Kettering Buccleuch Academy
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Part of United Learning

AS Biology Transition tasks

Name: _____

Previous School: _____

GCSE science grades

Combined: _____

Biology: _____
Chemistry: _____
Physics: _____

AS Biology – Transition task

Part A: AQA Specification - 3.2.1.1 Structure of eukaryotic cells

The cell theory is a unifying concept in biology. A lot of the Biology you learn about will depend on your understanding of the Ultra-structure (what can be seen with an electron microscope) of Eukaryotic cells.
You will need to be able to compare the structure of animal and plant cells.
This work should be presented as a continuous piece of work which includes the following;

1) A definition of the terms eukaryotic and ultra-structure.
2) Labelled (hand drawn) diagrams of an animal and a plant cells' ultrastructure. It is important that you take care in trying to draw the organelles accurately so you can easily recognise the organelles.
3) A description (in your own words) of the function of each of the organelles below.

    - Cell-surface membrane
    - Nucleus
    - Nucleolus
    - Mitochondria
    - Chloroplasts (in plants and algae)
    - Golgi apparatus and Golgi vesicles
    - Lysosomes (a type of Golgi vesicle that releases lysozymes)
    - Ribosomes
    - Rough endoplasmic reticulum
    - Smooth endoplasmic reticulum
    - Cell wall (in plants, algae and fungi)
    - Cell vacuole (in plants).

4) Electron micrograph images (at least 2 animal and 2 plant) which are labelled with all/most of the above structures.
5) **You should reference your research which will include a list of websites/sources you have used to research this information.**

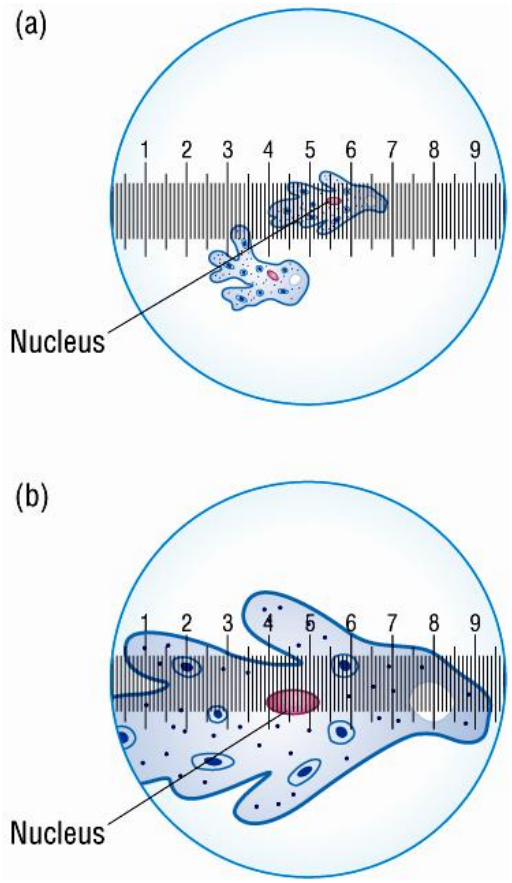
It always impresses us in Biology if you go above and beyond...

Extra challenge

⇒ Draw detailed diagrams of the chloroplast and mitochondria.
⇒ *Identify the function of the different structures within the chloroplast and mitochondria.*
⇒ *What increases the surface area of the inner mitochondrial membrane?*
⇒ *Give all the functions of the nucleus.*
⇒ *Find out at least four functions of the Golgi apparatus.*
⇒ *What is the role of lysosomes in the animal cell?*
⇒ *Do all cells have vacuoles?*
⇒ Select 2 different specialised cells and identify how their structures differ. Explain reasons behind these differences and how it allows the specialised cell to carry out its function.

Part B: AQA Specification - 3.2.1.3 Methods of studying cells

1. Research and find out what an eyepiece **graticule**, stage **graticule** and stage **micrometer** is.



The eyepiece graticule remains constant no matter what magnification the cells are viewed at.

