

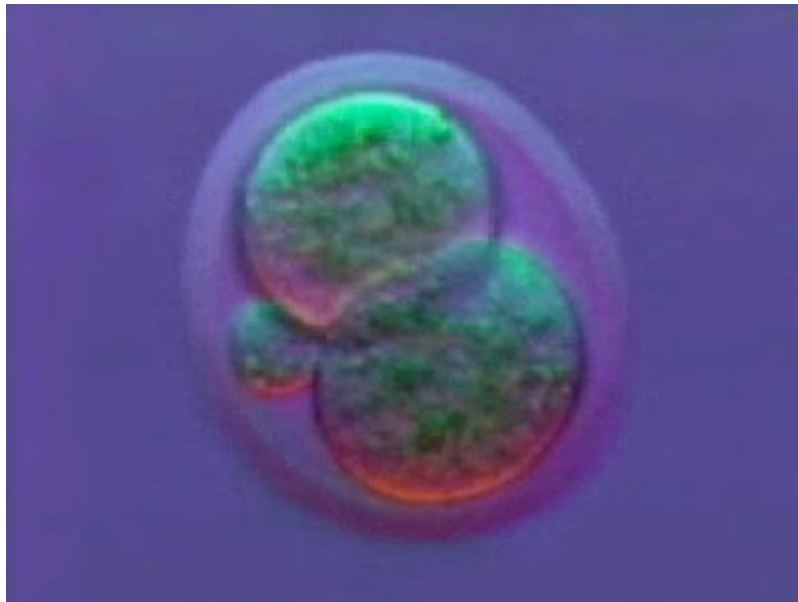
Plant and Animal Cells

Learning Goals:

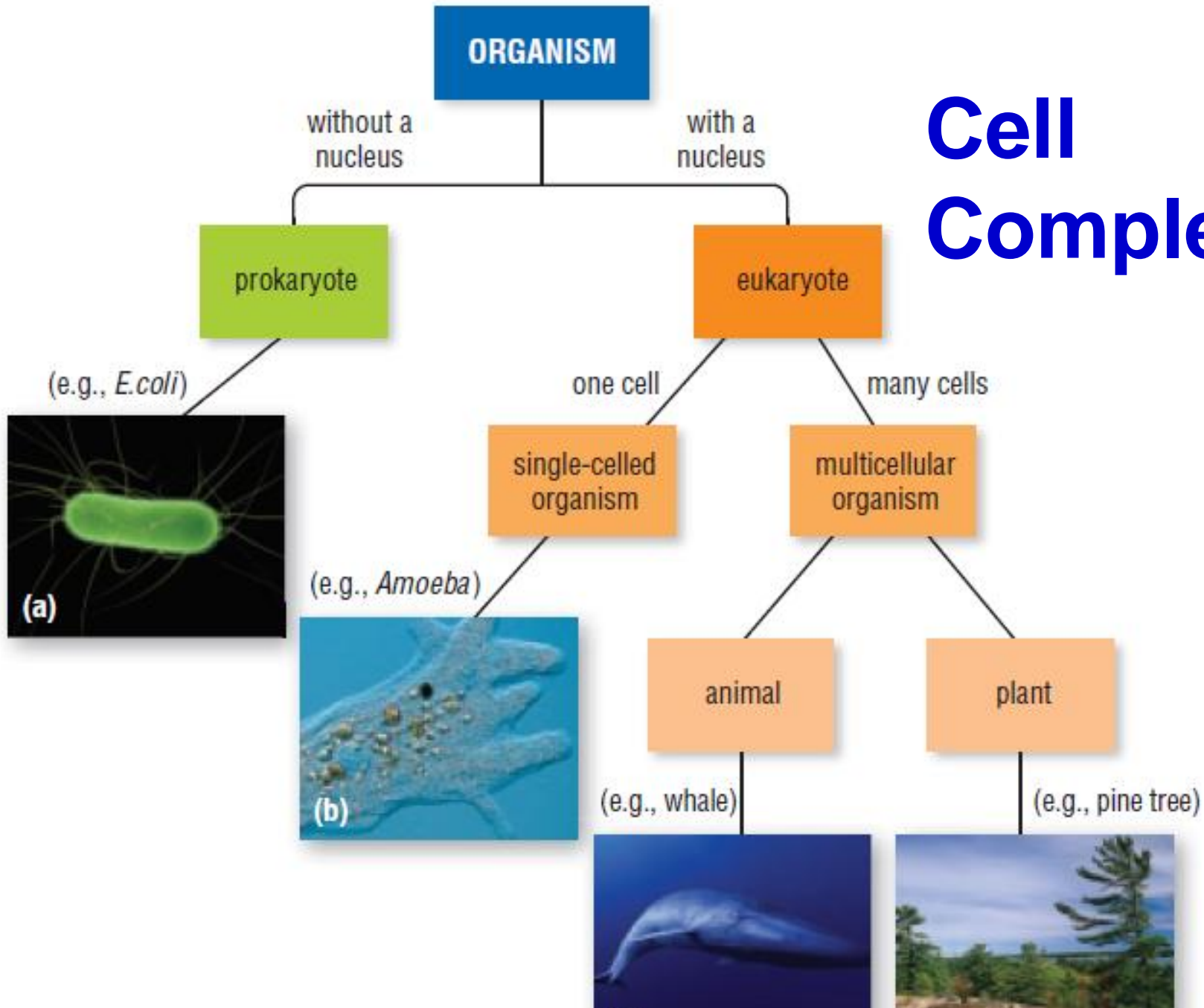
- *To be able to name various cell structures and describe their functions*
- *To observe and recognize structural differences between plant and animal cells*
- *To understand why cells divide*

