

AP BIOLOGY
CELL UNIT
ACTIVITY #2

NAME_____

DATE_____HOUR_____

CELL PARTS

TYPICAL ANIMAL CELL

ENDOMEMBRANE SYSTEM

TYPICAL PLANT CELL

QUESTIONS:

1. Write the name of the cell part in the box next to its description/function.

Cell membrane
Centrioles
Chloroplast
Chromatin
Cytoplasm
Endoplasmic reticulum, rough
Endoplasmic reticulum, smooth
Golgi apparatus
Lysosome
Mitochondria

Nuclear envelope
Nucleolus
Nucleus
Peroxisome
Ribosomes, bound
Ribosomes, free
Vacuole
Vesicle, secretory
Vesicle, transport

Cell Part	Description/Function
	Forms the boundary of the cell; acts as a selective barrier allowing certain materials to pass but not others
	The entire region between the nucleus and the cell membrane; consists of the cytosol
	Contains most of the genes that control the eukaryotic cell; generally the most conspicuous organelle in a eukaryotic cell; contains the nucleolus and chromatin
	Where the components of the ribosomes are synthesized and assembled; found in the nucleus
	Consists of DNA and protein; condenses to form chromosomes
	Double membrane that forms the boundary between the nuclear contents and the cytoplasm; perforated with pores
	Site of protein synthesis; suspended in the cytosol; produces proteins for use within the cell
	Site of protein synthesis; attached to the outside surface of the endoplasmic reticulum; produces proteins for use outside the cell or for use in the cell membrane.
	Synthesizes lipids including phospholipids and steroids; metabolizes carbohydrates; detoxifies drugs and poisons; stores calcium ions; lacks attached ribosomes

Cell Part	Description/Function
	Consists of flattened membranous sacs; receives transport vesicles from the ER; modifies ER products; produces certain molecules; produces lysosomes and secretory vesicles
	Channels proteins to transport vesicles; attaches carbohydrate to some proteins; involved in membrane production through the production of vesicles; has attached ribosomes
	Carries ER products to the Golgi
	Carries Golgi modified products to the cell membrane; fuses with the cell membrane releasing the contents to outside the cell
	Membrane bound sac of hydrolytic enzymes; enzymes are used to digest food, other molecules, and old, worn out cell parts
	Membrane bound sacs; larger than vesicles; stores materials
	Site of cellular respiration; produces ATP from sugars, fats, and other fuels
	Site of photosynthesis; produce food using light energy, CO ₂ and H ₂ O
	Contains enzymes that transfer H from substrates to oxygen producing H ₂ O ₂ ; detoxifies alcohol; contains enzymes (e.g. catalase) that converts H ₂ O ₂ to H ₂ O and O ₂
	Paired structures found in animal cells; consist of microtubules in a 9+0 arrangement; involved in cell division

2. Indicate if each of the following is true of chromosomes or chromatin. Use the key below to indicate your answers.

A. Chromosomes

B. Chromatin

_____ Consist of DNA and proteins

_____ Condensed

_____ Tightly coiled

_____ Visible when stained

_____ Dispersed

_____ Decondensed

_____ Uncoiled

3. Determine if each of the following is true of **Free** or **Bound** ribosomes.

- | | |
|--|-------------------------------------|
| _____ Produce proteins for use within the cell | _____ Suspended in the cytosol |
| _____ Produce proteins for export | _____ Consist of 2 subunits |
| _____ Attached to rough ER | _____ Composed of rRNA and proteins |

4. How does the function of the central vacuole in plant cells differ from the function of vacuoles in animal cells?

How are the functions similar?

5. Determine if the each of the following is true of microtubules, microfilaments, or intermediate filaments. Use the key below to indicate your answers.

