

# S3 science– Biology Rota 1

## Cells

Name.....

During Unit 1 I will learn about:

- Cell structure and function
- Diffusion and osmosis
- Enzymes
- Uses of microbes
- Respiration

### ☆☆☆☆ Homework Tasks☆☆☆☆

**For this topic you must complete the tasks as directed by your teacher**

### ☆☆☆☆ Homework Book☆☆☆☆

**You will be issued with 1 copy of this book only.  
If you lose it or destroy it you will be responsible for printing out another one  
at your own expense.  
An electronic copy is in the S3 Biology folder on the school system**

## WHEN IS IT DUE IN?

**You can hand your work in as soon as you like,  
but NO LATER THAN date requested**

**!!NO EXCUSES!!**

## Success criteria for extension questions

	(GREEN)	(ORANGE)	(RED)
Scientific content	Shows full understanding using correct scientific words. Can explain ideas in own words. Covers the entire topic in depth.	Shows some understanding of topic. Tries to use scientific words. Covers some aspects of topic in detail.	Limited understanding. Little detail/limited explanations. Copied words direct from source
Presentation	Excellent standard. Easy to read and makes good use of colour, pictures, labelled diagrams to explain.	Good standard contains pictures and labelled diagrams.	No labels on pictures and layout need improvement.
literacy skills	Paragraphs and sentences used consistently. Good spelling, grammar	Paragraphs and sentences used most times. Some spelling and grammar mistakes.	Little structure e.g. Paragraphs/ sentences Spelling/grammar could be improved.
References	Bibliography with 2 or more sources. All diagrams referenced.	Bibliography	No bibliography/ references given.

# Task 1

## Cell Structure

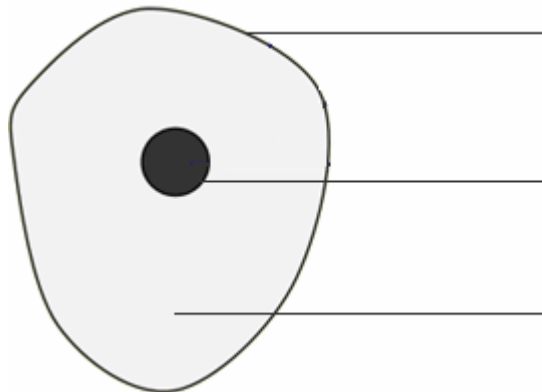
- State that cells are the basic units of living things
- Explain the purpose of staining cells
- Describe the similarities and differences between plant and animal cells
- Explain the functions of each cell structure

**Label the diagram shown below and complete the note and table to show the function of each cell structure:**

### CELLS

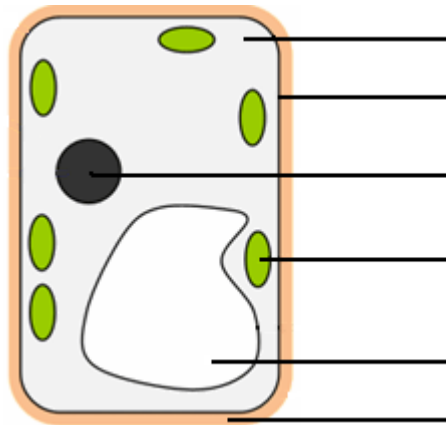
All plants and animals are made of \_\_\_\_\_ . A microscope is needed to look at cells and a \_\_\_\_\_ can be used to make the cell structures easier to see.

### ANIMAL CELL



Structure	Function
	Contains _____ and controls all the cell's _____ .
Cytoplasm	Where all the _____ _____ occur.
Cell _____	Controls the substances that _____ and _____ the cell.

**PLANT CELL**



Structure	Function
	Made of _____. Gives the cell _____.
	Contains a solution of _____ and _____.
Chloroplasts	Contain green _____ to trap _____ energy for use in _____.

**Summary of cell structure**

Tick the appropriate boxes to show which structures are found in plant and animal cells

Structure	Present <b>only</b> in <b>animal cells</b>	Present <b>only</b> in <b>plant cells</b>	Present in <b>both</b> animal and plant cells
Nucleus			
Cytoplasm			
Cell membrane			
Cell wall			
Vacuole			
Chloroplast			

## Task 2 – Extension Question Diffusion and Osmosis

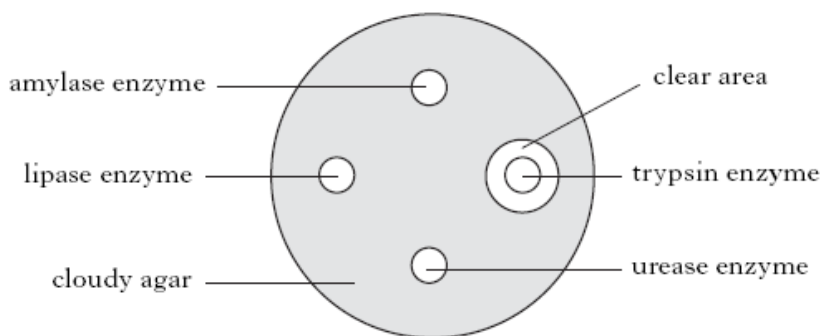
Water issues have become an extremely pressing global threat. With climate change come environmental impacts: torrential flooding in some areas, droughts in others, rising and falling sea levels. Add to that the threat of overpopulation -- and the demand and pollution a swelling population brings -- and water becomes one of the paramount environmental issues to watch for in the next generation.

