



Name

Biology Department Summer Work for New A level 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 | |

Task 1 - Eukaryotic cells answers on A4 Paper

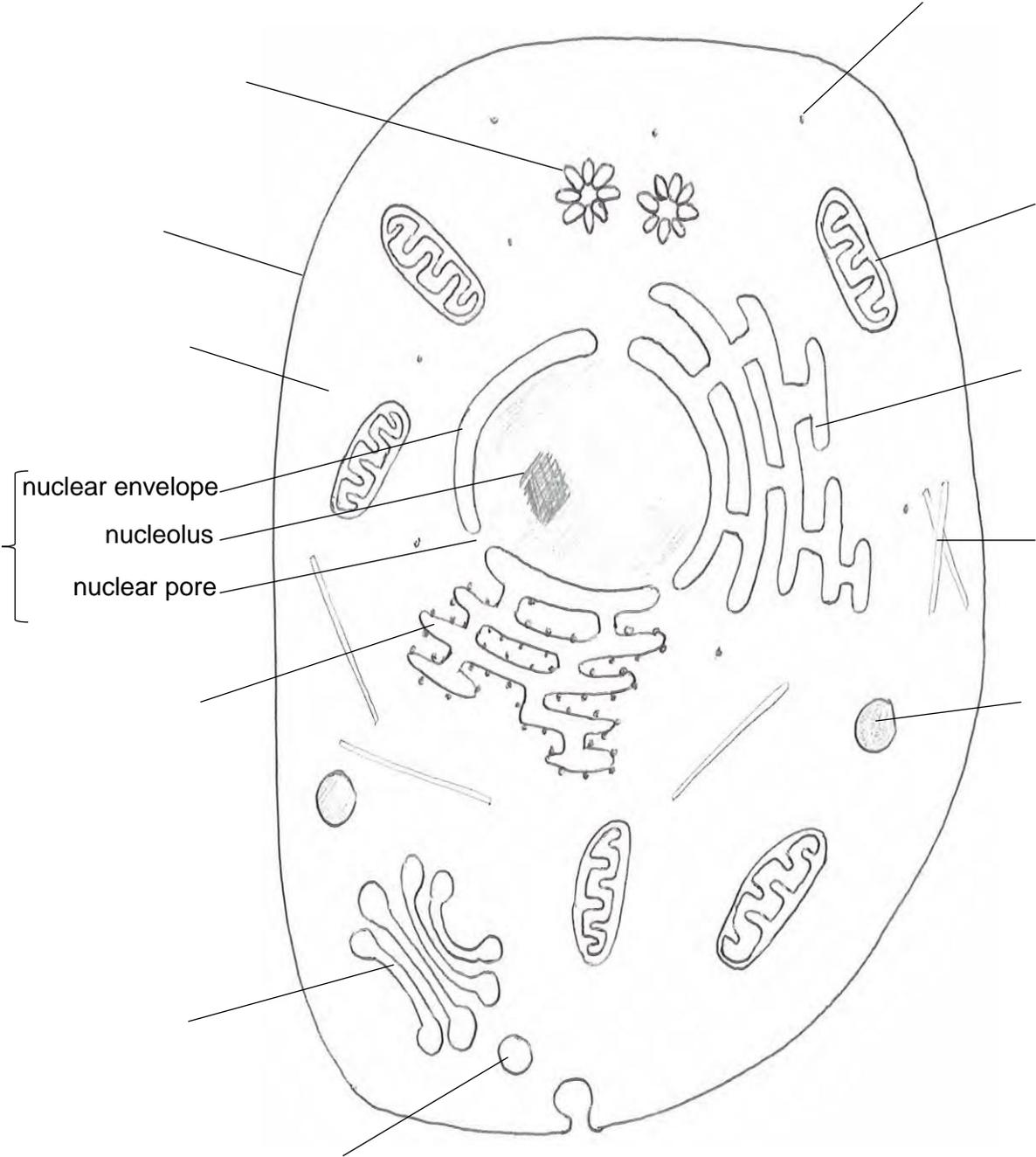
Use the resource links below to complete the questions- If you Google "A level Biology eukaryotic cells" you will get lots of other suitable links too

