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SCG 30

14Learn 30 Hours
2Enrich
14Study

Summer Work for New A level Biology Students

Welcome to A level Biology

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 the term.

You will also need to bring a Folder with dividers, lined A4 file paper, calculator, ruler, pens, highlighters and pencils.

Task	Description of task	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	
4	Applications of biology	

## Task 1 - Eukaryotic cells answers on A4 Paper

Use the resource links below to complete the questions- If you Google "A level Biology eukaryotic cells" you will get lots of other suitable links too

1. https://www.cellsalive.com/cells/cell_model_js.htm interactive cell models
2. http://www.ivyroses.com/Biology/Cells/Plant-Cell-Structure.php
3. On YouTube- "Crash courses Biology-Eukaryopolis-The City of Animal Cells: Crash course Biology #4 https://www.youtube.com/watch?v=cj8dDTHGJBY
4. Crash course Plant cells #6 https://www.youtube.com/watch?v=9UvlgAVCogY

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 below. An animal cell and a Plant cell as seen under a Transmission Electron microscope. You will need to **LEARN the names of these structures for the test.** Structures may look slightly different on different diagrams.
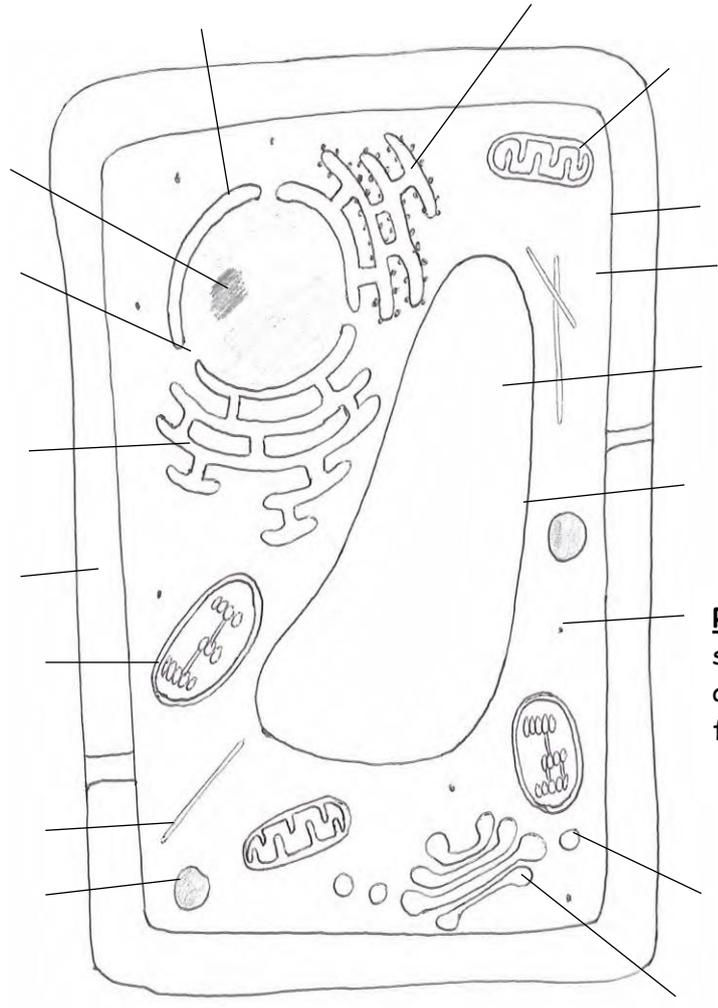6. Make a table in your notes to show the key differences between Plant and Animal cells

