

Biology A Level – Preparatory Work 2024

We are really pleased that you have enrolled onto A-level Biology. You are required to bring these completed tasks to your first biology lesson.

At college you will need to start taking responsibility for your own learning and in Biology will be required to prepare notes before coming to lessons. The aim of this is for you to refresh your memory of some of the biology you learned at GCSE and to introduce you to the style of learning you will encounter on the A-level course.

Task 1: Eukaryotic Cell Structure

At GCSE, you will have learned the names of some of the organelles found within eukaryotic cells. At A Level, you will learn about more organelles and in much more details.

Eukaryotic Cell Structure from Miss Estruch:

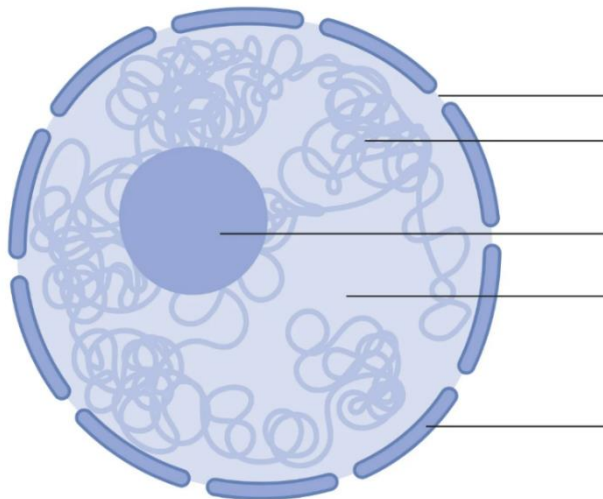
<https://www.youtube.com/watch?v=vEzXQGJSXhU>

Notes on Cell Structure from Save my Exams:

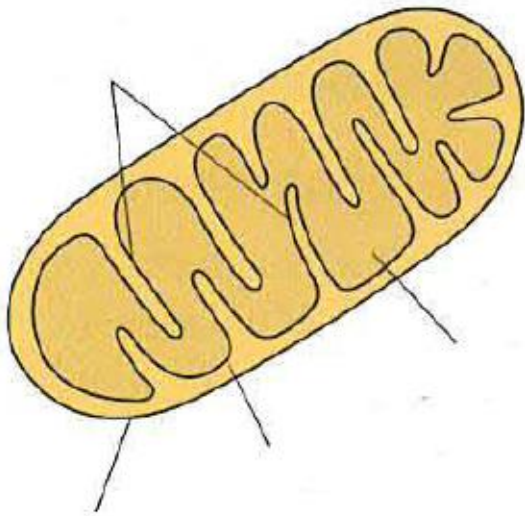
<https://www.savemyexams.com/a-level/biology/aqa/17/revision-notes/2-cell-structure/2-1-cell-structure/2-1-2-structure-of-eukaryotic-cells/>

Watch the video above and use notes above to label the diagrams of the organelles with their key features.

