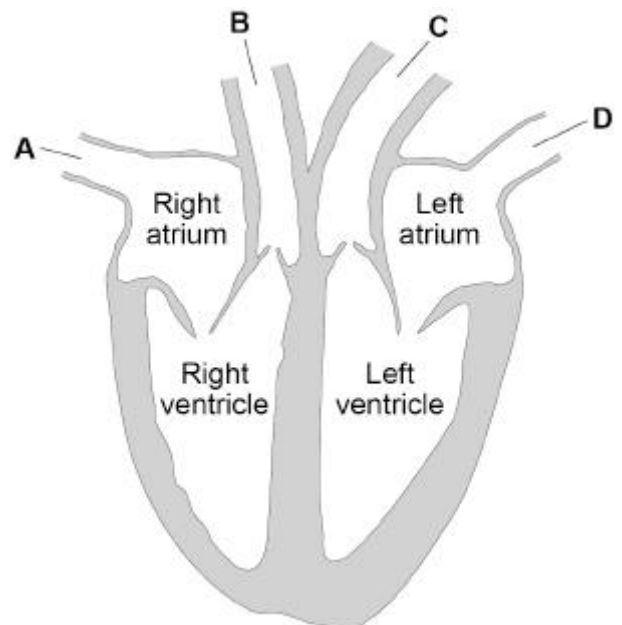
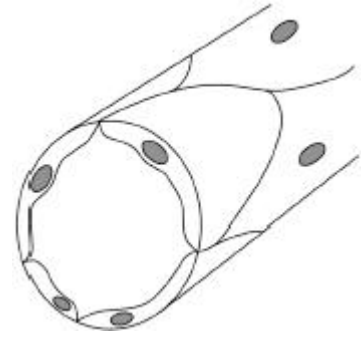


Figure opposite shows a blood capillary.

(e) Explain **one** way the capillary is adapted for its function.



(2)

The circulatory system includes the heart, blood vessels and blood.

(f) The heart pumps the blood in a double circulatory system. Describe what is meant by a 'double circulatory system'.

(2)

The structure of a vein is different from the structure of an artery.

One difference is that veins have valves but arteries do **not** have valves.

(g) Describe **two** structural differences between a vein and an artery.

Do **not** refer to valves in your answer.

1 _____

2 _____

(2)

Week 6: 24th August 2026

Topic: Osmosis Required Practical

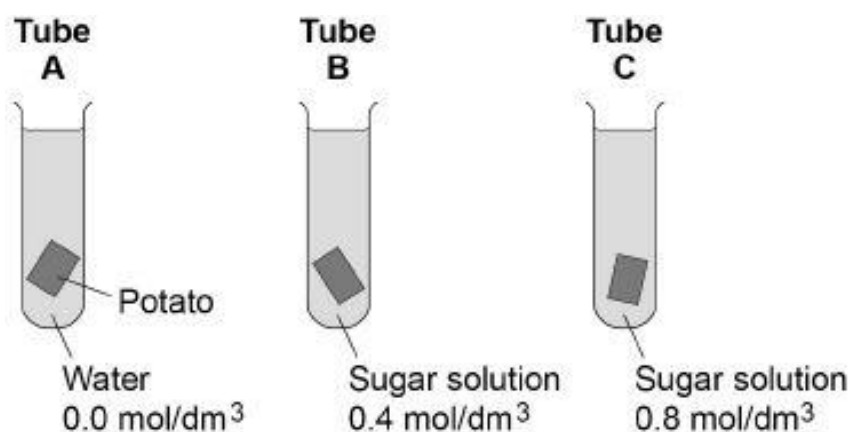
Revision guide pages	Combined Science: Trilogy Foundation Combined Science: Trilogy Higher GCSE Biology	11 11 14
YouTube Clip QR code	https://tinyurl.com/27h6e9f9	
SAM learning QR Code	https://tinyurl.com/mryemnzn	

Answer the following questions

A student investigated the effect of different concentrations of sugar solution on pieces of potato. This is the method used.

1. Cut three pieces of potato to the same length.
2. Dry each piece on a paper towel.
3. Weigh each piece.
4. Place each piece in a different concentration of sugar solution.
5. Leave all three pieces for 2 hours.
6. Remove the three pieces of potato from the solutions.
7. Dry each piece on a paper towel.
8. Measure the length and mass of each piece of potato.

Figure below shows how the investigation was set up.



(a) Why did the student dry each piece of potato before weighing it?

(1)

(b) What **two** changes would you expect in the potato in **tube A** after 2 hours?

1. _____

2. _____ (2)

(c) Complete the sentences.

Water moves into and out of cells by a process called _____ .

Water would move _____ the potato cells in **tube A**.

The solution outside the potato in **tube A** is at a _____

concentration than the solution inside the potato cells. (3)

(d) The potato in **tube B** did not change. Give **one** conclusion that can be made from this observation.

_____ (1)

(e) **Figure 2** shows the root of a germinating seed.