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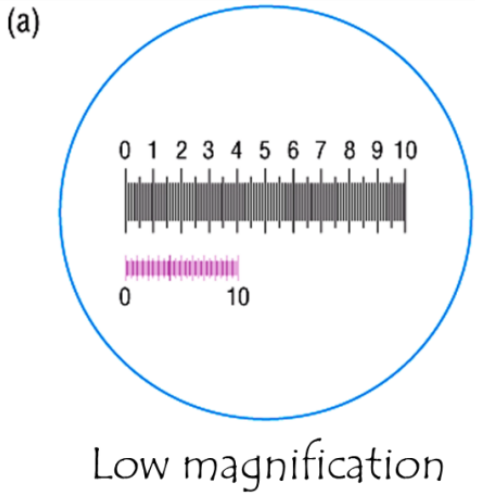
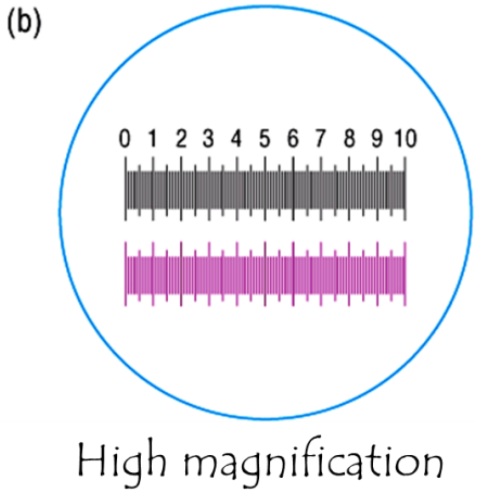
2. Can you spot which is the eyepiece graticule and which is the stage micrometer in these two images? Label which is which on the picture