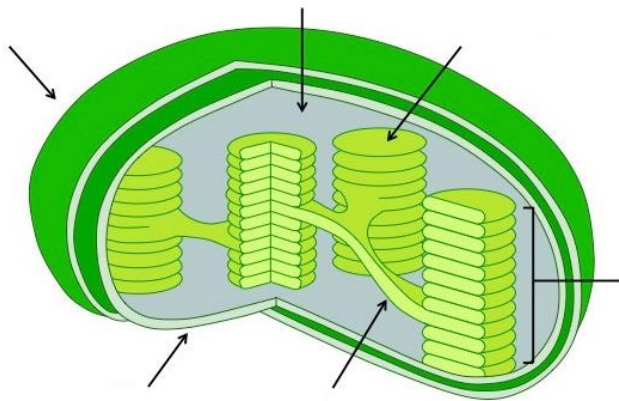
Nucleus



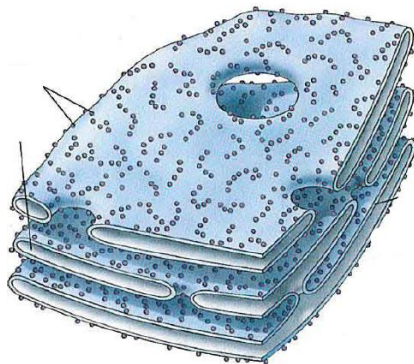
Mitochondria



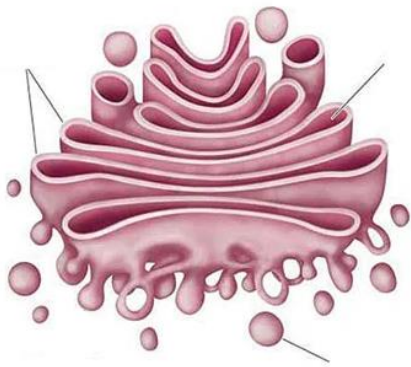
Chloroplast



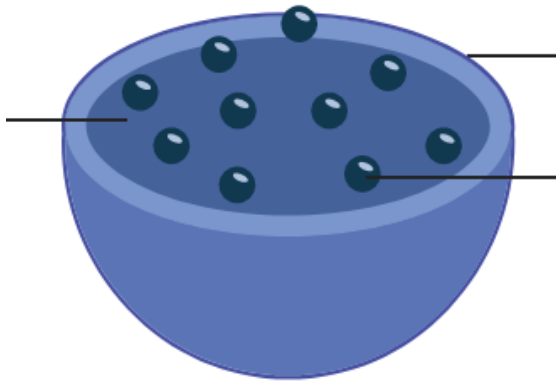
Rough Endoplasmic Reticulum



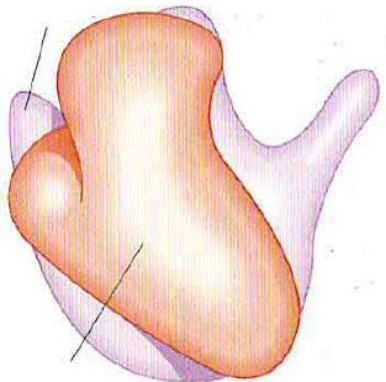
Golgi Apparatus



Lysosome



Ribosome



Once again using the video and notes, rearrange the table below to match the organelles to their structure and function.

Organelle name	Description of structure	Description of function
Nucleus	A crescent shaped stack of flattened, membrane-bound sacs called cisternae.	Produce ATP during aerobic respiration
Mitochondrion	Consist of a lumen, surrounded by a single membrane and contains hydrolytic enzymes.	Site of protein synthesis
Rough Endoplasmic Reticulum (RER)	A single membrane called a tonoplast, containing a solution of mineral salts, sugars, amino acids, wastes and sometimes pigments.	Hydrolyses material ingested by phagocytes, releases enzymes out of the cell, digests worn out organelles and breaks down cells after they have died.
Chloroplast	Composed of cellulose microfibrils in plant cells. These structures also have pores, called plasmodesmata, that allow the cytoplasm of adjacent cells to connect.	Contains the genetic material that is passed on from one generation to the next & provides the code for protein synthesis.
Cell wall	Consists of a series of flattened, membrane bound sacs (cisternae) that are linked to the nuclear envelope. It does not have ribosomes.	Supports herbaceous plants, acts as a temporary food store, may colour parts of plants e.g., petals to attract pollinators.
Golgi Apparatus	Large organelle surrounded by a double membrane. Contains a gel- like fluid called the stroma and internal membranes called thylakoids; these contain chlorophyll.	A variety of functions but its main role is chemically modifying & packaging proteins to be exported from the cell.
Smooth Endoplasmic Reticulum (SER)	Made of a type of RNA and protein. Consist of a large subunit and a small subunit.	Synthesises, stores and transports lipids and carbohydrates
Ribosome	Consists of a series of flattened, membrane-bound sacs (cisternae) that are linked to the nuclear envelope. This type of ER has ribosomes studded into its membranes.	Provides mechanical strength and support. Stops the cell bursting in dilute solutions i.e., prevents osmotic lysis.
Lysosome	Organelle found in nearly all cells surrounded by a double membrane consisting of an outer membrane & a highly folded inner membrane. Inside is a fluid matrix containing ribosomes & a loop of DNA.	Site of protein synthesis and used as a transport system for proteins
Vacuole	Contains DNA which is surrounded by a double membrane called a nuclear envelope. The nuclear envelope has pores which allow the movement of large molecules out of the nucleus.	Site of photosynthesis

