

A-Level Biology Bridging Course

Name: _____

Which course did you do at GCSE? Combined Triple

Congratulations on choosing to study Biology in our Sixth Form. We hope that you really enjoy the subject and your time in our lessons.

To give you an idea of the main topics that you will be studying at the start of your course we would like you to have a go at the work in this pack before joining us in September. This work will form part of your A-Level Biology notes. If you get stuck then email me at twillis@stjosephs.uk.net.

1. Use the GCSE BBC Bitesize page to revise the “Key Concepts in Biology” at:
<https://www.bbc.co.uk/bitesize/examspecs/zcq2j6f>
2. Complete the quick check sheets for SB1.
3. Answer the exam questions (they are A-level questions but can be answered using only GCSE knowledge).

We look forward to meeting and working with you.

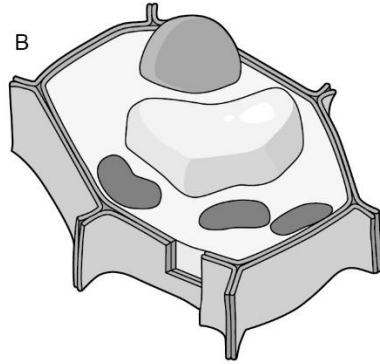
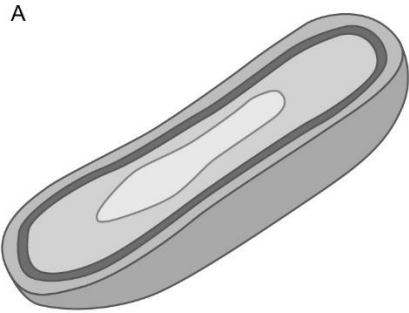
Mr TM Willis,

Head of Biology.

Cells Quick Check

1. Name the two cells:

- a. _____
- b. _____



- 2. Label the cell organelles.
- 3. Complete the table:

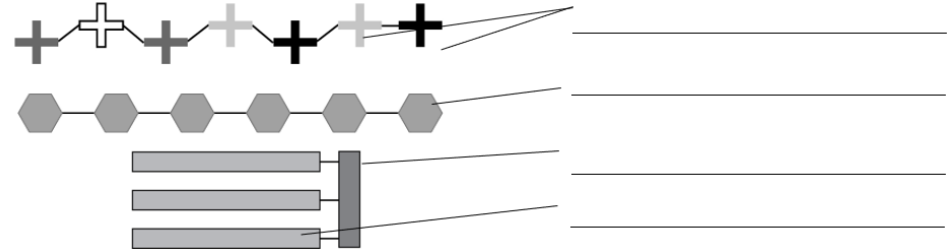
<u>Organelle</u>	<u>Function</u>
Capsule	
Cell membrane	
Cell Wall	
Chloroplast	
Chromosomal DNA	
Cytoplasm	
Nucleus	
Vacuole	

4. Compare the two cells:

- a. Similarities _____
- b. Differences _____

Enzymes Quick Check

1. Name & label the molecules:



2. Describe & explain the enzymes graphs:

	A
	B
	C
	D
	E
	F
	G
	H

3. Draw the action of a normal & denatured enzyme:

Practicals Quick Check

- Complete the method for observing onion cells:
 - Cut a 1cm^2 piece of _____ using a knife.
 - Carefully remove a _____ layer of onion cells.
 - Place the cells onto a glass _____.
 - Add a drop of _____ stain.
 - Lower a _____ on top of the onion cells.

- “Investigate the time taken for the enzyme amylase to break down starch at different pHs.” Variables:
 - Independent _____
 - Dependent _____
 - Control _____

3. Plot a graph for the following results:

<u>Temperature (°C)</u>	<u>Rate of Reaction</u>	
10	5	
20	20	
30	30	
40	35	
50	20	
60	0	

4. Describe how to investigate osmosis in potatoes:

Standard Form Quick Check H

1. Write these numbers in standard form:

- 1150000 _____
- 0.00000007 _____

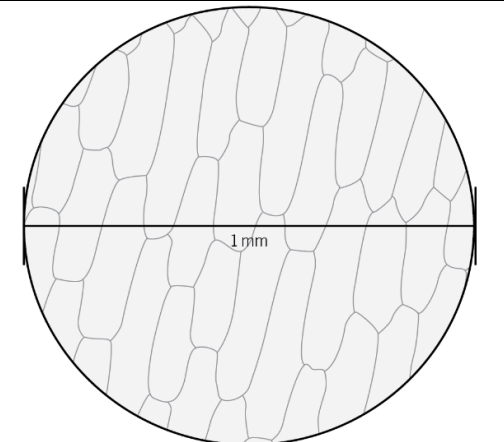
2. Write these numbers in standard form:

Length of a wasp: 0.0023 m m	Length of a human neurone: 1100 m m	Mass of a red blood cell: $0.000\ 027\ \mu\text{g}$ g
Diameter of a 3-day-old embryo: $100\ 000\ \text{nm}$ m	Diameter of a virus: $7 \times 10^{-8}\ \text{m}$ m	Diameter of a white blood cell: $22\ 000\ \text{nm}$ m

3. How wide is one cell...

a. ...in micrometres?

b. ...in metres using standard form?

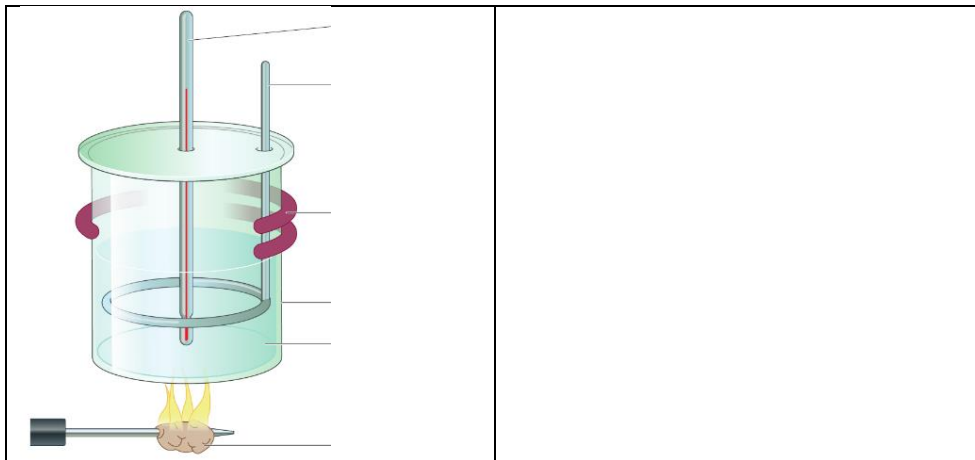


Testing Foods Quick Check

1. Complete the table for the different food tests:

<u>Substance</u>	<u>Chemical reagent</u>	<u>Description</u>	<u>Positive result</u>	<u>Negative result</u>
Fats & oil				
Protein				
Reducing sugars				
Starch				

2. Describe how to use a calorimeter to determine energy.



Q1.

- (a) The table shows some parts of cells and two different types of cell.

Complete the table by putting a tick in a box if the structure is present in the type of cell.

	Cell wall	Cell-surface membrane	Nucleus
White blood cell			
Bacterial cell			

(2)

- (b) The diagram is of a mitochondrion at a magnification of $\times 30\,000$.



Calculate the actual length of this mitochondrion in micrometres (μm). Show your working.

Answer = _____ μm (2)

- (c) Some scientists support the theory that mitochondria are organelles that evolved from prokaryotic cells.

- (i) Give **one** piece of evidence that supports the theory that mitochondria evolved from prokaryotic cells.

_____ (1)

- (ii) What is the advantage to cells of having mitochondria?

