

BIOLOGY A LEVEL INITIAL TASKS

Hi and welcome to A level biology 😊

The aim of these exercises are to help you to give you a gentle introduction in preparing for your A level studies and to remind you of some things you might have forgotten from GCSE.

Part 1: Please go to the relevant link below and complete the questions. This should be done by your first Biology lesson.

For Surnames between A and H

<https://forms.office.com/Pages/ResponsePage.aspx?id=bhK2dQTZx0CheM3jW8ljXwaTLtxu7G5PqoOfldEu4ilURDJMUDVQM0RWVkw0RDBEOFY5VTFHVFZROS4u>

For surnames between I and R

<https://forms.office.com/Pages/ResponsePage.aspx?id=bhK2dQTZx0CheM3jW8ljXwaTLtxu7G5PqoOfldEu4ilUOEQwOFJOWEdERINPVFdQSlpXS0ZUWkpKSS4u>

For surnames between S and Z

<https://forms.office.com/Pages/ResponsePage.aspx?id=bhK2dQTZx0CheM3jW8ljXwaTLtxu7G5PqoOfldEu4ilUMjE4VFYwOTJaWkVXNkQ2UDc1TkYwSVBFUC4u>

Part 2

Please print off and complete the questions on the next 2 pages and hand in to your teacher on your first biology lesson. These themes come up in the Autumn Term.

Part 3

Your first topic is Biological molecules. Try learning the terms etc on the final page of this document to give you a head start

Part 2 – Print this page and answer the questions

NAME:

Question 1

- 2 The table shows the concentrations of three mineral ions in the roots of a plant and in the water in the surrounding soil.

Mineral ion	Concentration in millimoles per kilogram	
	Plant root	Soil
Calcium	120	2.0
Magnesium	80	3.1
Potassium	250	1.2

(a) (i) The plant roots could not have absorbed these mineral ions by diffusion. Explain why. (2)

(ii) Name the process by which the plant roots absorb mineral ions. (1)

(b) How do the following features of plant roots help the plant to absorb mineral ions from the soil?

(i) A plant root has thousands of root hairs. (1)

(ii) A root hair cell contains many mitochondria. (2)

(iii) Many of the cells in the root store starch. (1)

(Total 7 marks)

Part 2 – Print this page and answer the questions

Question 2

A student investigated the effect of different sugar solutions on potato tissue.

This is the method used.

1. Add 30 cm³ of 0.8 mol dm⁻³ sugar solution to a boiling tube.
2. Repeat step 1 with equal volumes of 0.6, 0.4 and 0.2 mol dm⁻³ sugar solutions.
3. Use water to give a concentration of 0.0 mol dm⁻³.
4. Cut five cylinders of potato of equal size using a cork borer.
5. Weigh each potato cylinder and place one in each tube.
6. Remove the potato cylinders from the solutions after 24 hours.
7. Dry each potato cylinder with a paper towel.
8. Reweigh the potato cylinders.

The table below shows the results.

Concentration of sugar solution in mol dm ⁻³	Starting mass in g	Final mass in g	Change of mass in g	Percentage (%) change
0.0	1.30	1.51	0.21	16.2
0.2	1.35	1.50	0.15	X
0.4	1.30	1.35	0.05	3.8
0.6	1.34	1.28	-0.06	-4.5
0.8	1.22	1.11	-0.11	-9.0

