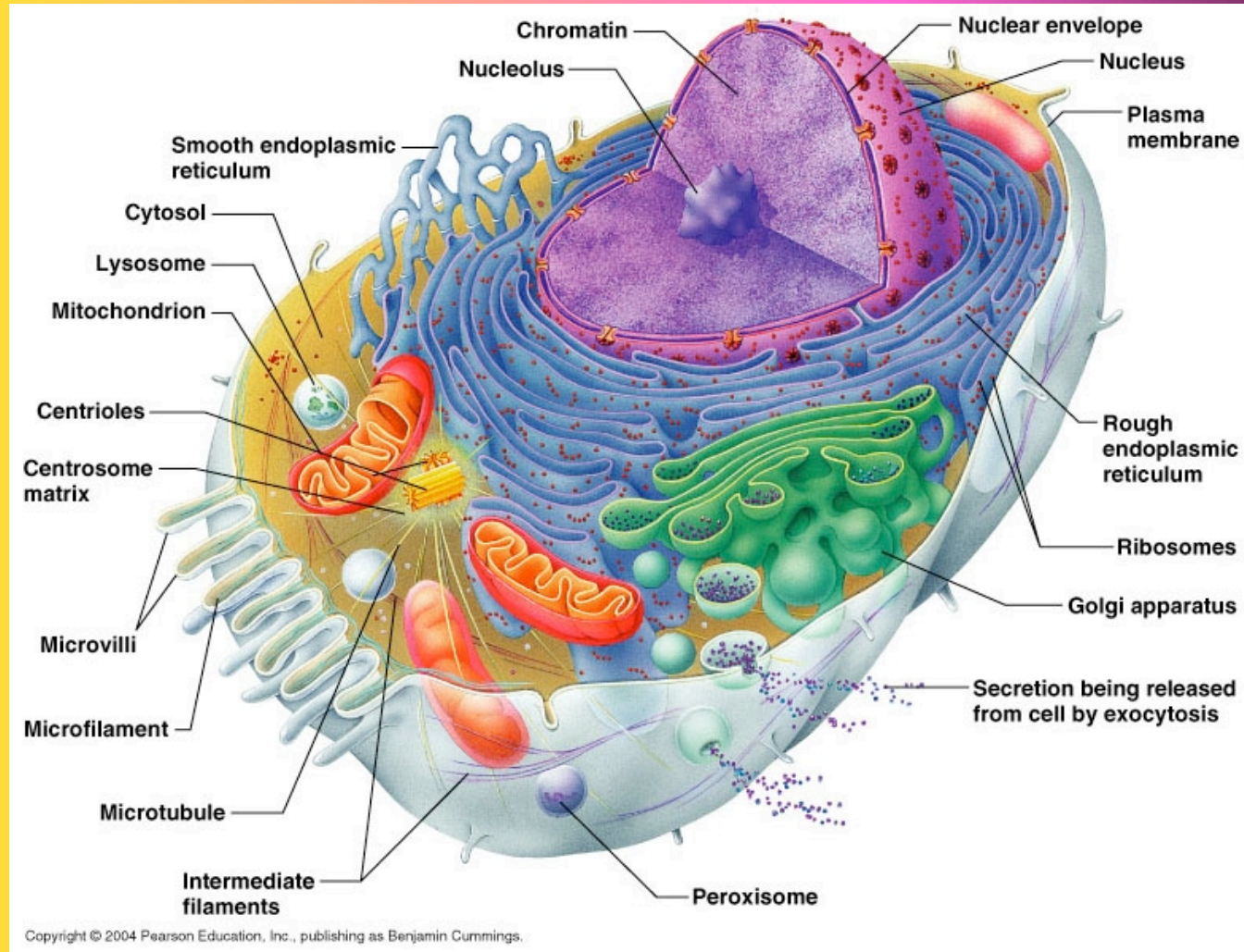


Unit 2: Cells- Structure & Function



TITLE: INTRO. TO CELLS WORKSHEET & VIDEO

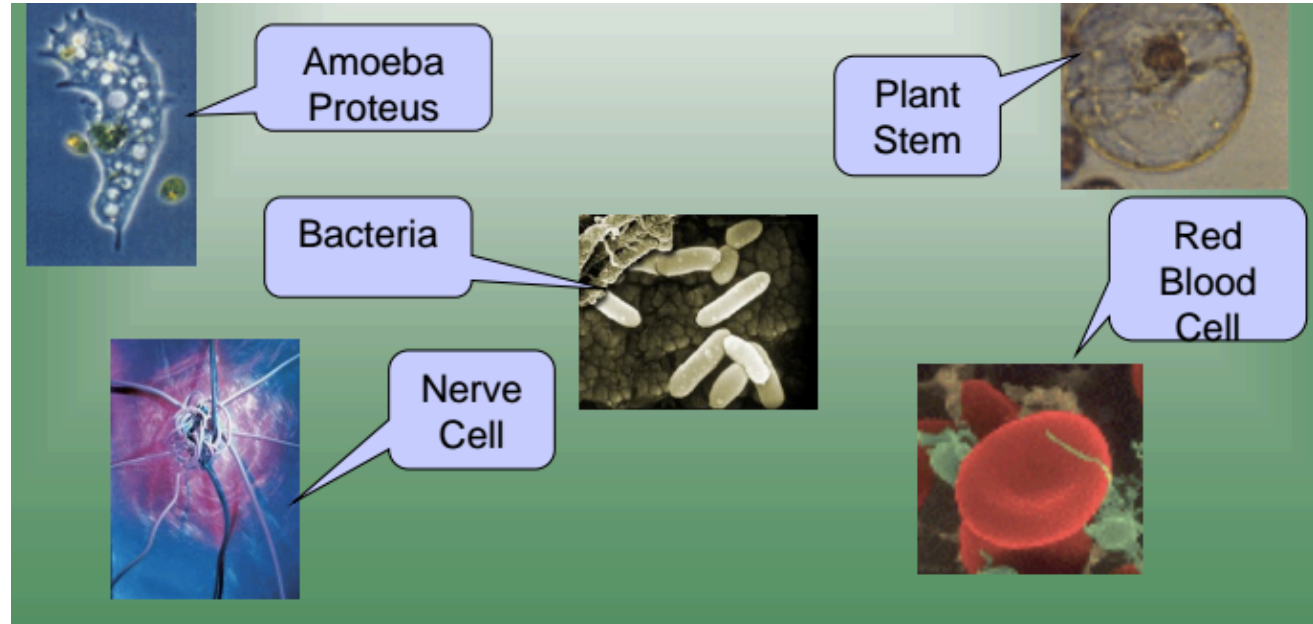
INB page. 26

Worksheet Answers	10 Facts from Video
1.	
2.	
3.	
4.	
5.	
6.	
7.	
8.	
9.	
10.	

Title: Cell Structure & Function

EQ: What is a cell & what are the differences among the types of cells?

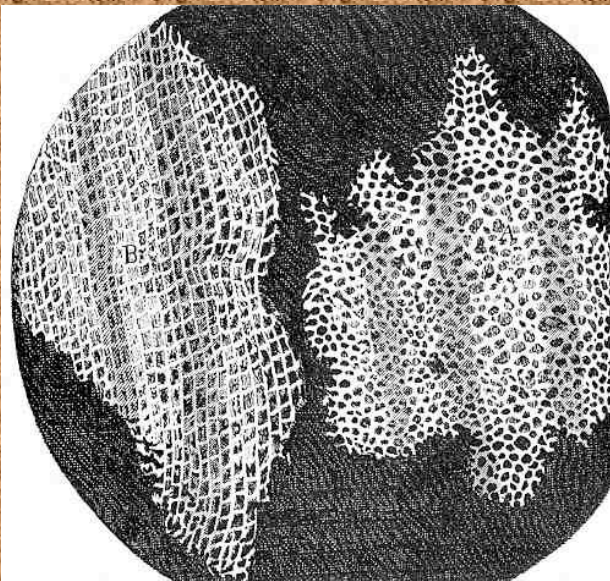
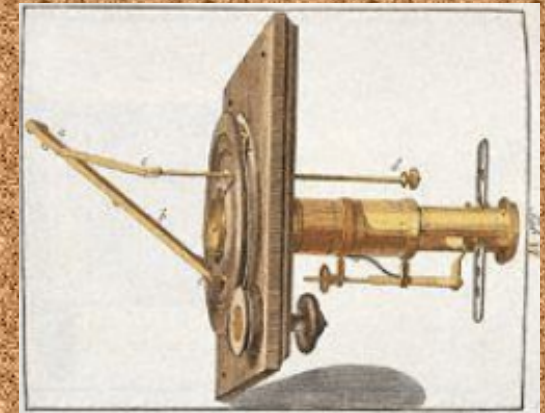
A Cell is: the smallest unit of structure & function of a living thing.



Anton van Leeuwenhoek first discovered cells by looking through a simple microscope.

- Robert Hooke first used a compound microscope to view cork cells.
- Hooke first used the term "cell"

<http://viewpure.com/XzEvK6KNivc>



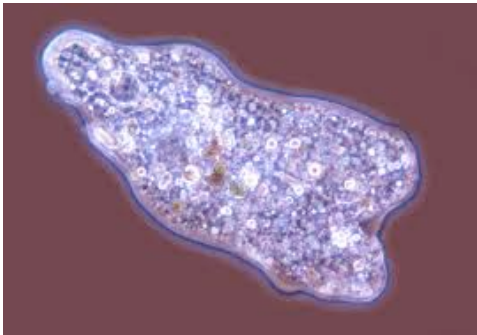
- In the Mathias Schleiden identified the first plant cells & found that all plants are made of cells.

Cell Theory

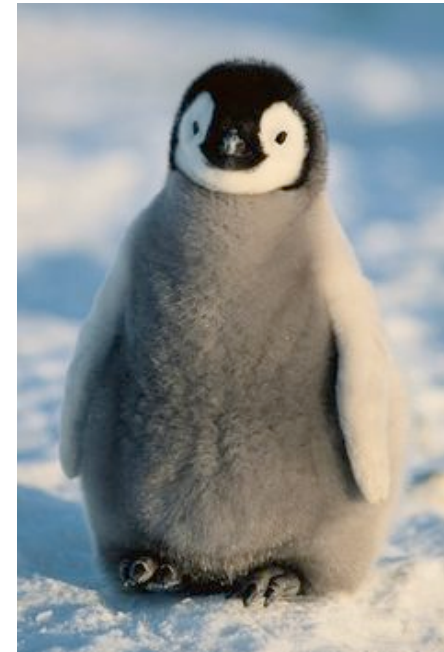
1. All living things are made up of 1 or more cells.
2. Cells are the smallest working units of all living things.
3. All cells come from other cells through cell division.