The Cell Theory

- All living things are made up of cells
- Cells are the basic unit of life
- All cells come from pre-existing cells

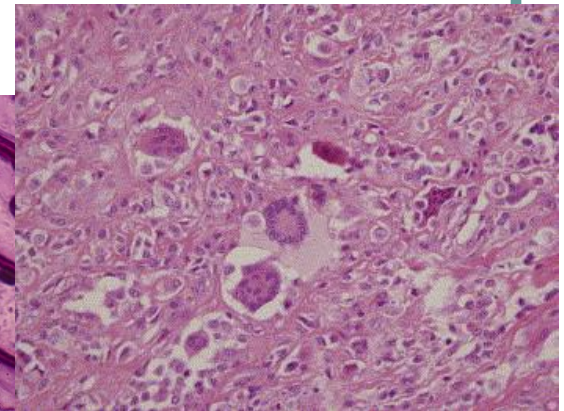


Cell Complexity



Cell Structure

- **Organelles** are structures within a cell with **specialized** functions
- Processes essential for life include:
 1. energy use
 2. movement/ transportation of nutrients
 3. waste removal
 4. reproduction



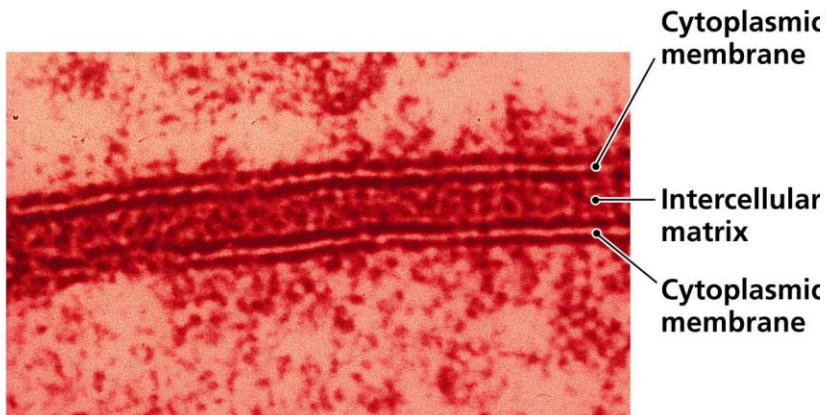
Organelles of Note:

- Make a table with these headings:
 - Organelle / Structure / Function

Organelle	Structure	Function

Cell membrane

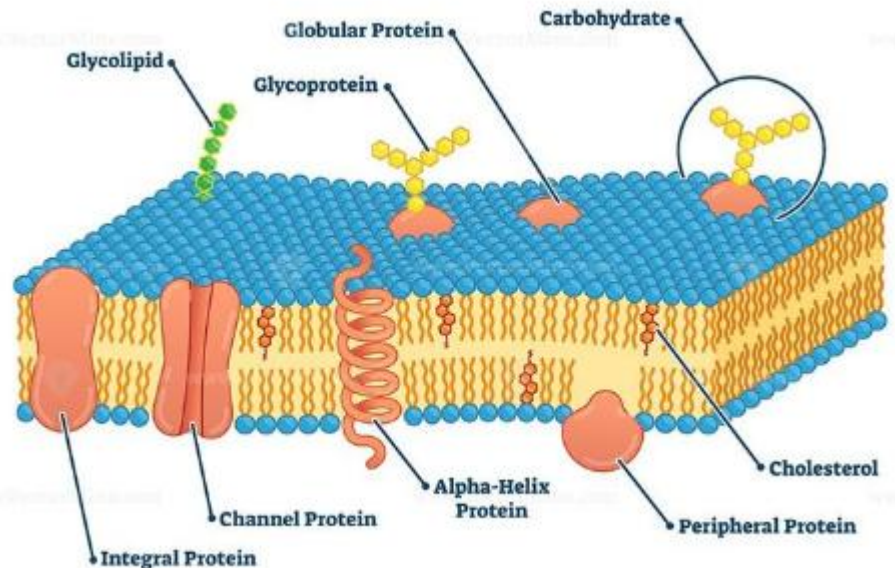
- Thin, **double-layered** wrapping around the cell
- Controls what goes **in and out** of the cell



TEM

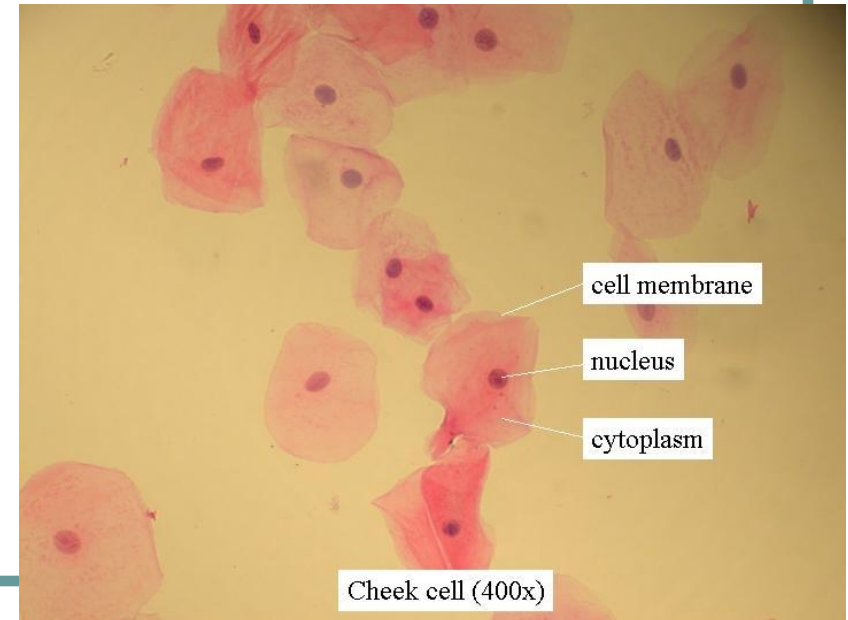
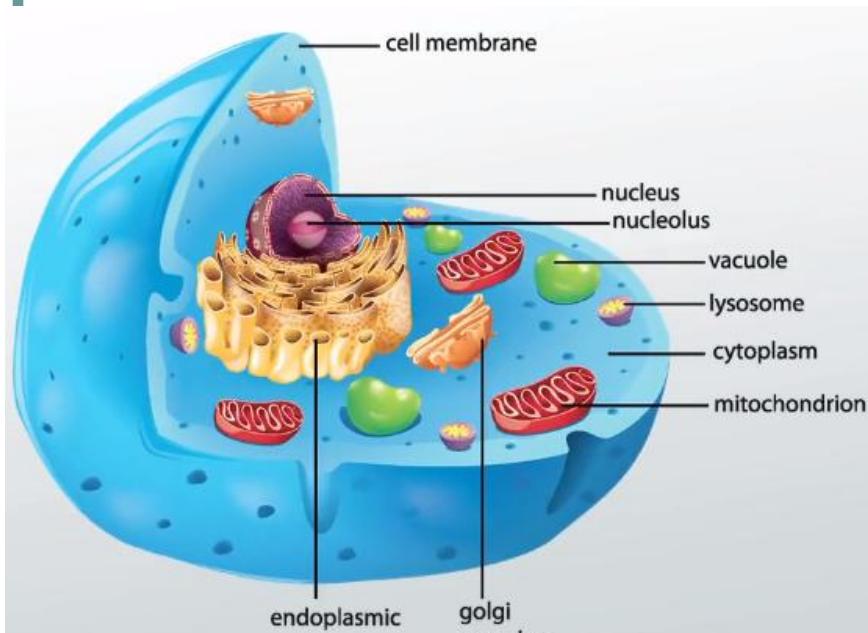
55 nm

