



Name:

Biology Summer work for New A Level Students

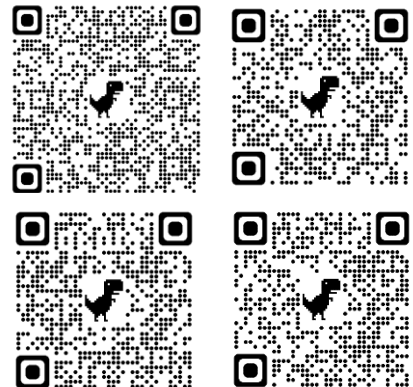
Here is a list of tasks for you to complete and bring to your **first** biology lesson in September. There will be a **TEST** on this work within the first 2 weeks of ter. You will also need to bring a Folder, A4 file lined paper, file dividers, calculator, ruler, pens, highlighter and pencil.

Task	Description of Task	Tick when task complete
1	Diagrams and notes on Organelles of Eukaryotic Cells	
2	Graph to draw and follow up questions. Use Graph paper	
3	Units and some simple mathematical tasks	

### Task 1

There are two main types of cells; **Eukaryotic and Prokaryotic**. Your task is to study the features of a **Eukaryotic cell**. Use the resource links below to complete the questions – If you google “A level Biology Eukaryotic cells” you will get lots of suitable links too.

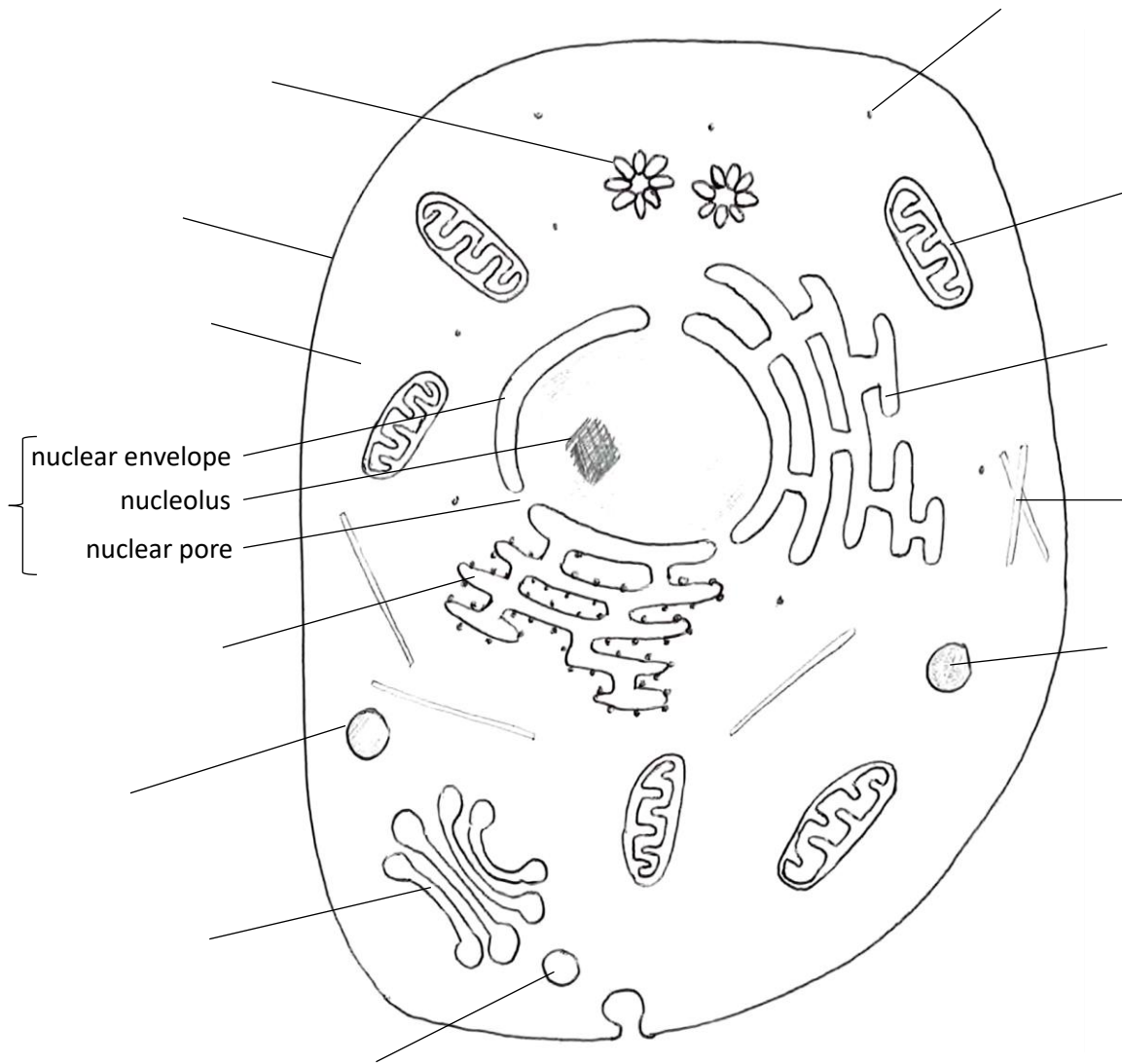
- <https://alevelnotes.com/notes/biology/cells/cell-structure/organelle-structure-and-function>
- <https://www.youtube.com/watch?v=cj8dDTHGJBY>
- <https://www.youtube.com/watch?v=9UvIqAVCoqY>
- <https://www.ivyroses.com/Revise/Biology/index.php>  
(scroll down to “Introduction to cell biology”)



### Task 1 Questions

1. What is the key feature of a eukaryotic cell?
2. List 4 groups of organisms that have Eukaryotic cells
3. What is a Prokaryotic cell?
4. What is an organelle?
5. Clearly label the two diagrams on the next page, an animal cell and a plant cell. You will need to learn these.

Animal cell





6. Make a table to show the key differences between animal and plant cells.

7. Make brief notes on the FUNCTION (not structure) of each of the organelles listed in the table below. Tick them off as you do them. You could present this information in a table or as neat notes. Attach them to the back of this document when you hand it in.

*e.g. Ribosome – site of protein synthesis where amino acids are condensed together to form polypeptides (proteins)*

Cell/Plasma membrane		Vesicle	
Cell Wall		Golgi apparatus/Bodies	
Nucleus		Mitochondria	
Nucleolus		Chloroplast	
Lysosome	✓	Centriole/Centrosome	
Ribosome		Cilia	
Rough Endoplasmic Reticulum		Flagellum	
Smooth Endoplasmic Reticulum		Cytoplasm	

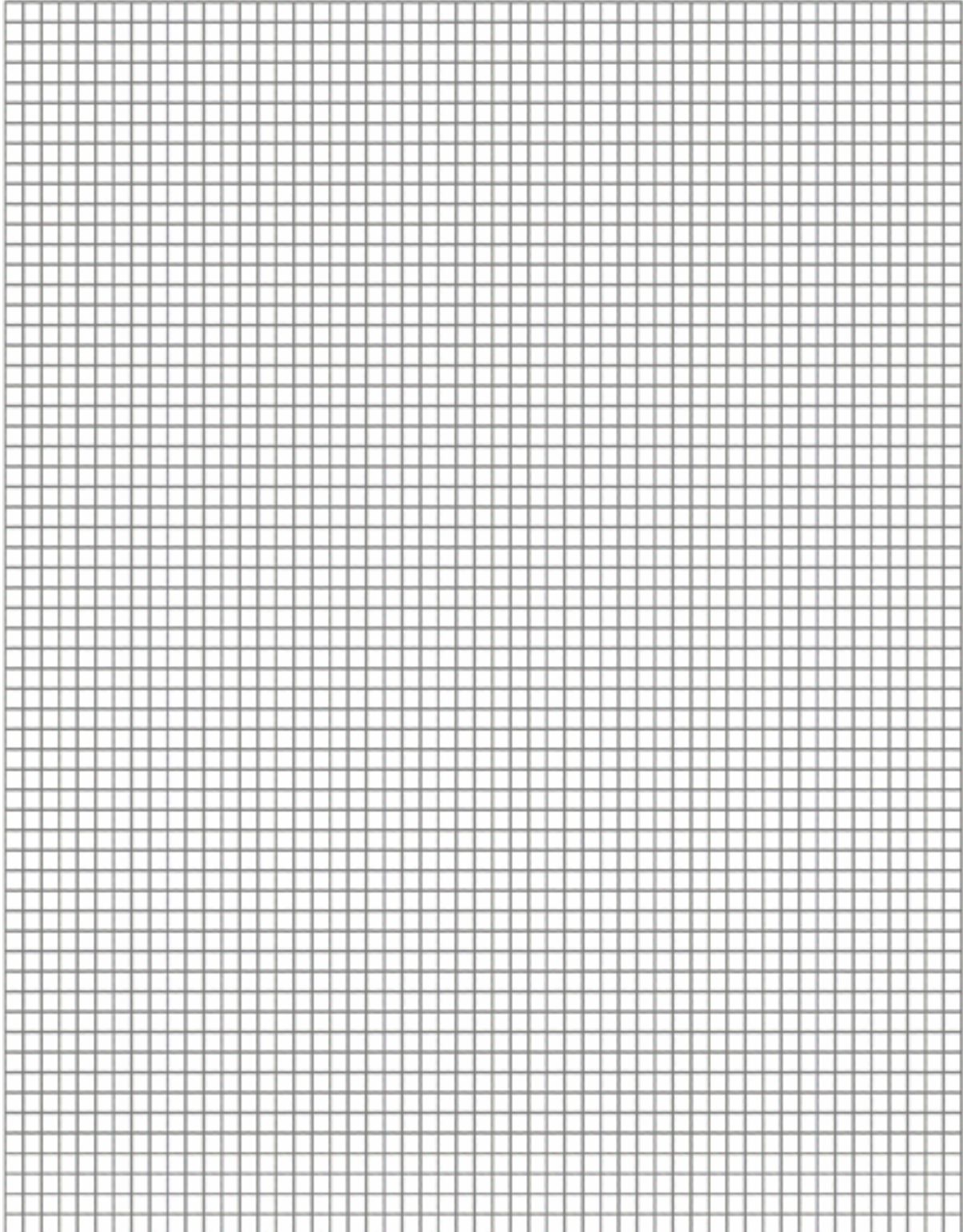
### Task 2 – Drawing a line graph and follow up questions