Animal Cell

Ribosome - Site of protein synthesis where amino acids are condensed together to form polypeptides (proteins)
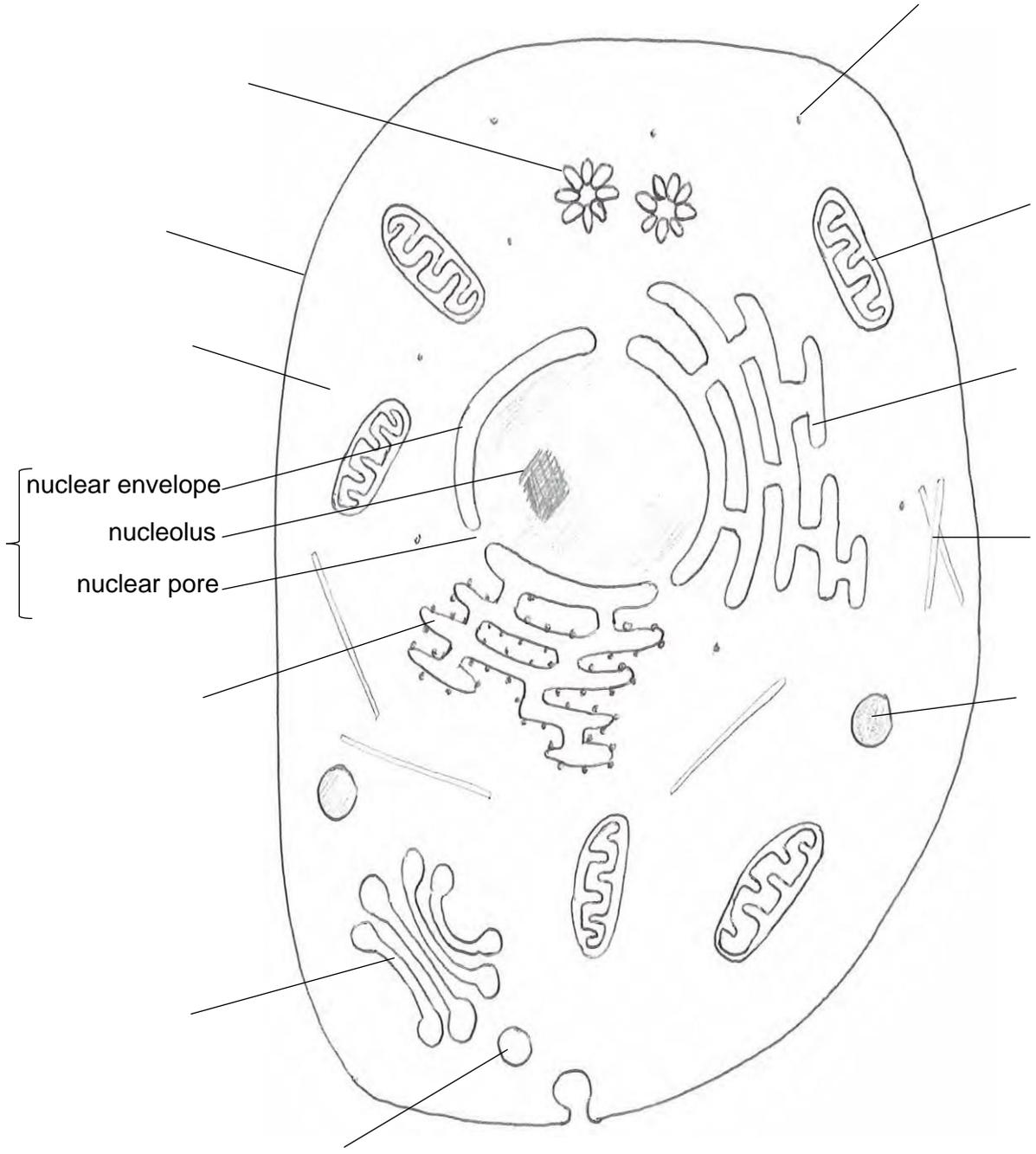
nuclear envelope

nucleolus

nuclear pore

Plant Cell

Ribosome - Site of protein synthesis where amino acids are condensed together to form polypeptides (proteins)

7. Next make brief notes on the **FUNCTION** of each of the organelles listed below. Tick them off as you do them. You could present this information as a table or clearly annotate the diagrams above. **Ribosome has been done for you on both diagrams.**

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 (cytosol)	

Task 2 - Drawing a line graph and some 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. Plot the data in the table as a suitable graph. Draw a smooth curve of best fit.
   - *Remember that the Independent variable (in this case the Temperature) goes on the x axis. Think carefully about your scales on your axes so as to use most of the graph paper. Use a sharp pencil to accurately plot your points. Label axes etc.*

Answer the following questions on lined paper.

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 at the place where it was found was
   a)   15°C
   b)   7°C

3. If flies eggs take 180 hours to hatch. Use your graph to estimate the temperature of the environment that these eggs where in

4. Describe the pattern of results (where possible use data to help you)

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a) When the temperature rose from 5 to 10 ^0C there was a decrease of 140 hours in the time taken for the eggs to hatch. (230-90). Calculate the percentage decrease.