NUMBER OF CELLS:

- Unicellular- made of 1 cell

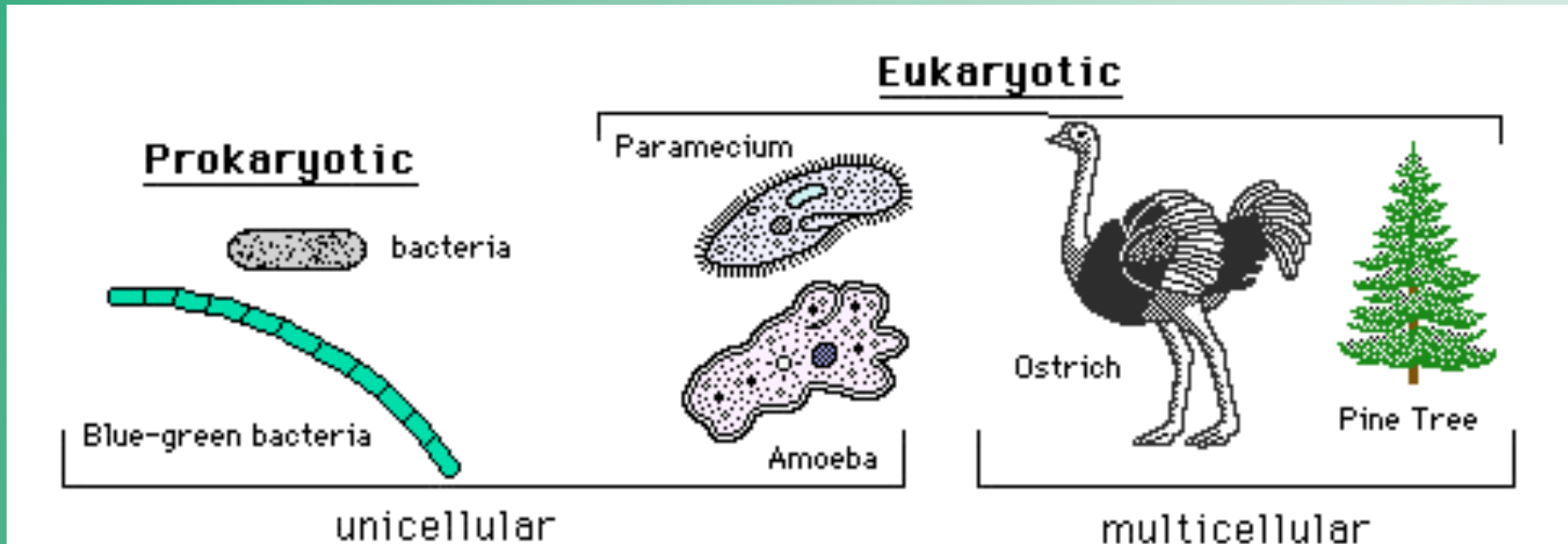


- Multicellular- made of many cells

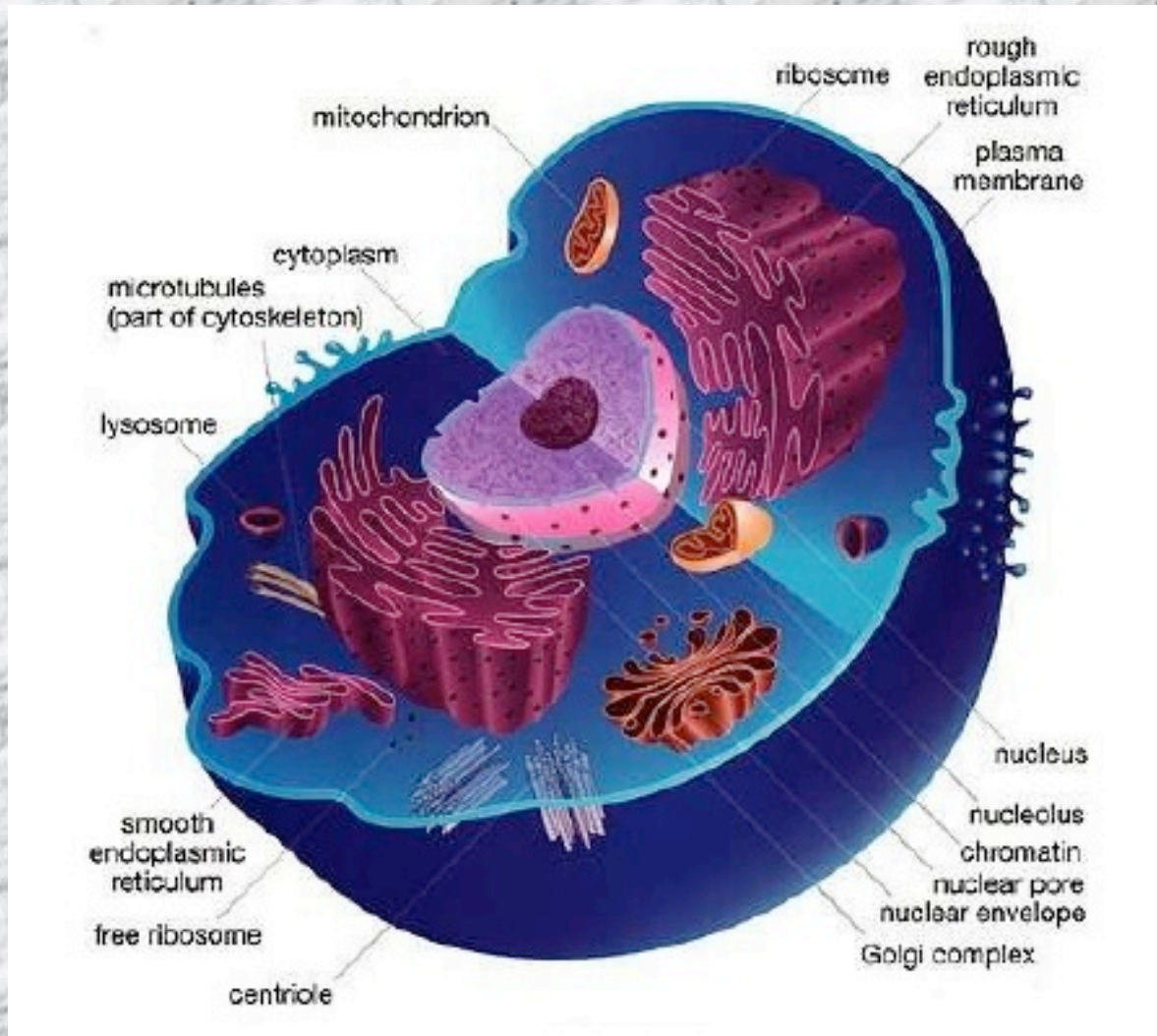


Two types of cells:

- Prokaryotes: no nucleus or organelles
 - Ex: bacteria
- Eukaryotes: have a nucleus & organelles
 - Ex: plants, animals, fungi

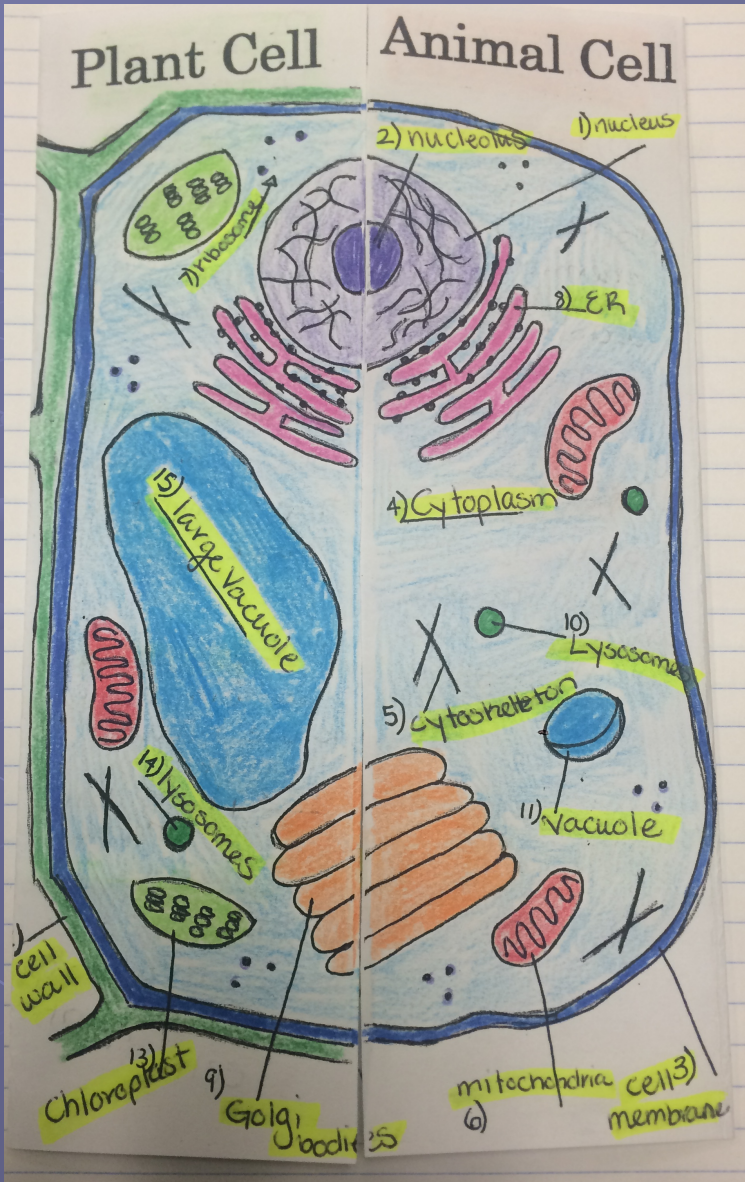


- **Organelles- found in a cell & have specific functions**



Cell Organelles

INB page. 27



Plant & Animal Organelles

Plant Cell Differences

- Cell Wall** - Rigid, protective barrier on the outside of the cell membrane.
- Chloroplast** - site of photosynthesis, trap sunlight to make food.
- Lysosomes** - contain chemicals to breakdown waste. Only some plants have these.
- Large Vacuole** - stores H₂O & minerals. Takes up 90% of plant cell.

Plant Cells + Animal cells Similarities

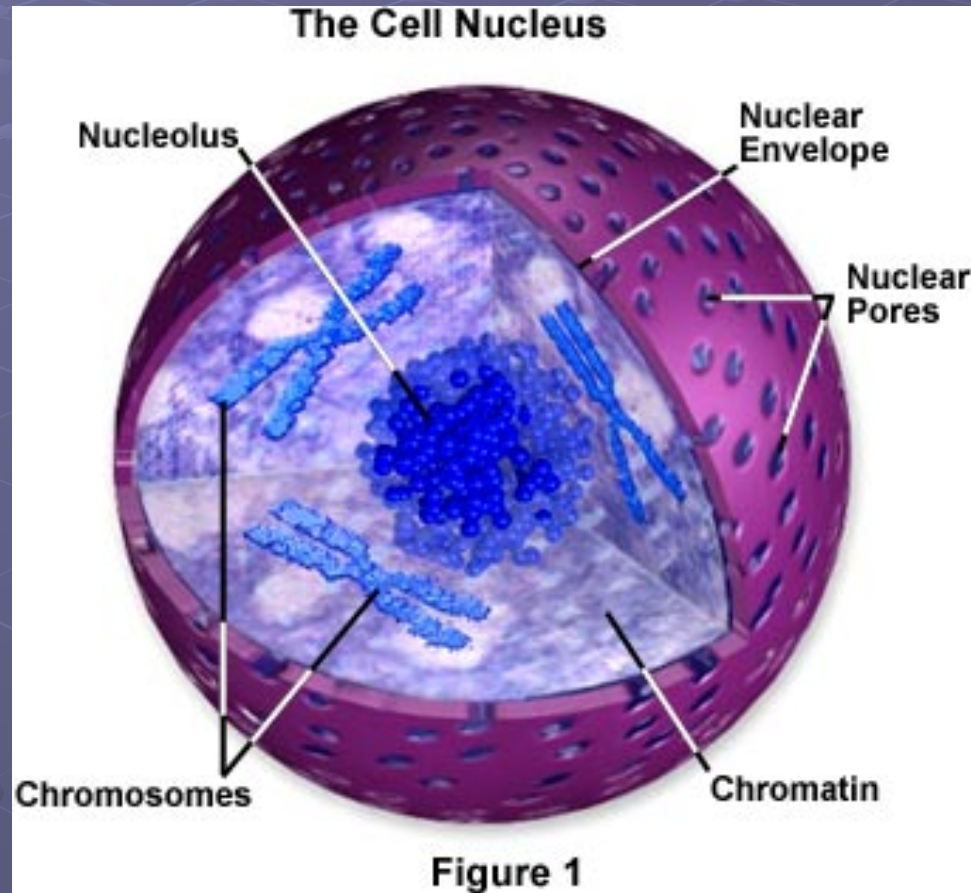
- Nucleus** - control center, stores DNA
- Nucleolus** - center of nucleus, produces ribosomes
- Cell membrane** - controls which substances can enter or leave the cell
- Cytoplasm** - gel like fluid in which organelles are found.
- Cytoskeleton** - gives the cell shape & structure
- Mitochondria** - "Powerhouse" of the cell, releases energy from food
- Ribosome** - small structures that make proteins
- Endoplasmic Reticulum (ER)** - Passageways that move materials within the cell.
- Golgi Apparatus** - flattened sacs that store & release chemicals

Animal Cell Differences

- Lysosomes** - "Garbage disposal," contain chemical that breakdown waste. Found in high #'s
- Vacuoles** - store H₂O, food, and minerals, animal cells have small vacuoles

