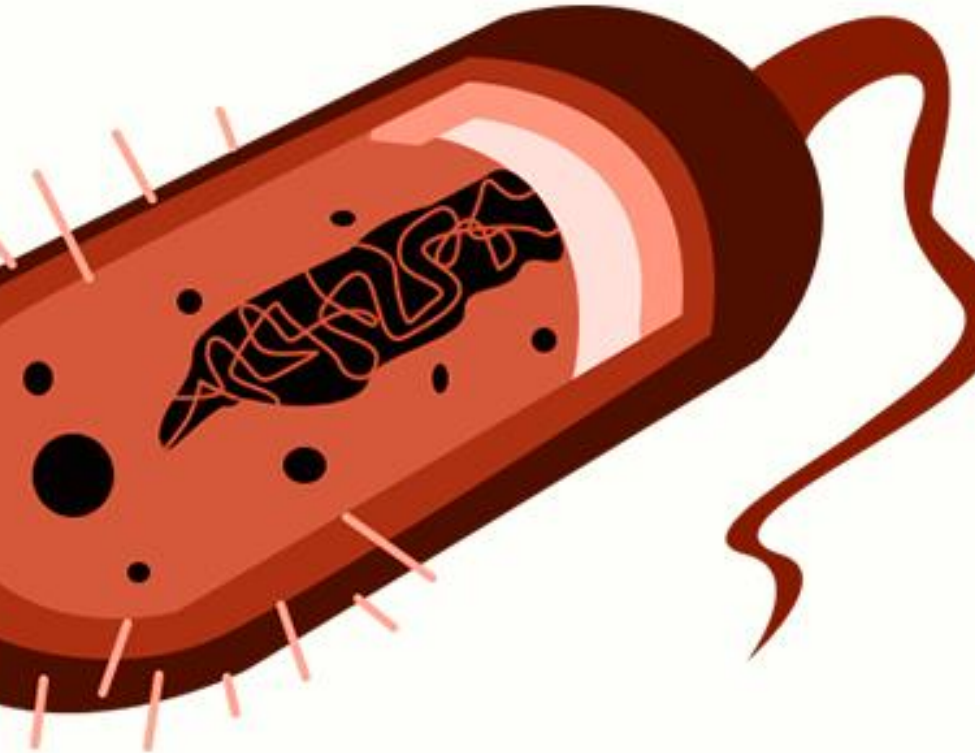


Topic 1.3: How are cells different from one another?

Science 8

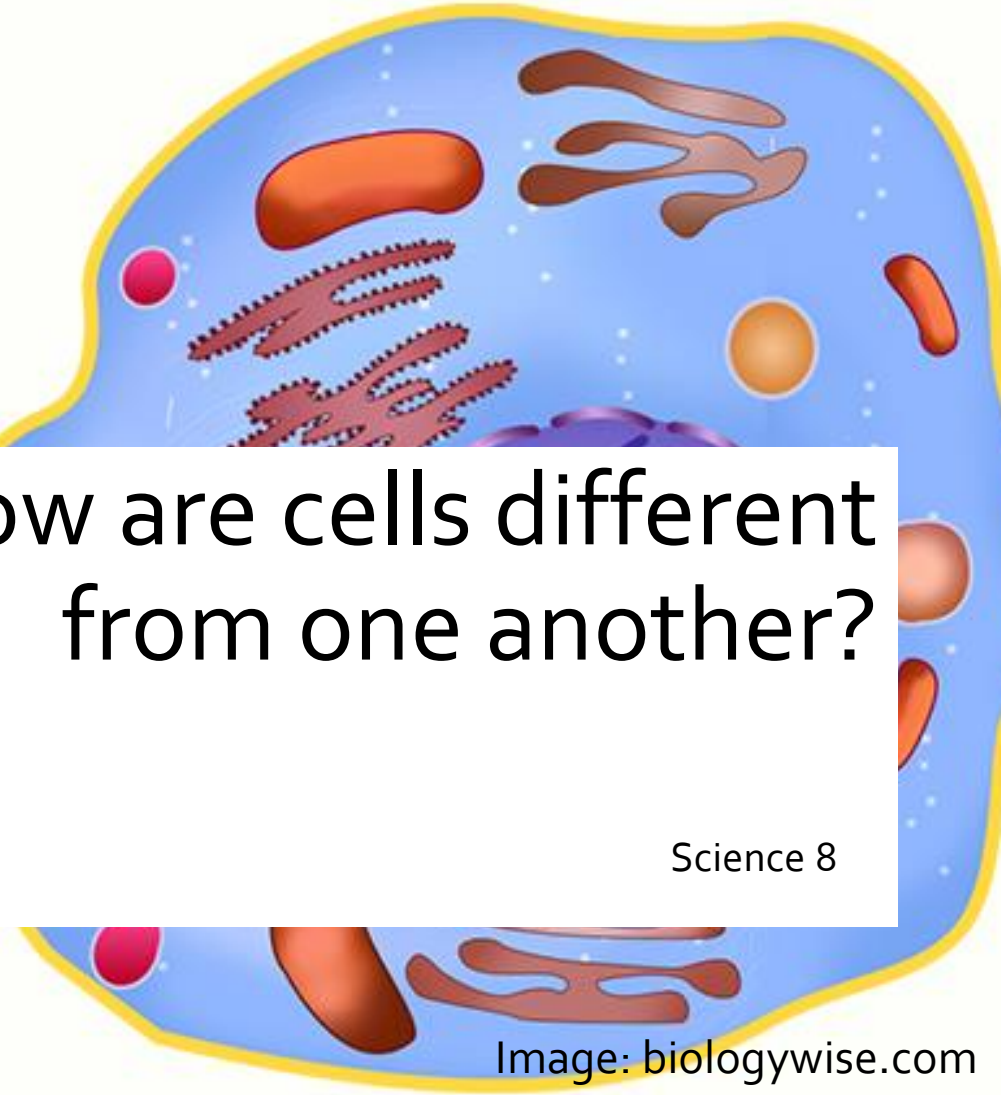
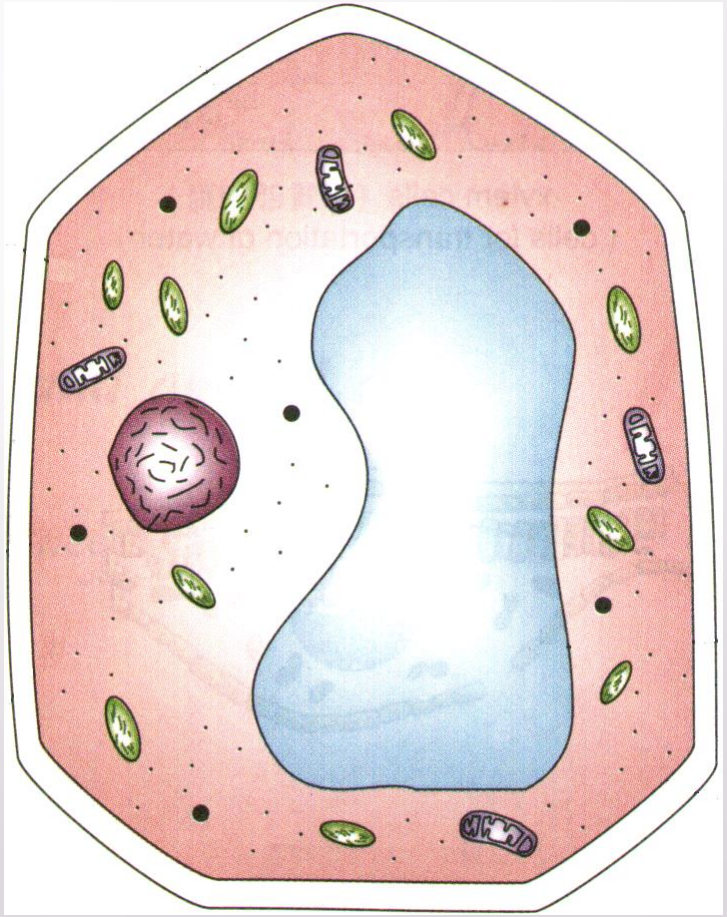


Image: biologywise.com

Cell Structures and Organelles

Cells have different cell structures.

