

BIOLOGY: UNIT 1: AOS 1: THE CELL...

MICROSCOPES

- Cells are mainly measured in **micrometres** (μm), one millionth of a metre & can be seen using a microscope
- **Electron** microscopes can view cells down to the **nanometre** (nm) size.

WHAT ARE CELLS?

- Cells are the **basic structural & functional units of life**
- Living things are defined by their ability to **grow & replicate & reproduce** themselves.
- **Unicellular**: organism made up of **one** cell
- **Multicellular**: organism consisting of **more than one** cell.

CELL THEORY

- all living things are composed of one or more cells
- all cells come from pre-existing cells.

TYPES OF CELLS

Feature	Prokaryote	Eukaryote
size	small 1-2 μm in diameter	larger 10-100 μm in diameter
chromosomes	✓ single circular DNA molecule	✓ multiple linear DNA molecules
ribosomes	✓	✓
plasma membrane	✓	✓
cell wall	✓	only in plants, fungi & some protists
membrane-bound nucleus	✗	✓
membrane-bound organelles	✗	✓ eg. lysosome, mitochondria
cytoskeleton	✗	✓

SIZE & SHAPE OF CELLS

- We have many different cells in our body that each carry out a specialised function.
- The advantage that multicellular organisms have is that there are many smaller cells which improves the cells ability to obtain nutrients & remove waste products, as there is a greater SA:V.
- Uptake of materials into a cell occurs via its plasma membrane.
- Surface Area relates to the area of the membrane around the cell
- Volume refers to the amount of the cytoplasm.

★ As a cell grows larger, its surface area & volume increase, but volume grows larger than its surface area. (table 1.2 pg. 21)

↳ As the size of the cell increases, the SA:V decreases

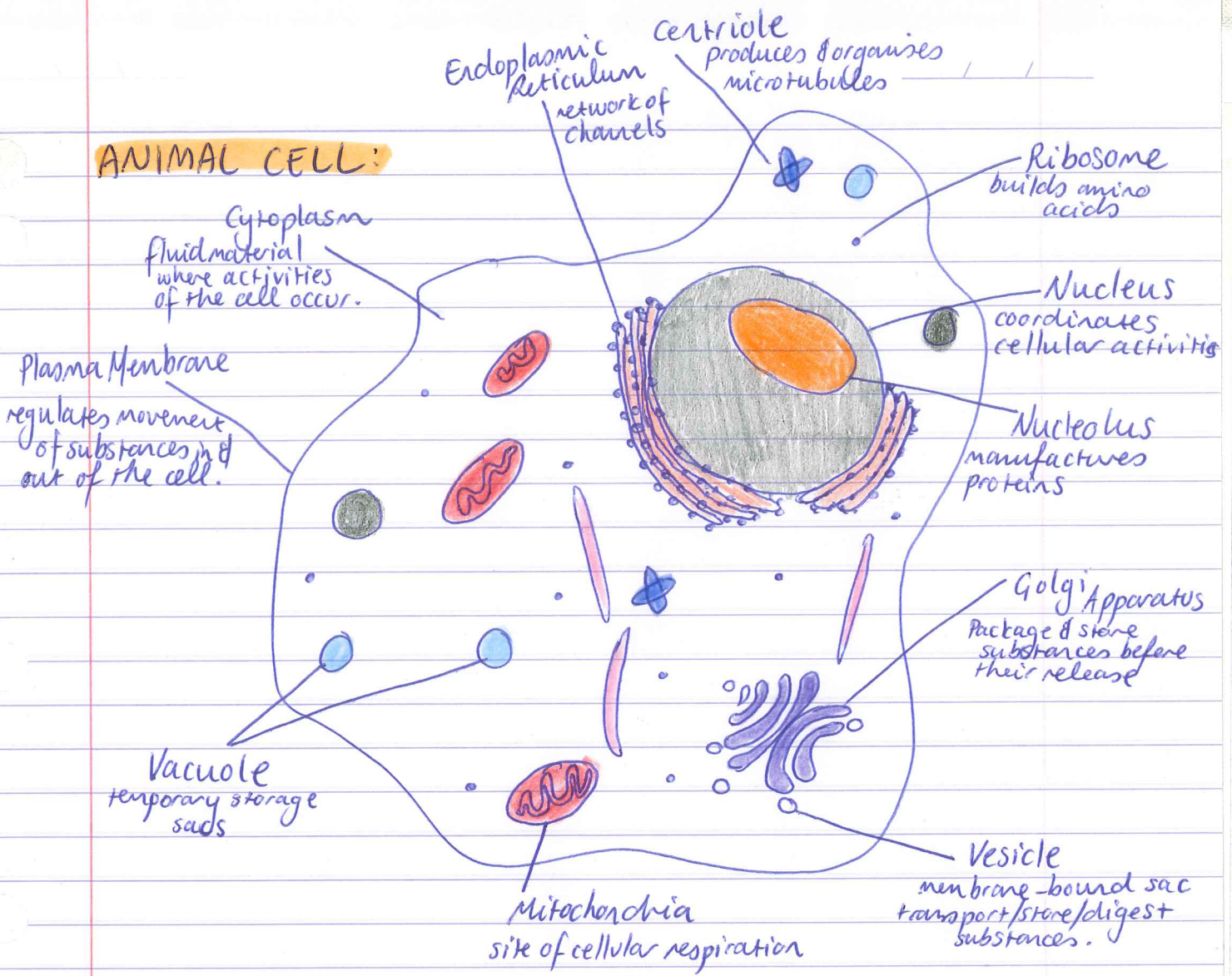
↓
efficiency is reduced
in obtaining nutrients & waste removal

Why are cells so small?

There is a greater surface area to volume ratio, which allows for efficient inward movement of required substances & outward movement of wastes via diffusion across the surface area.

- A sphere has the least surface area for the volume it encloses.
- Organelles are compartmentalised & also contain membranes to create a greater surface area.
- The shape of a cell depends on its function.

ANIMAL CELL:



PLANT CELL:

