

CELL STRUCTURE NOTES: Chapter 3

MICROSCOPES

- Cells were _____ to the naked eye until microscopes were invented in the 1600's.
 - (1665) Robert Hooke saw rows of little boxes in a slice of tree bark = _____
 - (1675) Anton van Leeuwenhoek saw living, moving 1-celled organisms in _____.

CELL THEORY

- All living things are made of _____
- Cells are the basic units of **structure** and _____ in all organisms
 - (i.e., cells make all the _____ and do all the _____ in living organisms)
- All cells come from _____

UNICELLULAR ORGANISMS

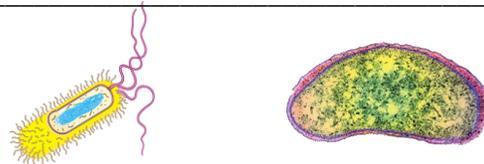
- Composed of only _____ cell
- Cells are versatile and must perform _____ functions necessary for life
 - 1 celled _____ = kingdoms Archaeabacteria & Eubacteria
 - 1 celled plants and animals = kingdom _____

MULTICELLULAR ORGANISMS

- Composed of _____ cells
- Cells are _____ to perform specific functions and they work in teams of tissues or organs to perform more complicated tasks.
 - Members of the kingdoms: _____

PROKARYOTIC CELLS

- NO _____
- NO _____
 - _____ is the most common and is found everywhere, even crawling on your skin



EUKARYOTIC CELLS

- _____
- Ex. _____

Lets compare Cell Types

Cell Characteristics	Bacteria	Fungus	Plant	Animal
These cells contain a nucleus :				
Considered eukaryotic :				
Cells are considered unicellular :				
These organisms are prokaryotic :				
Cells are multicellular :				
Cells are all purpose and do ALL jobs				
Contain DNA blueprints				
Cells are specialized to do specific jobs				

Tour of the Cell Parts

*** S = structure or shape L = location F = function ***

PART I: Organelles found in ALL cells

1) Plasma Membrane

S - 2 rows of lipid (fats) and protein molecules → looks like " _____ " or zipper

L - outside perimeter of cell

F - regulates movement of substances IN / OUT of cell → like a " _____ " or gatekeeper

- surface proteins allow for _____ and cell to cell _____

2) Cytoplasm

S - "soupy," gel-like liquid interior with water and dissolved _____

L - everywhere between nucleus and plasma membrane

F - dissolves cellular nutrients and allows for _____ of materials among organelles

3) Ribosomes

S - Small spheres or tiny _____

L - in _____ or attached to _____ ER

F - _____ production

4) Cytoskeleton

S - spiderweb-like frame or _____ made of 2 proteins: **Microtubules & Microfilaments**

L - everywhere throughout the cell between nucleus and plasma membrane

F - gives the cell shape and _____

PART II: Organelles Found ONLY in EUKARYOTIC Cells

5) Nucleus

S - large _____ surrounded by a nuclear membrane with _____ or openings

L - often in the cell center except in plants

F - protects the _____ blueprint codes and regulates cellular activities (command center)

6) Nucleolus

S - small sphere

L - inside the nucleus

F - Makes _____

7) DNA (Chromosomes / Chromatin)

S - Chromatin = uncoiled chromosomes; tangled, _____-like mass of DNA and proteins

Chromosomes = packages of _____ DNA and proteins → usually __ shaped

L - inside the nucleus

F - carries the inherited genetic " _____ " codes

8) Mitochondria ** has its own DNA codes inside **

S - peanut or _____ bean shape with inner folder membrane

L - random in cytoplasm; more in muscle cells

F - " _____ " converts glucose energy into _____ energy = (1\$ of energy)

- works like an _____ banking machine

Cellular Respiration

We use the food that we eat (sugar) to give us energy! Without this energy, we would die. This process occurs in the _____

Reactants

Products

_____ + _____ → _____ + _____ + _____

9) Rough Endoplasmic Reticulum (RER)

S - broad, _____ tube network studded by ribosomes

L - twists and turns from nucleus to plasma membrane

F - protein production and a _____ where proteins are modified and transported

10) Smooth Endoplasmic Reticulum (SER)

S - branching _____ tubule network

L - between RER and Golgi Apparatus

F - _____ harmful substances; produces _____ (fats, oils, hormones, cholesterol)

- donates _____ pieces for vesicle sacs to wrap materials for transport

11) Golgi Apparatus

S - series of flattened, slightly curved _____ sacs → looks like stacked Pita bread

L - near the nucleus and ER

F - "_____ " packages and sorts cell materials (proteins, lipids, wastes) into vesicles for transport within or out of the cell → works like _____ or _____

12) Vesicle

S - round _____ sac

L - any where, but usually near golgi bodies

F - package of food or proteins for _____

13) Vacuole

S - vesicle sac filled with _____

L - ANIMALS → small size, random PLANTS → _____ large central vacuole

F - storage water, minerals, and _____

PART III: Organelles Found ONLY in ANIMAL Cells

14) Lysosome

S - vesicle sac filled with digestive _____ (scissors)

L - random in cytoplasm

F - _____ food materials brought into the cell

- _____ foreign invaders (germs) and old and worn down cell parts for _____

15) Centriole

S - 2 microtubule bundles at a right angle form an "____" shape

L - near the nucleus

F - build the spindle to assist _____

PART IV: Organelles Found ONLY in PLANT Cells

16) Cell Wall

S - thick layers of _____ sugar fibers which form a rectangle shape

L - just outside the plasma membrane

F - helps give the cell shape, _____, protection, and connection to neighbor cells

17) Chloroplast ** has its own DNA codes inside **

S - vesicle _____ or sphere with specialized function

L - random in cytoplasm; usually closer to plasma membrane

F - stores GREEN chlorophyll _____ for photosynthesis of sugars

Plants Store Energy in Sugars = Photosynthesis

•Plants catch sunlight energy with their green _____ pigments and then store this energy inside _____ molecules. This process happens inside the _____ organelle.

Reactants

Products

_____ + _____ + _____ → _____ + _____

Explore how **Photosynthesis** and **Cellular Respiration** are COMPLEMENTARY processes. Use the terms in the word bank below as needed to complete the comparison matrix.

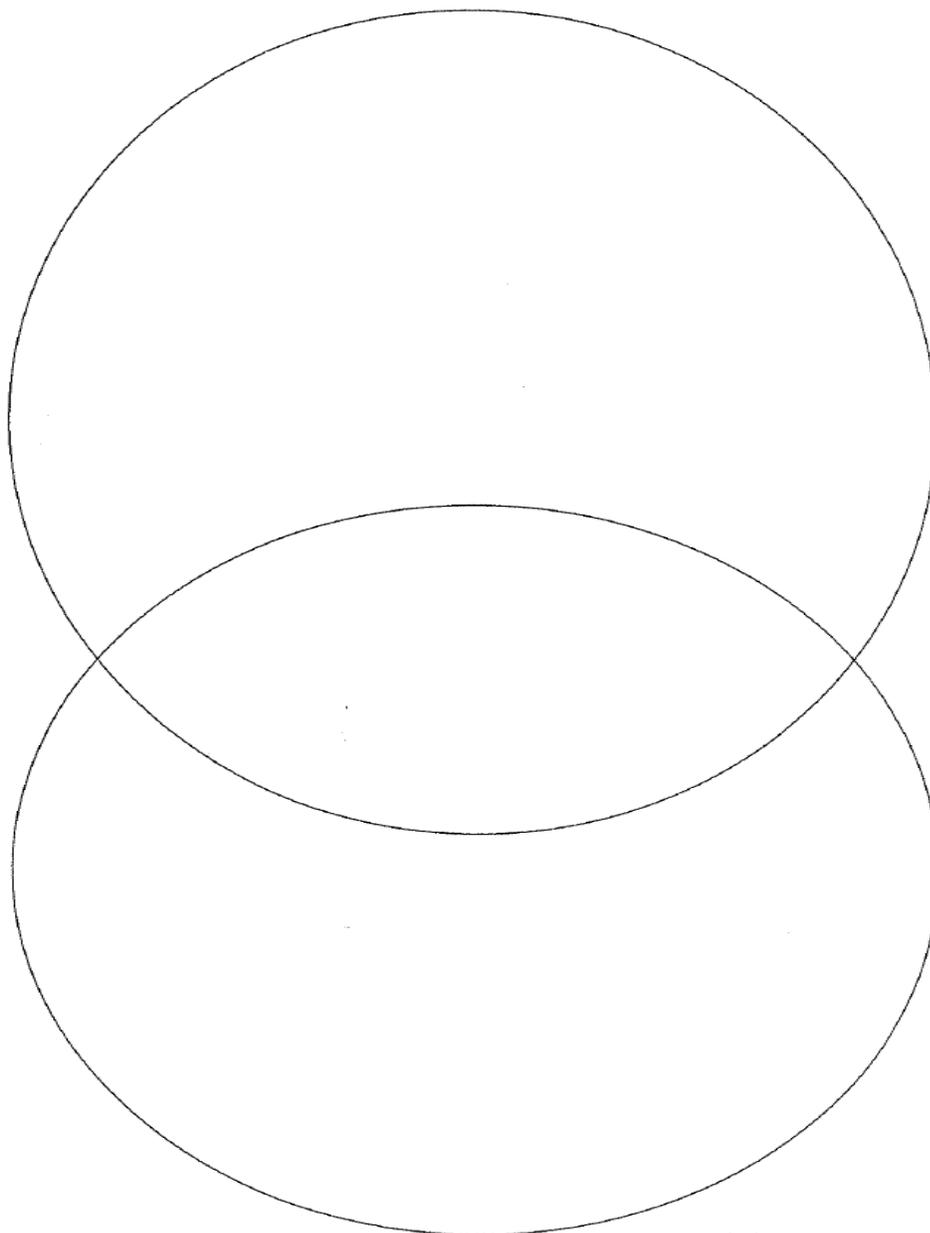
TOPICS	Photosynthesis	Cellular Respiration
1) INPUT materials?		
2) OUTPUT materials?		
3) Energy direction?		
4) Energy TERM?		
5) Chemical bonds are?		
6) Organelle needed?		
7) Cell Type?		