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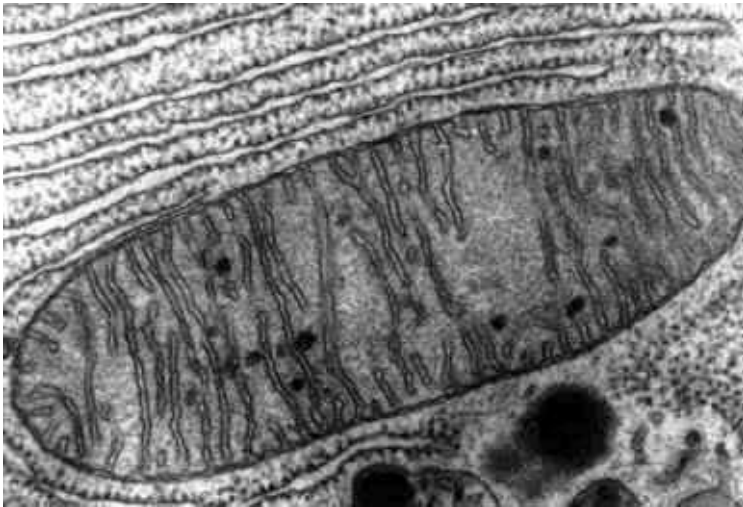
Nucleus

- **Large**, and somewhat **spherical**
- Contains **chromosomes** with genetic information and therefore **controls** all cell activities