When an animal such as a rabbit is knocked down and killed by a car, flies soon find its body. They lay their eggs on it. The eggs hatch into maggots which burrow into the body. The maggots grow rapidly and then moult to form pupae. A new generation of flies emerges from these pupae.

Table 1 The effect of temperature on the time taken for fly eggs to hatch.

Temperature / °C	Time taken for eggs to hatch / hours
5	230
10	90
11	70
13	50
17	30
19	25

1. Use the data from table 1 to plot a suitable graph below, draw a smooth curve of best fit. This can be worth 4 – 5 marks at A level. *Remember, the Independent variable (in this case Temperature) always goes on the x axis. This carefully about your scales on your axes to make the most of the graph paper. Use a sharp pencil to accurately plot your points and label your axes.*



2. A dead badger was found half-hidden among some bushes, there were many fly eggs on it and some of these had just hatched. Use your graph to estimate how many hours had passed since the badger's death if the temperature where it was found was:
  - a. 15°C
  - b. 7°C
  
3. If fly eggs take 180 hours to hatch, use your graph to estimate the temperature of the environment those eggs are in.
  
4. Describe the pattern of results from the table/graph.
  
5. When the temperature rose from 5°C to 10°C there was a decrease of 140 hours in the time taken for the eggs to hatch (230-90). Calculate the percentage decrease.

$$\text{Percentage decrease} = \frac{\text{change}}{\text{initial value}} \times 100 = \dots\dots\dots\%$$

6. What is the percentage decrease in the time taken for eggs to hatch when the temperature rose from 5°C to 17°C?

Task 3 – units, Standard Form and calculations

1. A student measured the length of some onion cells under a microscope. Here are the results – the unit is the micrometre  $\mu\text{m}$  – 250,200,200,320,200,250,300,290,160.
  - a. What is the range of the results?
  
  - b. What is the mode?
  
  - c. What is the median?
  
  - d. What is the mean?

2. Units – You may need to convert between units. Cells are very small so you need to be comfortable using small measurements such as micrometres and millimetres. Complete the following table.

$1\text{mm} = 1000\text{ micrometres } (\mu\text{m}) \text{ or } 1 \times 10^3 \mu\text{m}$ $\text{So } 1\text{ cm} = 10\text{ mm} = 10,000\ \mu\text{m}$
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In metres (m)	In centimetres (cm)	In millimetres (mm)	In micrometres ( $\mu\text{m}$ )
2	200	2000	2,000,000
		11	
		3.4	
0.35			
	65		
			78,500
			25

3. Convert these and write your answers in standard form when possible

In metres (m)	In centimetres (cm)	In millimetres (mm)	In micrometres ( $\mu\text{m}$ )
2.3	$2.3 \times 10^2$		$2.3 \times 10^6$
$4 \times 10^{-6}$		$4 \times 10^{-3}$	4
			40
		12	
	2.5		

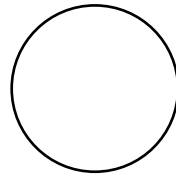
4. Give these numbers to 2 significant figures:

- a. 156
- b. 2,929,385
- c. 0.000837965
- d. 10,490

## Surface area and volume

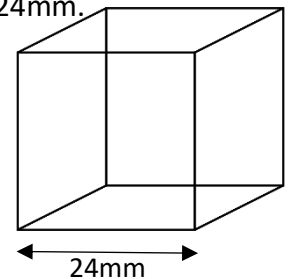
Make all measurements in mm and give answers to **one decimal place**. Don't forget your **units**.

- 1) Calculate the area of this circle?

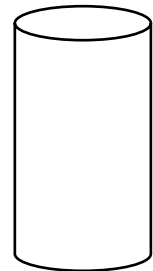


- 2) Draw a rectangle that is 2.1cm long and 3.6cm wide. Calculate the area of the rectangle you have drawn, give your answer in **mm and cm**.

- 3) Calculate the **surface area** and **volume** of a cube with the side length 24mm.



- 4) Calculate the **surface area** and **volume** of this cylinder – don't forget the units!



- 5) Finally, what is the surface area to volume ratio for:

a. The cylinder from question 4

b. The cube from question 3

*Hint: you just need to divide surface area by volume and write your answer .....:1*