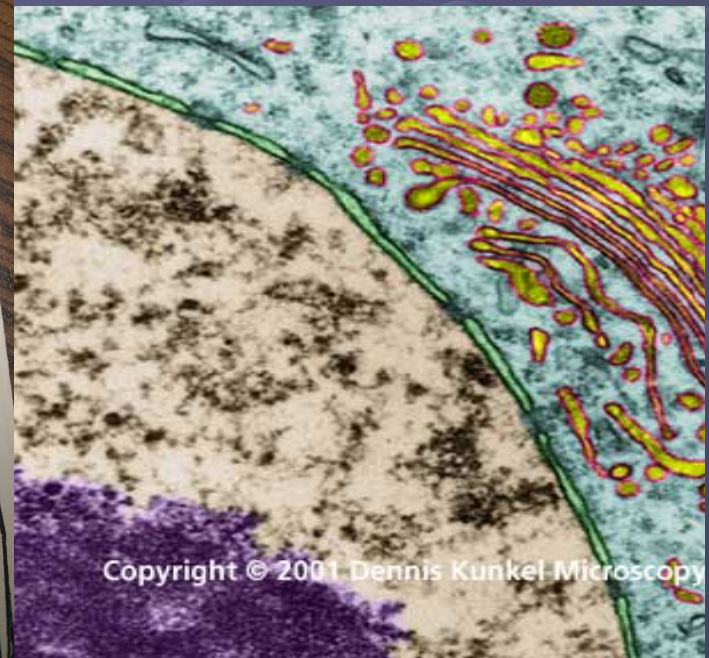
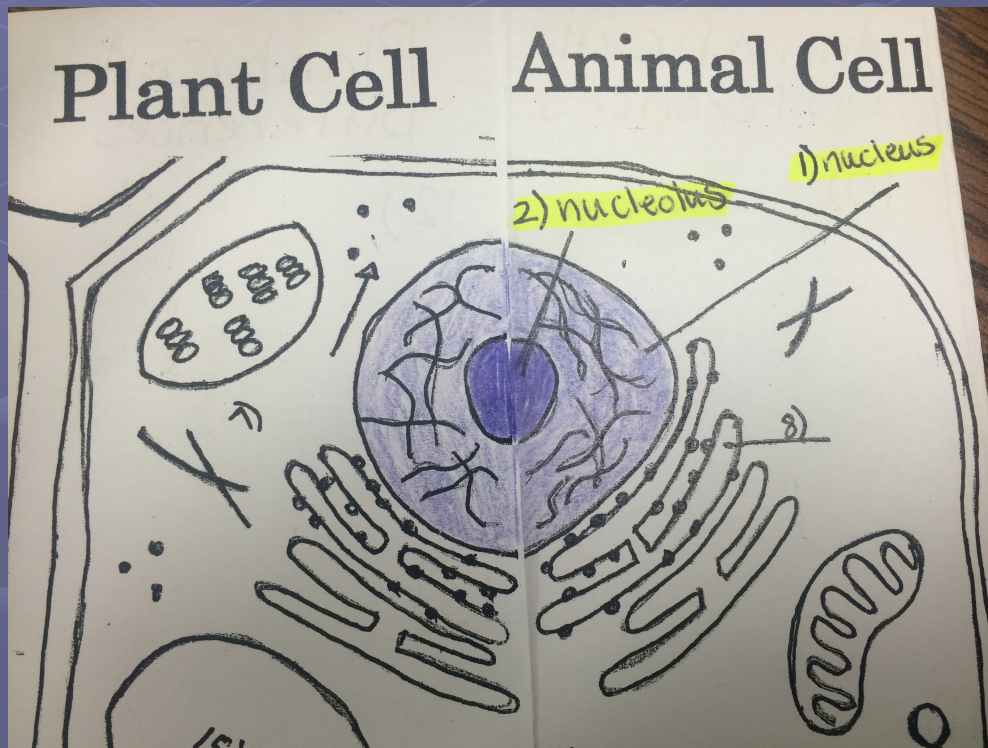
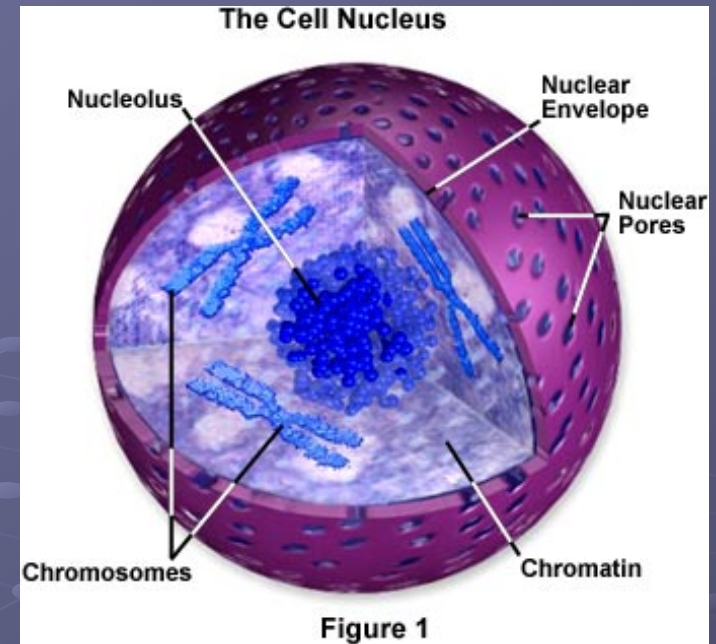
1) Nucleus

- Control center, stores DNA



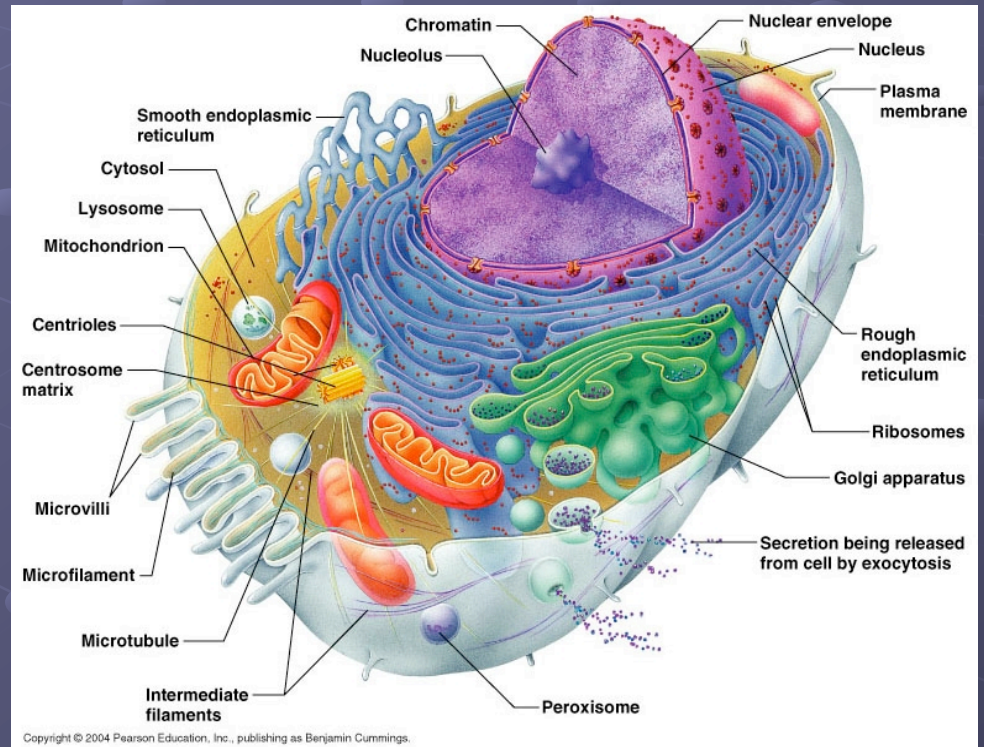
2) Nucleolus

- Center of the nucleus, produces ribosomes



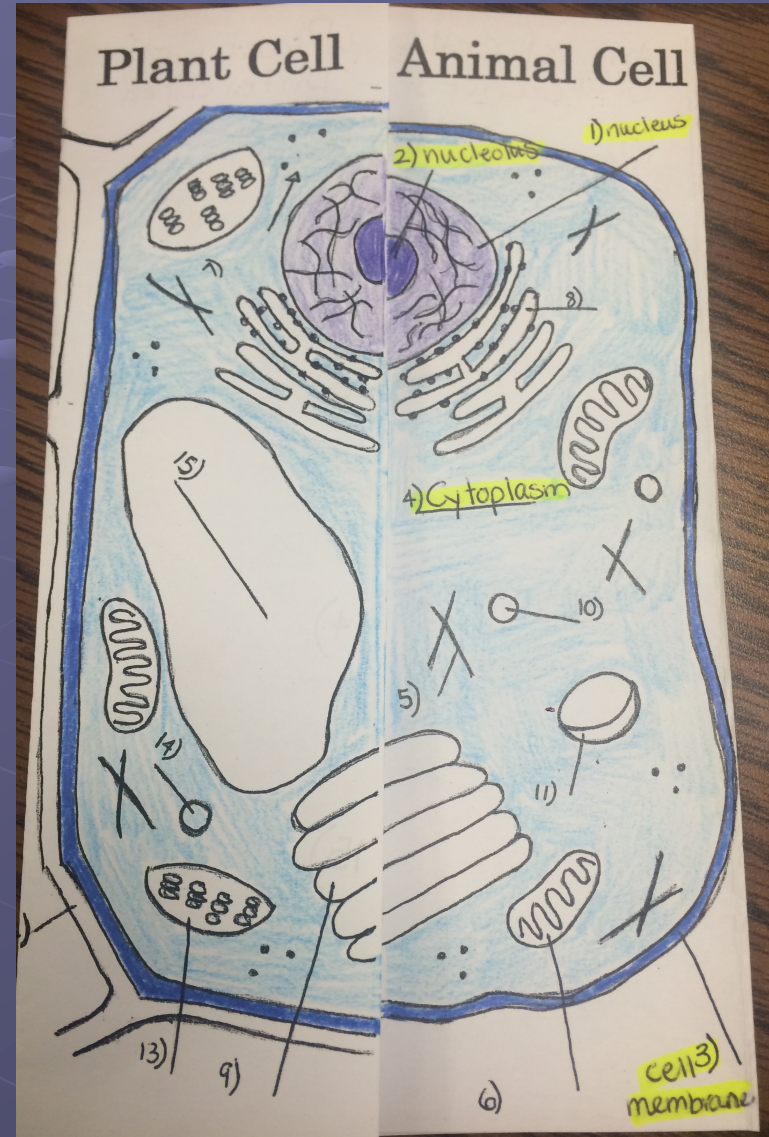
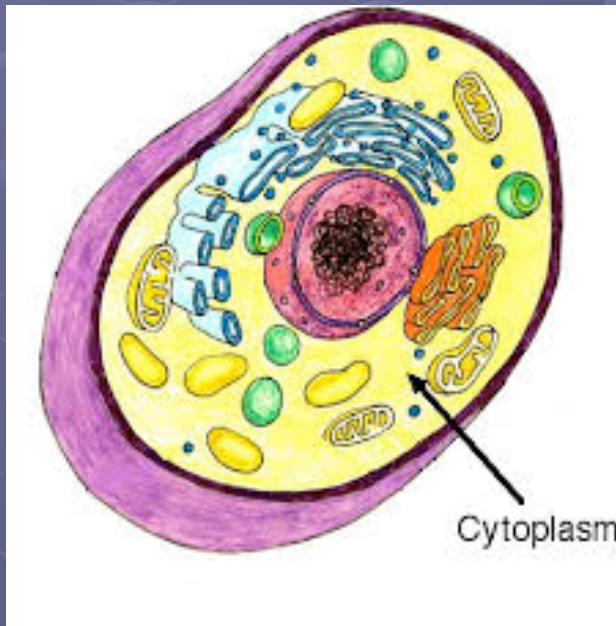
3) Cell Membrane

◆ Controls which substances can enter or leave the cell



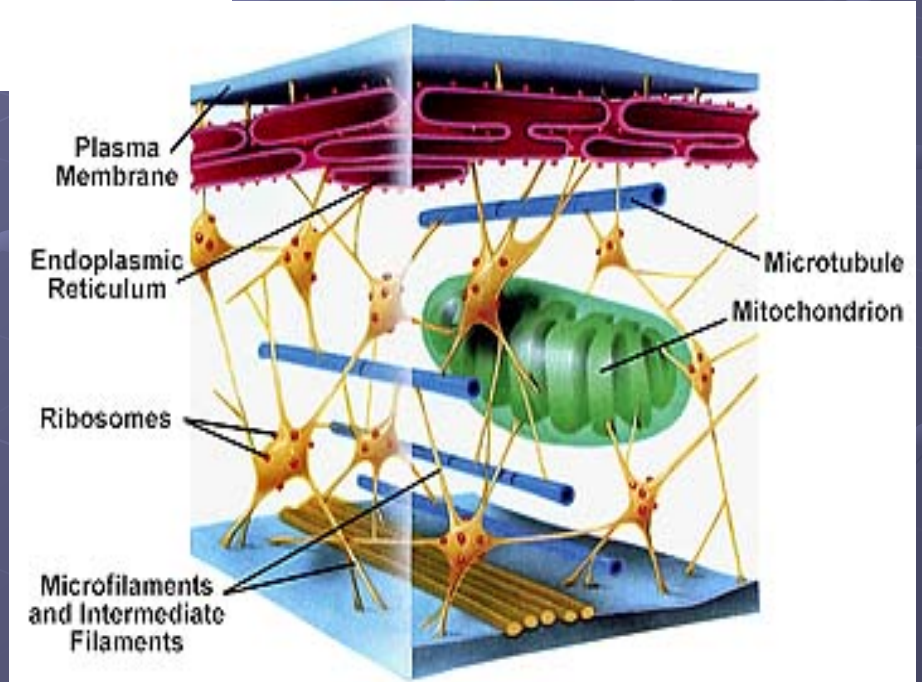
4) Cytoplasm

- ◆ gel-like fluid in which organelles are found.



