

1.1.1 Eukaryotes and Prokaryotes



Key Aims

1. Eukaryotic Cells - Structure and Properties
2. Prokaryotic Cells - Structure and Properties
3. Size and Scale



AQA Specification

Plant and animals cells (eukaryotic cells) have a cell membrane, cytoplasm and genetic material enclosed in a nucleus.



AQA Specification

Bacterial cells (prokaryotic cells) are much smaller in comparison. They have cytoplasm and a cell membrane surrounded by a cell wall.

Eukaryotic Cells

A **eukaryotic cell** contains a nucleus.

- **Plant and animal cells are eukaryotic.** A eukaryotic cell tends to be fairly large and complex. Animal and plant cells are both eukaryotic cells.

- **Plant and animal cells have common organelles:**

- Cell membranes
- Cytoplasm
- Nucleus

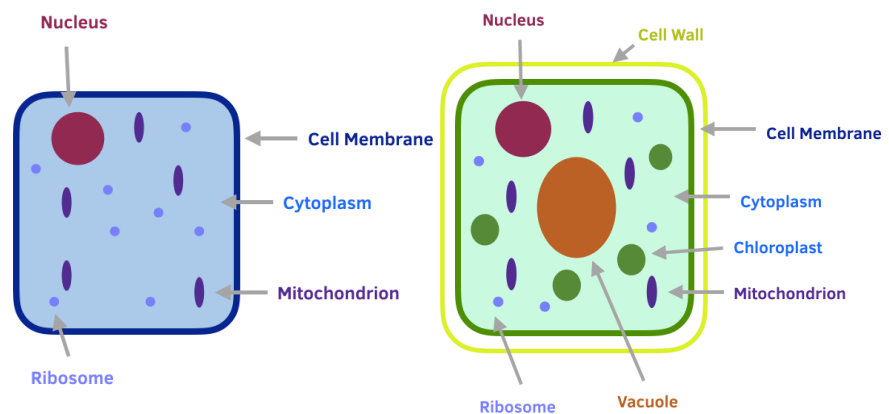


Fig 1. Plant and Animal Cell Structure.

Prokaryotic Cells

A **prokaryotic cell** does not contain a nucleus.



- **Bacterial cells are prokaryotic cells.** Prokaryotes cells are smaller and more simplistic. One prokaryotic cell forms a unicellular prokaryotic organism.
- **Bacterial cells have similarities to plant and animal cells.** Animal, plant and bacterial cells all have a cytoplasm and a cell membrane.
- **Bacterial cells have a cell wall.** In addition to the cell membrane, bacterial cells have a **cell wall** which surrounds the cell membrane.
- **Bacterial cells do not have a nucleus.** Instead they have genetic material in a loop. They also have smaller rings of DNA called **plasmids**.



AQA Specification

The genetic material in bacterial cells is not enclosed in a nucleus. It is a single DNA loop and there may be one or more small rings of DNA called plasmids.

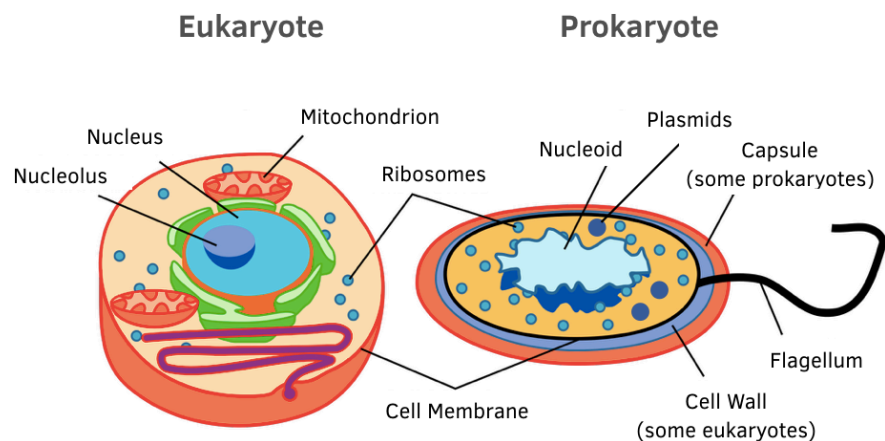


Fig 2. The Differences in Eukaryotic and Prokaryotic cell structure. Note the lack of nucleus.



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Students should be able to demonstrate an understanding of the scale and size of cells and be able to make order of magnitude calculations, including the use of standard form.

Size and Scale

- **There are prefixes that stand for certain orders of magnitude.** Centi- stands for 10^{-2} , milli stands for 10^{-3} , micro stands for 10^{-6} and nano stands for 10^{-9} .