- Basic cell structures (cell wall, cell membrane, cytoplasm) give the cell its _____.
- ***Organelle*** ("_____"):
  - Structure *inside the cell* that performs a _____
  - Can be membrane-bound (have its own membrane)



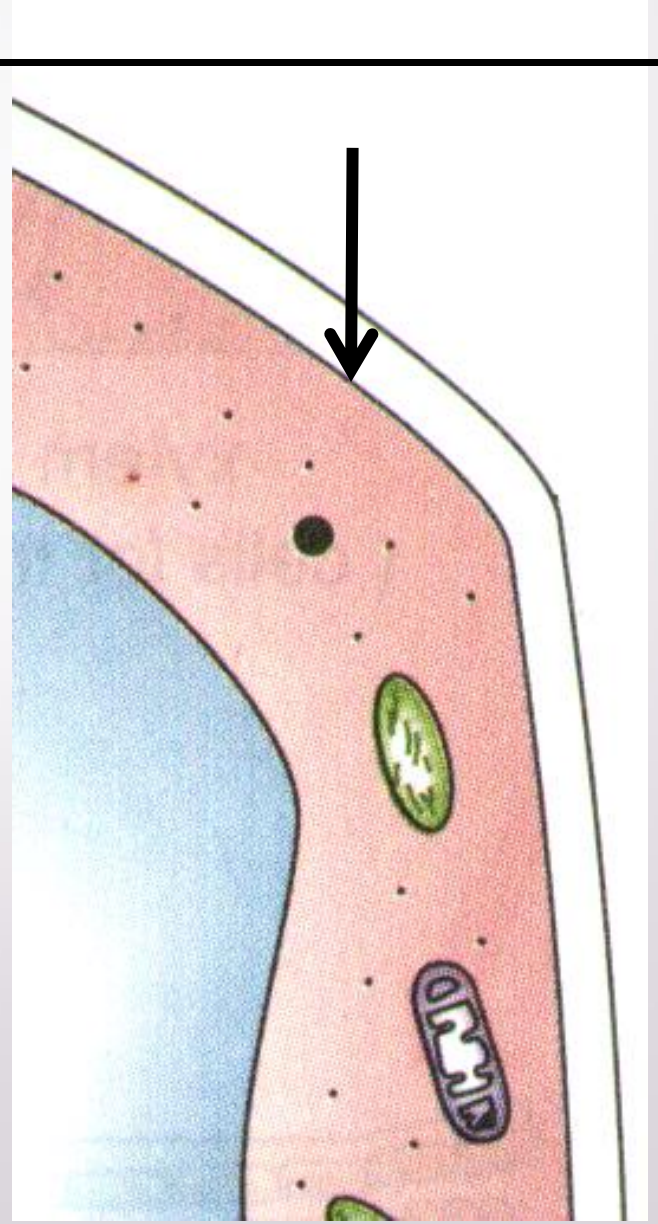
Cell Membrane

- Maintains _____
- Separates and helps _____ cell from its environment
- Controls movement of important

_____

_____

(e.g. sugar, oxygen, carbon dioxide) into and out of the cell



Cell Wall

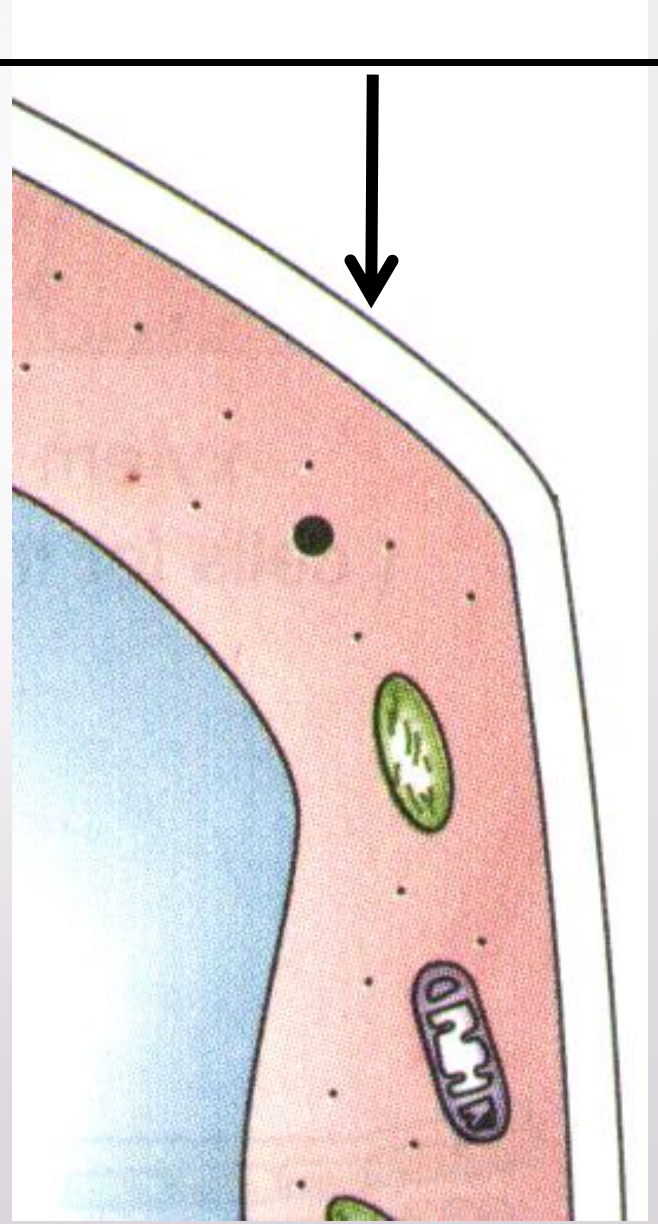
- In _____, fungi, some bacteria (prokaryotes)
- Found _____

_____

- _____

_____

  - Is strong and long-lasting! Sometimes remains behind even after cell has died.

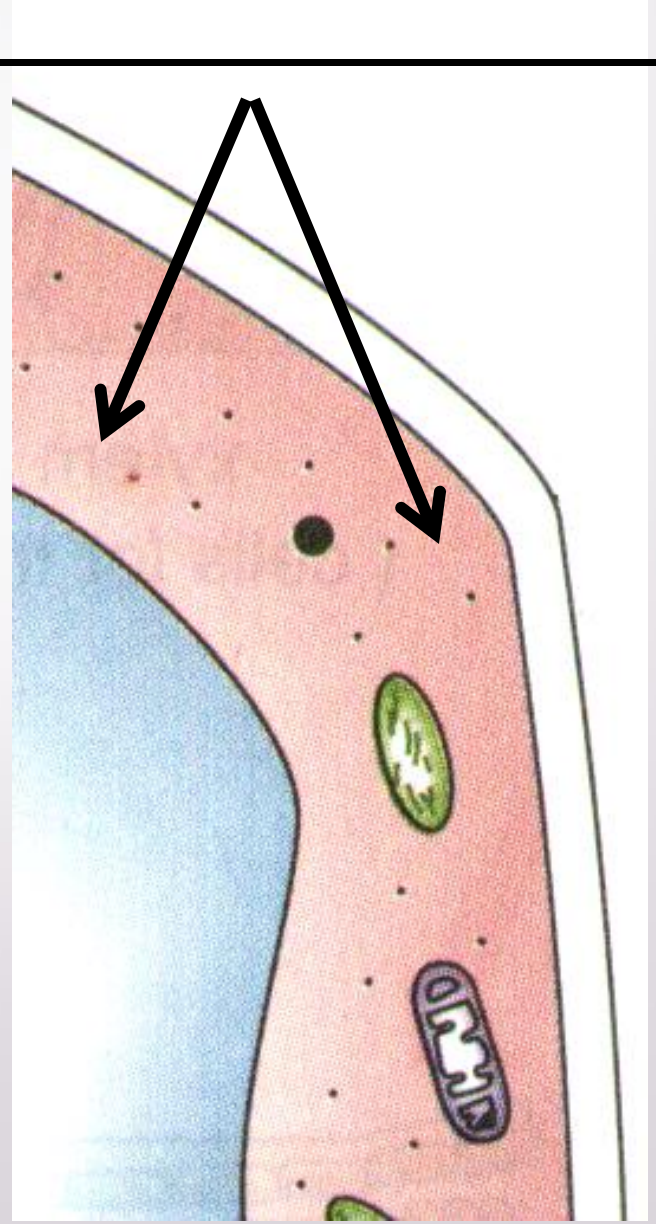


Cytoplasm

- _____-like substance (80% water)
- Makes up most space inside cell; has _____ inside
- Surrounded by _____