Describe **two** ways the root is adapted to absorb water efficiently. (2)

1. _____

2. _____



Week 7: 31st August 2026

Topic: Immunity and vaccinations

Revision guide pages	Combined Science: Trilogy Foundation Combined Science: Trilogy Higher GCSE Biology	40, 41 41, 42 44, 45
YouTube Clip QR code	https://tinyurl.com/53db2uma https://tinyurl.com/484mv8z7	 
SAM learning QR Code	https://tinyurl.com/2ezw5yjs https://tinyurl.com/2p8x3vyc	 

Answer the following questions

White blood cells protect the body against pathogens such as bacteria and viruses.

(a) (i) Pathogens make us feel ill.

Give **one** reason why.

(1)

(ii) White blood cells produce antibodies. This is one way white blood cells protect us against pathogens.

Give **two** other ways that white blood cells protect us against pathogens.

1. _____
2. _____

(2)

(b) Vaccination can protect us from the diseases pathogens cause.

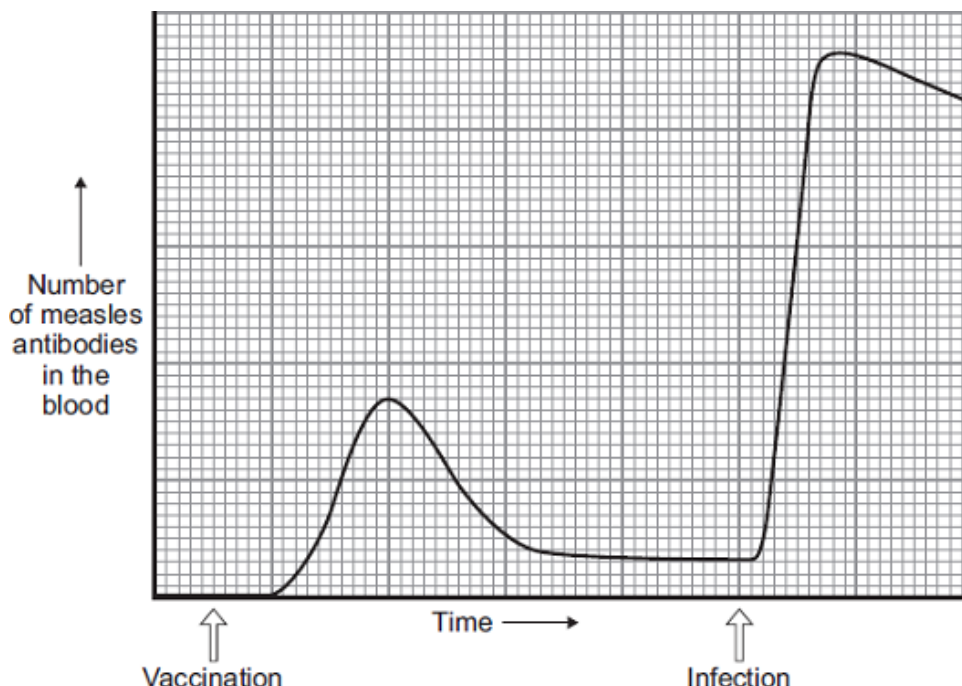
(i) One type of virus causes measles. A doctor vaccinates a child against measles.

What does the doctor inject into the child to make the child immune to measles?

(2)

(ii) A few weeks after the vaccination, the child becomes infected with measles viruses from another person.

The graph shows the number of measles antibodies in the child's blood from before the vaccination until after the infection.



More measles antibodies are produced after the infection than after the vaccination.

Describe **and** explain other differences in antibody production after infection compared with after vaccination.

(3)

(iii) Vaccination against the measles virus will **not** protect the child against the rubella virus. Why?

(1)

(c) What is the advantage of vaccinating a large proportion of the population against measles?

(1)

Week 8: 7th September 2026

Topic: Photosynthesis

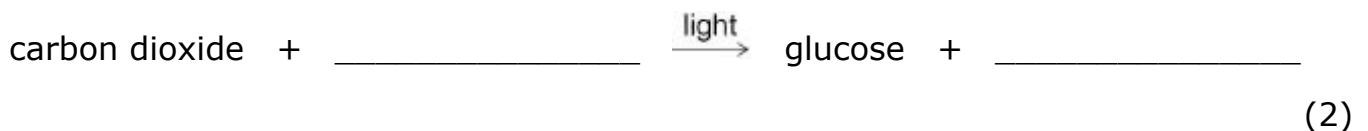
Revision guide pages	Combined Science: Trilogy Foundation Combined Science: Trilogy Higher GCSE Biology	44, 45 45, 46, 47 53, 54, 55, 56
YouTube Clip QR code	https://tinyurl.com/5d4rsnzv https://tinyurl.com/5xybpaa8	 
SAM learning QR Code	https://tinyurl.com/5n67skr4 https://tinyurl.com/39jr4fam	 

Answer the following questions

This question is about photosynthesis.

- (a) Complete the equation for photosynthesis. Choose answers from the box.

nitrogen	oxygen	ethanol	water
-----------------	---------------	----------------	--------------



- (b) What is the chemical formula for glucose? Tick (✓) **one** box.