_____ (2)

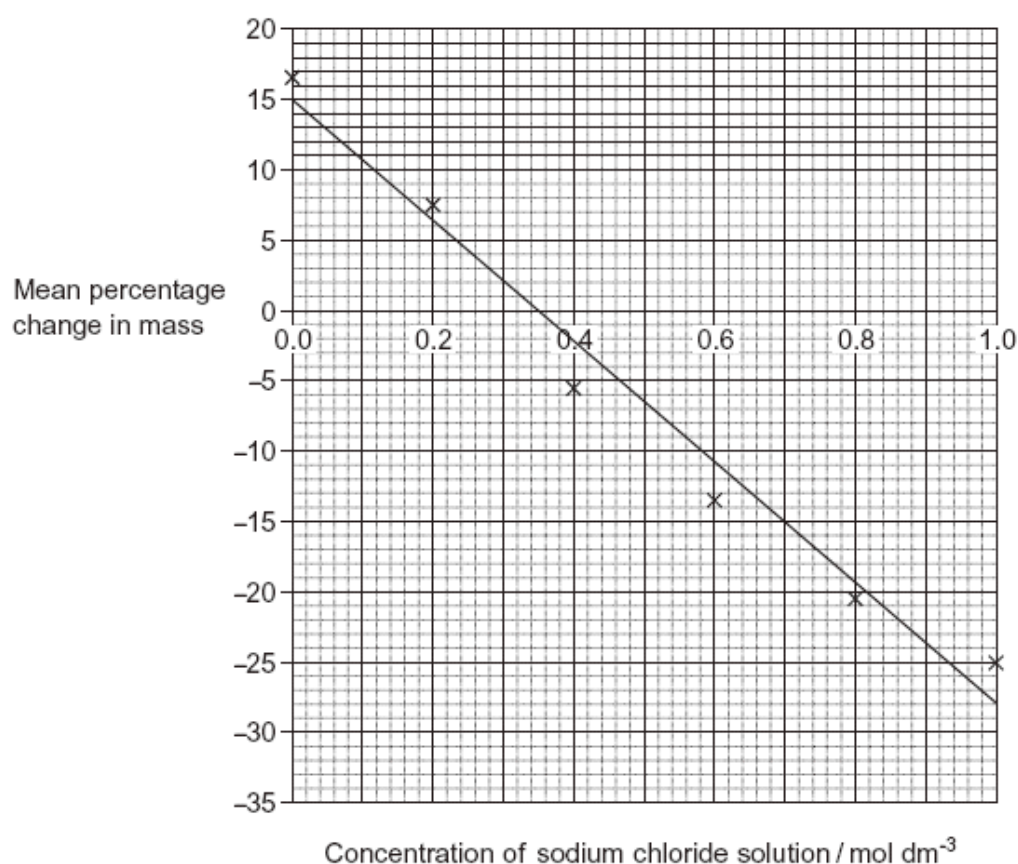
(Total 7 marks)

Q2. A student investigated the effect of putting cylinders cut from a potato into sodium chloride solutions of different concentration. He cut cylinders from a potato and weighed each cylinder. He then placed each cylinder in a test tube. Each test tube contained a different concentration of sodium chloride solution. The tubes were left overnight. He then removed the cylinders from the solutions and reweighed them.

(a) Before reweighing, the student blotted dry the outside of each cylinder. Explain why.

(2)

The student repeated the experiment several times at each concentration of sodium chloride solution. His results are shown in the graph.



(b) The student made up all the sodium chloride solutions using a 1.0 mol dm⁻³ sodium chloride solution and distilled water.

Complete the table to show how he made 20 cm³ of a 0.2 mol dm⁻³ sodium chloride solution.

Volume of 1.0 mol dm ⁻³ sodium chloride solution	Volume of distilled water

(1)

- (c) The student calculated the *percentage* change in mass rather than the change in mass. Explain the advantage of this.

(2)

