

Name: _____

The Building Blocks of Life

Introduction

Atoms can bond with each other to form molecules. Molecules are needed to form structures called organelles. Different organelles help to form a cell which is the basic unit of living matter. Each organelle has a particular function(s) however the organelles often work together to ensure the survival of the cell.

Activities

Animal and plant cells have the following living parts:

1. Nucleus

The nucleus contains thread-like structures called _____ which are made of very long double helix molecules called _____ and protein. When a cell divides these structures coil up tightly and become visible especially if they have been stained. When a cell is not dividing, the DNA is loosely coiled and appear as dense granular patches called chromatin.

The nucleus controls the cell's activities because the DNA contains instructions for making _____. Some of these molecules help to make the structure of the cell whilst some are _____ which speed up or _____ chemical reactions inside the cell. The DNA can copy itself or replicate so its instructions can be passed on to new cells.

Inside the nucleus is a darkly stained area called the nucleolus. This contains DNA and is responsible for making tiny round organelles called _____. The latter are important because this is where proteins are made inside a cell. The nucleus is surrounded by the nuclear envelope. It contains gaps or pores to allow materials to enter and leave the nucleus.

2. Cytoplasm

The cytoplasm is a watery environment with many organelles suspended in it. One such organelle called the _____ is the site of aerobic respiration. Also present are energy storage materials such as _____ in animal cells. Such stores are prominent in those animal cells which actively respire such as _____ cells. Plant cells also contain carbohydrate energy stores called _____.

3. Plasma Membrane (Cell Membrane- as it was known at GCSE!!!!)

The plasma membrane is a flexible boundary which isolates the cell contents from the surroundings . It exerts control over what can enter and leave the cell. Thus it is described as being _____. Raw materials such as _____ and _____ pass into the cell for aerobic respiration. This reaction produces a waste substance called _____ which diffuses out of the cell.

Plant Cells also have the additional structures:

1. Vacuole

The vacuole is surrounded by a membrane called the tonoplast. It contains a substance called _____ which is a mixture of sugars, acids, mineral ions and water. It supports the plant cell. If the water concentration is lower compared to the fluid surrounding the cell , then water molecules will move in by _____ so the cell appears _____ under the microscope.

2. Cell Wall

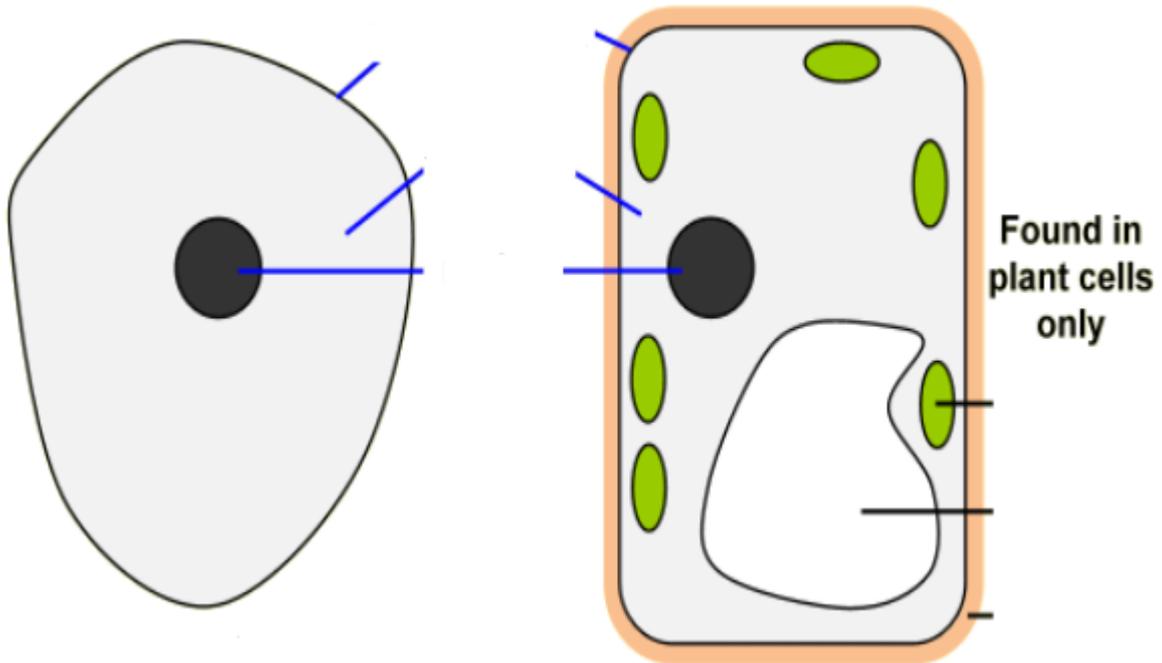
The cell wall is the non- living part of the cell which consists of fibres of a substance called _____. The fibres are irregularly arranged so allowing the cell wall to be fully permeable to molecules. Like the vacuole, it also _____ the plant cell.