Released	sunlight	mitochondria	endergonic	Plant ONLY
Absorbed	ATP	chloroplast	exergonic	Animal ONLY
Broken	kinetic	ribosome	H ₂ O	BOTH Plant/Animal
Formed	glucose	O ₂	CO ₂	

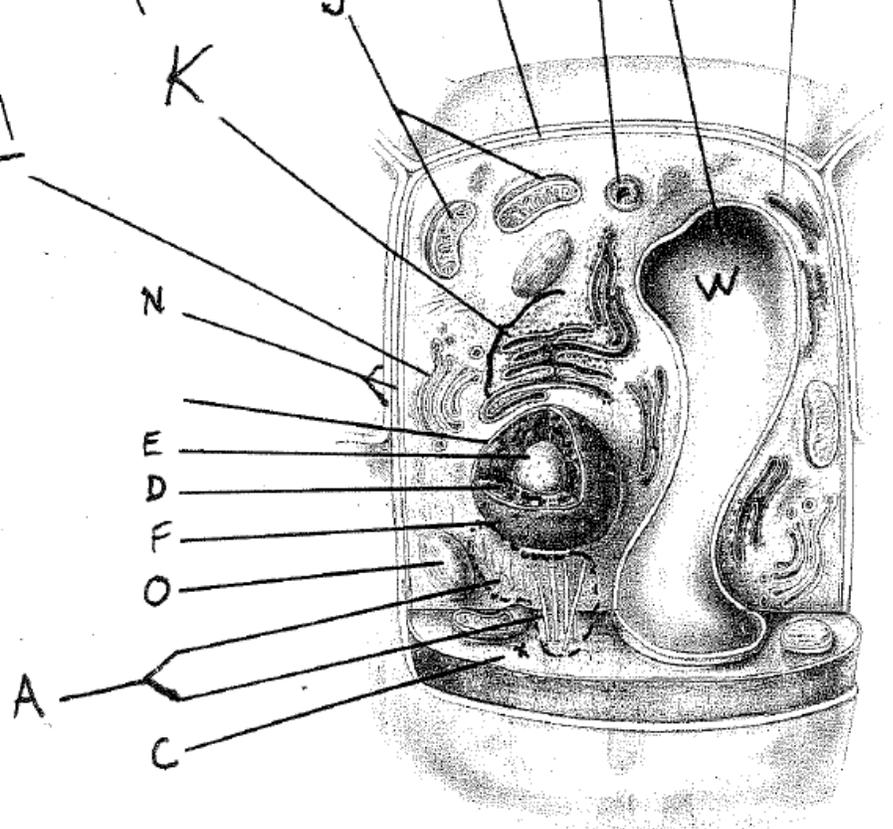
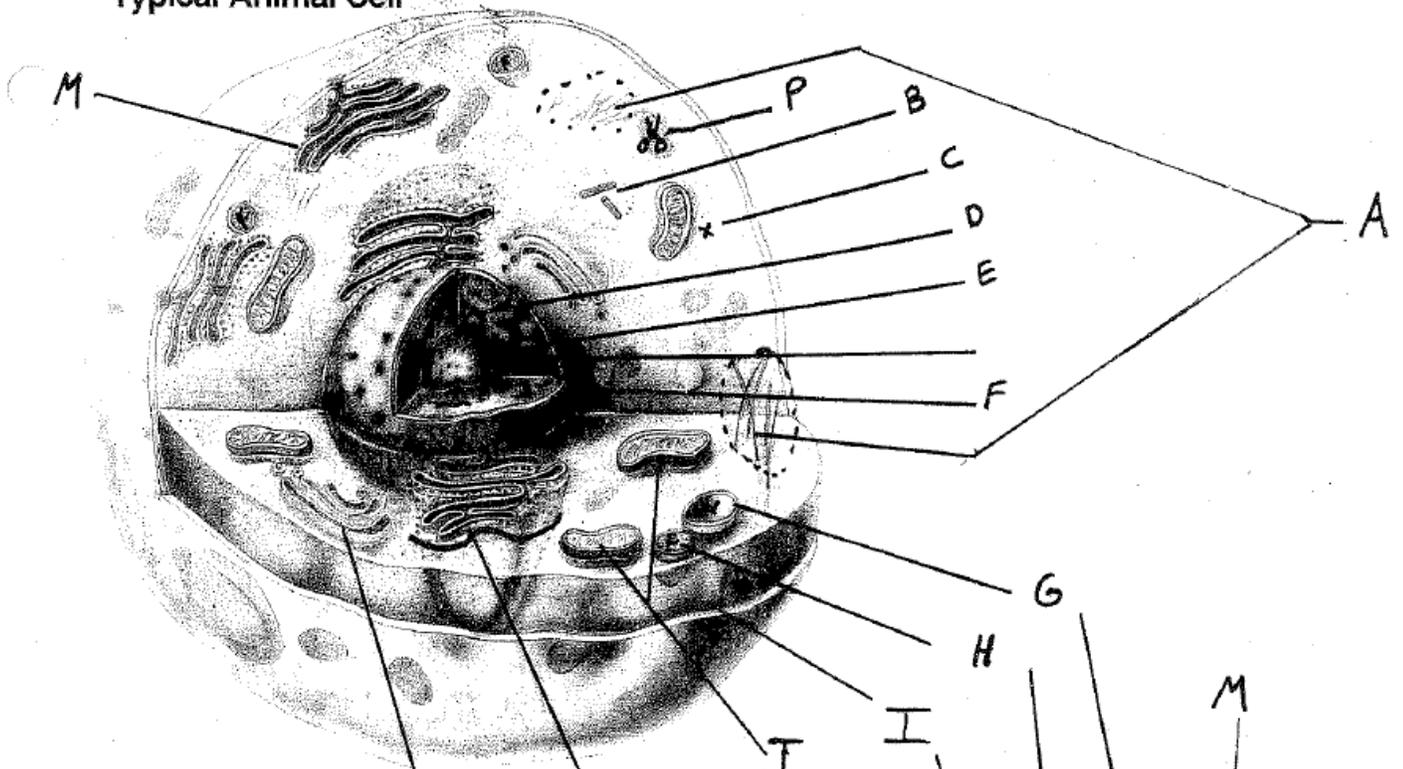
Let's Compare Cell Types

	<u>Bacteria</u>	<u>Fungus</u>	<u>Plant</u>	<u>Animal</u>
Make their own food				
Cell walls are found here:				
Contain chloroplasts:				
Contain lysosomes:				
Contain mitochondria:				
Contain chromosomes:				
Have a large, central vacuole:				
Have a box-like rectangular shape				
Has a cytoskeleton:				
Contain ribosomes:				

Plant Cell vs Animal Cell



Typical Animal Cell



Typical Plant Cell

5. THE CELL