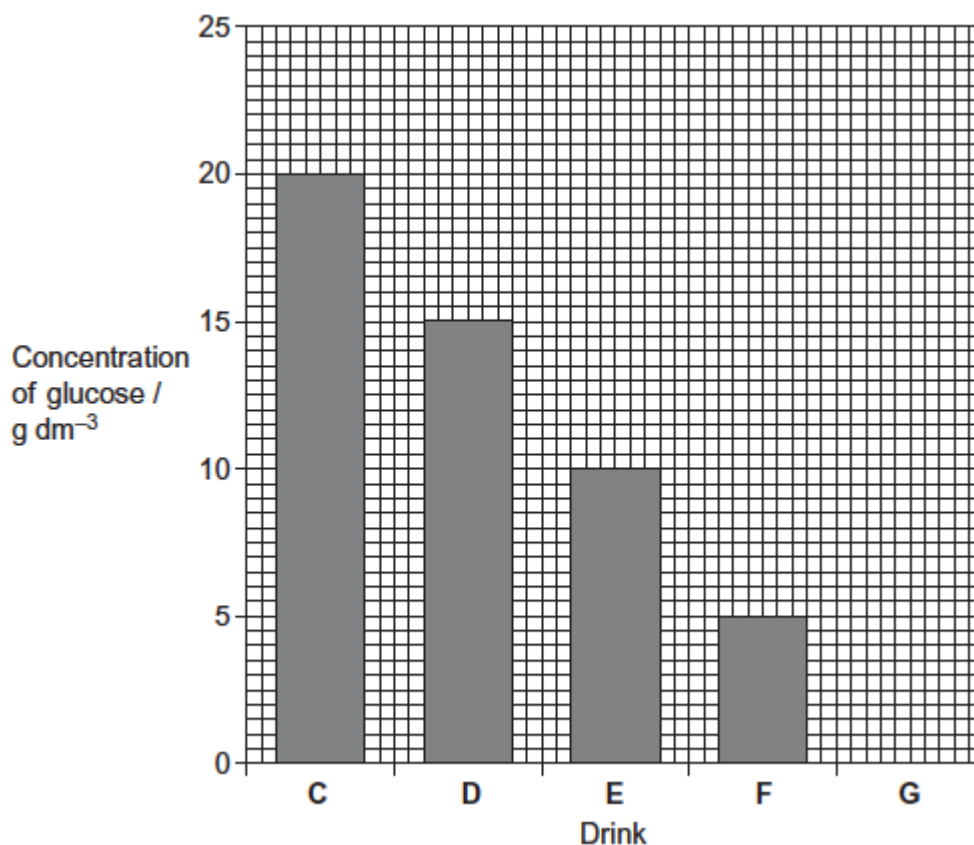
- (d) The student carried out several repeats at each concentration of sodium chloride solution. Explain why the repeats were important.

(2)

- (e) Use the graph to find the concentration of sodium chloride solution that has the same water potential as the potato cylinders.

_____ mol dm⁻³ **(1)**
(Total 8 marks)

Q3. A student investigated the glucose concentration in five different drinks. His results are shown below.



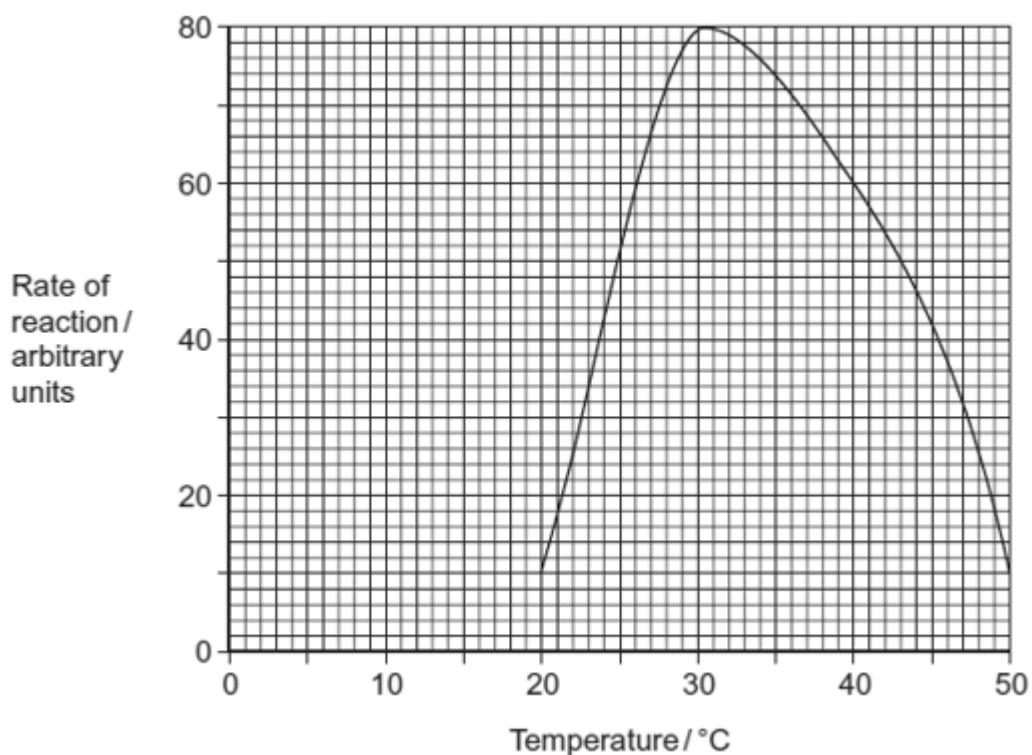
(a) Using the data, calculate how many grams of glucose would be in 220 cm^3 of drink **F**.