Task 2: Prokaryotes

As with eukaryotic cells, at A Level, you will learn more detail about the structure of prokaryotic cells.

Introduction to Prokaryotic Cells on SnapRevise:

https://www.youtube.com/watch?v=W_geqbT3KUc&list=PLkocNW0BSuEEMyVUCyaRPVj_cahCvjxAr&index=28

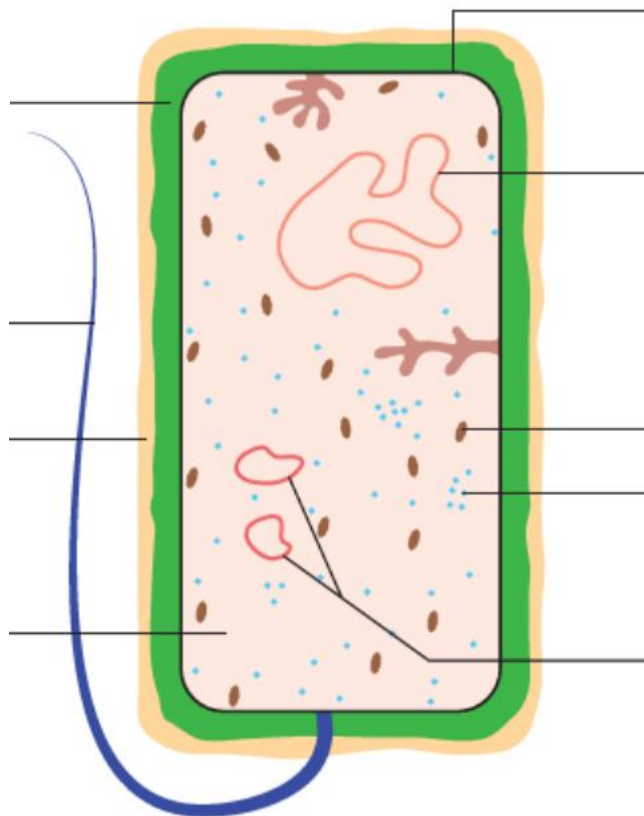
Notes on Prokaryotic Cell Structure from Save my Exams:

<https://www.savemyexams.com/a-level/biology/aqa/17/revision-notes/2-cell-structure/2-1-cell-structure/2-1-5-structure-of-prokaryotic-cells/>

Using the video and notes above, label the diagram below. Your labels should include the name of the feature, key details of its composition and its function. One is done for you as an example.

Highlight the features that occur in ALL prokaryotic cells, leaving the features that may be present unhighlighted.

Cell wall- Made of the glycoprotein murein. Provides strength and rigidity to the cell.



Task 3: Comparing Types of cells

Now that you have looked at the two main types of cells, you can look at their similarities and differences.