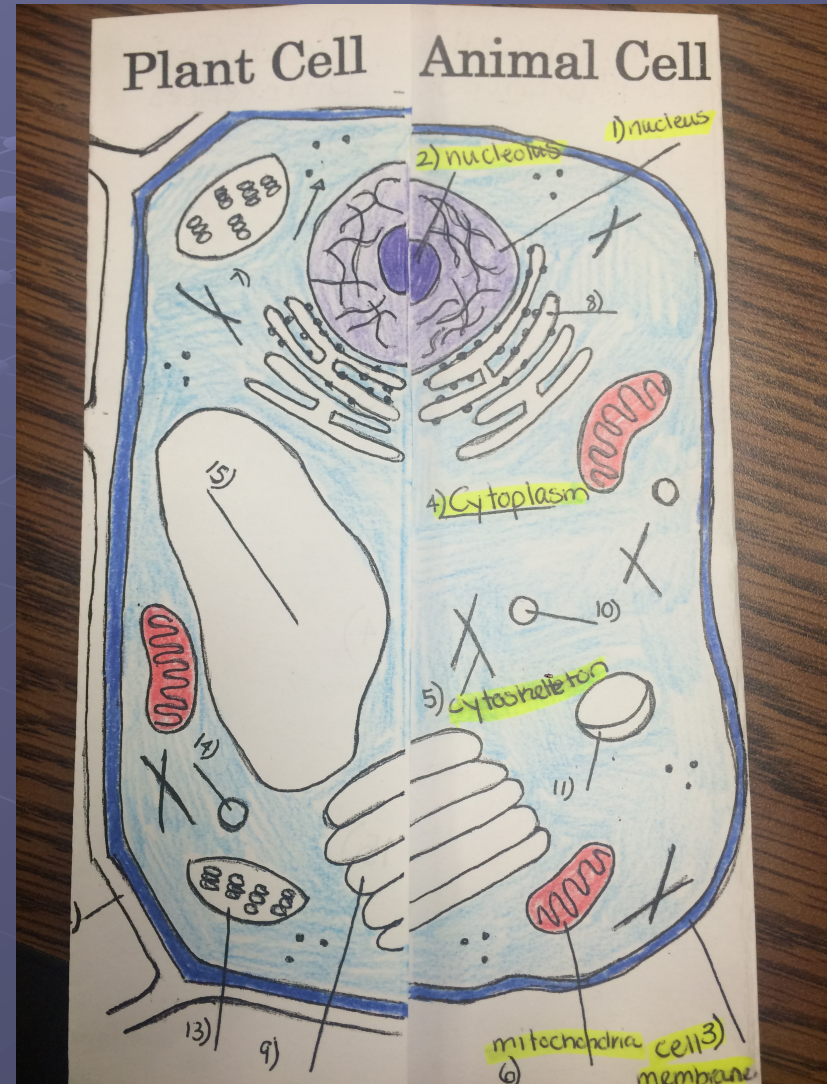
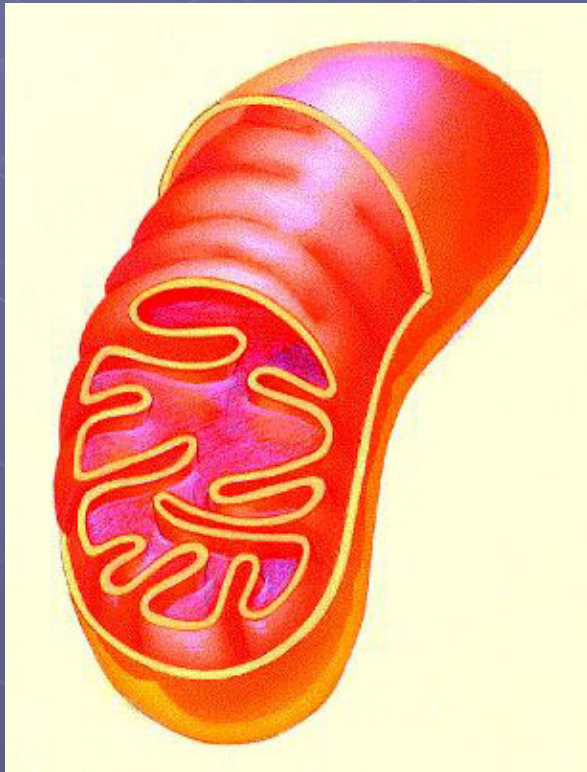
5) Cytoskeleton

- Gives the cell shape and structure



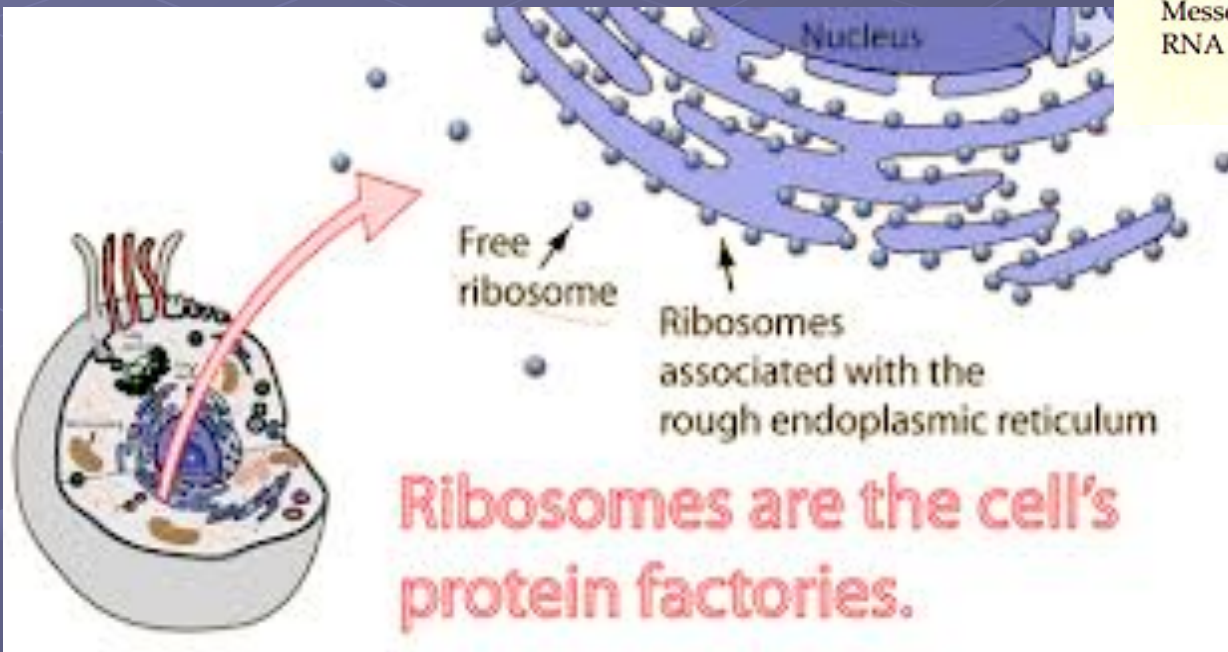
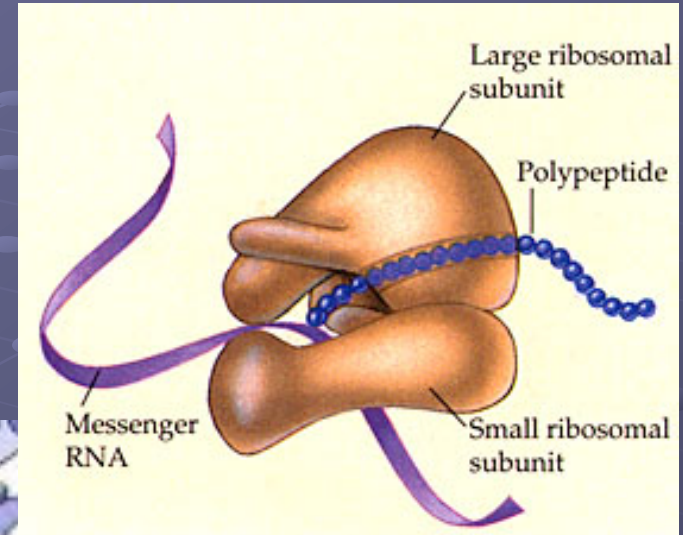
6) Mitochondria

● “Powerhouse of the cell”, releases energy from food



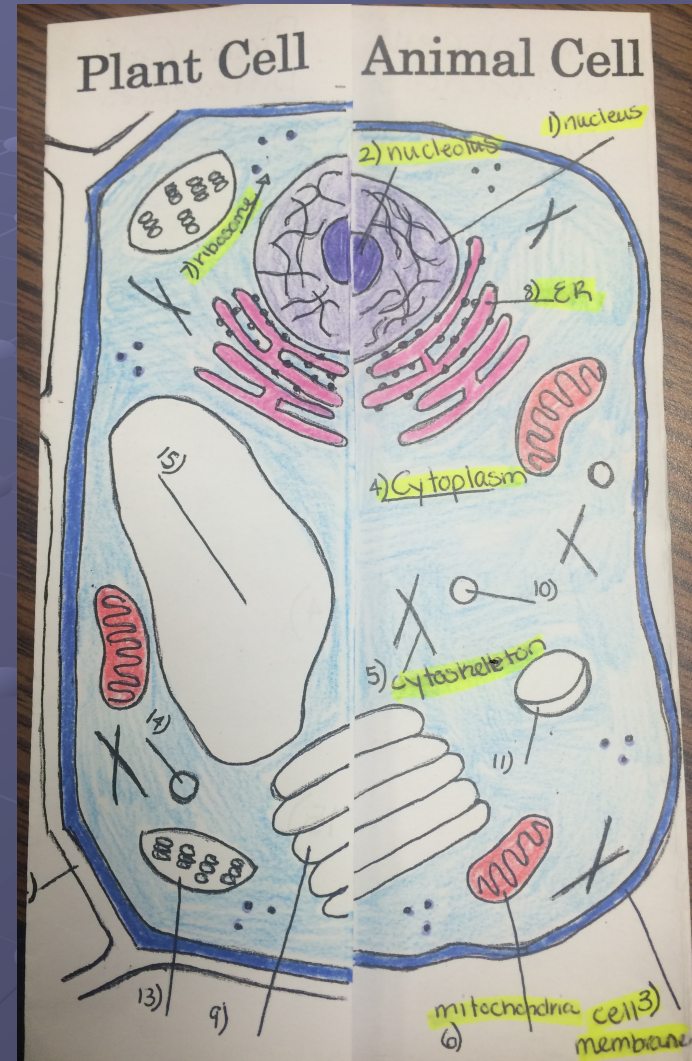
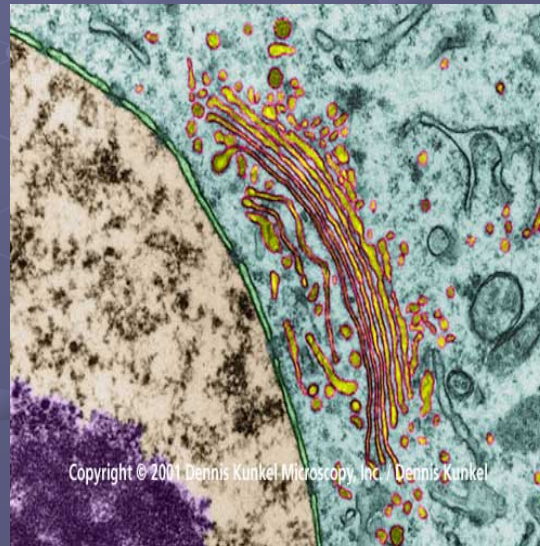
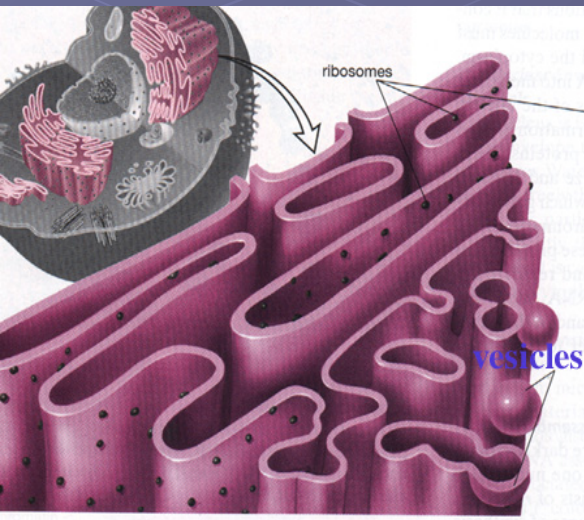
7) Ribosome