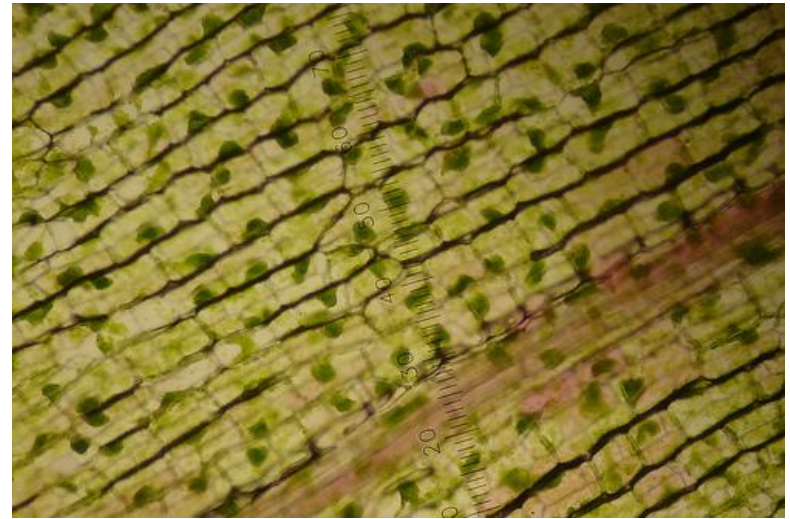
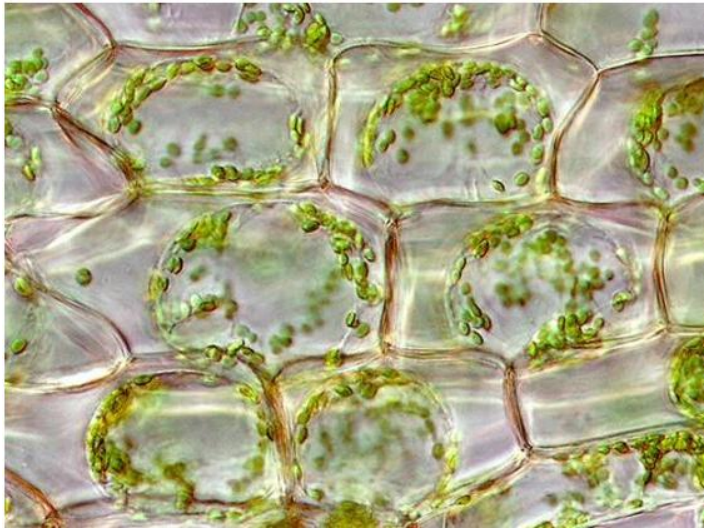
Mitochondrion (pl. mitochondria)

- **Bean-shaped** organelle
- **'power plant'** of the cell; this is where **energy** is extracted from nutrients



Organelles Unique to Plant Cells

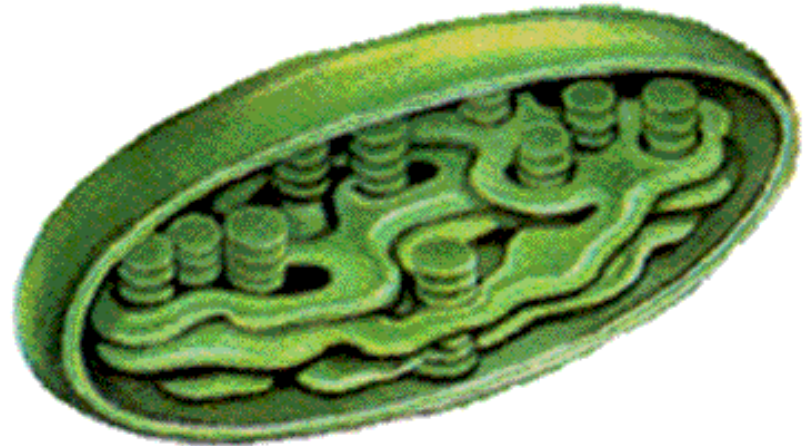
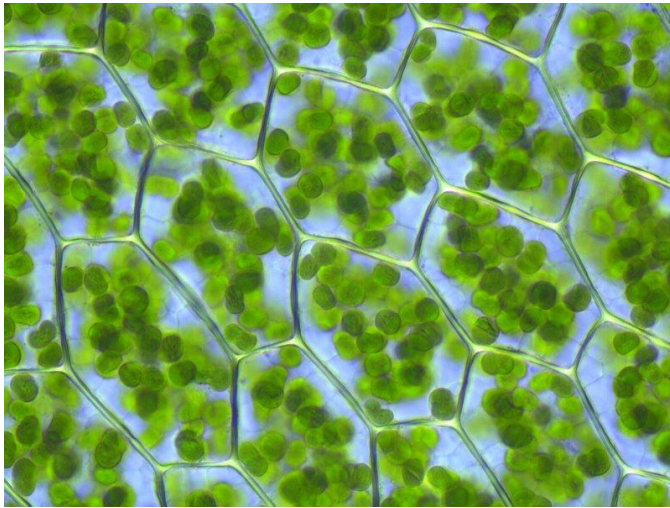
- **Cell Wall**
 - **Rigid**, porous layer outside cell membrane
 - Provides **support** and **protection**



