

CELL STRUCTURE AND FUNCTION

CHAPTER 7

SECTION 7.1: LIFE IS CELLULAR ☺

Discovery of the Cell

- ✓ Early Microscopes:
 - Robert Hooke
Looked at empty cork cells
 - Anton Van Leeuwenhoek

Saw organisms in pond water

- ✓ The Cell Theory
 - Define:
 - What is a cell?

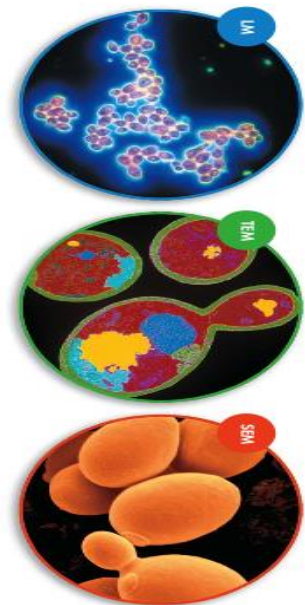
Basic unit of life

THE 3 POINTS OF THE CELL THEORY

1. All living things are made of cells
2. Cells are the basic unit of structure and function of life
3. Cells come from pre-existing cells

Exploring the Cell

- ✓ Light Microscopes & Cell Stains
 - Compound Light Microscopes
 - The first lens: Objective lens
 - The second Lens: Ocular lens (eyepiece)
 - Limitations of magnification (why?)
Light waves scatter as they pass through lenses
 - Purpose of cell stains:
They reveal specific compounds or structures
 - How do stains differ- they stain specific structures, some are fluorescent
- ✓ Electron Microscopes
 - Use beams of electrons that are focused by magnetic fields
 - Allows for much greater magnification and resolution