Water treatment plants and systems are now adapting reverse osmosis to address some of these concerns.

Find out what reverse Osmosis is. Describe how it can be used to help provide clean drinking water.

### Task 3 enzymes

1. An investigation was carried out into digestion of a protein. The protein was mixed with agar gel in a petri dish. Four holes were cut in the gel and a different enzyme was placed in each hole. The dish was left for two days. Where digestion of the protein had taken place, a clear area developed in the gel around the hole. The diameter of the clear area was measured. The experiment was carried out four times. The diagram below represents the appearance of one of the petri dishes after two days.



a) What name is given to the substance an enzyme acts upon?

\_\_\_\_\_

1

b) Explain why trypsin digested the protein but no other enzyme did.

\_\_\_\_\_

1

The table below shows the results for each dish.

<i>Petri dish</i>	<i>Diameter of clear area (mm) around trypsin enzyme</i>
1	4.7
2	3.9
3	4.2
4	4.4
Average	

c) Complete the table by calculating the average diameter of the clear area.

1

d) Give **two** precautions, **not already mentioned**, that would have to be taken each time the experiment was carried out, to ensure validity of the results.

1. \_\_\_\_\_
2. \_\_\_\_\_

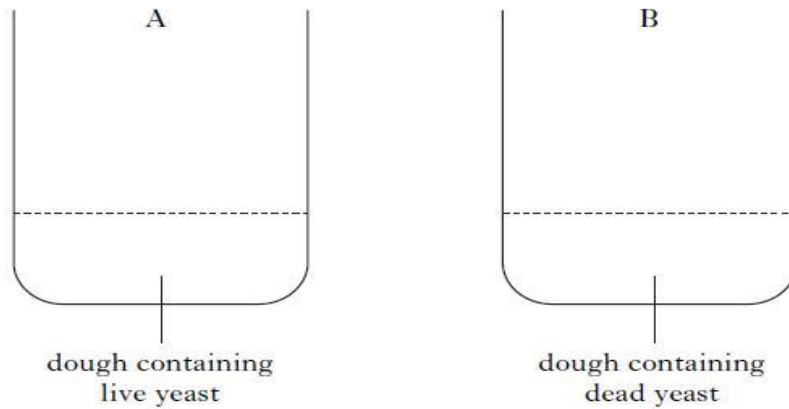
2

### Extension Question-

Enzymes are often used in industry to make products that we use every day. Find out about one product you use that is manufacture using enzymes. Name the product, the enzyme and describe as much about the process as you can.

### Task 4 Microorganisms in action

1. (a) During an investigation into the activity of yeast in bread making, a pupil divided a batch of dough into two equal portions. He added yeast to each portion before placing the dough into identical beakers as shown in the diagrams.



The volume of dough in each beaker was measured at the start and end of the investigation. The results are shown in the table below.

<i>Beaker</i>	<i>Volume of dough (cm<sup>3</sup>)</i>	
	<i>At start</i>	<i>At end</i>
A	100	250
B	100	100

(i) How many times greater was the volume of dough in beaker A at the end compared to the start?

\_\_\_\_\_ times greater

(iii) Give **two** factors, not already mentioned, which would need to be kept constant during this investigation.