3. Chloroplasts

Different plant species have chloroplasts with different shapes and sizes. It contains a pigment called _____ which absorbs _____ energy for _____. This energy is used to convert carbon dioxide and water to a carbohydrate called _____. Chloroplasts are only found in those parts of the plant which are exposed to light such as the _____.

Diagram of an animal cell and plant cell

- Complete the diagrams by labelling the parts



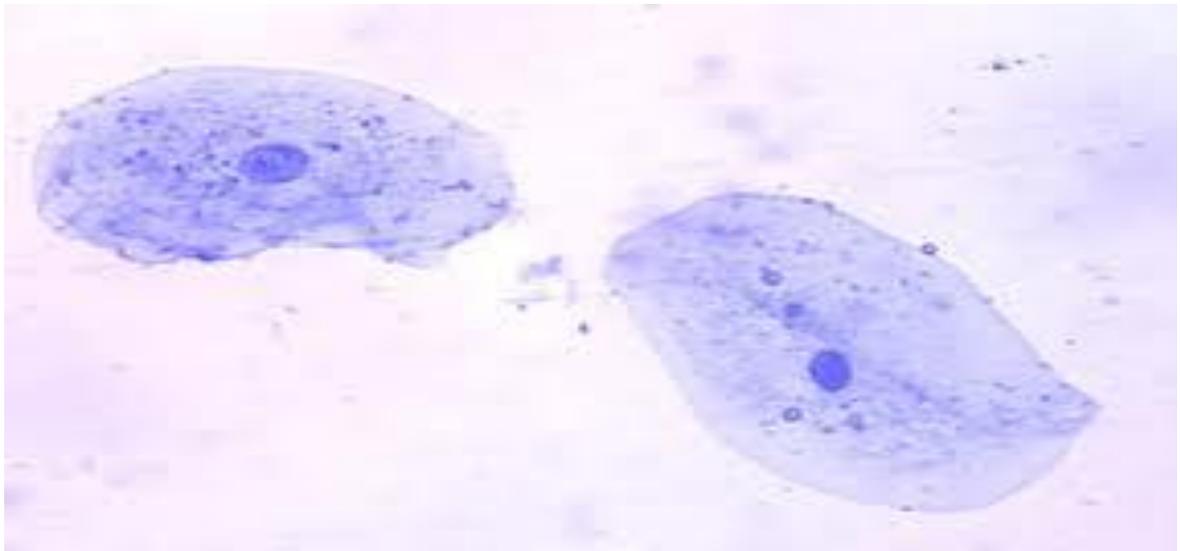
- Construct a table to summarise the differences between the structure of an animal cell and a plant cell in the space below.

Microscopy

- Used to examine specimens such as cells which are too small to be seen with the human eye. Stains have to be often used to enable certain structures to be seen.
- Two types of microscope exist: light microscopes and electron microscopes

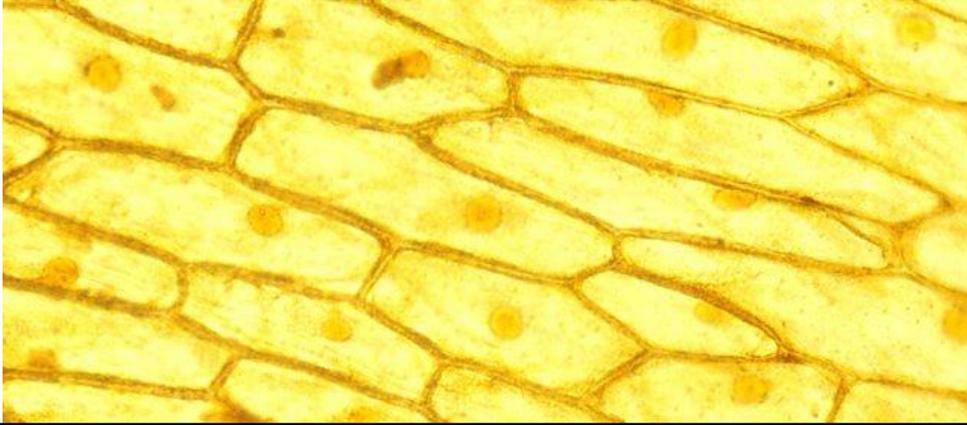
Activity: Animal Cell Structure as seen under the Light Microscope

- When drawing cells as seen under a microscope, the cells must be drawn using a sharp pencil and lines should be smooth and continuous-not jagged!!! Labelling should be done using pencil and a ruler. There should be no shading.
- Below is a photomicrograph of cheek cells as seen under a light microscope. Draw and label one of the cells in the box underneath. Write a description underneath each label to say how it looks. Give your drawing a title.



Activity: Plant Cell Structure as seen under the Light Microscope

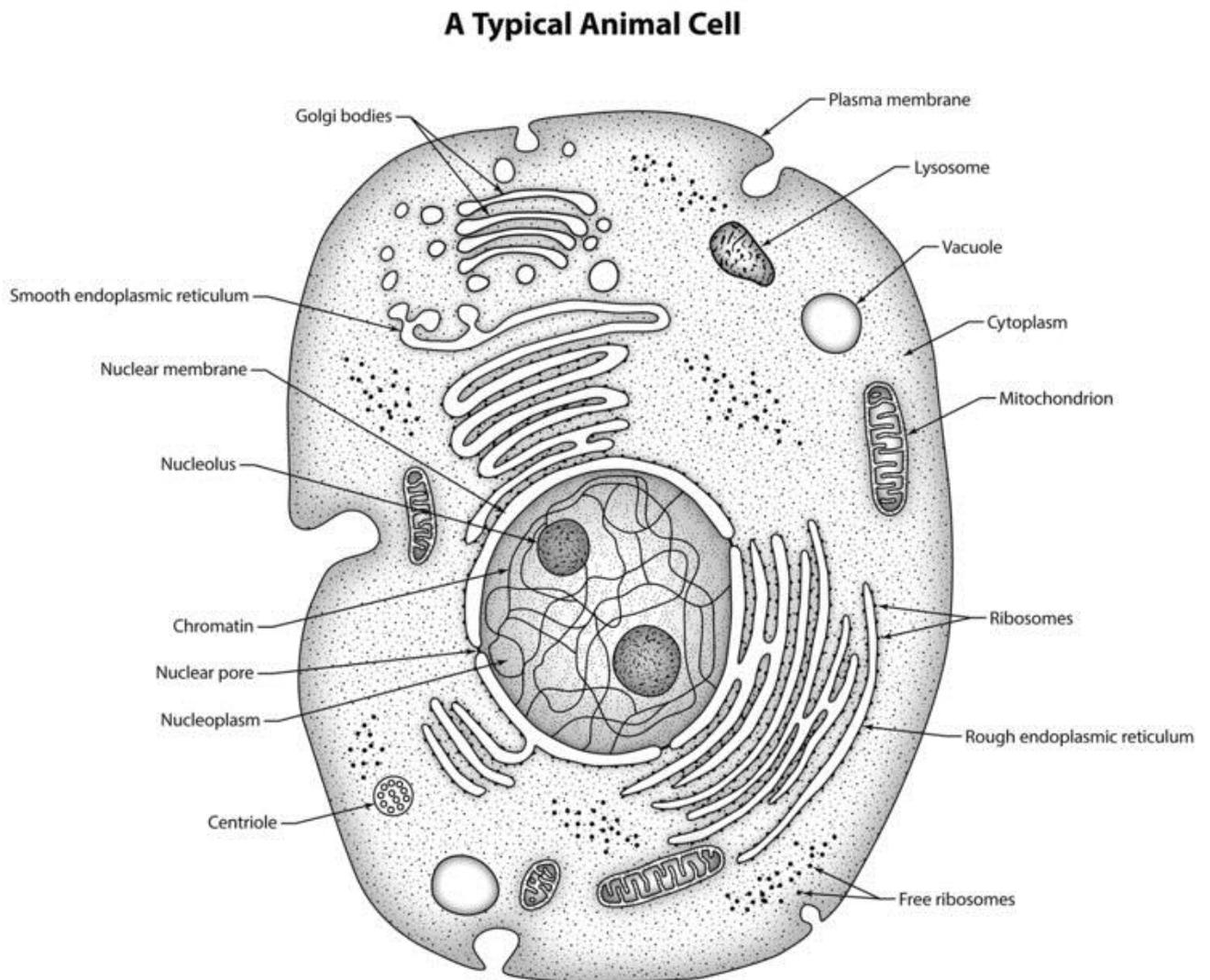
- Below is a photomicrograph of some onion cells. Draw three adjacent cells in the box underneath. Label each structure **once** on any cell on the diagram. Write a description, underneath each label, to say how it looks. Give your drawing a title.



A large, empty rectangular box with a black border, intended for drawing and labeling the onion cells.

Ultrastructure of Animal cells as seen under the Electron Microscope

- The electron microscope reveals more intricate detail about the structure of cells. This is often termed the ultrastructure.
- Below is a labelled diagram showing the ultrastructure of an animal cell:



- For A Level, you need to know about the structure and role of the different components or organelles of a cell.
- Use the internet to complete the table on the next page of the different organelles found in an animal cell. However...try to keep it simple!! Just sufficient information to complete the table!!!!

The following websites may be useful with your research:

www.s-cool.co.uk

www.biologymad.com

www.mrothery.co.uk

Name of Organelle	Description	Function
Mitochondria		
Ribosomes		
Rough Endoplasmic Reticulum		
Smooth Endoplasmic Reticulum		
Golgi Body (Apparatus)		
Lysosome		
Nucleolus		
Centrioles		
Plasma Membrane		

Movement of Substances into a Cell

- Substances can move in and out of cells in a variety of ways including diffusion and active transport
- Find a definition for diffusion and active transport:

Diffusion-

Active transport-

Specialised Cells

A specialised cell is a cell which has a particular job or function to carry out. Its structure enables it to carry out its job well.

Activity: In the space below draw a labelled diagram of an erythrocyte **and** a palisade mesophyll cell. Explain how each cell is related to their function.