_____

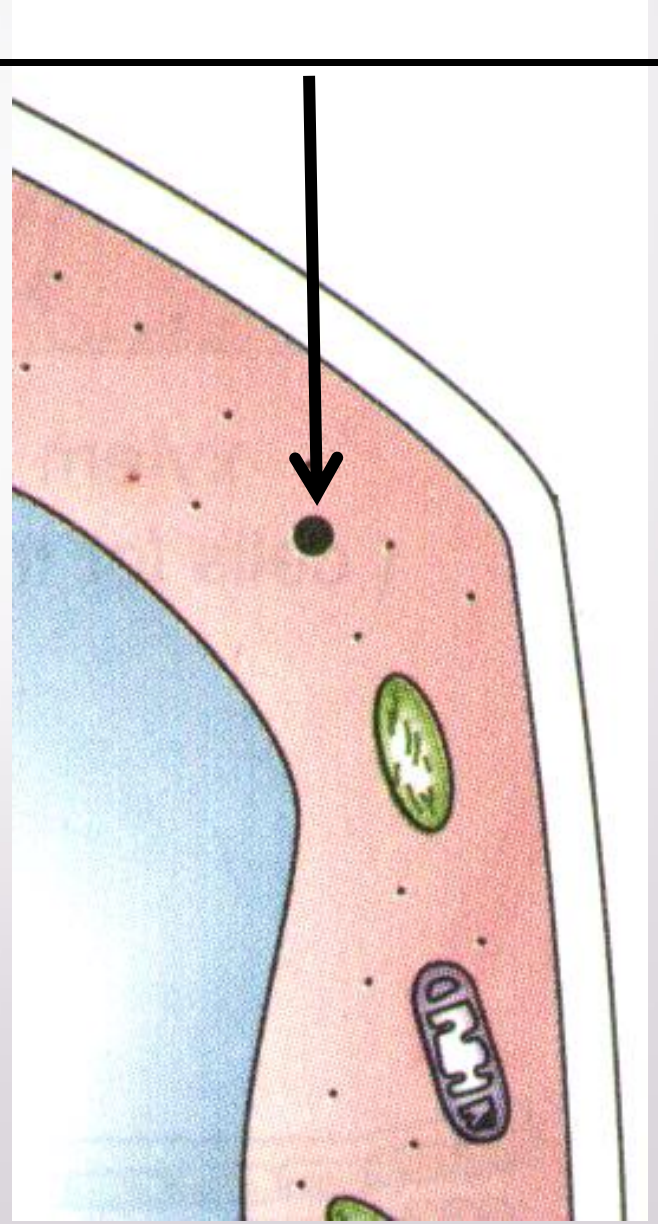
- Maintains cell _____



Ribosome

- Very small, usually dark-coloured
- Found in _____

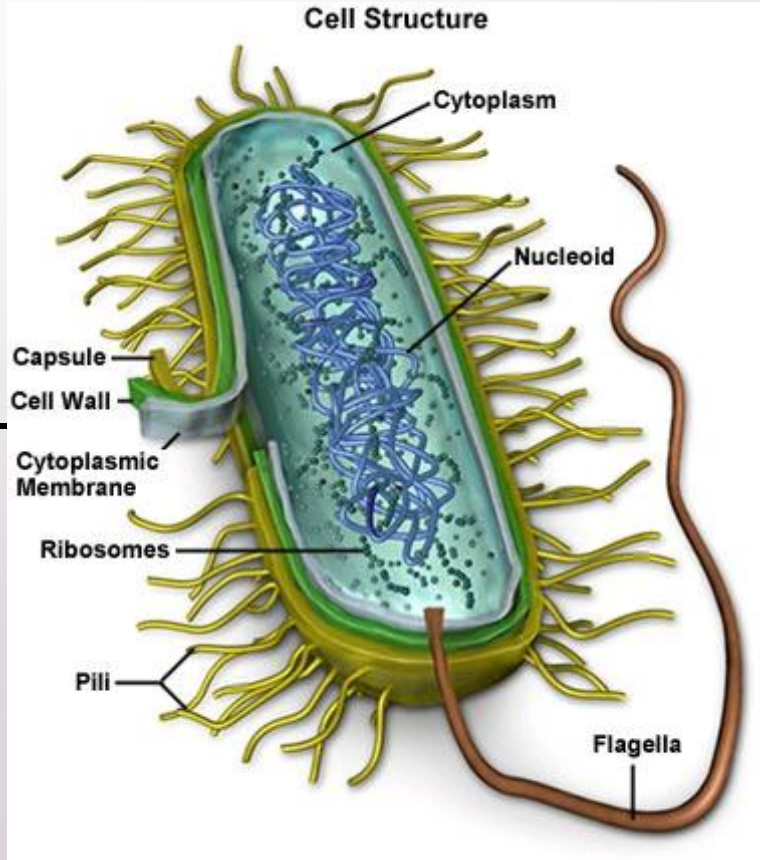
  (prokaryotes and eukaryotes)
- Makes _____
  - Cells use proteins for *everything*! Growth, structure, taking in nutrients, getting rid of wastes…you name it!



Prokaryotes: The First Cells

- Are _____ organisms
- _____ are prokaryotes
- Simplest, smallest type of cell
- Have _____.

Can have cell wall.



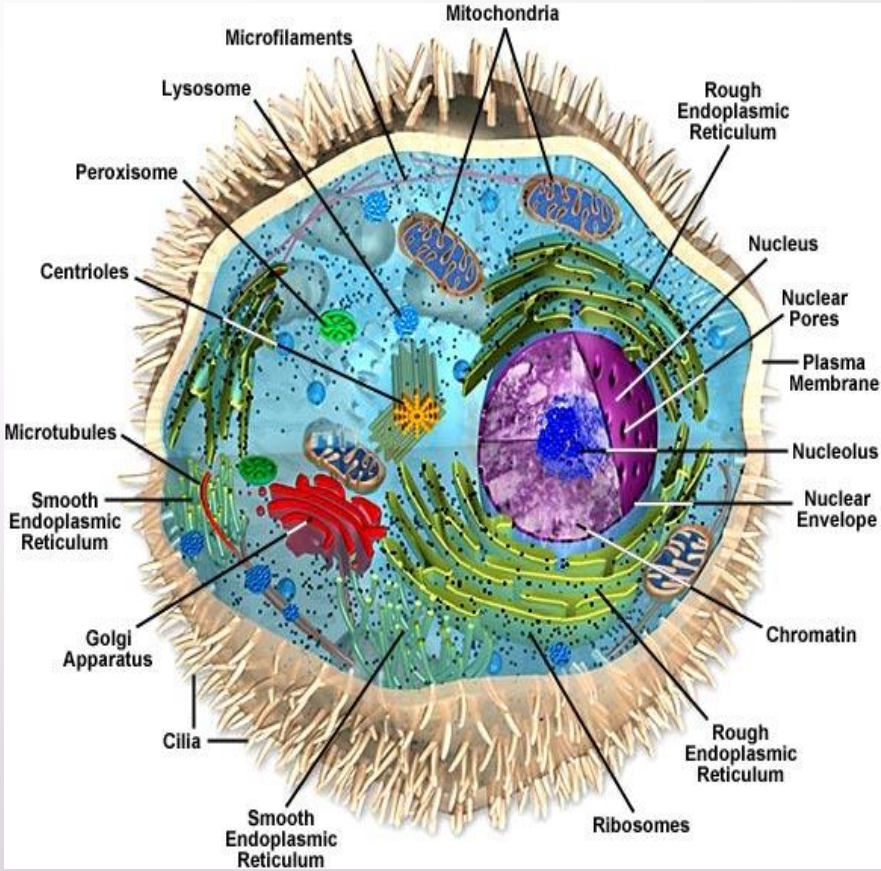
Eukaryotes: More Complex Cells

- Can be _____ or

  _____ organisms
- Includes amoeba, plants, animals, fungi
- Complex, larger cells (approx. _____ larger than prokaryotic cells)
- Have membrane-bound

  _____

  (nucleus, ER, mitochondria, vacuole, sometimes chloroplast)



