Name: _____ Block: _____ Date: _____

Biology 12 - The Cell – REVIEW WORKSHEET

Part A: In **ONE** sentence, in the space provided, describe the function of the following organelles. **Use point form**. Use your own words. **Paraphrase** and **condense** the textbook definitions. **DO NOT** copy any definition or part of a definition. In the box to the left of each definition, make a **sketch** of the organelle.

	1. cell membrane:
	2. cell wall:
	3. centriole:
	4. chloroplast:
	5. chromosome:
	6. cilia:
	7. cytoskeleton:
	8. flagella:
	9. Golgi body
	10. lysosomes:
	11. microfilament:
	12. microtubule:
	13. mitochondria:
	14. nucleolus:
	15. nucleus:
	16. plastids:
	17. ribosome:
	18. rough endoplasmic reticulum:
	19. smooth endoplasmic reticulum:
	20. vacuoles:
	21. vesicle:

Part B: Mix and Match! Each definition has only one correct matching answer

	1.	internal framework that anchors organelles, gives shape	A)	cell membrane
	2.	cellular "ropes" made of repeating units of the protein *actin*	B)	cell wall
	3.	hollow tubes for transport, movement, made of actin & tubulin proteins	C)	centriole
	4.	vesicles pinch off these structures; proteins modified and packaged here	D)	chloroplast
	5.	cellular "stomach"	E)	chromosome
	6.	selectively permeable "doorman"	F)	cilia
	7.	the most important plastid, turns CO_2, H_2O, sunlight into glucose	G)	cytoskeleton

	8. membrane-bound spheres that store water & dissolved materials. Membrane surrounding it is called a *tonoplast*. Plants have a large, central one.	H) flagella
	9. site of rRNA production in nucleus	I) Golgi body
	10. rod-like structures that package the DNA into neat, discrete units; play role in cell division	J) lysosomes
	11. used for movement, and to move material past cell. Beat back and forth like little oars	K) microfilament
	12. site of lipid synthesis	L) microtubule
	13. appearance due to being peppered with ribosomes; this membranous network receives the just-synthesized protein and may modify it	M) mitochondria
	14. the "brain" of the cell	N) nucleolus
	15. this organelle has a double membrane and converts glucose and O_2 to produce energy in the form of ATP	O) nucleus
	16. enclose plant cells. Strong cellulose fibers give rigidity	P) plastids
	17. small organelles in plants that contain pigments or store starch	Q) ribosome
	18. small membranous spheres that transport materials around cell, out of cell via exocytosis, and into cell via endocytosis	R) rough endoplasmic reticulum
	19. made of rRNA and protein, these small, numerous organelles are the site of protein synthesis	S) smooth endoplasmic reticulum
	20. twin barrel like structures in animal cells that play a role in cell division; have 9 + 2 arrangement of microtubules	T) vacuoles
	21. whip-like structures used for movement in unicellular organisms; have 9 + 2 arrangement of microtubules	U) vesicle

Part C: Short Answer

1. What component of the cell membrane causes it to have a **FLUID** consistency? _____
   What component causes it to be like a mosaic? _____.
2. The cristae in mitochondria are the location for _____involved in _____.
3. List the 3 main classes of microscopes and in the box underneath, list the most important distinguishing characteristic of each type of microscope.

4. The nucleus is enclosed by the _____, which contains _____ that open into the cytoplasm.
5. The three organelles enclosed by a double membrane are:

6. Describe the relationship between nucleoli and ribosomes:

7. DNA within the nucleus controls what (be specific)?_____
8. Study the table below and answer the following questions:

Unit of Measurement	Symbol	Seen By
centimeter	cm = 0.01 m	Naked Eye
millimeter	mm = 0.001 m = 0.1 cm	Naked Eye
micrometer	μm = 0.000001 m = 0.001 mm	light microscope
nanometer	nm = 0.000000001 m = 0.001 μm	electron microscope

Which of the cell organelle could be seen with
   a. the naked eye? _____
   b. the compound light microscope? _____
   c. the electron microscope?_____
   d. Most cells are between _____ and _____ in diameter.