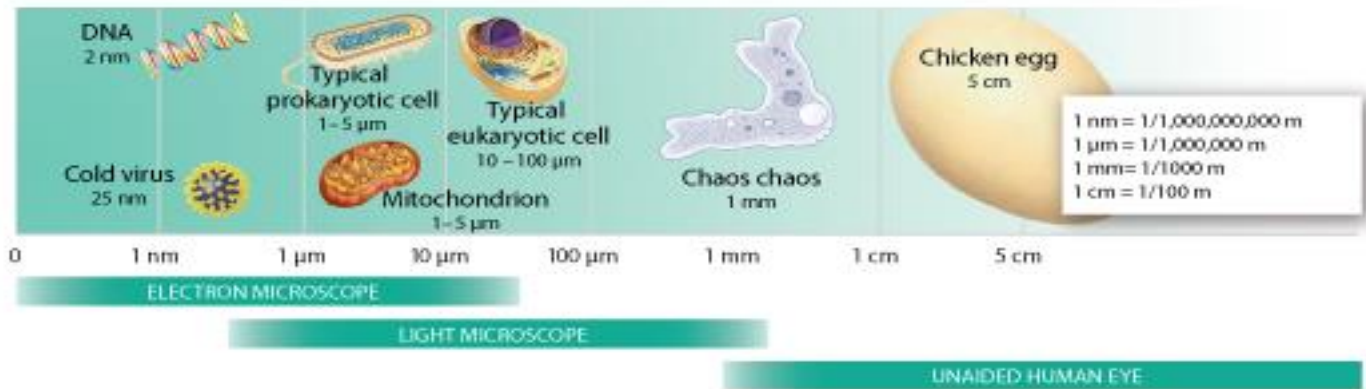
Electron Scanning Microscopes

Beam of electrons scans the surface
3D image
Specimens don't need to be cut

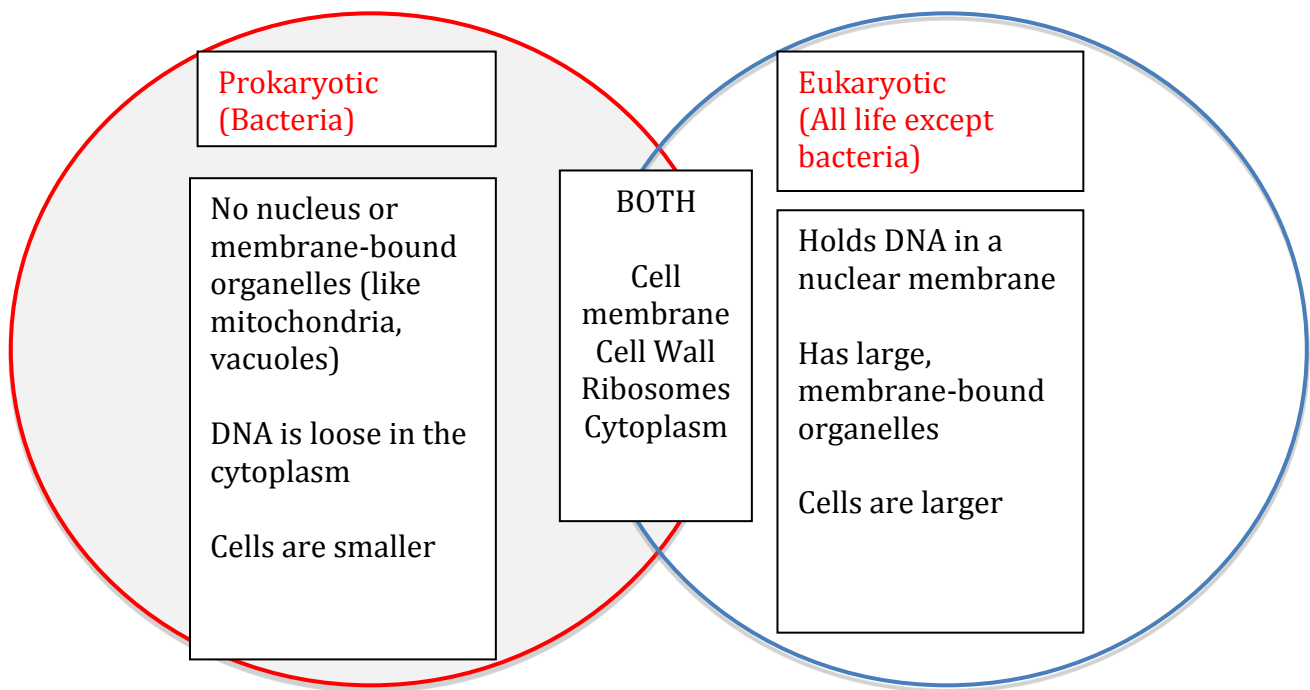
Transmission Electron Microscopes

2D image
Electrons pass through
Specimens must be sliced ultrathin

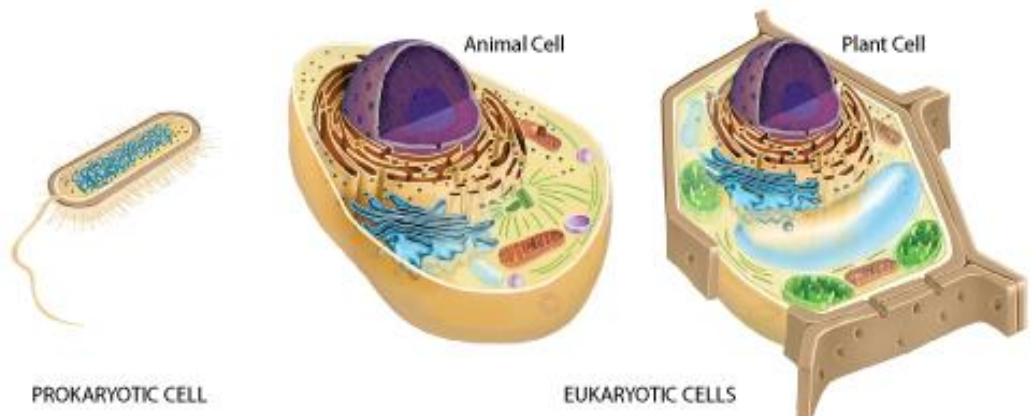
Prokaryotes & Eukaryotes



- Fill in the Venn Diagram below to distinguish prokaryotic cells from eukaryotic cells.



[Mr. D to the Rescue!!](#)



[Lost all Control, on a](#)



[Crash Course!!](#)