- Small structures that make proteins



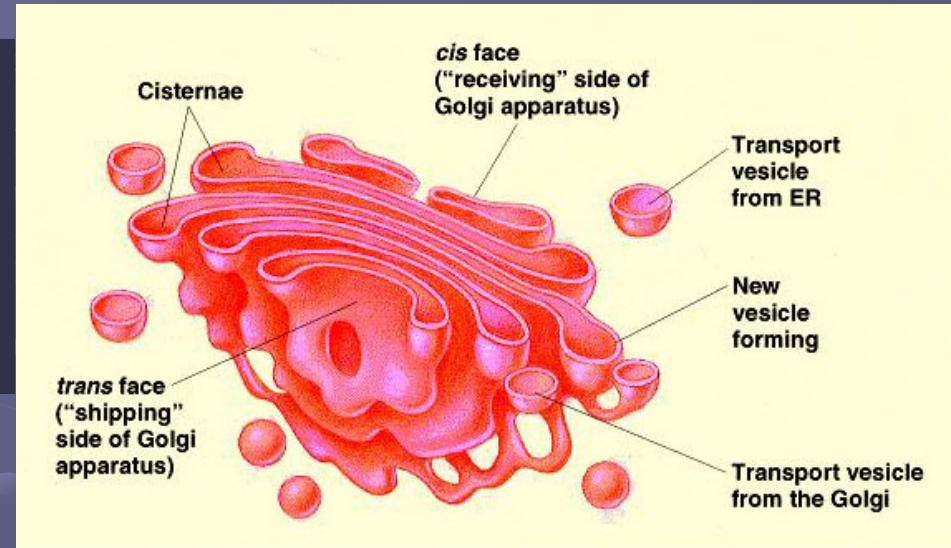
8) Endoplasmic Reticulum (ER)

● Passageways that move materials within the cell



9) Golgi Apparatus

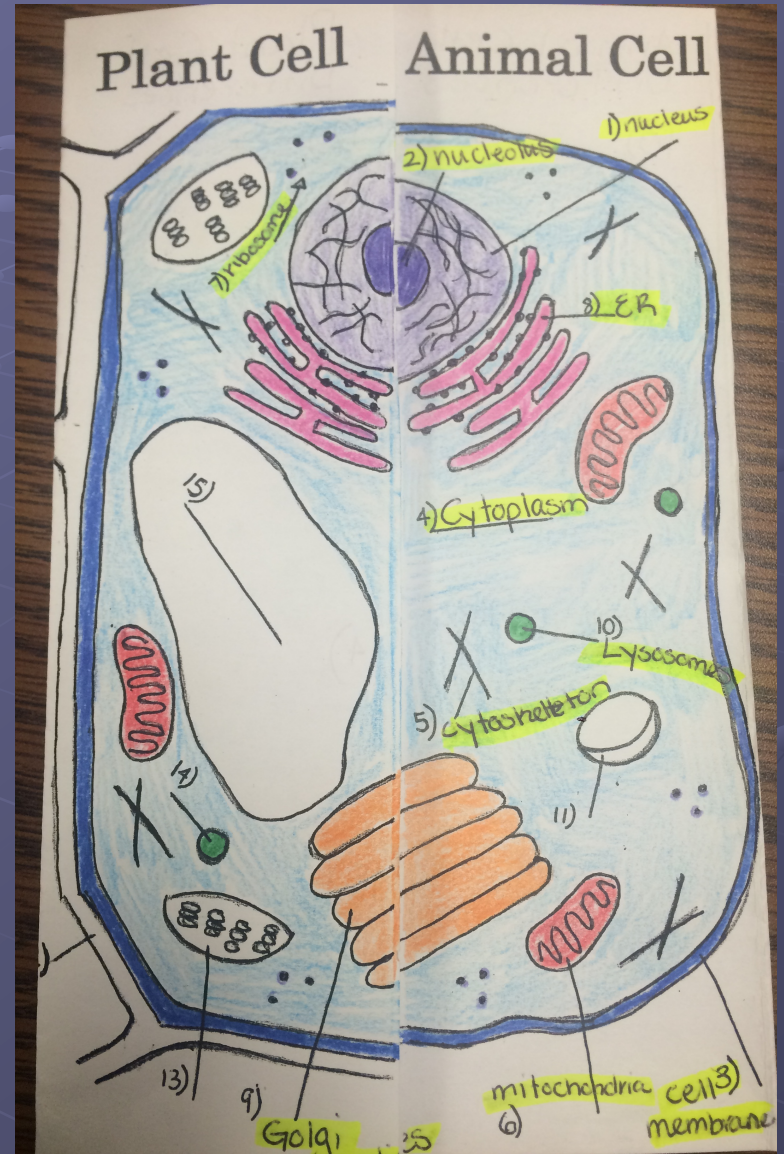
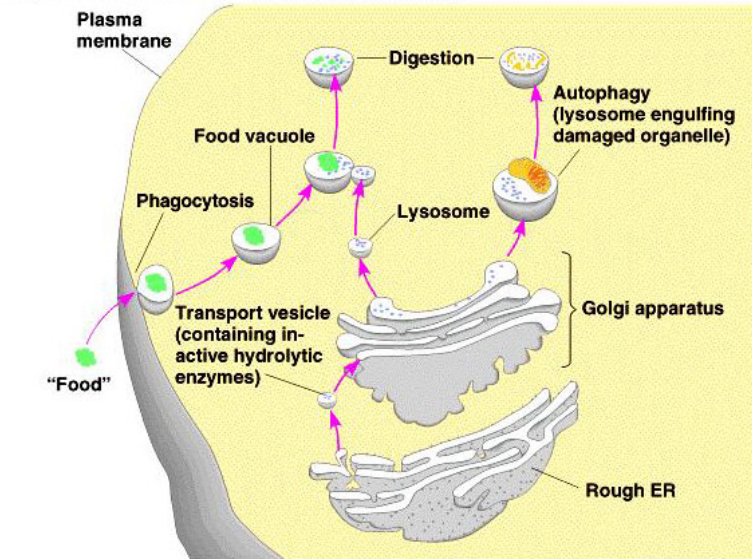
- Flattened sacs that store & releases chemicals



10) Lysosomes

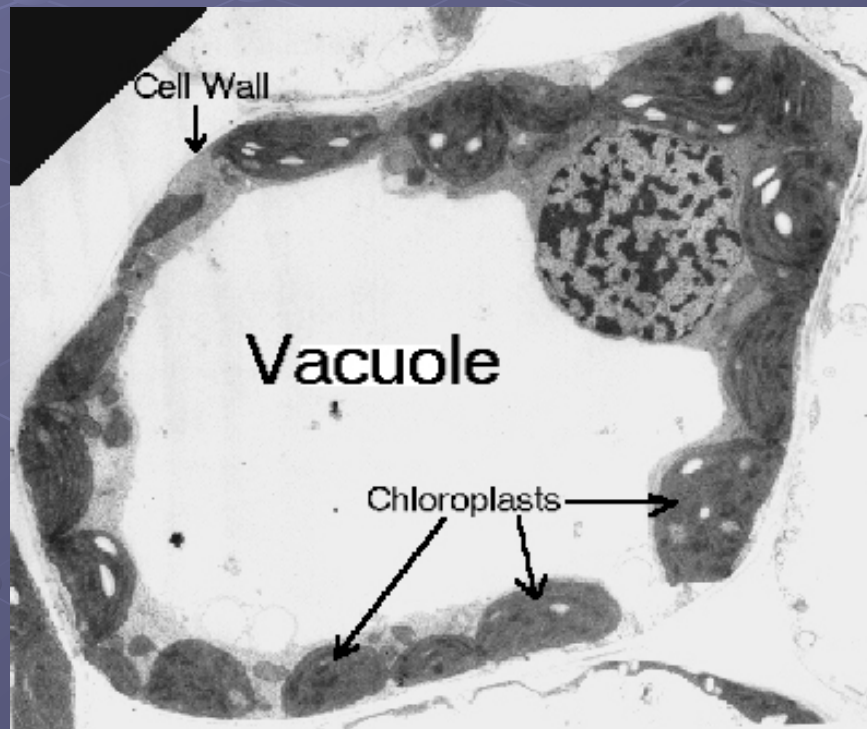
- “Garbage disposal,” contain chemicals that breakdown wastes, **animal** cells have a lot.

Figure 7.14 Formation and functions of lysosomes



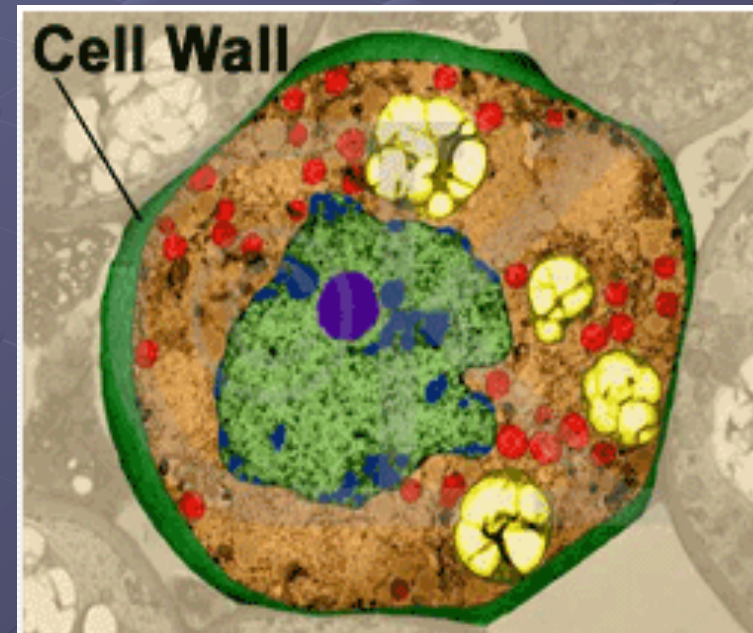
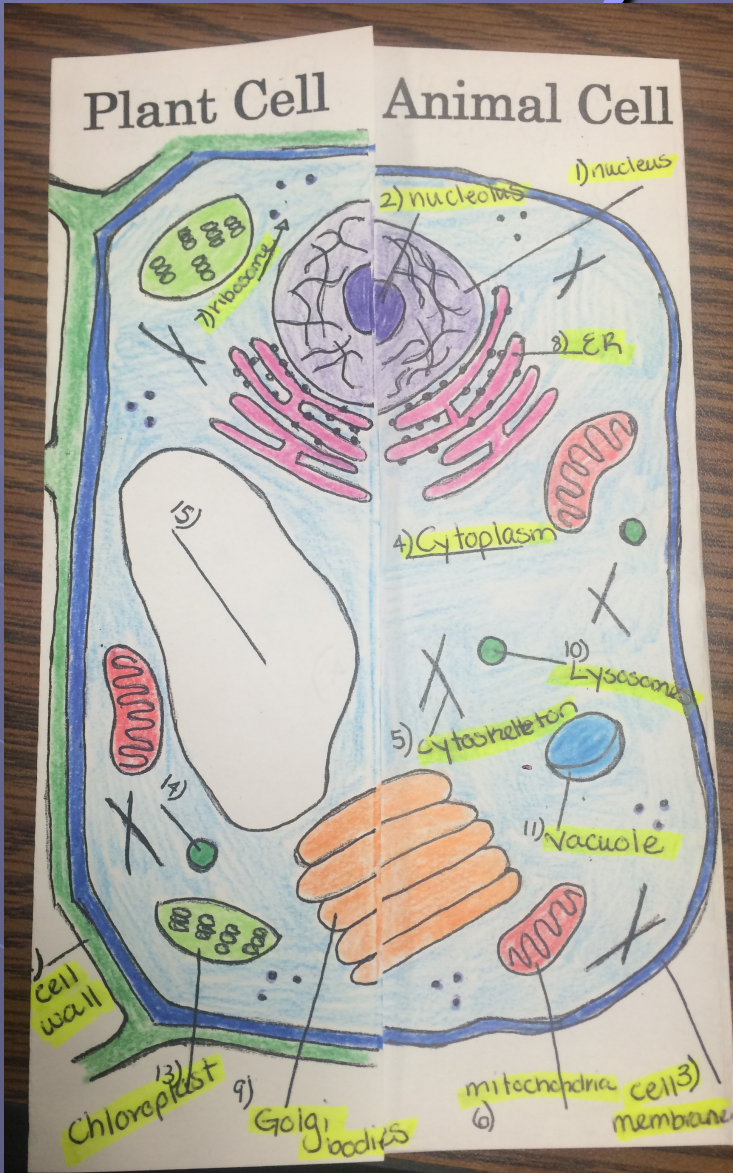
11) Vacuoles