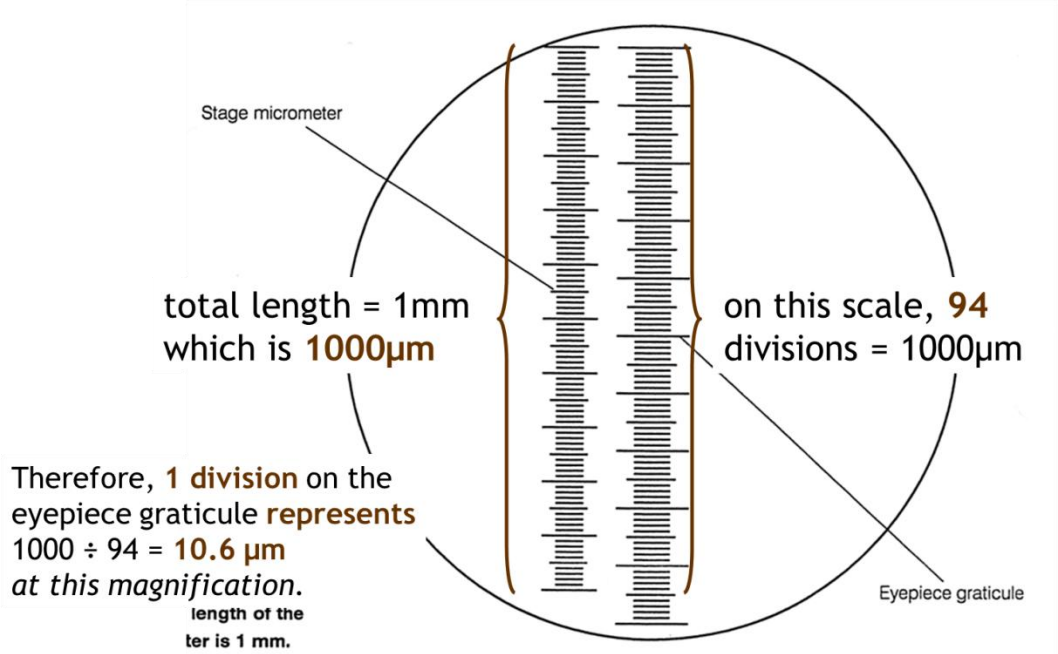
Low magnification



High magnification

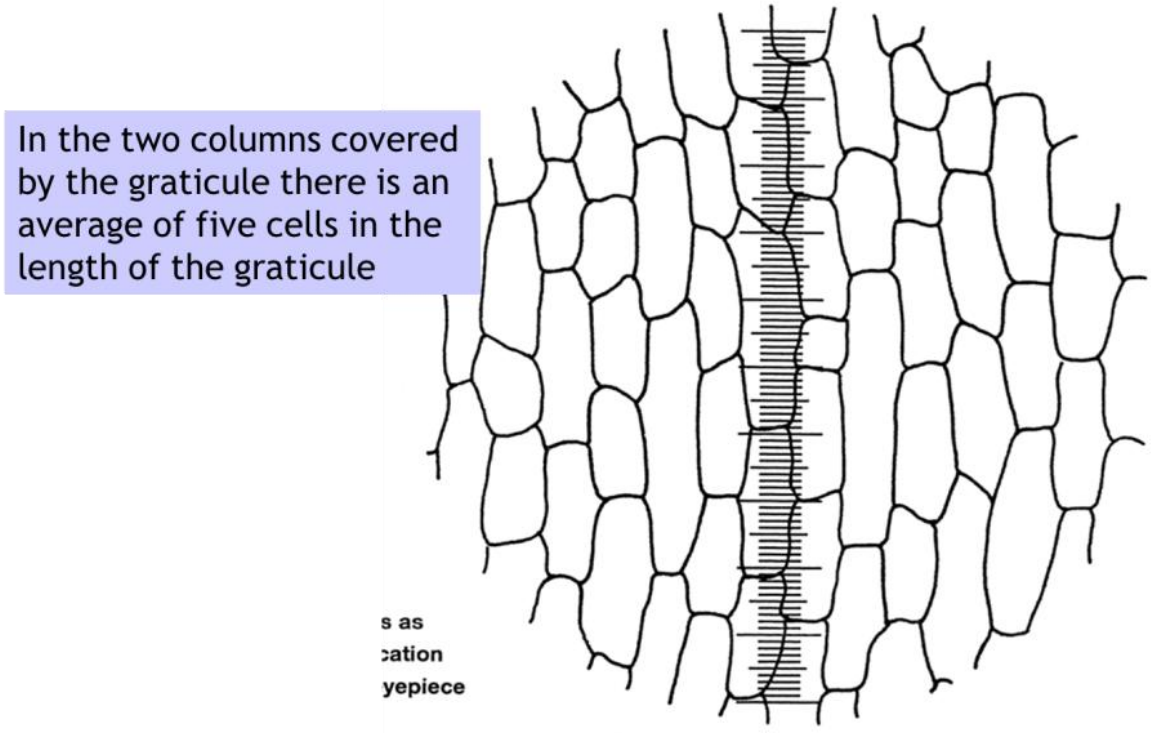
Here, a stage micrometer and eyepiece graticule are seen at **x100 magnification**

3. You are shown what 94 divisions of the eye piece graticule represents so….**What is the TOTAL LENGTH OF THE GRATICULE? _____ µm**