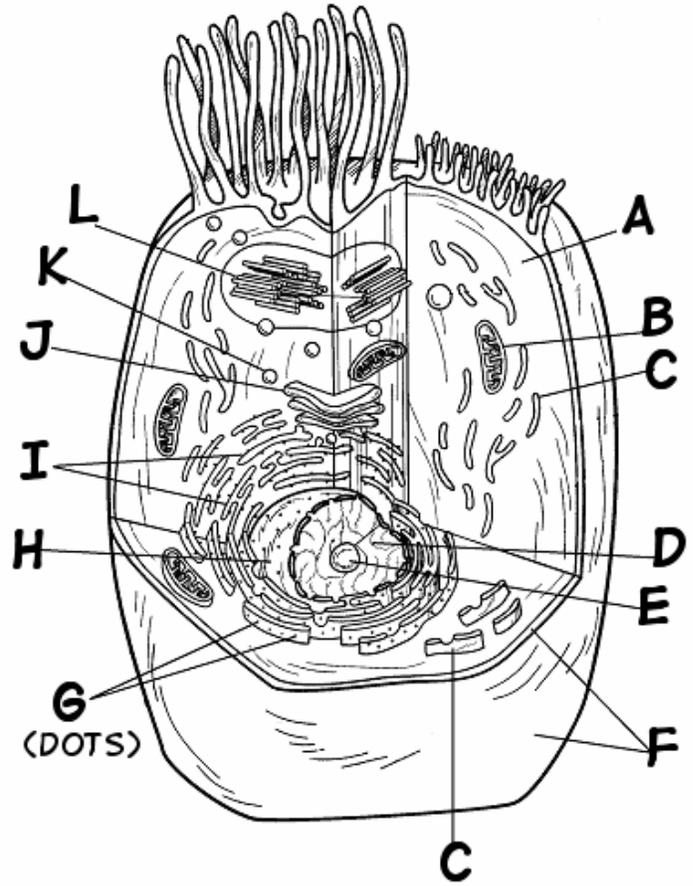
- MT = Microtubules
MF = Microfilaments
IF = Intermediate filaments

- _____ Straight, hollow tubes
- _____ Made of tubulin
- _____ Involved in cell transport
- _____ Provides tracts for organelle movement
- _____ Make up spindle fibers, centrioles, cilia, and flagella
- _____ Solid rods
- _____ Made of actin
- _____ Involved in muscle contraction and localized cell contractions
- _____ Form 3-D support network just inside the cell membrane

- _____ Form contractile ring that pinches dividing animal cell in two
- _____ Produces cytoplasmic streaming
- _____ Intermediate in diameter
- _____ Composition varies
- _____ More permanent
- _____ Reinforces cell shape and may fix organelle position

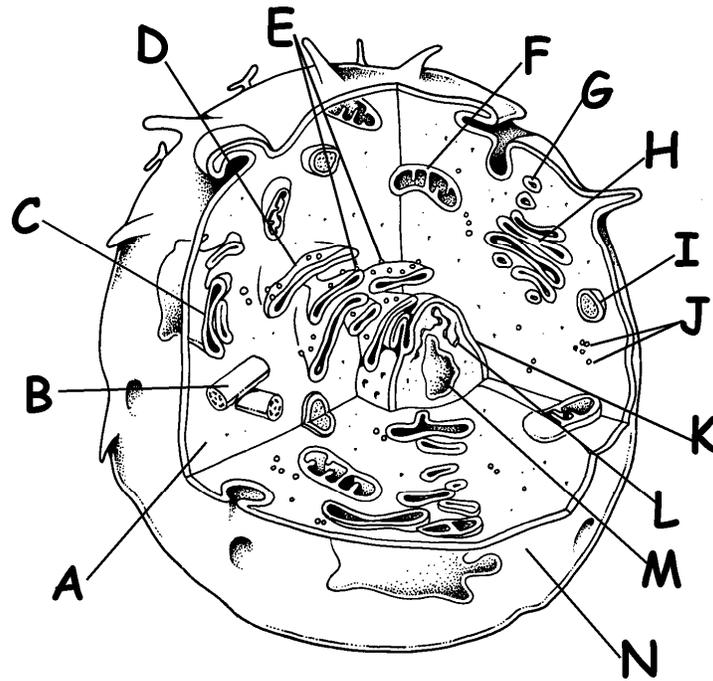
6. Match the cell part with the correct letter from the diagram below.

- _____ Cell membrane
- _____ Centrioles
- _____ Chromatin
- _____ Cytoplasm
- _____ Golgi
- _____ Lysosome
- _____ Mitochondria
- _____ Nuclear envelope
- _____ Nucleolus
- _____ Ribosomes
- _____ Rough ER
- _____ Smooth ER



7. Is the cell pictured in number 6 above an animal or plant cell? _____
 How do you know? _____

8. Match the function with the correct cell part from the diagram below.

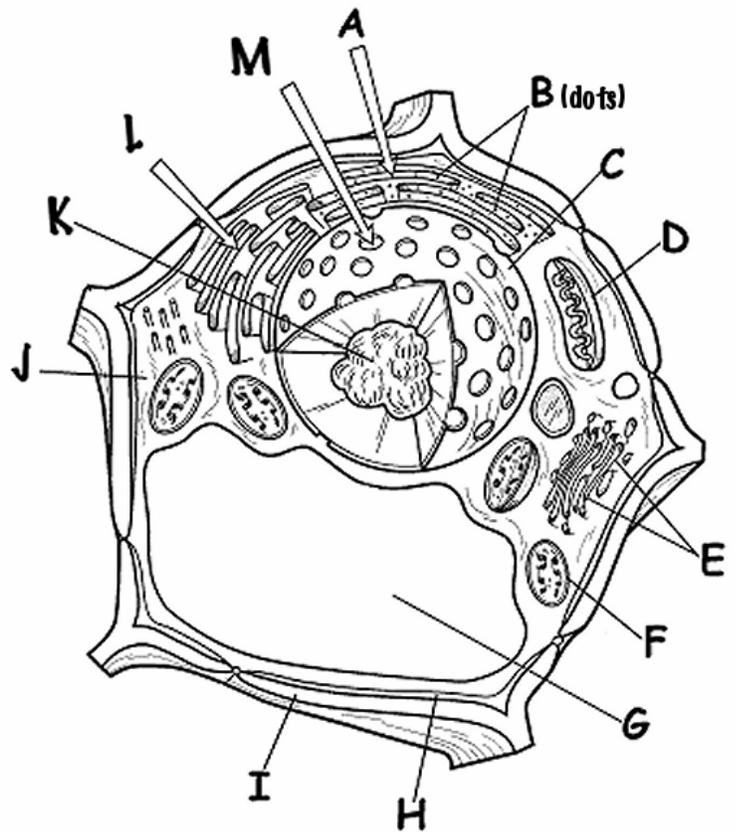


Letter	Description/Function
	Carries Golgi modified products to the cell membrane; fuses with the cell membrane releasing the contents to outside the cell
	Consists of DNA and protein; condenses to form chromosomes
	Site of protein synthesis; suspended in the cytosol; produces proteins for use within the cell
	Membrane bound sac of hydrolytic enzymes; enzymes are used to digest food, other molecules, and old, worn out cell parts
	Contains most of the genes that control the eukaryotic cell; generally the most conspicuous organelle in a eukaryotic cell; contains the nucleolus and chromatin
	Site of cellular respiration; produces ATP from sugars, fats, and other fuels
	Where the components of the ribosomes are synthesized and assembled; found in the nucleus
	Paired structures found in animal cells; consist of microtubules in a 9+0 arrangement; involved in cell division

Letter	Description/Function
	Site of protein synthesis; attached to the outside surface of the endoplasmic reticulum; produces proteins for use outside the cell or for use in the cell membrane.
	Synthesizes lipids including phospholipids and steroids; metabolizes carbohydrates; detoxifies drugs and poisons; stores calcium ions; lacks attached ribosomes
	The entire region between the nucleus and the cell membrane; consists of the cytosol
	Channels proteins to transport vesicles; attaches carbohydrate to some proteins; involved in membrane production through the production of vesicles; has attached ribosomes
	Forms the boundary of the cell; acts as a selective barrier allowing certain materials to pass but not others
	Consists of flattened membranous sacs; receives transport vesicles from the ER; modifies ER products; produces certain molecules; produces lysosomes and secretory vesicles

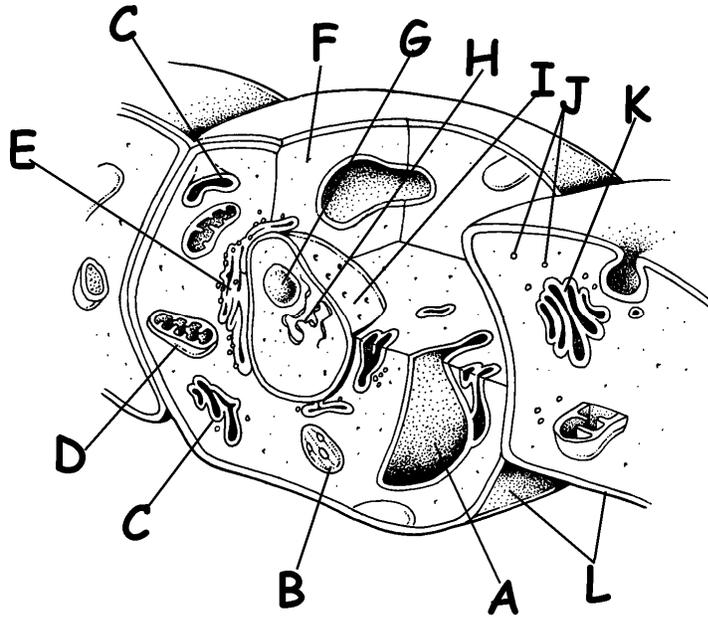
9. Match the structure with the correct letter from the diagram below.

- _____ Bound ribosomes
- _____ Cell membrane
- _____ Cell wall
- _____ Central vacuole
- _____ Chloroplast
- _____ Cytoplasm
- _____ Golgi
- _____ Mitochondria
- _____ Nuclear envelope
- _____ Nuclear Pore
- _____ Nucleolus
- _____ Rough ER
- _____ Smooth ER



10. Is the cell pictured in number 9 above an animal or plant cell? _____
 How do you know? _____

11. Match the function with the correct letter from the diagram below.

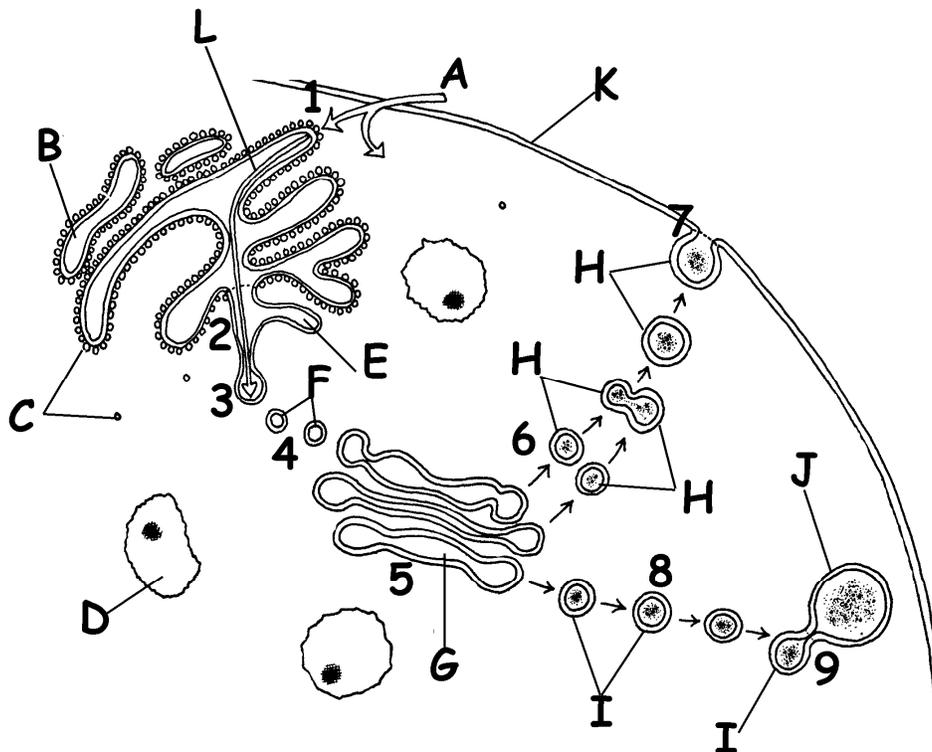


Letter	Description/Function
	Consists of DNA and protein; condenses to form chromosomes
	Site of protein synthesis; suspended in the cytosol; produces proteins for use within the cell
	Contains most of the genes that control the eukaryotic cell; generally the most conspicuous organelle in a eukaryotic cell; contains the nucleolus and chromatin
	Site of cellular respiration; produces ATP from sugars, fats, and other fuels
	Where the components of the ribosomes are synthesized and assembled; found in the nucleus
	Synthesizes lipids including phospholipids and steroids; metabolizes carbohydrates; detoxifies drugs and poisons; stores calcium ions; lacks attached ribosomes

Letter	Description/Function
	Protective layer external to the cell membrane; consists of cellulose
	Site of photosynthesis; produce food using light energy, CO ₂ and H ₂ O
	The entire region between the nucleus and the cell membrane; consists of the cytosol
	Channels proteins to transport vesicles; attaches carbohydrate to some proteins; involved in membrane production through the production of vesicles; has attached ribosomes
	Contains hydrolytic enzymes; sequesters dangerous by-products; contains soluble pigments; stores water; involved in cell growth
	Consists of flattened membranous sacs; receives transport vesicles from the ER; modifies ER products; produces certain molecules; produces lysosomes and secretory vesicles

12. Color the following parts on the diagram below:

- | | |
|---|--|
| <input type="checkbox"/> Amino Acid (arrow) (A) | <input type="checkbox"/> Golgi (G) |
| <input type="checkbox"/> Rough ER (B) | <input type="checkbox"/> Secretory vesicle (H) |
| <input type="checkbox"/> Ribosomes (C) | <input type="checkbox"/> Lysosome (I) |
| <input type="checkbox"/> Peroxisomes (D) | <input type="checkbox"/> Food vacuole (J) |
| <input type="checkbox"/> Smooth ER (E) | <input type="checkbox"/> Cell membrane (K) |
| <input type="checkbox"/> Transport vesicle (F) | <input type="checkbox"/> Protein product (L) |



13. The diagram in #12 shows the relationship among the majority of the components on the endomembrane system. Use the diagram and your notes to complete the following chart.

	Transition Vesicle	Secretory Vesicle	Lysosome
Origin			
Contents			
Destination			

14. Match each of the events listed below with the correct **number** from the diagram in #12.

- _____ Proteins routed by ER; proteins may be modified
- _____ Formation of transition vesicle
- _____ Lysosome fuses with vacuole
- _____ Transition vesicle carries contents to the Golgi
- _____ Secretory vesicle produced
- _____ Golgi modifies proteins
- _____ Amino acids imported into the cell; bound ribosomes use the amino acids to produce proteins
- _____ Lysosome produced; lysosome contains hydrolytic enzymes
- _____ Secretory vesicle contents released to the outside

15. Determine if each of the characteristics listed below are true of **Cilia** or **Flagella**.

- | | |
|--|--|
| <input type="checkbox"/> 9+2 arrangement of microtubules | <input type="checkbox"/> Many per cell |
| <input type="checkbox"/> Involved in movement | <input type="checkbox"/> One or two per cell |
| <input type="checkbox"/> Shorter | <input type="checkbox"/> Produce an oar-like motion |
| <input type="checkbox"/> Longer | <input type="checkbox"/> Produce a snake-like motion |

16. What is the extracellular matrix?

17. Determine if each of the following characteristics or examples are true of **Plasmodesmata**, **Tight junctions**, **Desmosomes**, or **Gap junctions**.

- Found in plant cells
- Found in animal cells
- Form channels between cells
- Allow free passage of water and small solutes between cells
- Found in embryos, cardiac muscle tissue, and endocrine glands
- Hold cells tightly together
- Block intercellular transport of materials
- Found in epithelial layers that separate two kinds of solutions
- Found in the lining of the digestive tract and the blood-brain barrier
- Rivet cells together
- Well developed in cells subjected to considerable mechanical force
- Found in skin cells
- Permit intercellular transport
- Glycoprotein (intermediate) filaments penetrate and bind plasma membranes of two adjacent cells