- Store water, food and minerals,
animal cells have small vacuoles



12) Cell Wall

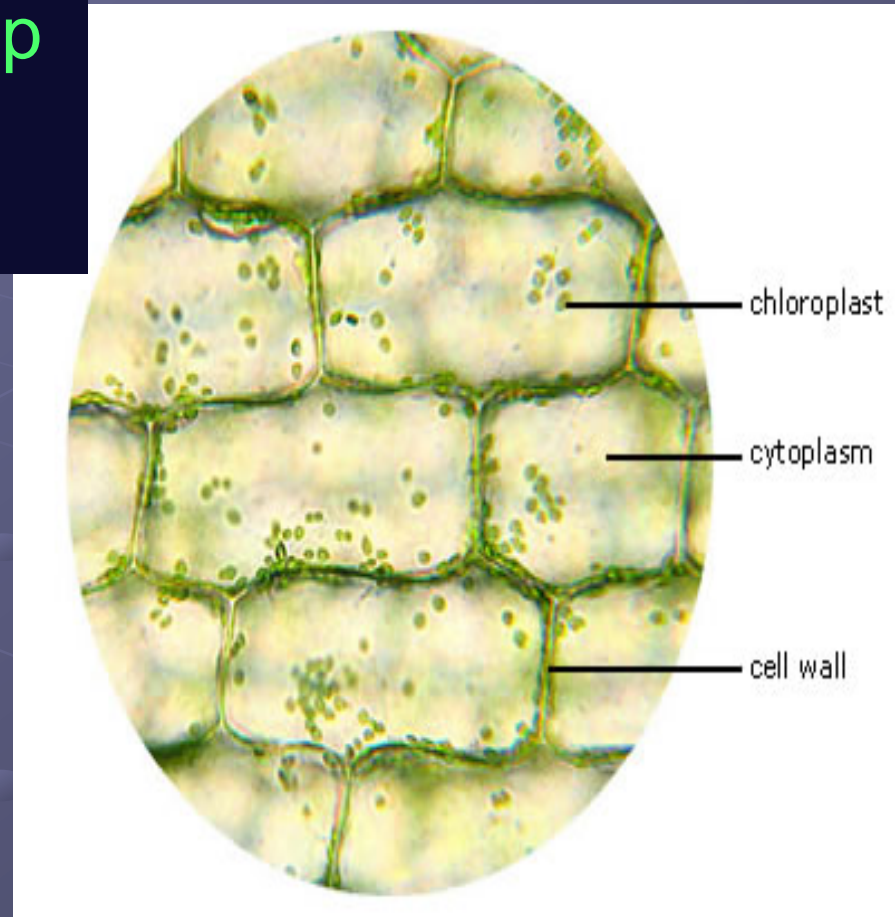
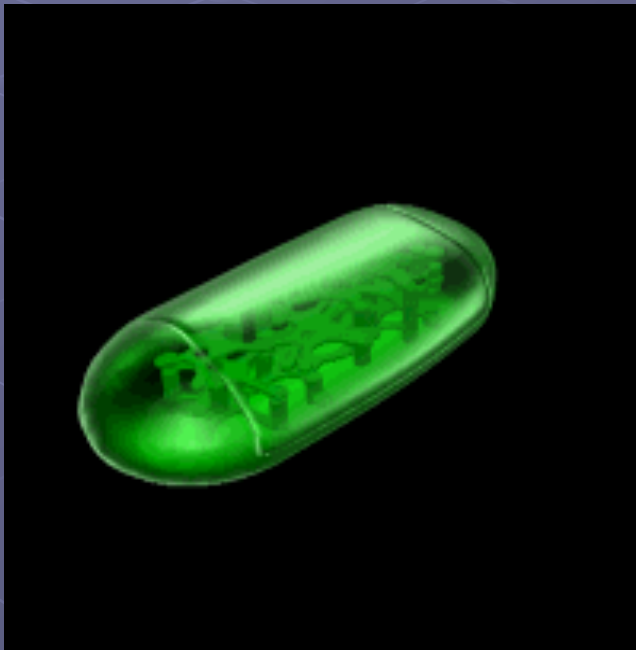
- Rigid, protective barrier on the outside of the cell membrane. Plants only!



13) Chloroplast

- Site of photosynthesis, trap sunlight to make food.

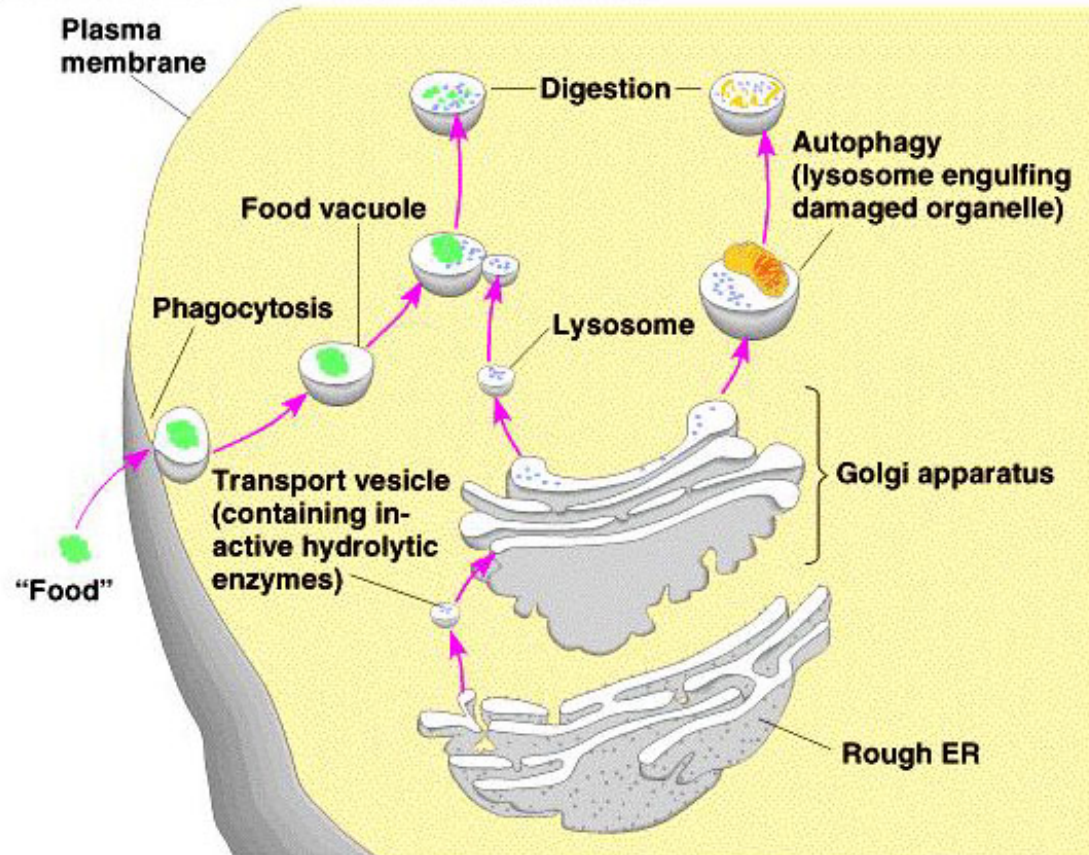
Plants ONLY!



14) Lysosomes

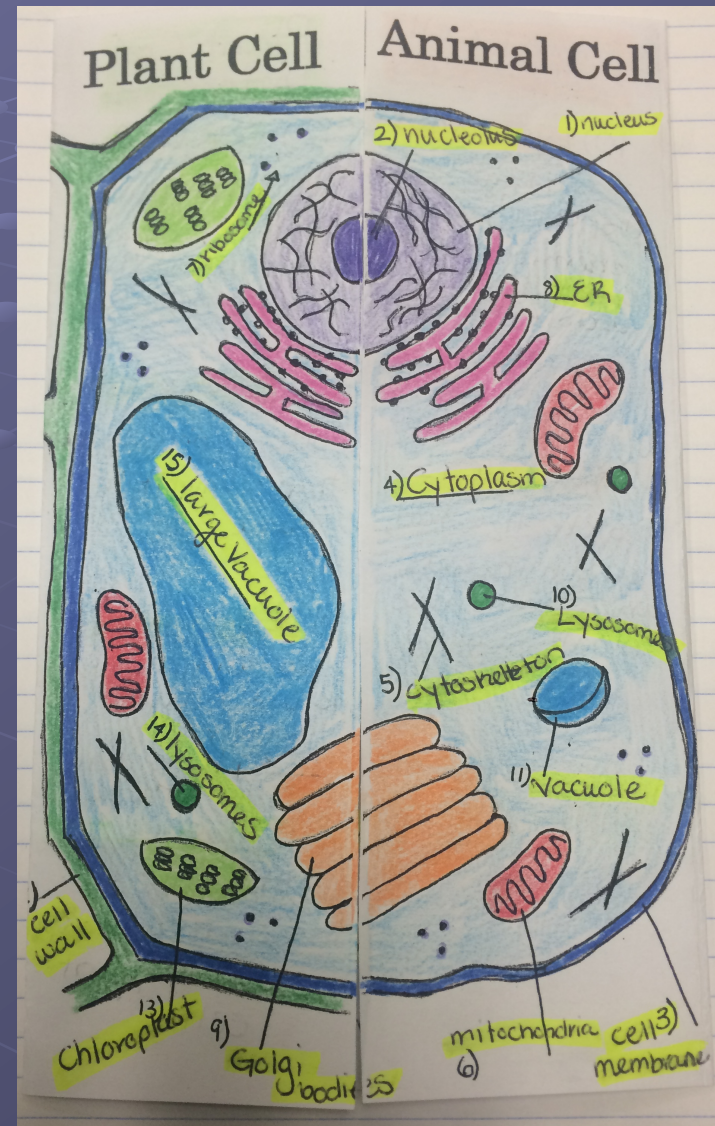
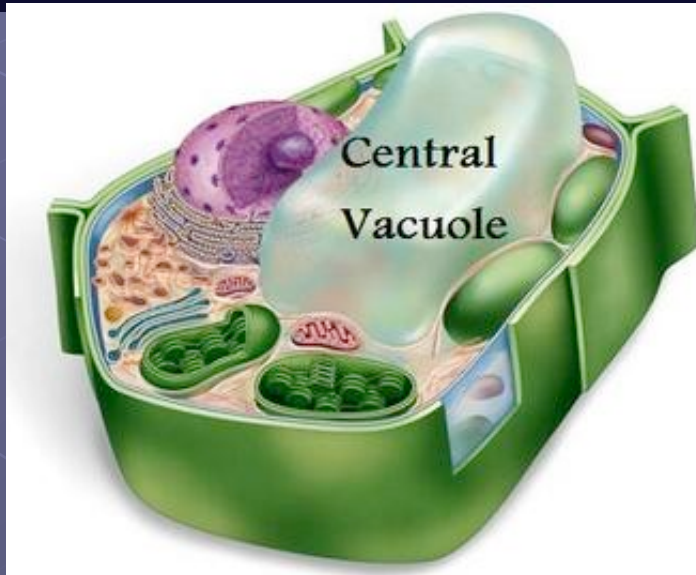
- Contains chemicals to breakdown wastes. Only **SOME** plants have these.