1 \_\_\_\_\_

2 \_\_\_\_\_

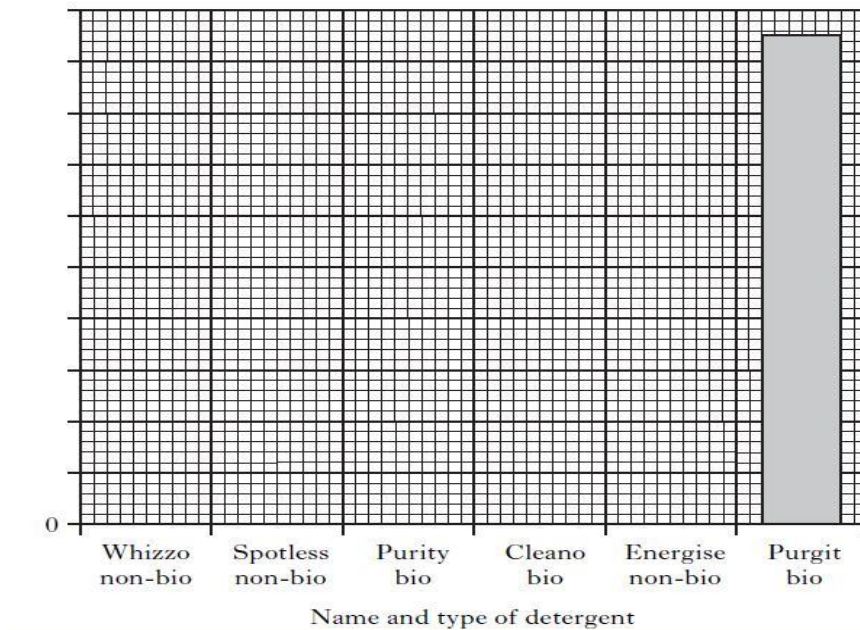
a) In an investigation into the effectiveness of different detergents, six pieces of cloth were washed. Each of the cloths had identical stains and all variables other than the detergent were



kept the same. After washing, the percentage of the stain which had been removed was calculated. The results are shown in the table.

<i>Name of detergent</i>	<i>Type of detergent</i>	<i>Stain removed (%)</i>
Whizzo	Non-biological	50
Spotless	Non-biological	40
Purity	Biological	75
Cleano	Biological	80
Energise	Non-biological	65
Purgit	Biological	95

Use the information from the table to copy and complete the bar chart showing the detergents and their percentage of stain removed by:



ii) Give **two** conclusions which can be drawn from the results (on graph).

1. \_\_\_\_\_

2. \_\_\_\_\_

3, The table shows how the fat content of the yoghurt varies according to the type of milk used to make it.

<i>Type of milk used</i>	<i>Fat content of yoghurt (%)</i>
whole	over 3·0
semi-skimmed	0·5–3·0
skimmed	under 0·5

The following table shows the fat and lactose content of three yoghurts.

<i>Yoghurt</i>	<i>Composition</i>	
	<i>fat (%)</i>	<i>lactose (%)</i>
A	2·8	3·9
B	4·0	4·5
C	0·4	3·0

(i) Using information from both tables, identify which yoghurt was made from:

- 1 semi-skimmed milk yoghurt \_\_\_\_\_
- 2 whole milk yoghurt \_\_\_\_\_

(ii) What is the range of lactose concentrations in the yoghurts?

From \_\_\_\_\_ to \_\_\_\_\_%

Task 5- Respiration

1. The following list contains some features of aerobic and anaerobic respiration in germinating peas

- W Does not use oxygen
- X Produces carbon dioxide
- Y Yields 38 molecules of ATP per glucose molecule
- Z Produces ethanol

Complete the table below by writing the letters from the list in the correct columns. Each letter may be used once or more than once.

<i>Aerobic respiration in germinating peas</i>	<i>Anaerobic respiration in germinating peas</i>

2. The word equation for aerobic respiration is:-



## Self-evaluation

### Skills

Skills for Learning	Skills for Life	Skills for Work
<ul style="list-style-type: none"><li>• Creating</li><li>• Evaluating</li><li>• Analysing</li><li>• Applying</li><li>• Understanding</li><li>• Remembering</li></ul>	<ul style="list-style-type: none"><li>• Working with others</li><li>• Good communicator</li><li>• Accept and respond to challenges</li><li>• Take responsibility for managing own learning</li><li>• Take good care of yourself</li></ul>	<ul style="list-style-type: none"><li>• Positive attitude</li><li>• Determined to succeed</li><li>• Ability to work with others</li><li>• Ability to communicate (orally and written)</li><li>• Flexibility in approach to work</li><li>• Ability to take responsibility</li></ul>

**Choose 1 skill from each box and describe an occasion during the course you used this skill.**

### **This list of Biology Skills may help you**

1. Focused a microscope.
2. Calculated cell size.
3. Wrote a scientific report.
4. Constructed a line graph
5. Make a contribution when working in a group.
6. Worked independently.
7. Designed and carried out practical investigations.
8. Related what I learned to real life situations.
9. Debate an ethical issue.
10. Make physiological measurements.

I can make life style choices based on consequences to my health. I now know that I must:-

1. My marks for unit 1 assessment.

Unit	Marks
1. Cell Biology	

2. I completed a practical report

The title of the report I did best in was:

To learn I must:

1. Attend class.
2. Listen and take part in lessons.
3. Complete all the classwork.
4. Complete all the homework.
5. Revise from my notes at home.
6. Attend supported study for extra help.
7. Take responsibility for my learning and look after my jotter and books.
8. If I miss work it is my responsibility to catch up.

Things I could do to improve my learning:

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