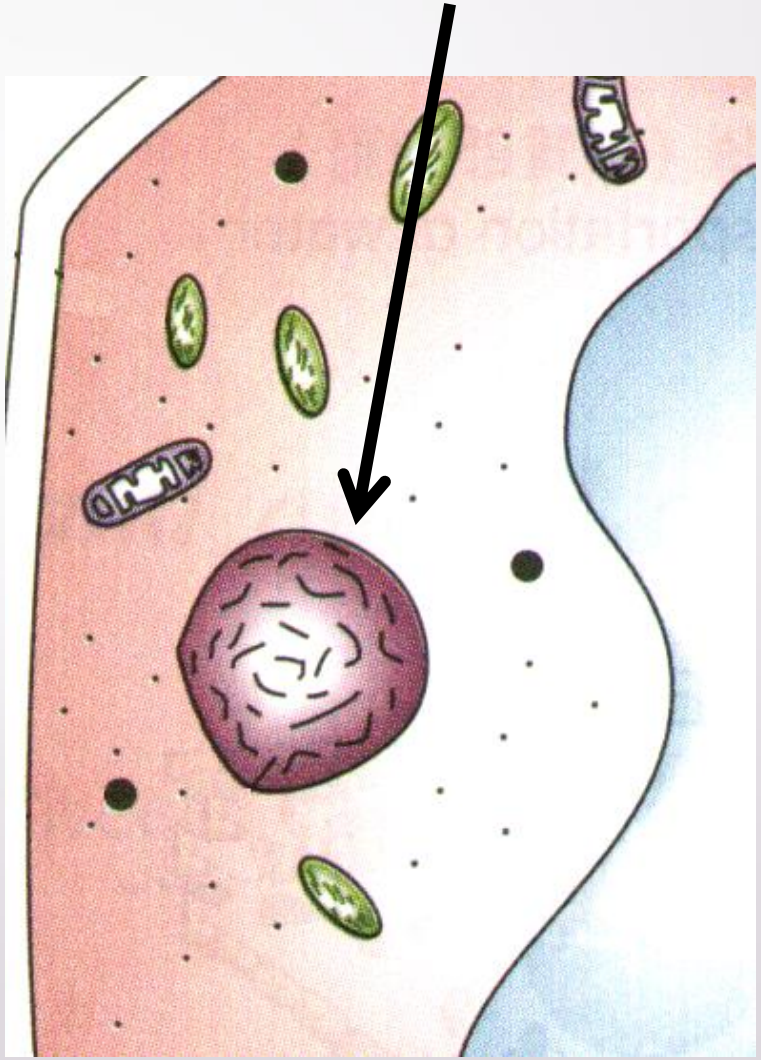
	Prokaryotes	Eukaryotes
Cell membrane	☐	☐
Cell wall	☐ (_____)	☐ (_____)
Cytoplasm	☐	☐
Ribosomes	☐	☐
Nucleus	☐	☐
Membrane-bound organelles (e.g. nucleus, mitochondria, chloroplasts, vacuoles, endoplasmic reticulum, lysosomes)	☐	☐

Nucleus

- _____ the cell's activities
- Contains _____

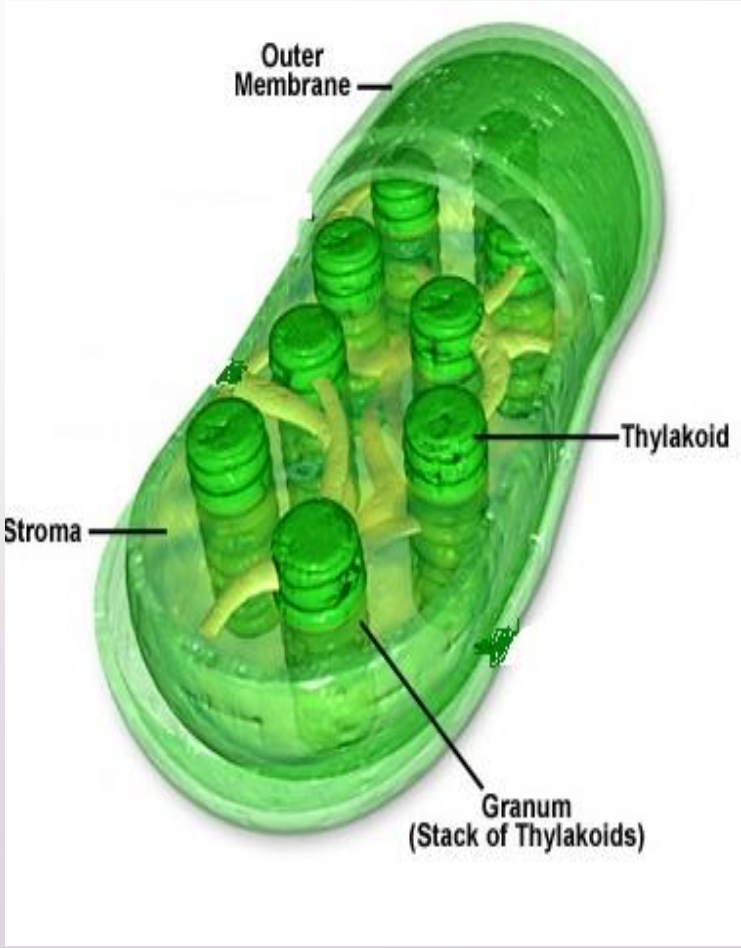
_____

- Surrounded by nuclear membrane
- In all _____ cells



Chloroplasts

- Found only in _____ (living things that make their own food, e.g. _____)
- Site of _____: converts solar energy to sugar



Mitochondrion (pl. mitochondria)

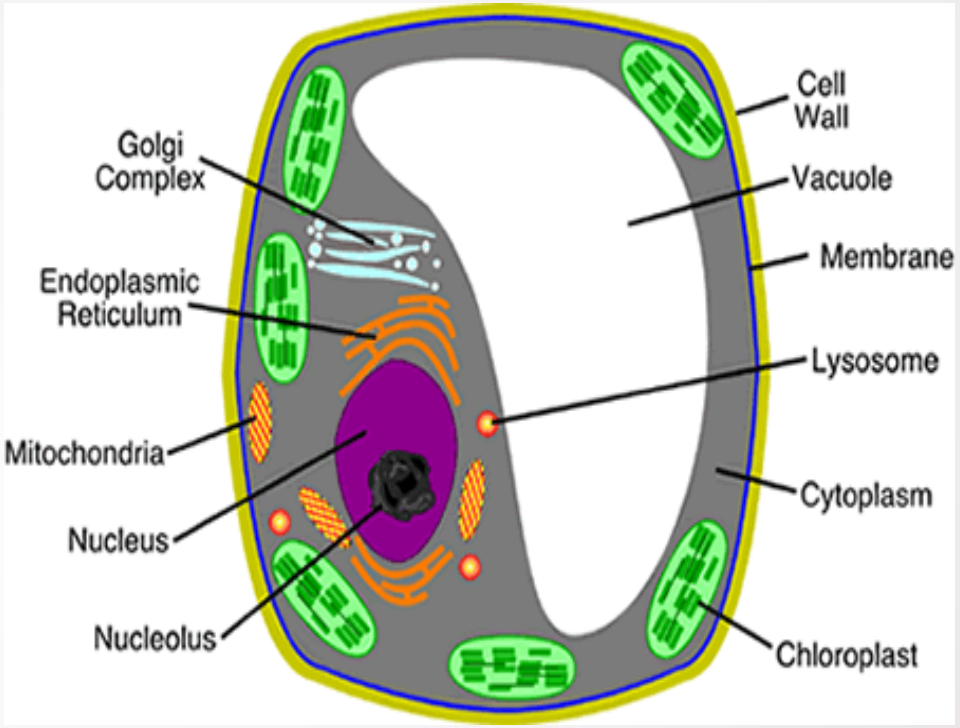
- "Powerhouse of the cell"
- Is the site of _____

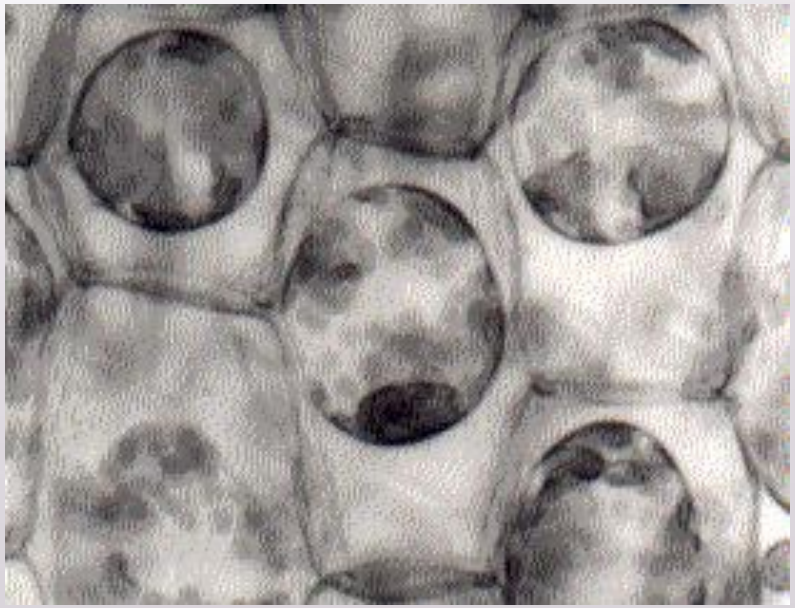
  _____:

  converts sugar to useable ATP energy
- In all eukaryotic cells

Vacuole

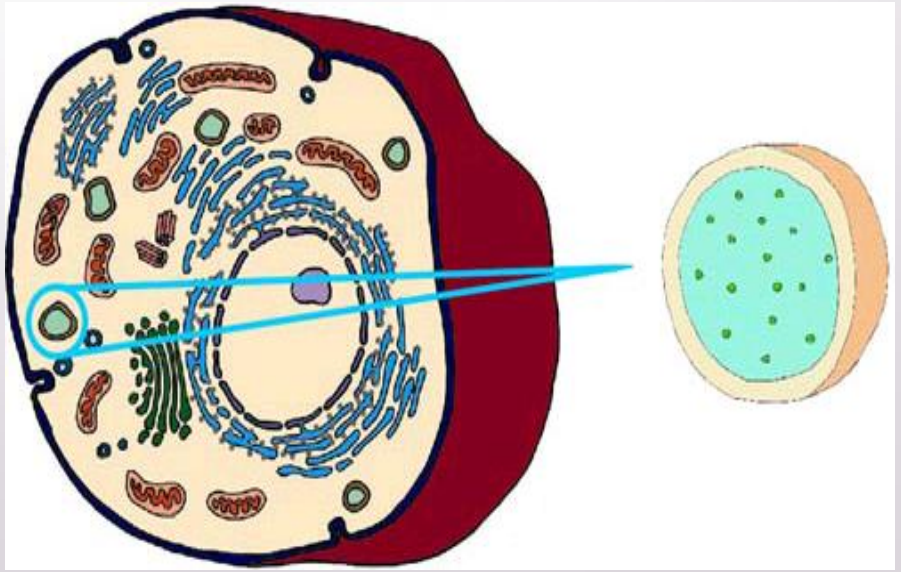
- Fluid-filled sac for _____
  - Water, sugar, proteins, minerals, fats, wastes, enzymes
- Plants have a large central vacuole
- Animals have many _____