Figure 7.14 Formation and functions of lysosomes



15) Large Vacuole

- Stores water and minerals, takes up 90% of plant cell



Quick Review

- Which organelle is the control center of the cell? **Nucleus**
- Which organelle holds the cell together? **Cytoplasm**
- Which organelles are not found in animal cells?
- Which organelle helps plant cells make food?
- What does E.R. stand for? **chloroplasts**
- Draw the Mitochondria. **Endoplasmic Reticulum**
- What organelle makes proteins? **ribosomes**
- What is the function of the cell membrane?
- Draw the Golgi apparatus. **Controls what enters & exits cell**
- What does “cyto” mean? **cell**
- Draw the cytoplasm.
- Where are ribosomes made?

nucleolus

**Cell wall,
chloroplasts,
lysosomes,
large vacuole**

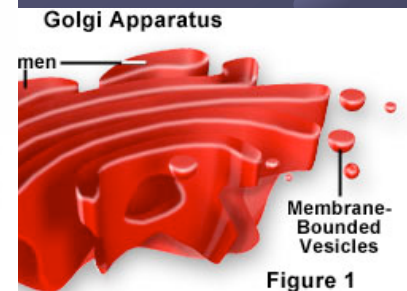
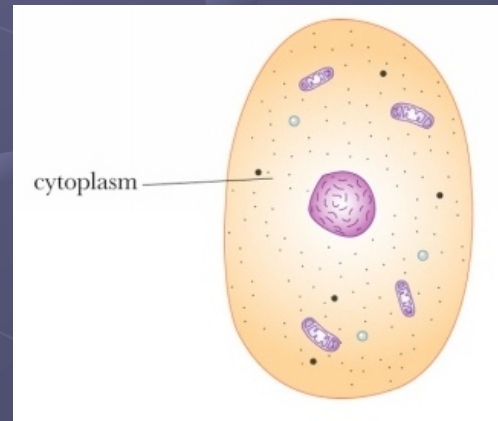
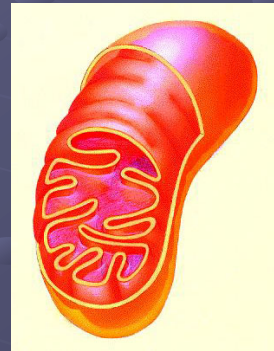


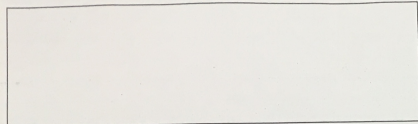
Figure 1

Title: Unit of Life- Cell Lab

INB page. 28-30

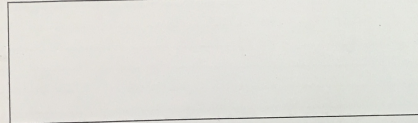
Part A: Cork

Draw several cork cells as they appear under high magnification. Label cell wall.



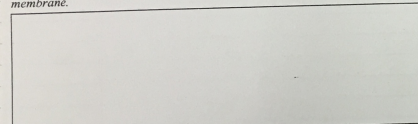
Part B: Cheek Cells

Draw several cheek cells as they appear under high magnification. Label the cell membrane and cytoplasm.



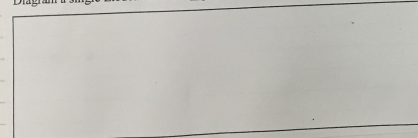
Part C: Cell Nucleus and Nucleolus

Diagram a single onion cell as it appears under high power. Label the cell wall, nucleus, nucleolus, membrane.



Part D: Chloroplasts

Diagram a single Elodea cell. Use high power. Label cell wall and chloroplast.



28.

Analysis, Part A:

1. Is the cork you observed alive? _____
2. What are the small units that can be seen under high power called? _____
3. Do these units appear filled or empty? _____
4. In 1665, Robert Hooke, an English scientist, reported an interesting observation while looking through his microscope at cork. "I took a good clear piece of cork, and with a penknife sharpened as keen as a razor, I cut a piece of it off, then examining it with a microscope, me thought I could perceive it to appear a little porous, much like a honeycomb, but that the pores were not regular.
 - a) What were the honeycomb units at which Hooke was looking? _____
 - b) What specific cell part was all that was left of the cork? _____
5. (a) Is the cork produced by a plant or an animal? _____
(b) Do animal cells have cell walls? _____

Analysis, Part B:

1. Describe the shape of a cheek cell. _____
2. a) Are cheek cells produced by plants or animals? _____
b) Is a cell wall present? _____
3. Are cheek cells alive? _____
4. Describe the location of the cell membrane. _____
5. Describe the function of the cell membrane (use the text if needed) _____
6. Describe the location of the cell's cytoplasm. _____
7. Describe the appearance of the cytoplasm. _____
8. Determine the function of a cell's cytoplasm: _____

Analysis, Part C:

1. Describe the shape of an onion cell. _____
2. a) Are onion cells produced by plants or animals? _____
b) Is a cell wall present? _____
3. a) Describe the shape of the nucleus of an onion cell. _____
b) Within what cell part already studied, does the nucleus lie? _____
4. What is the function of a cell's nucleus? _____
5. a) Describe the shape of the nucleolus of an onion cell. _____
b) Where is the nucleolus found? _____
6. What structure separates the contents of the nucleus from the cytoplasm? _____
7. Why were the cells stained? _____

Analysis, Part D:

1. Describe the shape of an Elodea cell. _____
2. a) Is elodea a plant or animal? _____
b) Is a cell wall present? _____
3. Describe the
a) color of the chloroplast. _____
b) shape of the chloroplast. _____
4. What is the function of the chloroplast? _____

29.

Complete Figure 12-6 of a "typical plant cell." Use your text to draw and label where the following plant cells parts are located: **vacuoles, mitochondria, Golgi bodies, endoplasmic reticulum, ribosomes**. Label these parts which are already drawn for you: **cell wall, cytoplasm, cell membrane, chloroplast, nucleus, & nucleolus**.

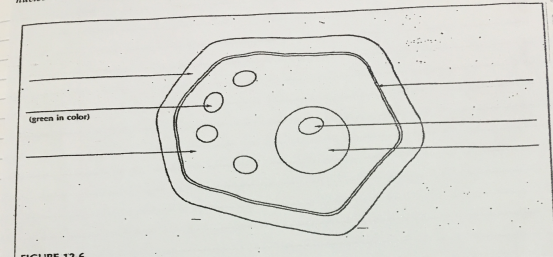


FIGURE 12-6

3. Complete Figure 12-7 of a "typical" animal cell. Label these parts which are already drawn for you: **cell membrane, nucleus, nucleolus, & cytoplasm**. Use your text to determine where the following animal cells parts are located: **mitochondria, centrioles, Golgi bodies, endoplasmic reticulum, ribosomes, and lysosomes**. Draw these parts as they would appear under an electron microscope onto figure 12-7 and correctly label them.

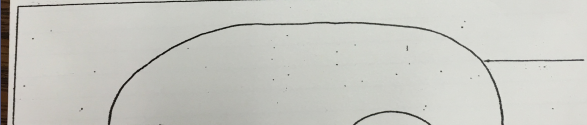


FIGURE 12-7

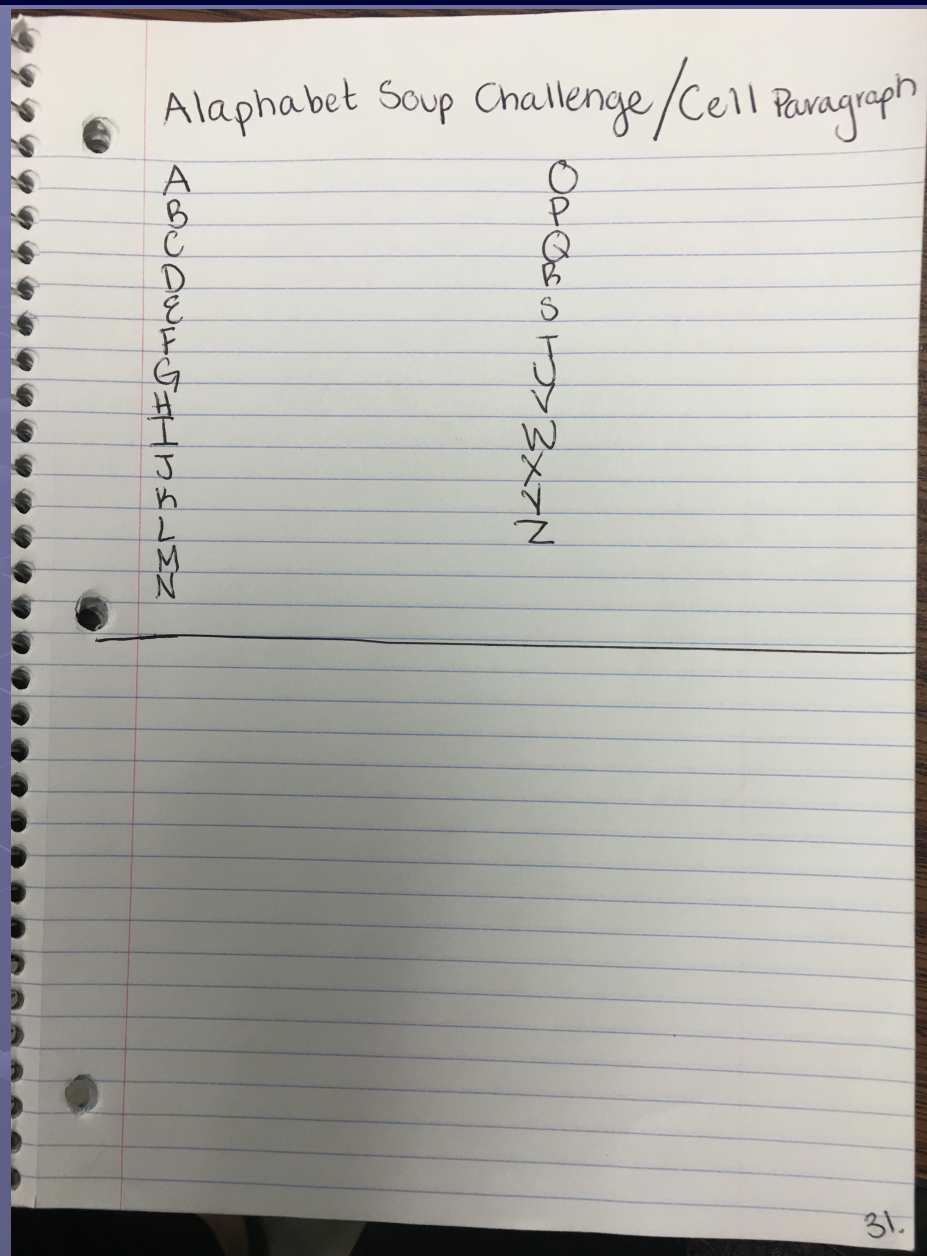
30.

*Please glue in your lab pages to match the pictures above.



Title: Alphabet Soup Challenge/ Cell Paragraph

INB page. 31



RULES

1. Each team will choose ONE word associated with THE CELL UNIT for each letter of the alphabet.
2. Your team's goal is to pick a word that no other team chooses.
3. Your team will receive a point if your word is not duplicated by any other team.

Cell Paragraph

Use pg. 14-15 in Cell
Textbook

INB page. 31

Topic: Describe the similarities and differences of a prokaryotic cell and a eukaryotic cell.

1st Sentence: The main similarity between a _____ & _____ is _____.

2nd Sentence: The most obvious difference between _____ & _____ is _____.

3rd Sentence: Another difference is _____.

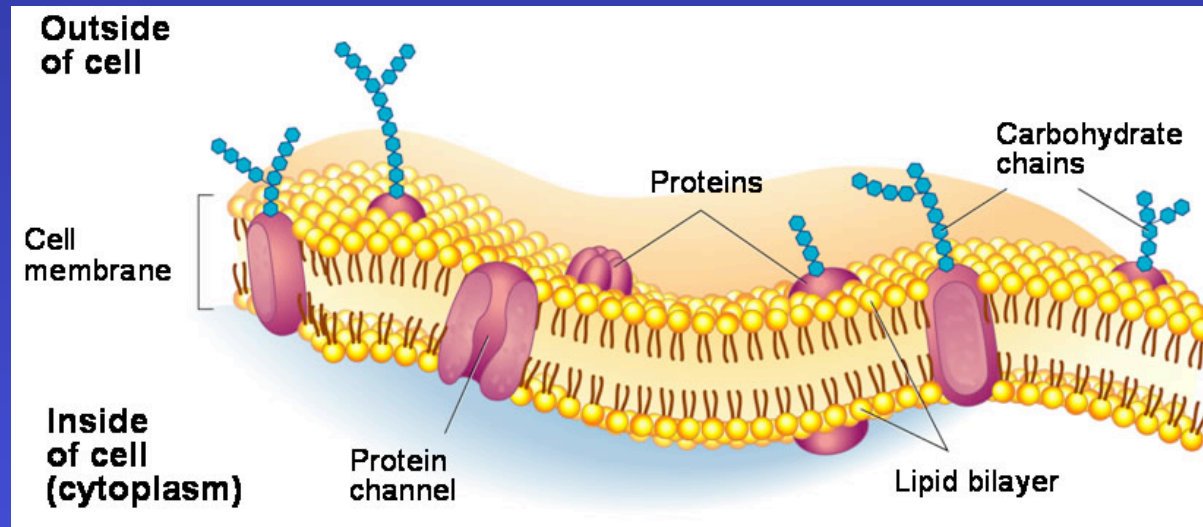
4th Sentence: By comparing _____ & _____, I understood that _____.