Organelles Unique to Plant Cells

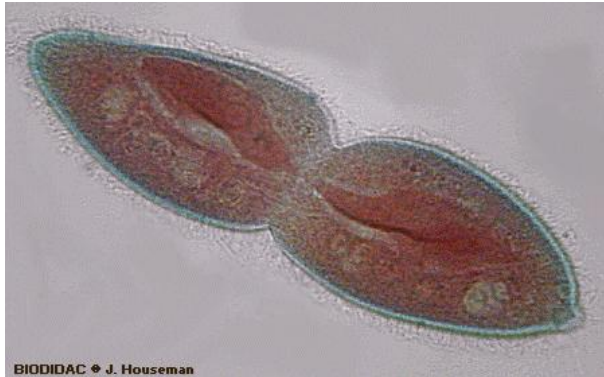
- **Chloroplasts**

- **Green** structures made of **stacked disks**
- Site of **photosynthesis**



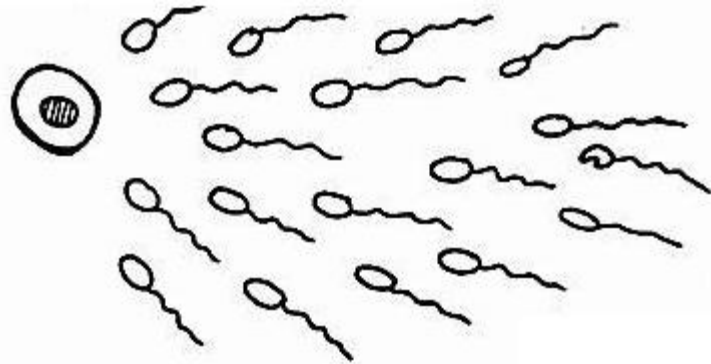
The Importance of Cell Division

1. Reproduction



Asexual

Offspring are genetically identical to parents



"Are we there yet?"