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=9UvlqAVCoqY>

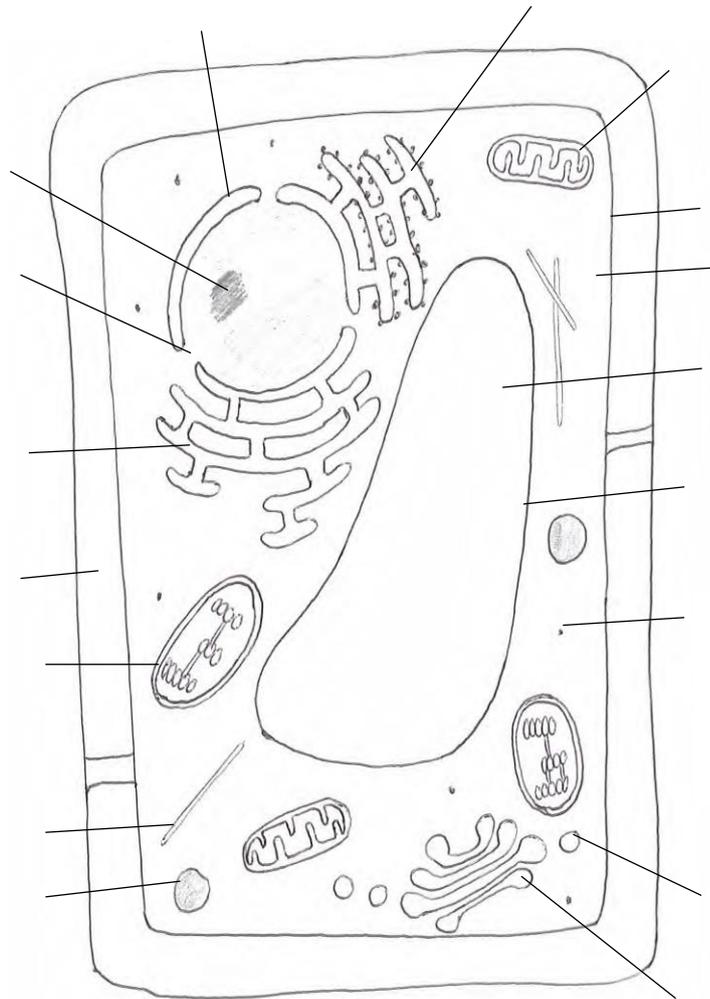
1. What is the key feature of a Eukaryotic cell?
2. List 4 groups of organisms that have Eukaryotic cells
3. What is a Prokaryotic cell?
4. What is an Organelle?
5. Clearly label the two diagrams below. An animal cell and a Plant cell as seen under a Transmission Electron microscope. You will need to **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)