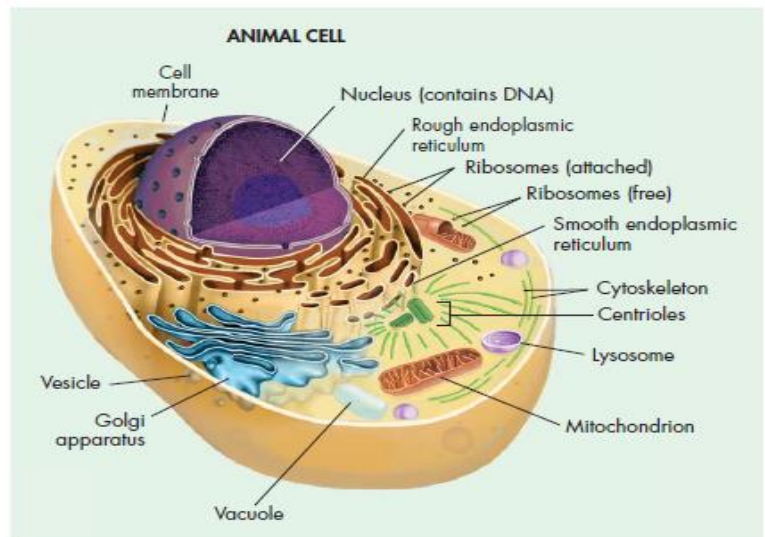
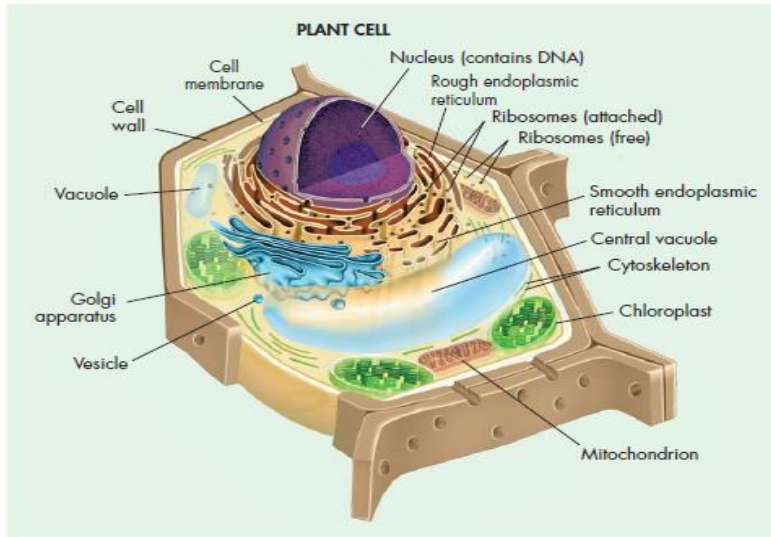
[Bozeman Bashes Biology](#)



SECTION 7.2 CELL STRUCTURE

Cell Organization (Eukaryotes)

- The cell is highly specialized and organized. Like any complex machine or factory the cell has separate areas or compartments that each work to accomplish larger tasks.
- These compartments are called Organelles.
- Using the book (pages 196-207) and the information provided below, complete the assignment in the grey box below.



	Structure	Function	Prokaryote	Eukaryote:	
				Animal	Plant
Cellular Control Center	Nucleus	Contains DNA	Prokaryote DNA is found in cytoplasm.	✓	✓
Organelles That Store, Clean-Up, and Support	Vacuoles and vesicles	Store materials		✓	✓
	Lysosomes	Break down and recycle macromolecules		✓	✓ (rare)
	Cytoskeleton	Maintains cell shape; moves cell parts; helps cells move	Prokaryotic cells have protein filaments similar to actin and tubulin.	✓	✓
	Centrioles	Organize cell division		✓	
Organelles That Build Proteins	Ribosomes	Synthesize proteins	✓	✓	✓
	Endoplasmic reticulum	Assembles proteins and lipids		✓	✓
	Golgi apparatus	Modifies, sorts, and packages proteins and lipids for storage or transport out of the cell		✓	✓
Organelles That Capture and Release Energy	Chloroplasts	Convert solar energy to chemical energy stored in food	In some prokaryotic cells, photosynthesis occurs in association with internal photosynthetic membranes.		✓
	Mitochondria	Convert chemical energy in food to usable compounds	Prokaryotes carry out these reactions in the cytoplasm rather than in specialized organelles.	✓	✓
Cellular Boundaries	Cell wall	Shapes, supports, and protects the cell	✓		✓
	Cell membrane	Regulates materials entering and leaving cell; protects and supports cell	✓	✓	✓

For Each Organelle:

- State its function of the organelle, and why it is vital to the cell.
- Give a brief description of what the organelle looks like as it appears in diagrams.
- List any cellular or life processes that the organelle is involved in.
- State the cell type in which the organelle exists. (Plant cell, Animal cell, both)
- Include a “best of your ability” sketch of the organelle.

Format:

- You have creative control over the format of this task. You may simply complete this in outline form, or perhaps be more creative and make each organelle a page in a magazine or written as a short story, or a FLIP BOOK!! Whatever you choose, be sure to meet each of the above listed criteria.