Sexual

There is variation in offspring

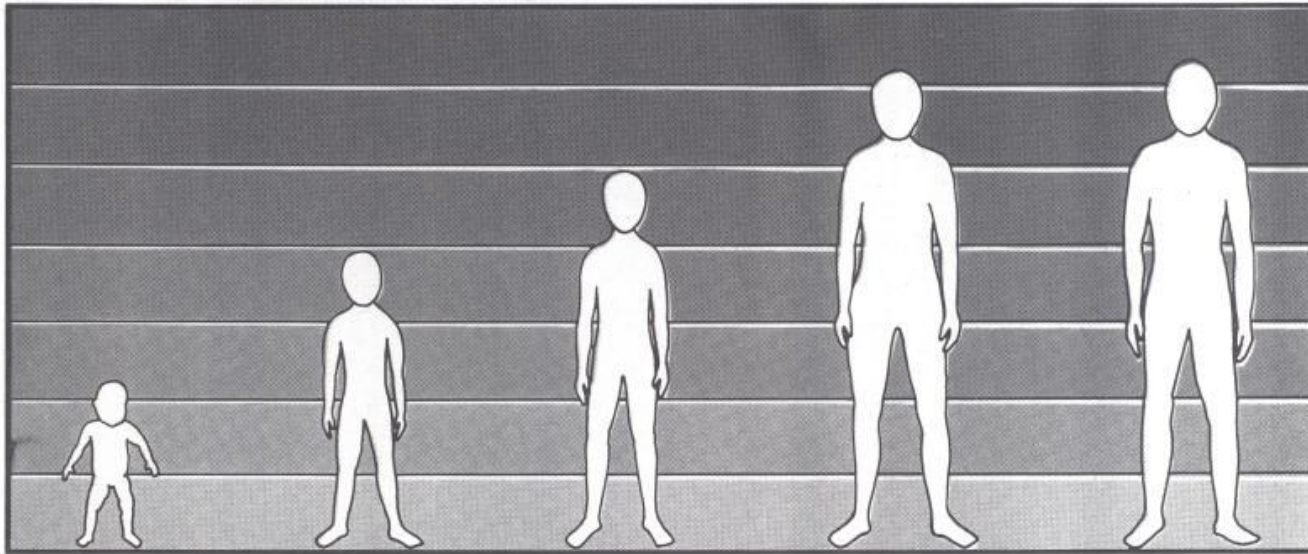
The Importance of Cell Division

2. Repair and Replacement of damaged or dead cells.



The Importance of Cell Division

3. Growth: it is the increase in **cell numbers** that causes growth, **not** an increase in **cell size**



The increase in body size from birth to adult

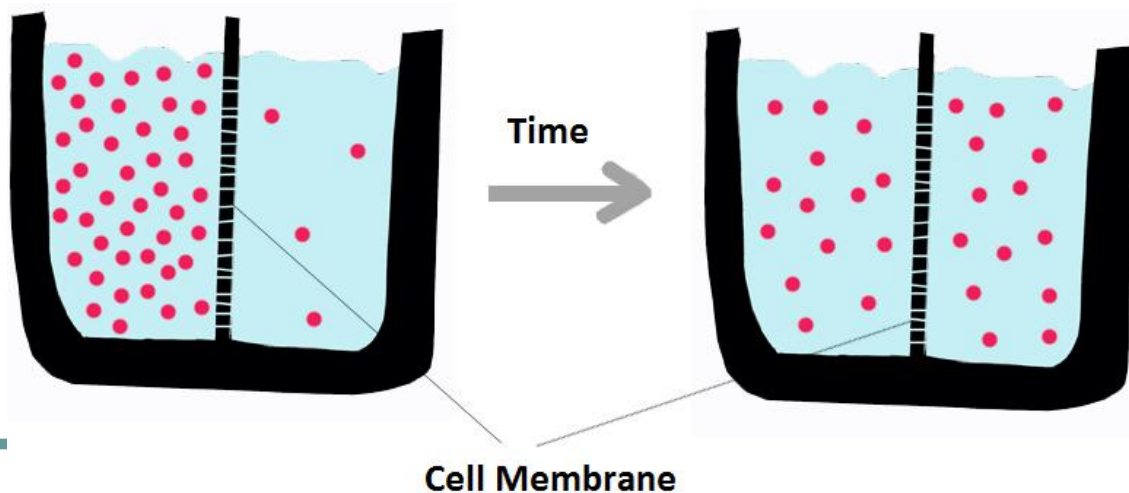
Cell Processes

- Chemicals and water are needed by the cell to carry out life processes
- What are those again? *Hint: There are 4 of them.*
- *(Energy Use, Movement of Nutrients, Waste removal, Reproduction)*
- Waste products need to be eliminated by the cell
- These needs are met by two processes
 - diffusion and osmosis

Diffusion

- The movement of chemicals across the cell membrane **from** areas of **high** concentration **to** areas of **low** concentration