   % decrease = <u>change</u>   x100   =
              Initial value

b) What is the percentage decrease in the time taken for eggs to hatch when the temperature rose from 5 ^0C to 17 ^0C?
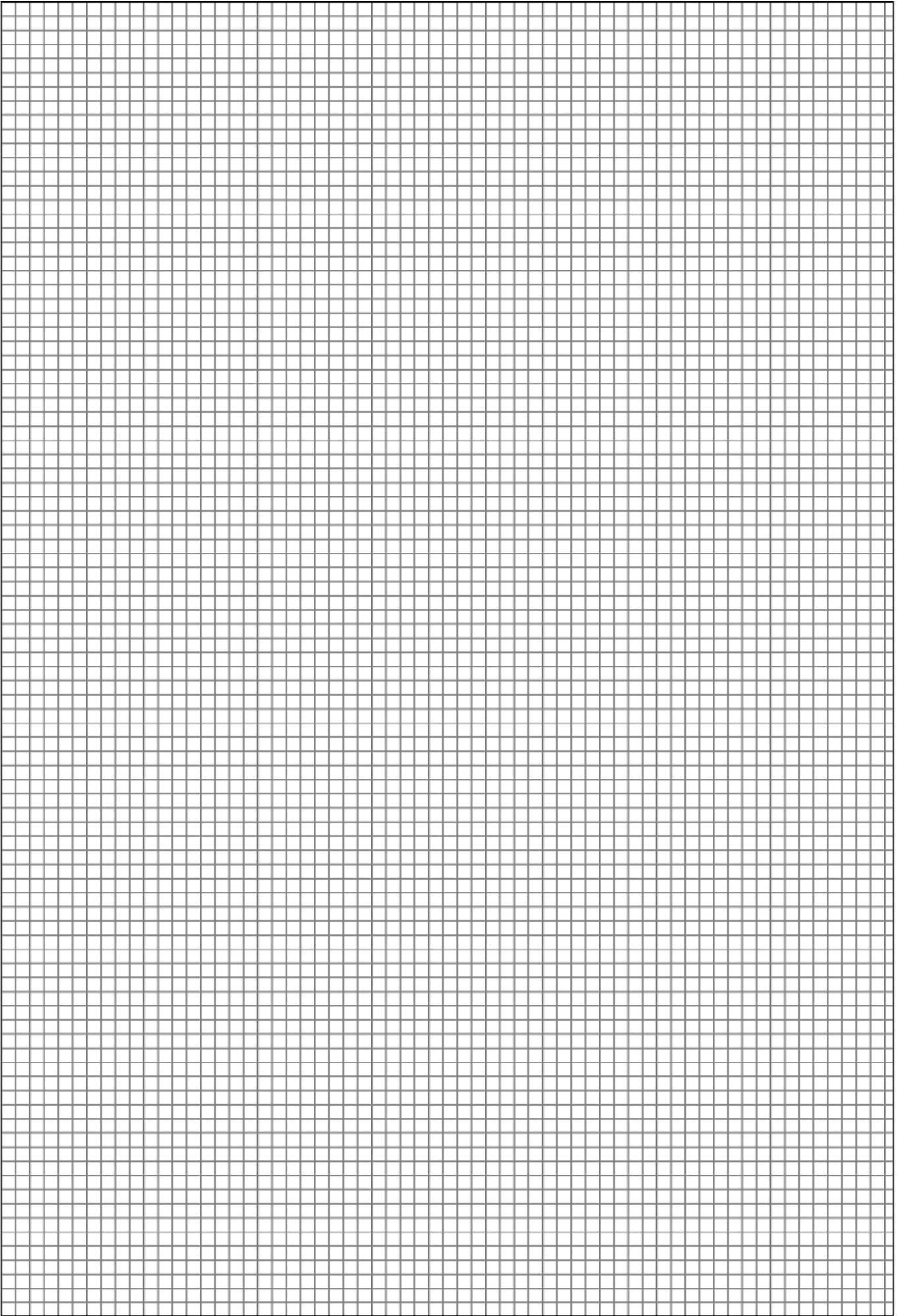
Task 3 - Units, Standard form and calculations- Some maths questions-
Answers on this sheet please

1. A student measured the length of some onion cells under a microscope in micrometres (μm) here are the results: 250, 200, 200, 320, 200, 250, 300, 290, and 160.

a) What is the range of the results, don't forget the units!

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 and so we often use micrometres as a unit of length when measuring cells. Complete these tables

> **1mm = 1000 micrometres** (μm) or 1×10^3 μm
> So 1cm = 10mm=10,000 micrometres (μm) or $1 \times 10^4 \mu$m

In metres (m)	In centimetres (cm)	In millimetres (mm)	In micrometres (μm)
2	200	2000	2000000
		11	
		3.4	
0.35			
	65		
			78500
			25

3. Convert these and write all your answers in **STANDARD FORM**

In metres (m)	In centimetres (cm)	In millimetres (mm)	In Micrometres (μm)
2.3×10^0	2.3×10^2		2.3×10^6
4×10^{-6}		4×10^{-3}	4×10^0
			4×10^1
		1.2×10^1	
	2.5×10^0		

4. Give these numbers to 2 **SIGNIFICANT FIGURES**.

a) 156   b) 2929385   c) 0.000837965   d) 10490

Task 4 - Biology and its practical applications

A Level Biology will give you an exciting insight into the contemporary world of biology. You will learn about the core concepts of biology and about the impact of biological research and how it links to everyday life. You will learn to apply your knowledge, investigate, and solve problems in a range of contexts. You will learn how society makes decisions about scientific issues and how science contributes to the success of the economy and society.

TASK:
Visit the following website, which is part of the University of Cambridge's HE+ resources for A level students:
https://myheplus.com/subject/biology
This website has details of different and diverse biological topics, e.g. epigenetics, microscopy, and neuroscience.

Choose one of the topics on the HE+ website. Use the resources (and your own research if you wish) to produce a written report on your chosen topic, up to 500 words maximum.

Include:
- ☐ an introduction explaining why you picked this particular topic
- ☐ the key ideas related to the topic
- ☐ explanations of any keywords used
- ☐ an outline of some practical applications for the future, if research in this area is developed further
- ☐ you may include a diagram/image if it will help you explain the topic

Your report may be handwritten or typed.
Note: If you have a particular interest in medicine or veterinary medicine, you may use a topic from those sections instead.