Comparing Eukaryotes & Prokaryotes on SnapRevise:

https://www.youtube.com/watch?v=V-leAba-4SY&list=PLkocNW0BSuEEMyVUCyaRPVj_cahCvjxAr&index=29

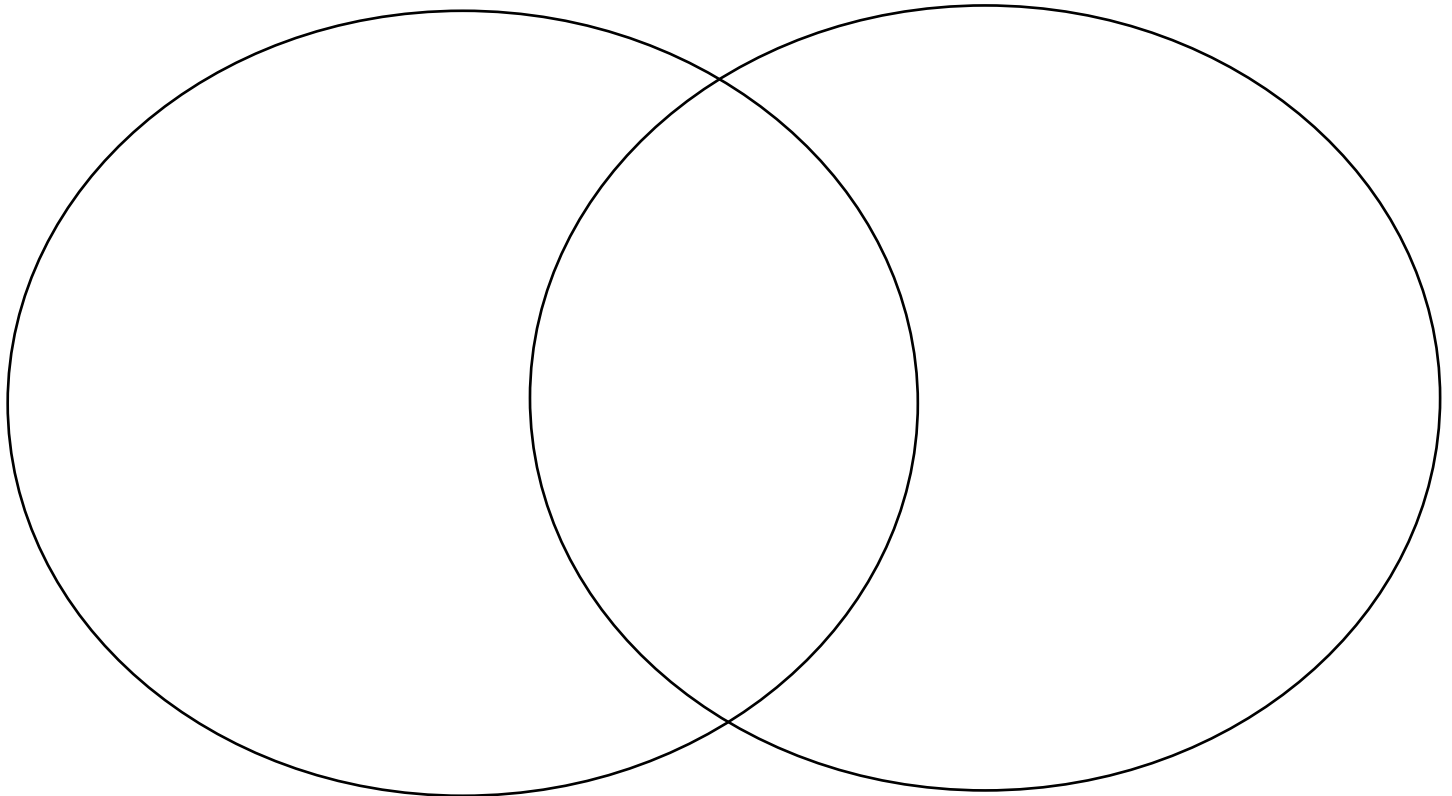
Notes on Comparing Cell Types from Save my Exams

<https://www.savemyexams.com/a-level/biology/aqa/17/revision-notes/2-cell-structure/2-1-cell-structure/2-1-6-prokaryotic-v-eukaryotic-cells/>

Complete the Venn Diagram to show the differences and similarities between Eukaryotic and Prokaryotic Cells

Eukaryotic Cells

Prokaryotic Cells



Task 4: Methods of Studying Cells

Microscopy is one of the tools that scientists have used to determine the structure of different cell types. You will be familiar with light microscopes and may have also come across electron microscopes. At A Level, we will look at these in more detail and you will become more confident in your use of light microscopes.