Lysosomes

- _____
  (to get nutrients)
- _____
  and invaders such as bacteria and viruses
- _____
  and **recycles** worn out cell parts
- In all eukaryotic cells*



_____(ER)

- Network of _____
- _____ materials around the cell
- ER often has _____ attached (to transport _____ after they are made)
- In all eukaryotic cells

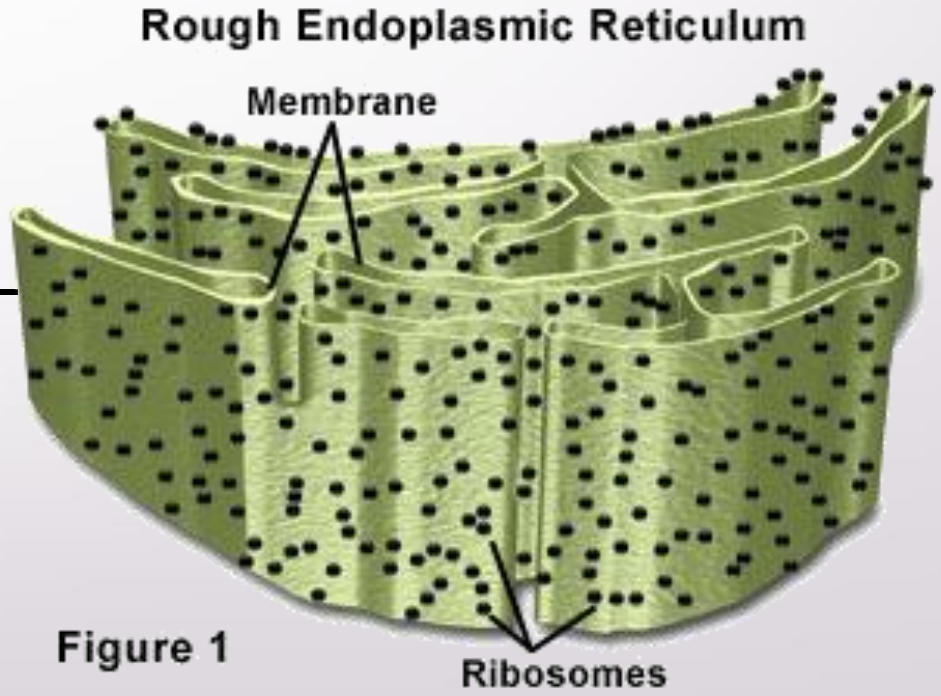
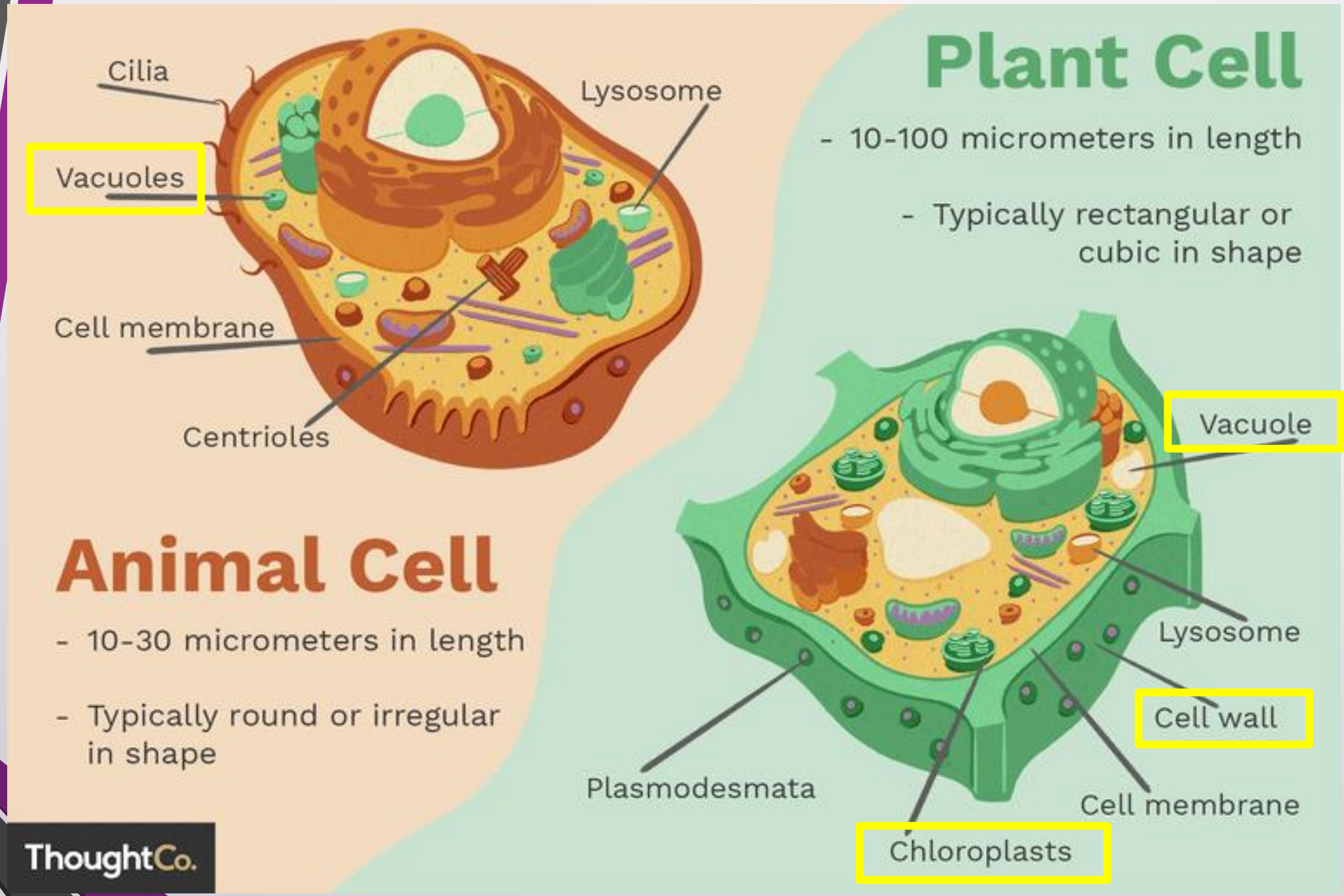