Answer = _____ g (1)

(b) Calculate how much more glucose is in drink **C** than in drink **F**. Show your answer as a percentage.

Answer = _____ % (1)
(Total 2 marks)

Q4. A protease is an enzyme that digests protein. The graph shows how the activity of a protease varies with temperature.



- (a) (i) Describe what the graph shows about the effect of temperature on the rate of reaction.

_____ (1)

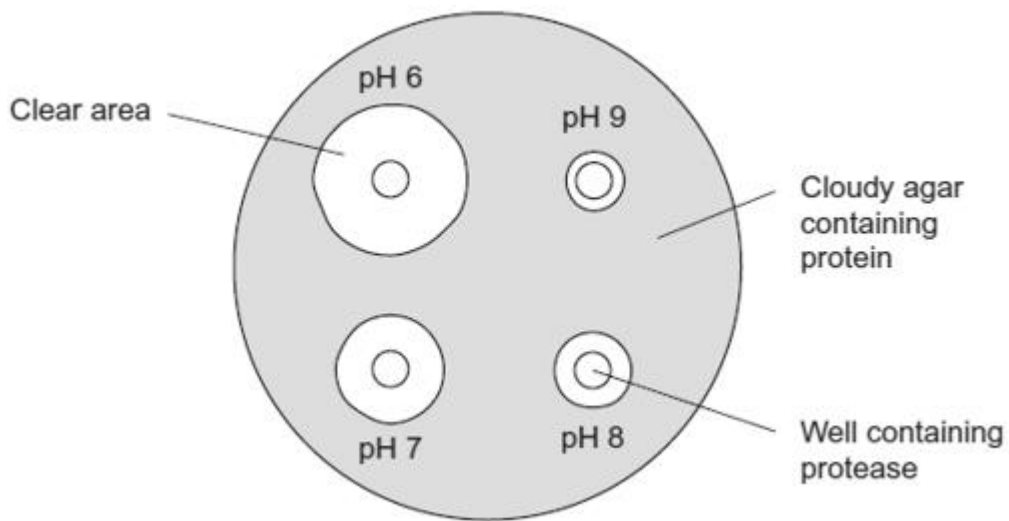
- (ii) Explain the shape of the curve between 30 °C and 50 °C.

_____ (3)

(b) Students investigated the effect of pH on the activity of the protease.

- The students used agar plates containing protein. The protein made the agar cloudy.
- They made four wells of equal size in the agar of each plate.
- They added a drop of protease solution to each of the wells. The protease solution in each well was at a different pH.
- The students incubated the agar plates for 4 hours at a constant temperature.

The diagram shows the agar plates after they were incubated and the pH of the protease solution in each well.



(i) How should the students make sure that the pH of the protease solution did **not** change?

_____ (1)

(ii) Use the graph to suggest a suitable temperature for incubating the agar plates.
Explain your answer.

_____ (1)

(iii) Use the diagram to describe the effect of pH on the activity of this protease.

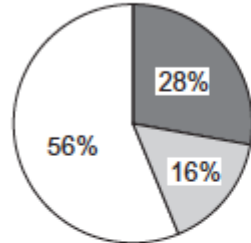
_____ (1)

(Total 7 marks)

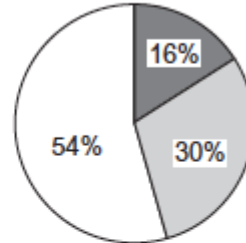
Q5. Nutritionists investigated the relationship between eating oily and non-oily fish and the incidence of asthma. They analysed the diets of children with asthma and the diets of children without asthma.

The pie charts show the results.

Children with asthma



Children without asthma



Key

- Children who ate no fish
- Children who ate oily fish
- Children who ate non-oily fish

(a) What conclusions can you make from the data?

(3)

(b) Describe how you could use the emulsion test to show the presence of oil in a sample of fish.

(3)

(Total 6 marks)

Evaluation

Please rate how confident you were with each section (green = easy, amber = could do it, red = very difficult).

	<u>Green</u>	<u>Amber</u>	<u>Red</u>
Cells			
Enzymes			
Practicals			
Standard Form H			
Testing Foods B			
Question 1			
Question 2			
Question 3			
Question 4			
Question 5			

Do you have any questions to ask your teacher?