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 were in

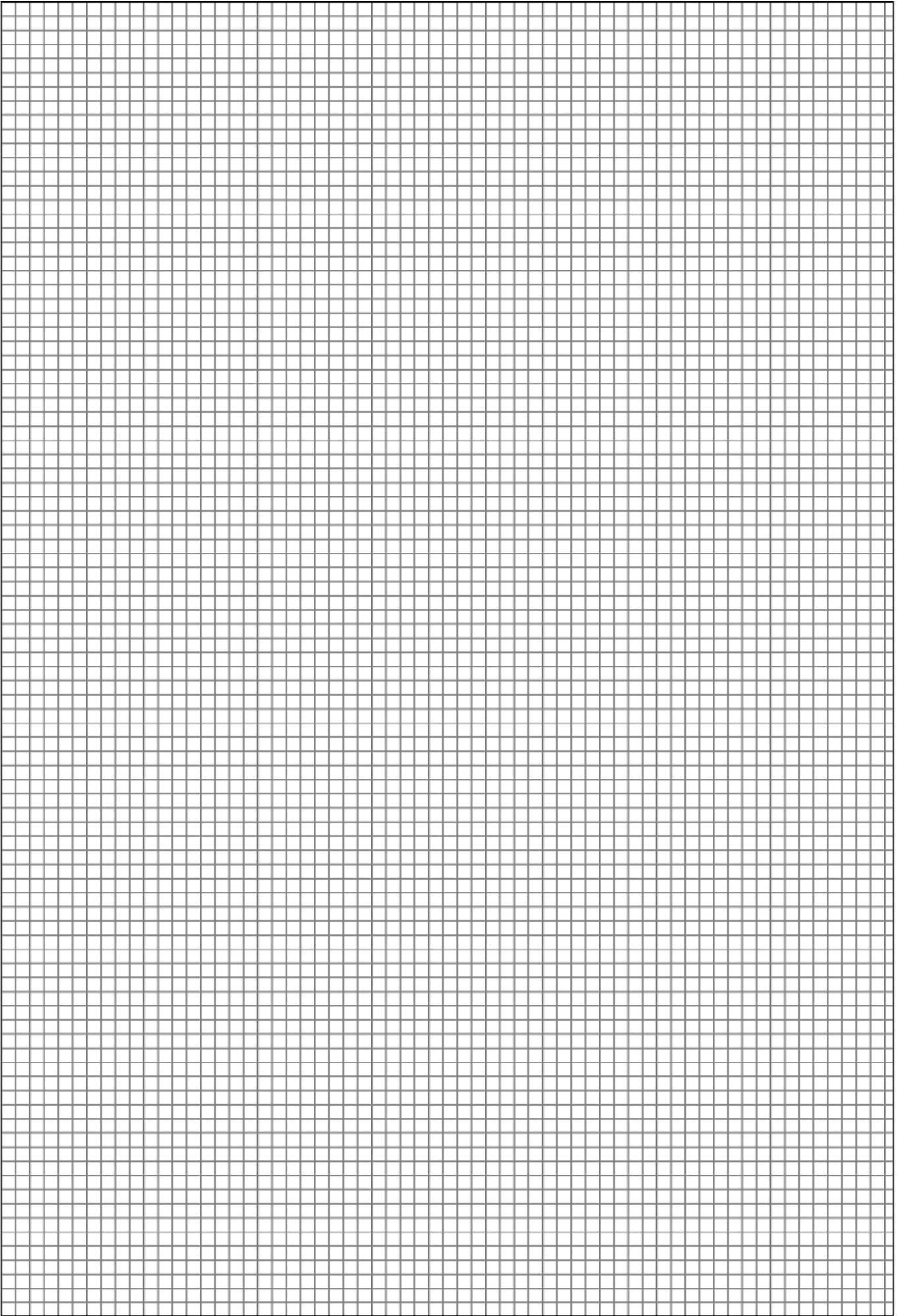
4. Describe the pattern of results (where possible use data to help you)

5

- a) When the temperature rose from 5 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.

$$\% \text{ decrease} = \frac{\text{change}}{\text{Initial value}} \times 100 =$$

- b) 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- 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

| |
|---|
| $1\text{mm} = 1000 \text{ micrometres } (\mu\text{m}) \text{ or } 1 \times 10^3 \mu\text{m}$ $\text{So } 1\text{cm} = 10\text{mm} = 10,000 \text{ micrometres } (\mu\text{m}) \text{ or } 1 \times 10^4 \mu\text{m}$ |
|---|

| 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

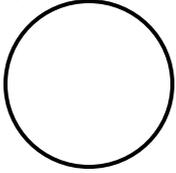
c) 0.000837965

d) 10490

Surface Area and Volume

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

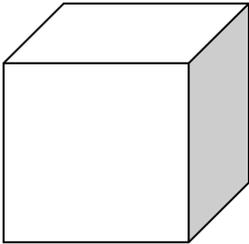
1) Measure and calculate the area of this circle.



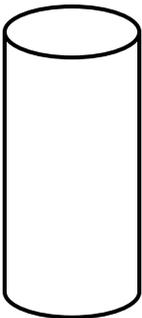
2) Calculate the Area of a rectangle which is 2.1cm wide and 3.6cm in length. Please give your answer in cm^2 **and** mm^2



3) Calculate the Surface Area **and** Volume of a cube with sides all 24mm



4) Measure and calculate the Surface Area **and** the Volume of this cylinder in - units please for both



Finally what is the surface area to volume ratio for:

a) The Cylinder

b) The cuboid

Hint - you just need to divide your answer for SA by your answer for volume and then write your answer ... : 1