EQ: What is the cell membrane made of & what is its main function?

Cornell Notes	
Subject	
Key Points	Notes
Review your notes and pull out main ideas, dates, and people	• Take notes in bullets and indents • Cut unnecessary words • Use short sentences
Write a Summary	

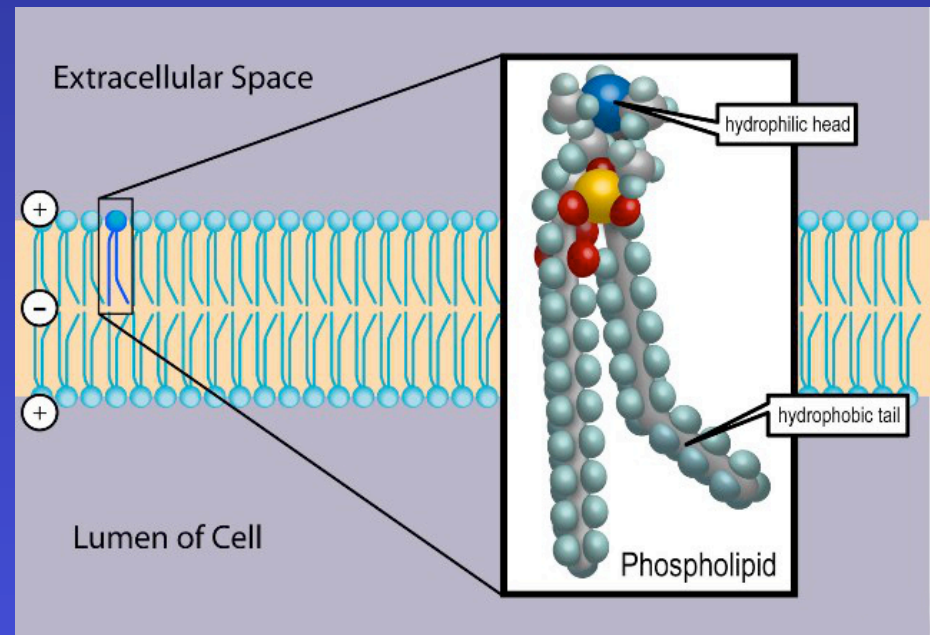
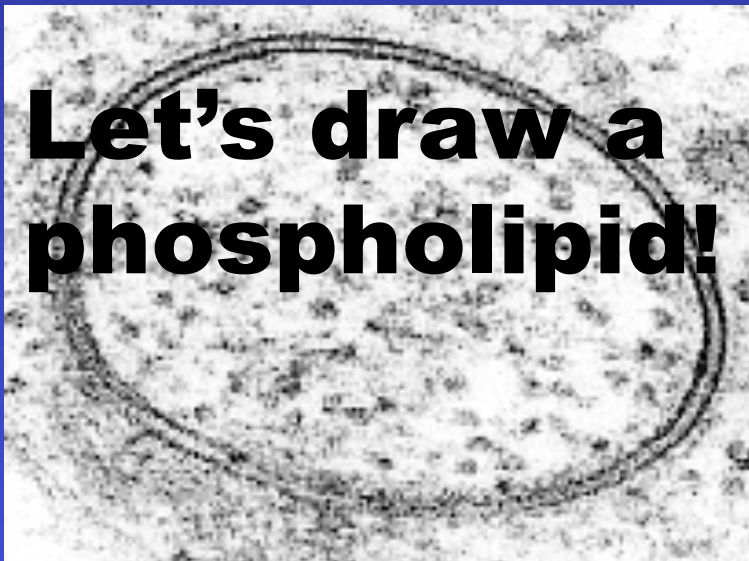
Functions

- ✓ Protective barrier
- ✓ Regulates what moves in & out of cell
- ✓ Keeps **HOMEOSTASIS** (balance of molecules inside & outside of cell)



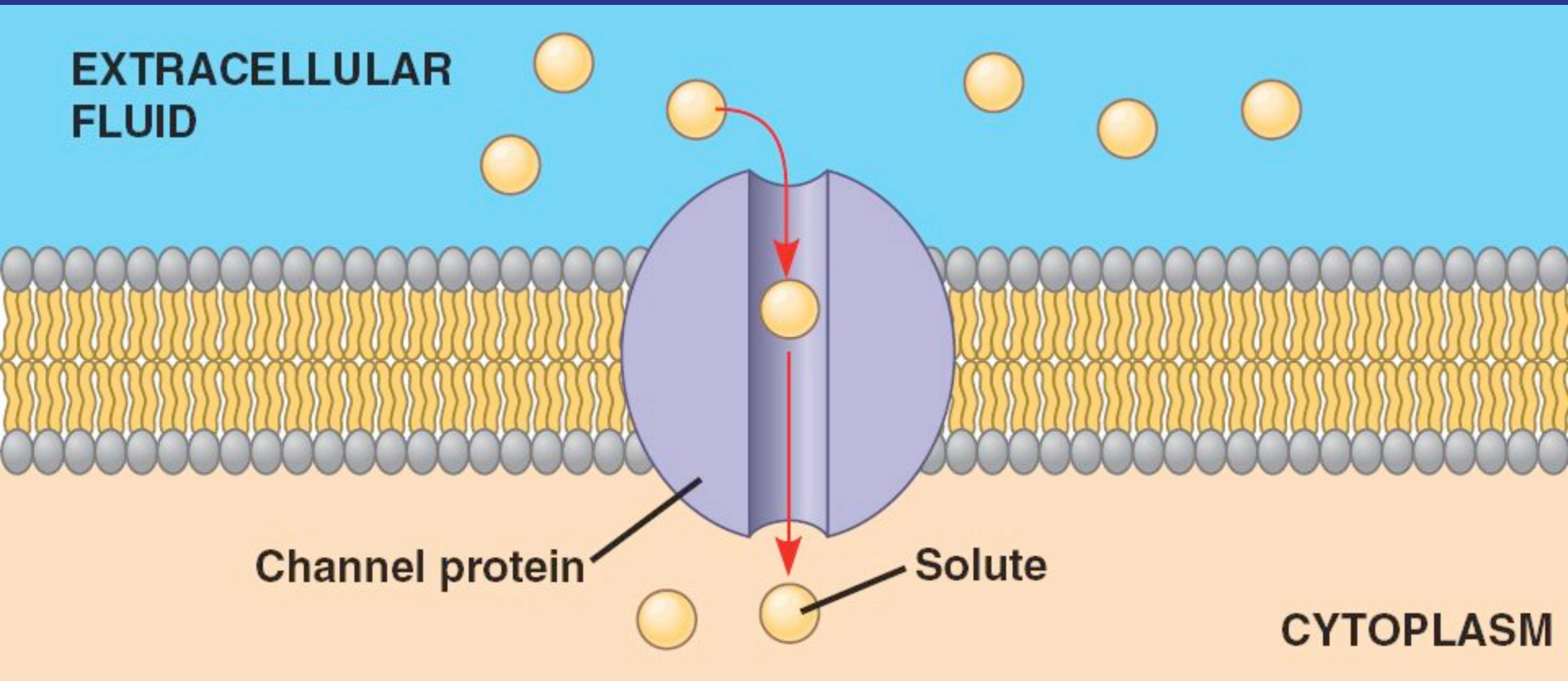
Structure

- ✓ Bilayer (two layers) of Phospholipids (fats)
 - ◆ Hydrophobic tails- “fear water”
 - ◆ Hydrophilic heads- “love water”
 - ◆ Small molecules can fit between phospholipids ex, H₂O



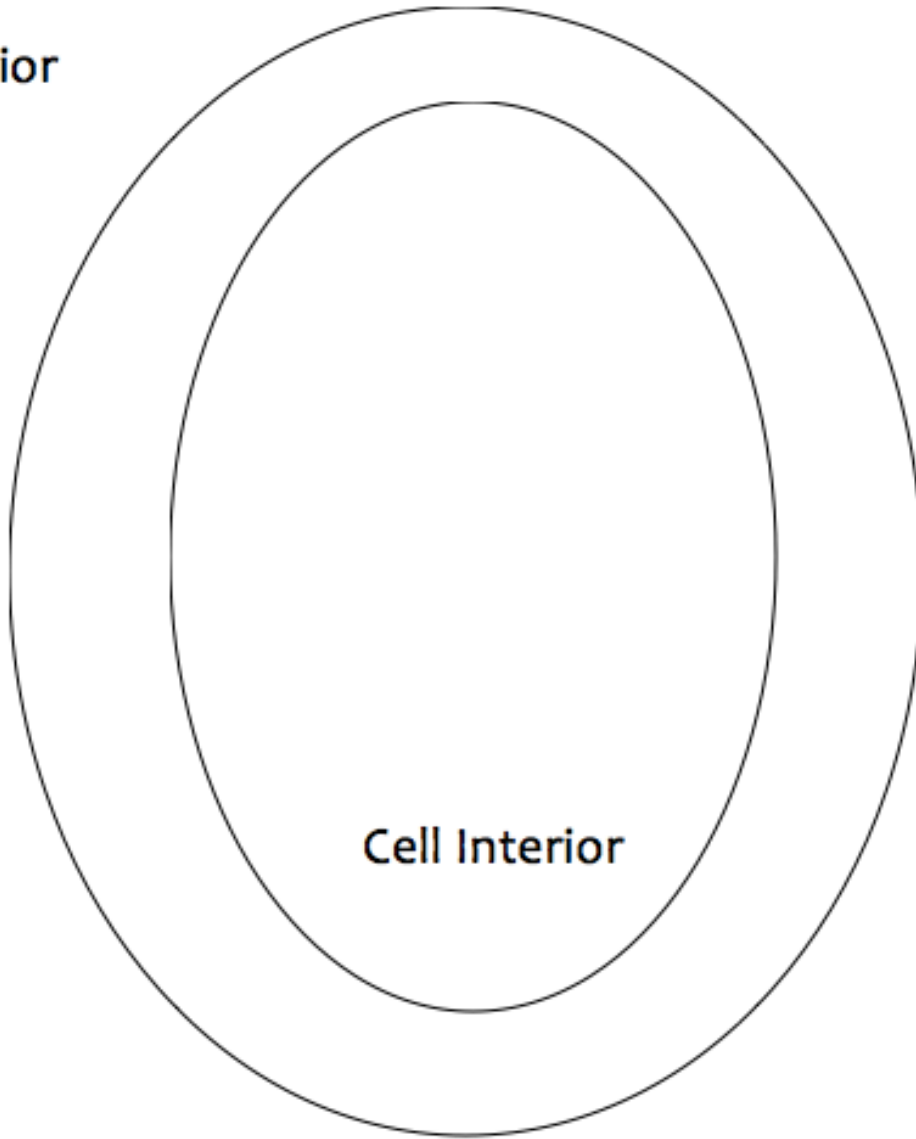
Structure

- ✓ Channel Proteins- allow big molecules to move in & out of cell



Title: Diagram of Cell Membrane

Cell Exterior



Cell Interior

Cell Membrane Drawing Instructions

1. Use **BLUE** to color the cell interior AND the cell exterior, because both areas contain WATER.
2. Use **PURPLE** to draw three channel proteins. Make sure to label one channel protein. (Use pg. 36 for help)
3. Use **ORANGE** to draw a few molecules moving in or out of the cell through the channel proteins. Use arrows to show what direction the molecules are moving. (Use pg. 36 for help)
4. Use **RED** for the Hydrophilic heads and **GREEN** for the Hydrophobic tails.

*Fill in the rest of the cell with phospholipids. Make sure there are **NO SPACES** between the molecules in your membrane! If there are any spaces/holes your cell will leak all of its contents or a bacteria/virus will enter and your cell will die!

5. Label one phospholipid's hydrophilic head and hydrophobic tail.