Ex. Axe spray in a change room



Osmosis

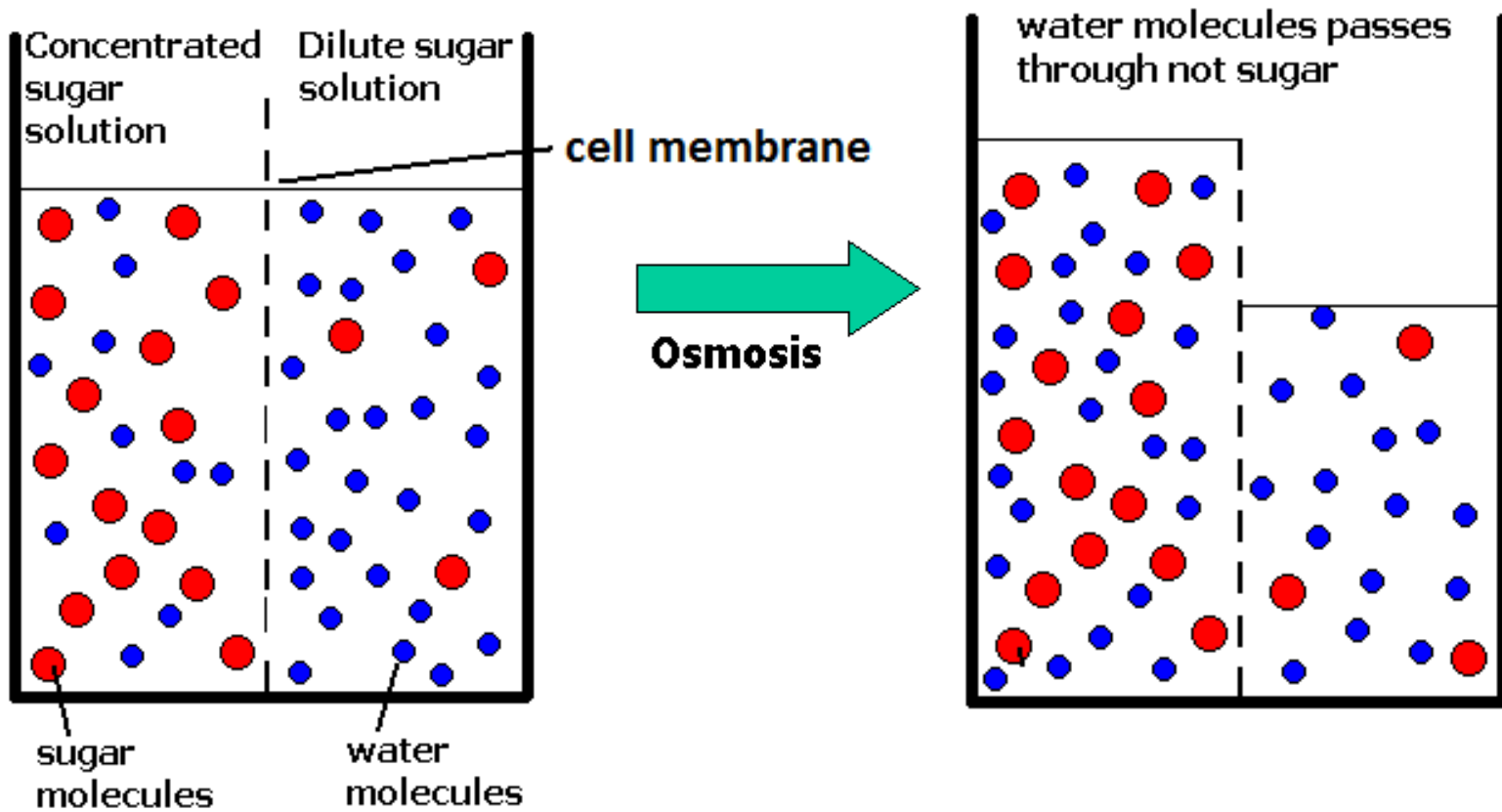
- The movement of **water** across the cell membrane **from** areas of **low solute concentration** **to** areas of **high solute concentration**



Wrinkly fingers are common after being in contact with water for a long time. This phenomenon occurs because once Sebum (a protective skin lubricant) is washed away, the water in our body can transport out of the skin due to osmosis.



Osmosis



Cell Size

- Diffusion and osmosis take time
- The **larger** the cell, the **longer** the process
- Therefore **smaller cell size** allows **quicker** and **more efficient accumulation** of necessary substances, and **quicker** and **more efficient elimination** of wastes

Questions.....

- Page 32 # 2, 4 – 8
- Page 37 # 1, 2, 4 – 6
- Plant / Animal Cell Colouring



Observing plant and animal cells

- Observe at least two slides each of plant and animal cells
 - What do the animal cells have in common?
 - What do the plant cells have in common?
 - How are plant cells different from animal cells?
 - What structures can you identify?

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