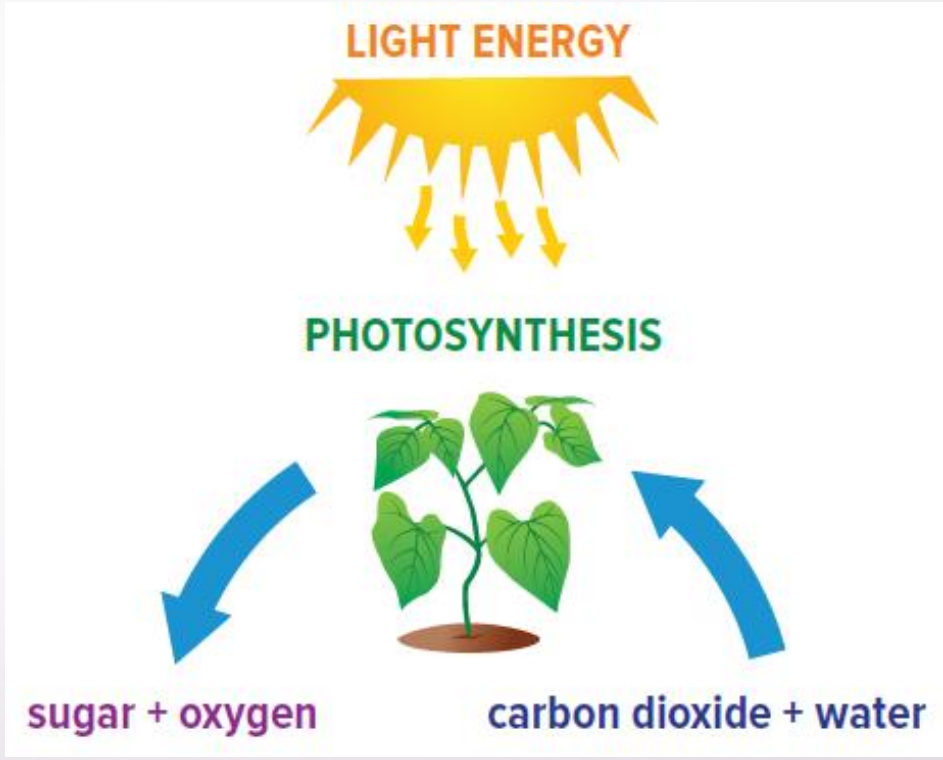
Figure 1


Cilia
Lysosome
Vacuoles
Cell membrane
Centrioles
Animal Cell
- 10-30 micrometers in length
- Typically round or irregular in shape
Plant Cell
- 10-100 micrometers in length
- Typically rectangular or cubic in shape
Vacuole
Lysosome
Cell wall
Plasmodesmata
Cell membrane
Chloroplasts
ThoughtCo.

Photosynthesis

- *Photo* = "_____"
  synthesis = making something
- Occurs in _____
- A chemical reaction that converts the Sun's _____

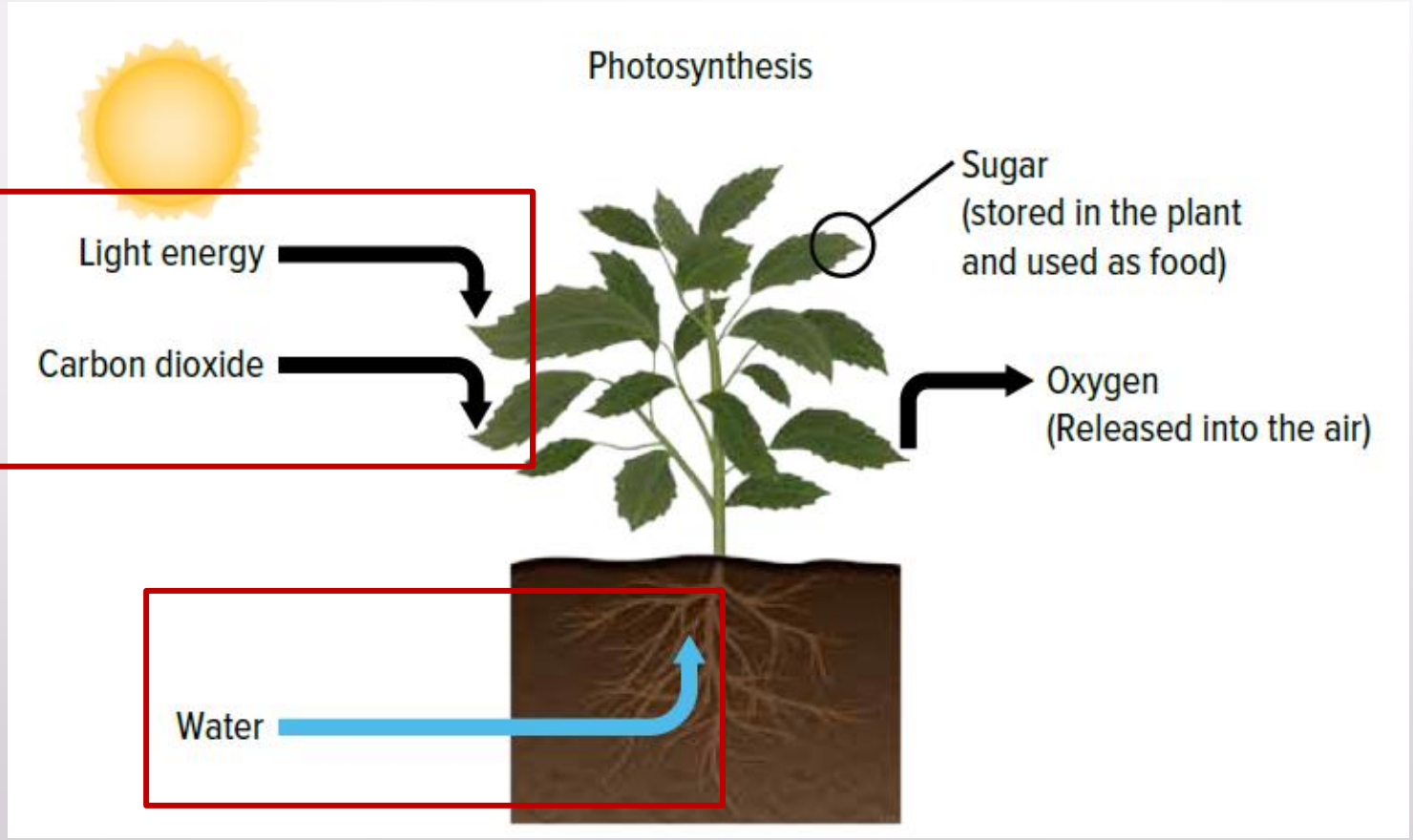
  _____ into chemical energy (sugar) that organisms can use



_____

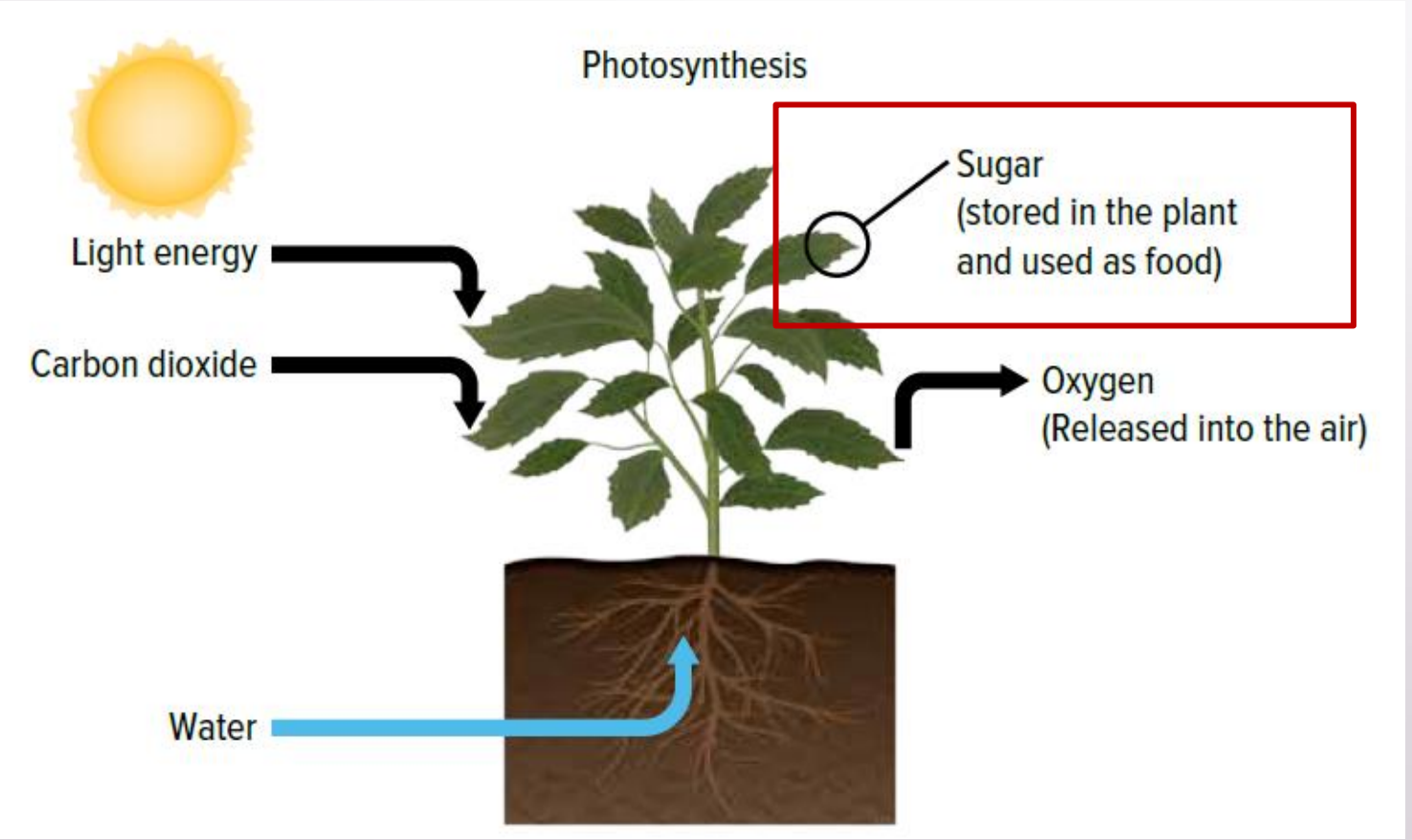
Photosynthesis

- Plants take in carbon dioxide from the _____
- Plants absorb water through _____



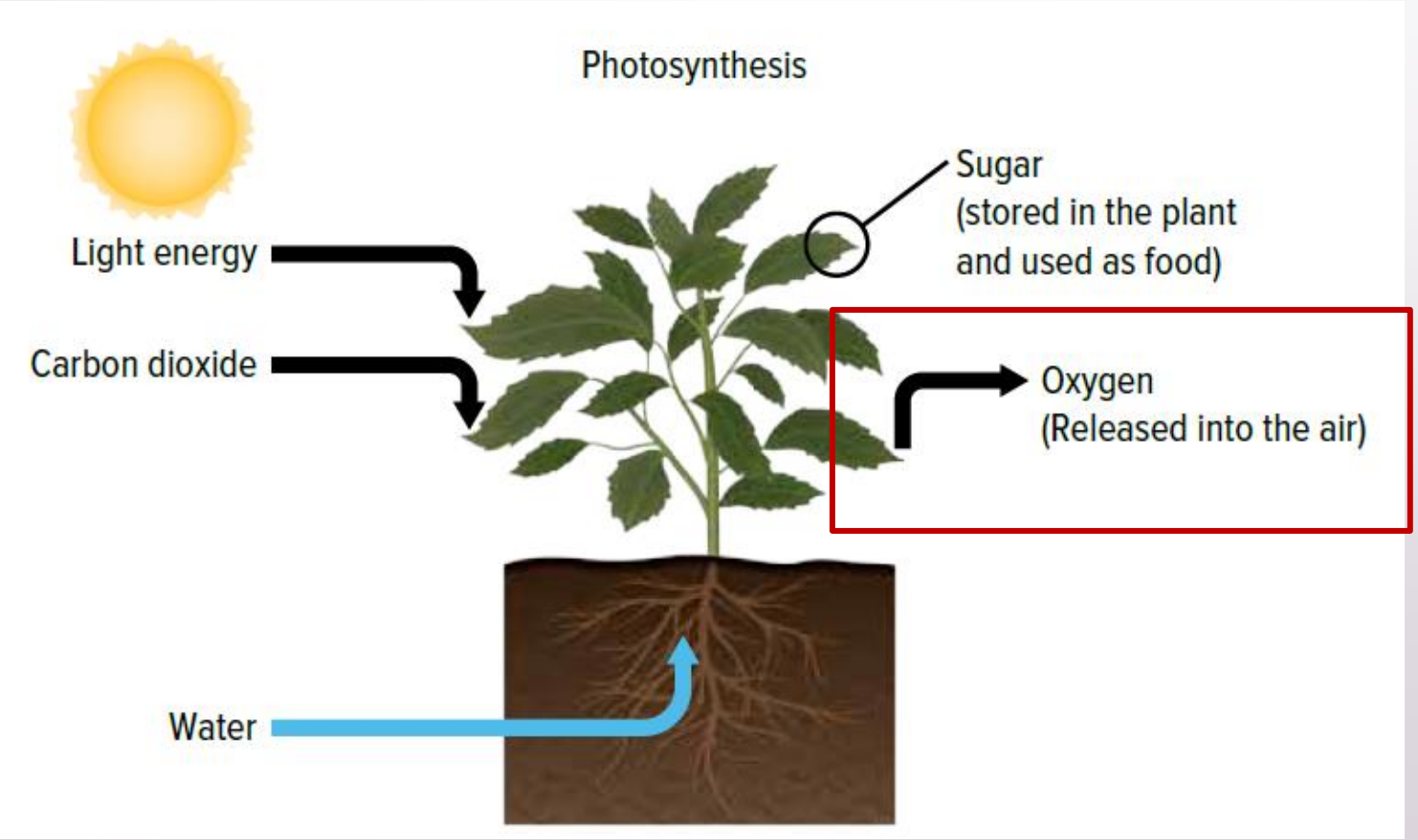
Photosynthesis

- Plants convert light energy into chemical energy (sugar)
- _____ for the plant



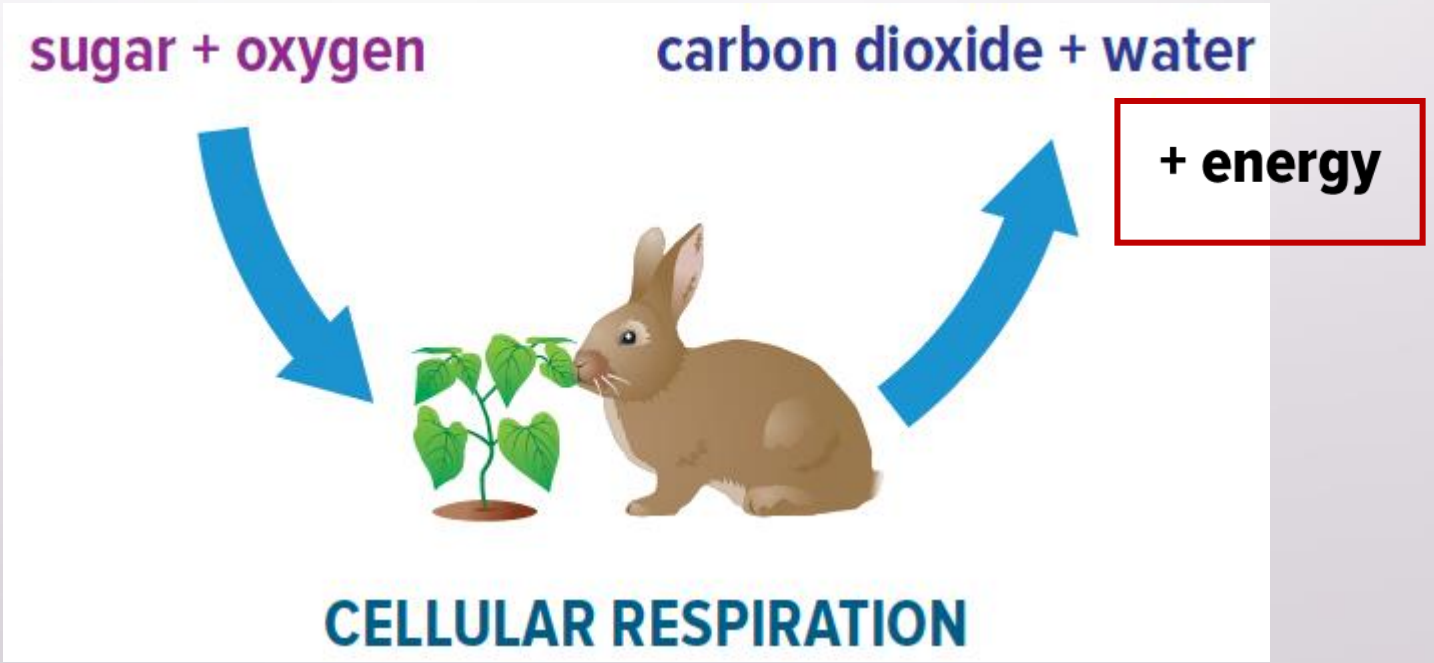
Photosynthesis

- _____ is released into the air as a _____ by-product



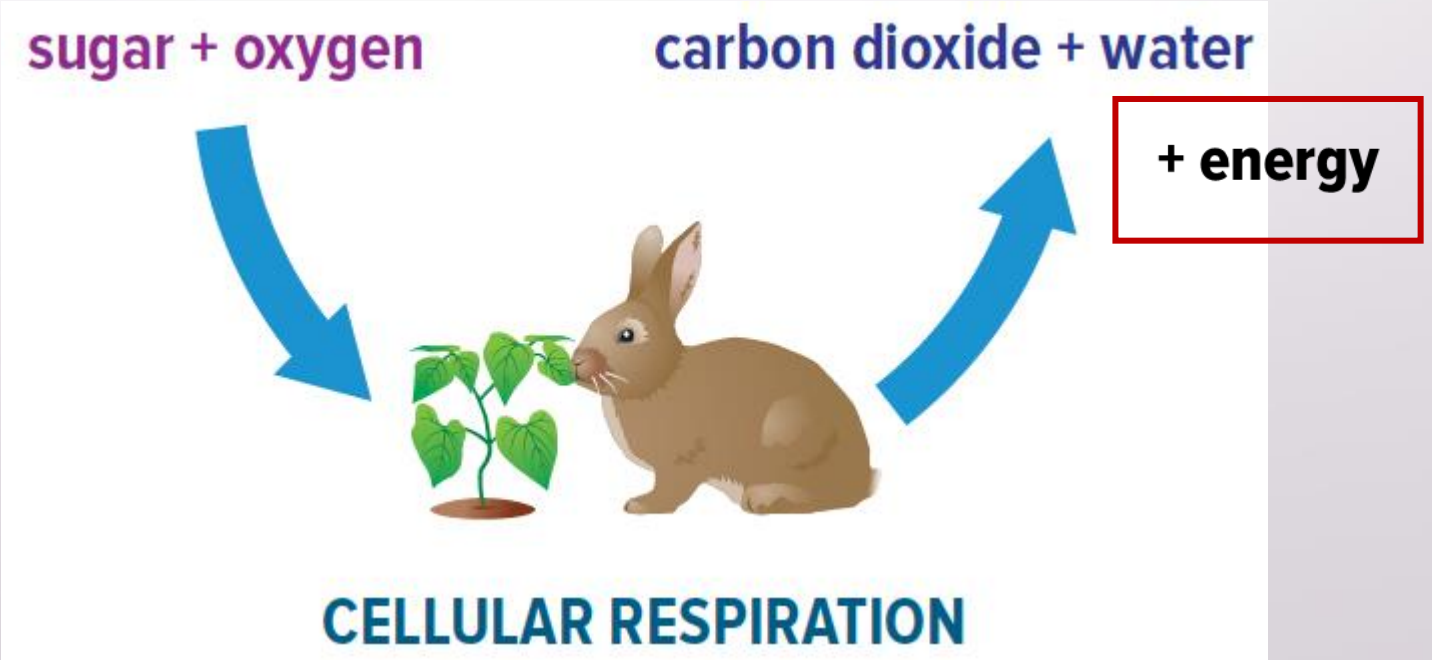
Cellular Respiration

- Occurs in _____
- A chemical reaction in the cells of _____ _____ that release the energy needed to carry out life processes



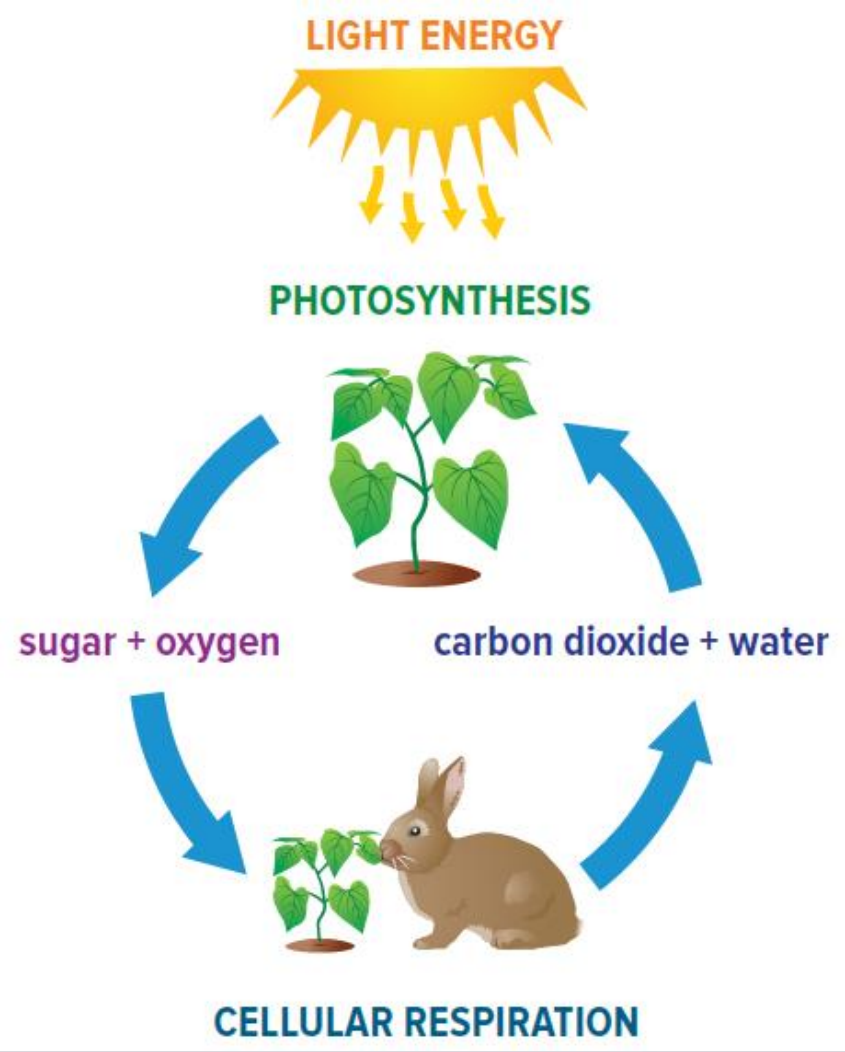
Cellular Respiration

- _____
- Sugar and oxygen are converted into carbon dioxide and water (waste products)
- _____ is released (used to power cell processes)



Photosynthesis and Cellular Respiration

- Photosynthesis and cellular respiration function in a _____