CO₂ ☐ C₆H₁₂O₆ ☐ H₂O ☐ O₂ ☐

(1)

- (c) Give **two** ways plants use the glucose produced by photosynthesis.

1 _____

2 _____

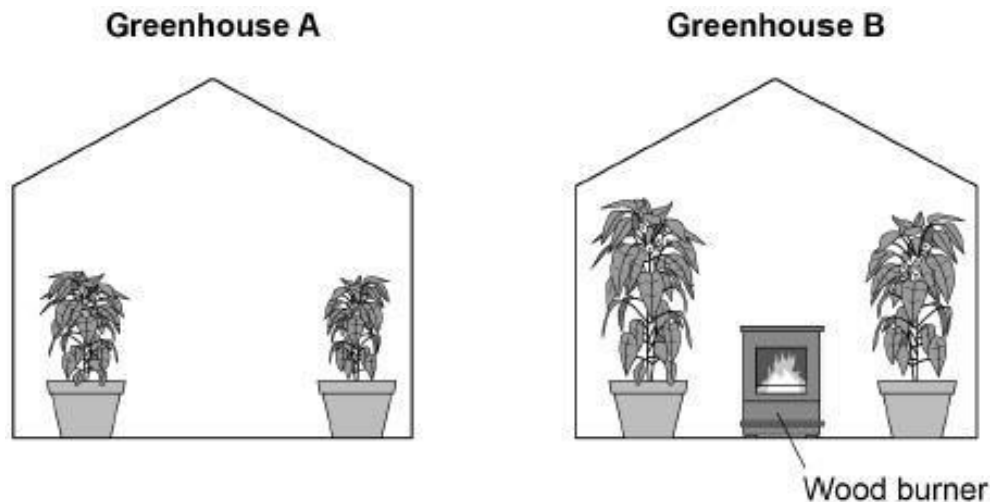
(2)

(d) A person has two greenhouses.

In each greenhouse, the plants:

- are all the same type
- receive the same intensity of light and the same volume of water
- grow in the same type of soil.

The figure below shows the greenhouses.



The person burns logs in the wood burner in greenhouse **B**.

Explain why the plants in greenhouse **B** grow faster than the plants in greenhouse **A**.

(4)

Week 9: 14th September 2026

Topic: Food tests

Revision guide pages	Combined Science: Trilogy Foundation Combined Science: Trilogy Higher GCSE Biology	21 22 25
YouTube Clip QR code	https://tinyurl.com/4p9smrnp	
SAM learning QR Code	https://tinyurl.com/yc2wcyuh	

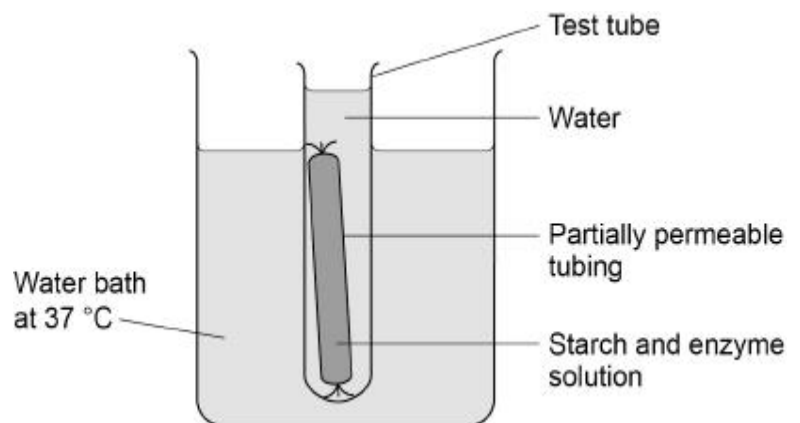
Answer the following questions

This question is about digestion.

(a) Name the enzyme that digests starch in the human digestive system.

(1)

A student set up a model to represent the digestion and absorption of food molecules in the digestive system. The diagram shows the student's model.



This is the method used.

1. Fill a test tube with water at 37 °C
2. Test the water for starch and for sugar.
3. Mix together starch and enzyme solution and immediately test it for starch and for sugar.
4. Fill some partially permeable tubing with the starch and enzyme mixture.
5. Seal the tubing and place it in the test tube of water.
6. Place the test tube in a water bath at 37 °C
7. After 30 minutes, test the mixture inside the partially permeable tubing and test the water in the test tube for starch and for sugar.

(b) Suggest which parts of the body the partially permeable tubing and the water in the test tube represent.

Partially permeable tubing _____

Water in the test tube _____ (2)

The table below shows the results. **Key** ✓ = Present ✗ = Not present

Test	Description of liquid	Result of starch test	Result of sugar test
1	Mixture inside tubing at start	✓	✗
2	Water in the test tube at start	✗	✗
3	Mixture inside tubing after 30 minutes	✓	✓
4	Water in the test tube after 30 minutes	✗	✓

(c) Name the reagents used to test for starch and for sugar.

Starch _____

Sugar _____ (2)

(d) Why was there no sugar present in test **1**?

_____ (1)

(e) Explain the results for test **3**.

_____ (2)

(f) Explain the results for test **4**.

_____ (2)