Notes on Studying Cells from Save my Exams

<https://www.savemyexams.com/a-level/biology/aqa/17/revision-notes/2-cell-structure/2-2-the-microscope-in-cell-studies/2-2-1-methods-of-studying-cells/>

Be sure to use the menu on the right to find all of the correct information for each task.

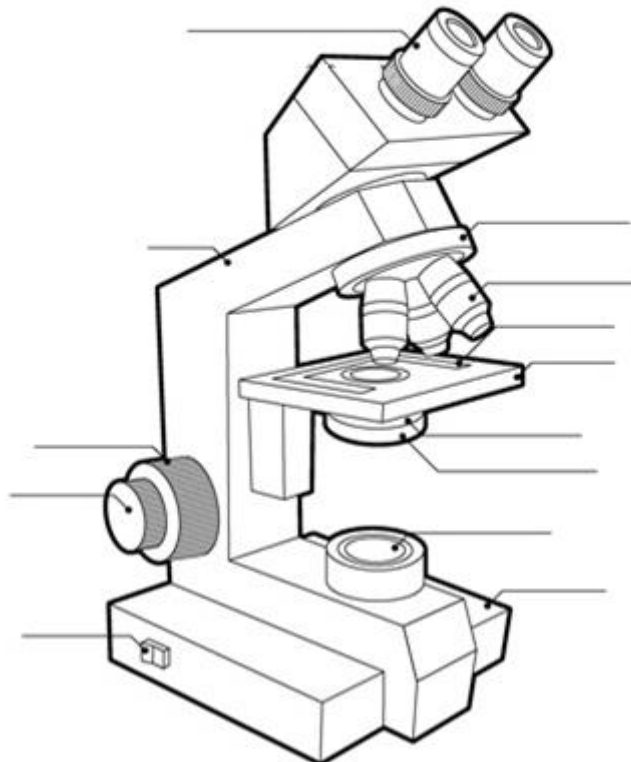
Define the following terms:

Magnification-

Resolution-

Label the diagram to show the key parts of the microscope.

Parts of a Microscope

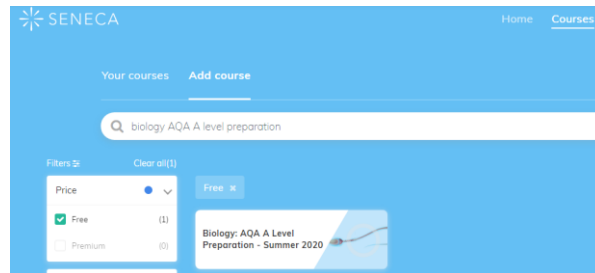


Complete the table. One is done for you as an example of the level of detail to include.

		Advantages	Disadvantages
Optical microscope			<ul style="list-style-type: none"> • Lower resolution- maximum of 0.2 μm
Electron microscope	Transmission	<ul style="list-style-type: none"> • Higher resolution- maximum of < 1nm 	
	Scanning	<ul style="list-style-type: none"> • Higher resolution- maximum of 1-20 nm 	

If you have struggled with any of the above:

If you have used Seneca Learning for any of your GCSE subjects, then you can simply log into your account search for the following course:



...or click on the link below:

<https://app.senecalearning.com/dashboard/courses/add?Price=Free&text=biology+AQA+Alevel+preparation>

If you do not have an account, you can enrol for free – see the link below:

<https://senecalearning.com/en-GB/>

- To refresh your knowledge gained during your GCSE biology Course, please complete section 1.1 GCSE Refresher course: (this should take 15-25 minutes)