- Most living things depend on this cycle to survive
- Photosynthesis: _____ _____
- Cellular respiration: _____ _____



Photosynthesis and Cellular Respiration

_____

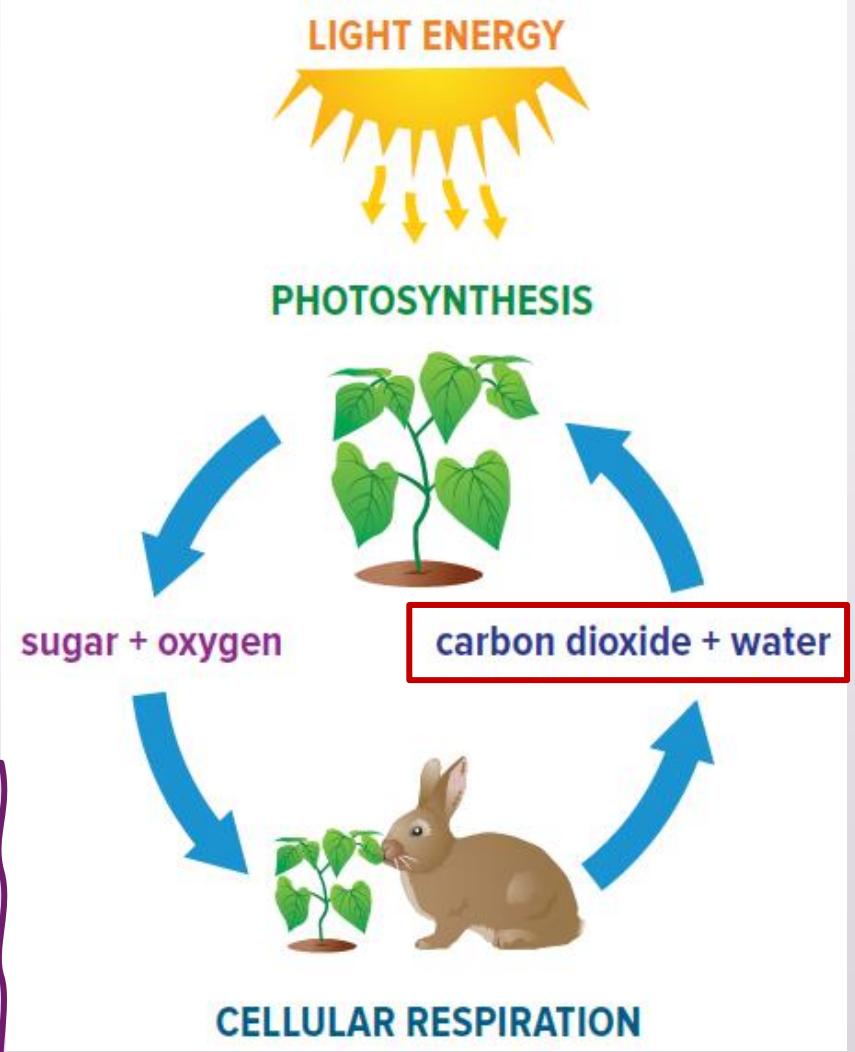
(e.g. plants, algae):

- Use the carbon dioxide and water produced by

  _____

  _____

  as part of photosynthesis



Fun fact: _____ evolved first, releasing oxygen into the atmosphere. Cellular respiration evolved after that, to use the oxygen.

Photosynthesis and Cellular Respiration

- All living things use the _____ _____ produced by photosynthesis as part of cellular respiration
- Obtaining sugar and oxygen:
  - Plants _____
  - Animals _____ _____ to obtain these nutrients