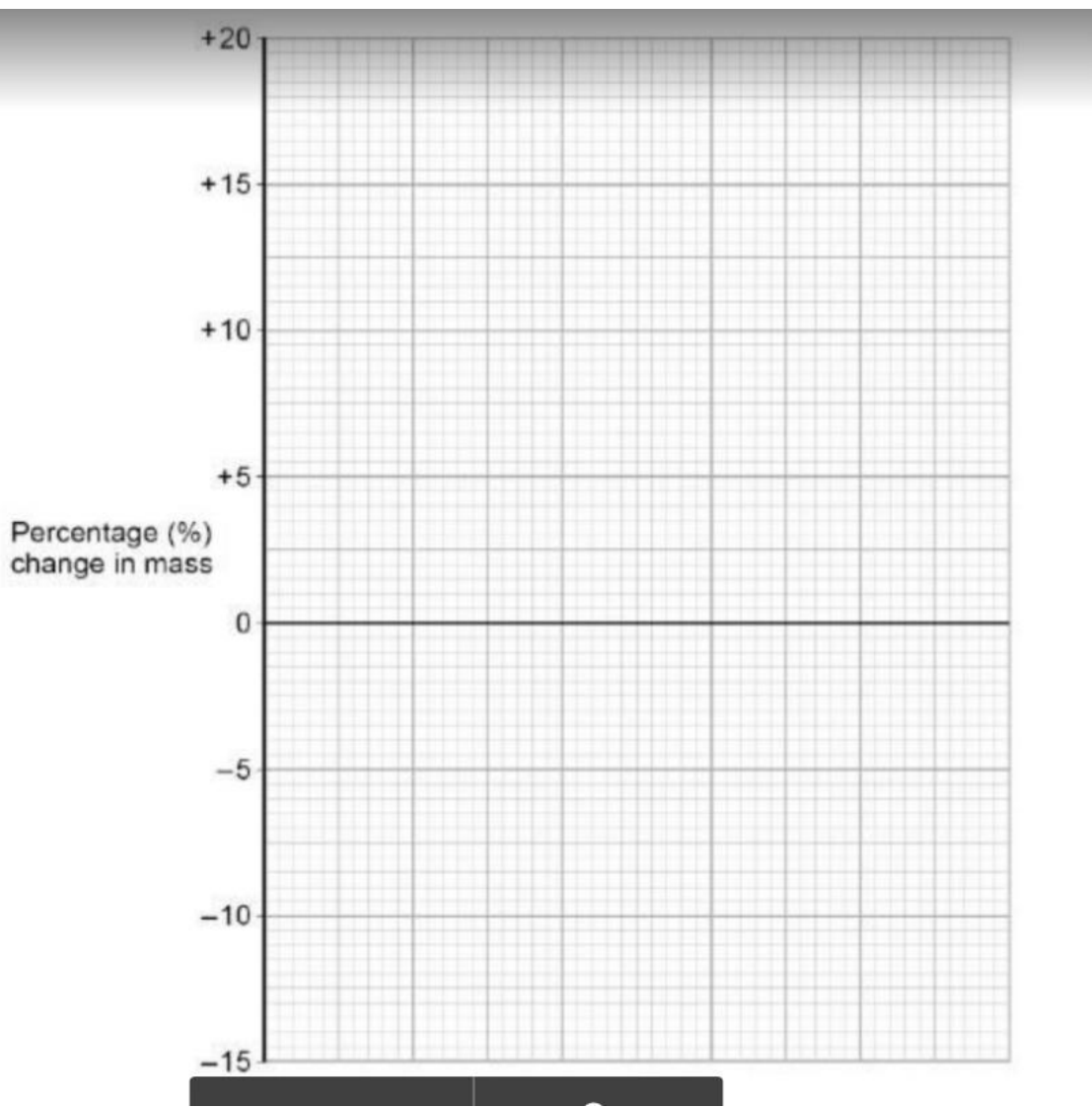
(a) Calculate the value of **X** in the table above.

Percentage change in mass = % (2)

(b) Why did the student calculate the percentage change in mass as well as the change in grams? (1)

Part 2 – Print this page and answer the questions

- (c) Complete the graph using data from the table above. • Choose a suitable scale and label for the x-axis.
 • Plot the percentage (%) change in mass. • Draw a line of best fit.



(4)

(d) Use your graph to estimate the concentration of the solution inside the potato cells.

Concentration = mol dm⁻³ (1)

(e) The results in the table above show the percentage change in mass of the potato cylinders.
 Explain why the percentage change results are positive and negative. (3)

(f) Suggest two possible sources of error in the method given for question 2. (2)

Part 3 – Preparation for the first topic

Biological molecules

Learn the answers to the questions below then cover the answers column with a piece of paper and write as many answers as you can. Check and repeat.

What are monomers?	smaller units from which larger molecules are made
What are polymers?	molecules made from a large number of monomers joined together
What is a condensation reaction?	a reaction that joins two molecules together to form a chemical bond whilst eliminating of a molecule of water
What is a hydrolysis reaction?	a reaction that breaks a chemical bond between two molecules and involves the use of a water molecule
What is a monosaccharide?	monomers from which larger carbohydrates are made
How is a glycosidic bond formed?	a condensation reaction between two monosaccharides
Name the three main examples of polysaccharides.	glycogen, starch, cellulose
Describe Benedict's test for reducing sugars	gently heat a solution of a food sample with an equal volume of Benedict's solution for five minutes, the solution turns orange/brown if reducing sugar is present
Name the two main groups of lipids	phospholipids, triglycerides (fats and oils)
Give four roles of lipids	source of energy, waterproofing, insulation, protection
What is an ester bond?	a bond formed by a condensation reaction between glycerol and a fatty acid
Describe the emulsion test for lipids	mix the sample with ethanol in a clean test tube, shake the sample, add water, shake the sample again, a cloudy white colour indicates that lipid is present
What are the monomers that make up proteins?	amino acids
Draw the structure of an amino acid	$ \begin{array}{c} \text{R} \\ \\ \text{H}_2\text{N} - \text{C} - \text{COOH} \\ \\ \text{H} \end{array} $
How is a peptide bond formed?	a condensation reaction between two amino acids
What is a polypeptide?	many amino acids joined together
Describe the biuret test for proteins	mix the sample with sodium hydroxide solution at room temperature, add very dilute copper(II) sulfate solution, mix gently, a purple colour indicates that peptide bonds are present
How does an enzyme affect a reaction?	it lowers the activation energy
Give five factors which can affect enzyme action.	temperature, pH, enzyme concentration, substrate concentration, inhibitor concentration
What is a competitive inhibitor?	a molecule with a similar shape to the substrate, allowing it to occupy the active site of the enzyme
What is a non-competitive inhibitor?	a molecule that changes the shape of the enzyme by binding somewhere other than the active site.