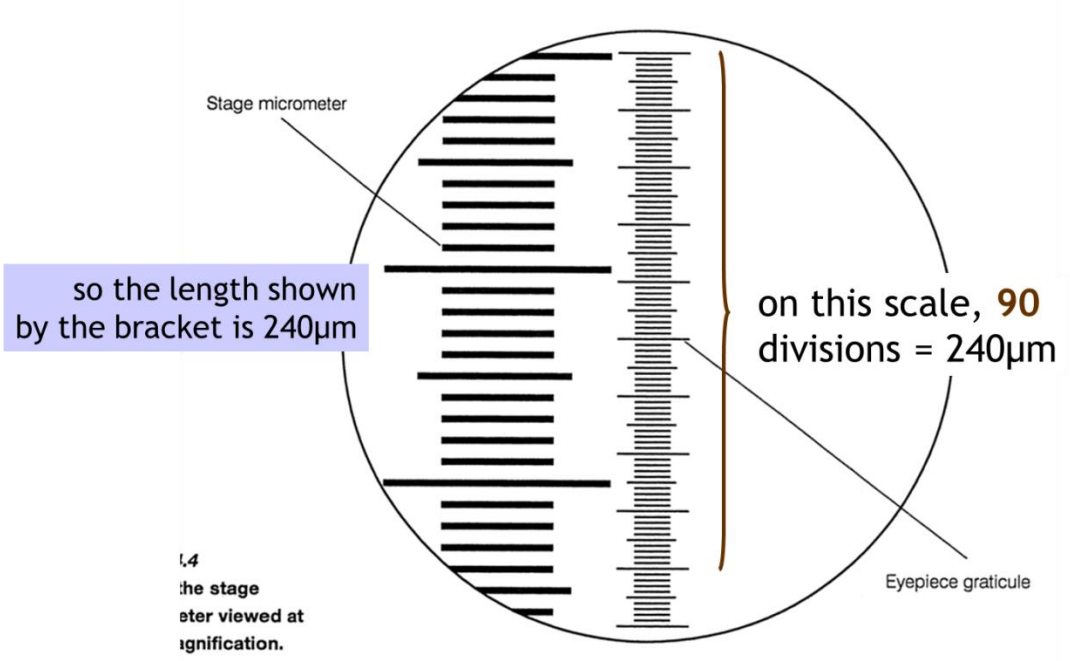


4. Here is a slide of onion epidermis viewed at x100 magnification with a graticule in the eyepiece – what is the length of one cell in **micrometres (µm)? (top tip: use the number of cell shown and the total length of the eye piece graticule) Show your working.**

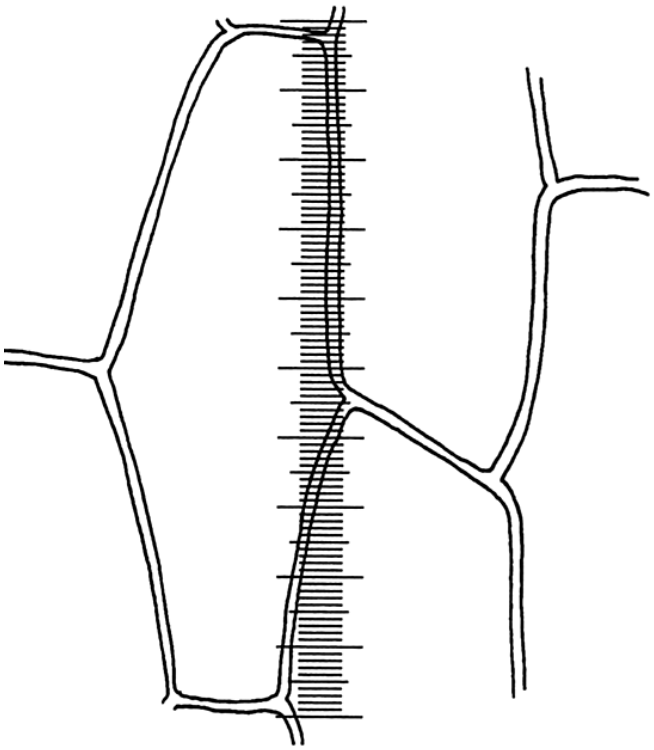
_____



5. Here is the stage micrometer and eyepiece graticule again – this time at x400 magnification. Remember the stage micrometer's total length was 1mm (1000µm). Can you follow the steps to work out what one division of the eyepiece graticule now represents?
   1 division of the eyepiece graticule now represents _____µm

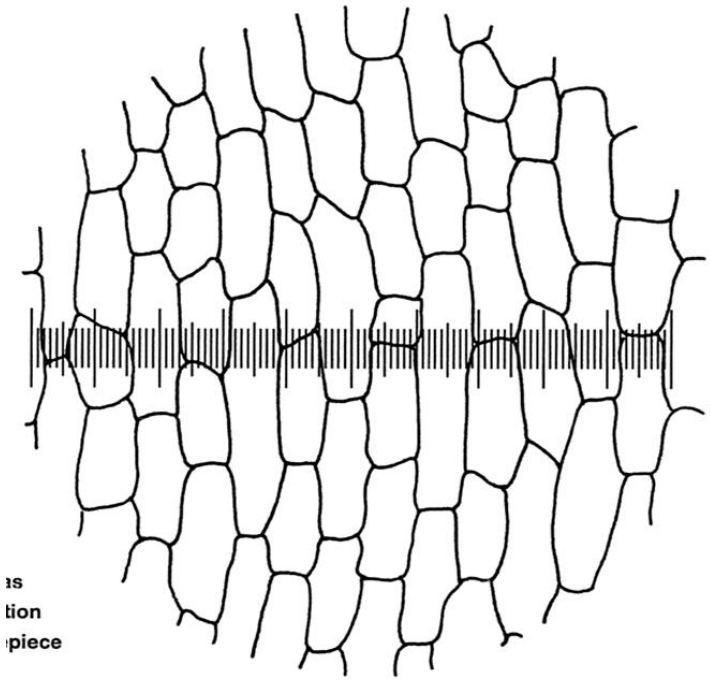


6. Using this information – what is the length of the full cell that is shown below? Remember to give the appropriate units. _____

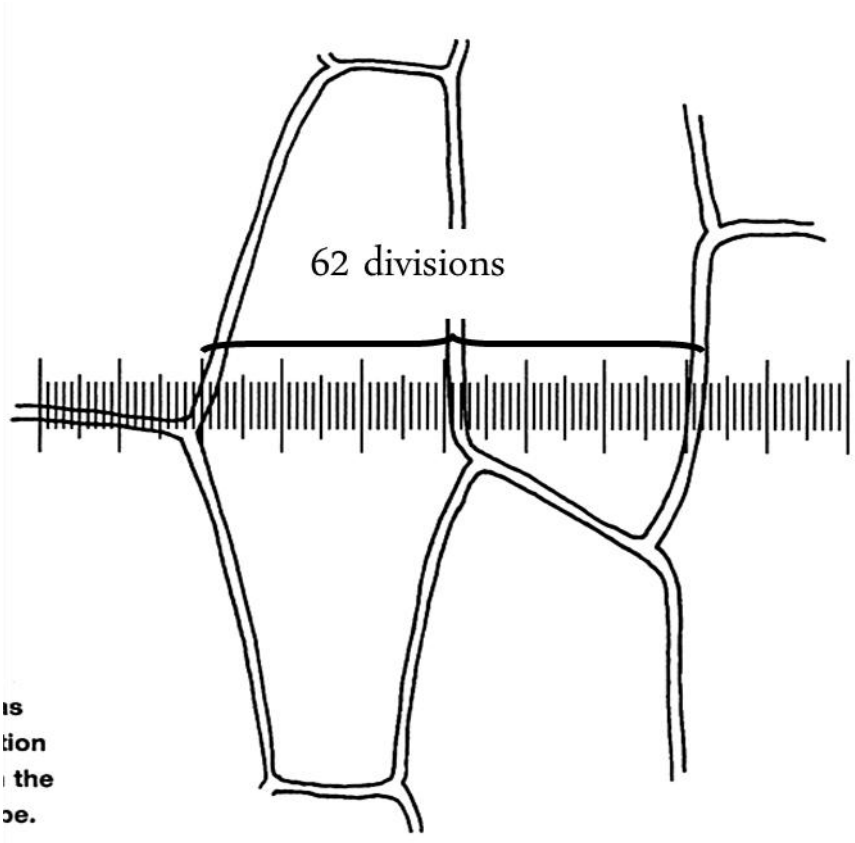


7. Remind yourself of what the total length of the eyepiece graticule was at x100 magnification (from earlier in this exercise) What is the width of one cell? _____

There are approximately thirteen cells in the length of the graticule



8. Here is a different sample viewed at x400 magnification – what did we work out one division of the eyepiece graticule represented at this magnification? _____
9. Using this, work out the width of **one** cell at this magnification? _____



And finally, are your calculations of cell width the same?

Why do you think this is? Which measurement is more accurate? Why?