9. Examine the following equation; then write the word "mitochondrion" above or below the correct arrow in the reaction. Write the word "chloroplast" above or below the correct arrow.

   CARBOHYDRATE + OXYGEN ⇌ CARBON DIOXIDE + WATER

10. Place these terms in the appropriate column below: centrioles, cell membrane only, cell membrane and cell wall, large central vacuole, small vacuoles only, mitochondria only, mitochondria and chloroplasts, lysosomes, plastids.

Animal	Plant

11. How do these organelles work together?
    a. **lysosomes** and **vacuoles**

    b. **endoplasmic reticulum** and **Golgi apparatus**

    c. **centrioles** and **cilia**

    d. **ribosomes** and **endoplasmic reticulum**

    e. **chloroplast** and **mitochondria**

12. Prokaryotic compared to eukaryotic cells. Fill in this table by writing *yes* or *no* on the lines provided.

	Prokaryotic (e.g. bacteria)	Eukaryotic (e.g. humans)
a. cell membrane		
b. cell wall		
c. nuclear envelope		
d. mitochondria		
e. endoplasmic reticulum		
f. ribosomes		
g. centrioles		

13. Plant cells a) have a cell wall but no cell membrane b) have chloroplasts but no mitochondria c) do not have any centrioles and yet divide d) have a large central vacuole but do not have endoplasmic reticulum.

14. How are mitochondria like chloroplasts? a) they have the same structure b) they both absorb the energy of the sun c) they are both concerned with energy d) they are both found in all cells

15. Which type of molecule forms a bilayer within the membrane? a) carbohydrate b) protein c) lipid d) nucleic acid

16. Which organelle doesn't contain membrane? a) mitochondria b) lysosomes c) Golgi apparatus d) endoplasmic reticulum e) ribosomes

17. Which of the following does not contain nucleic acids? a) chromosomes b) ribosomes c) chromatin d) centrioles e) genes

18. Which of the following is considered to be the greatest advantage of the electron microscope over the light microscope? a) its maximum magnification power is 2000X. b) its resolving power is increased by almost a thousand fold. c) its image may be used to produce a photographic plate d) the observer may look directly at the screen instead of through eyepieces.

19. Which of the following cell structures within the cytoplasm is connected to the nuclear envelope? a) the nucleolus b) chromatin c) endoplasmic reticulum d) vacuoles e) lysosomes

20. When secretory products are transported to the cell membrane for export, a) they move enclosed in a vesicle derived from the Golgi apparatus b) they are still attached to ribosomes c) they travel directly to the cell membrane through the rough endoplasmic reticulum d) all of these

Part D - Please answer the following questions on a *separate sheet of paper*, in *full sentences*.

1. If a tiny hole is made in a plasma membrane, it usually "heals" immediately, and no harm results. **What property** of the plasma membrane allows this?

2. **Lipids**, **small molecules**, and **uncharged particles** pass into and out of the cell with **relative ease**. What **characteristics** of the cell membrane can be inferred from these observation?

3. Describe the **Fluid Mosaic Model** of membrane structure.

4. A **continuous system of membranous channels** is believed to connect the nucleus with the cell membrane. Describe the **structure** and **function** of the organelles prominent in this system.

5. Why is the **nucleus** centrally positioned in most eukaryotic cells?

6. a) Describe the **structure** and **function** of **mitochondria** and **chloroplasts**.

7. An inherited disorder in humans results in the absence of dynein (an important structural protein) in flagella and cilia. The disease causes respiratory problems and sterility in males. What is **connection between these two symptoms**?

8. What are the **two main types of cells** and how do they differ structurally? *Hint: the answer is NOT plant and animal cells!*

9. Most animals are **heterotrophs** that can move. Most plants are stationary **autotrophs**. Explain how the differences in the structure of plant and animal cells contribute to these characteristics.

10. What challenges face a cell that undergoes a **great increase in size**? How can the cell **overcome** these challenges?

11. **Vinblastine** is a drug that interferes with the assembly of microtubules. It is widely used for chemotherapy in treating cancer patients. **Suggest a hypothesis** to explain how vinblastine slows tumour growth by inhibiting cell division.

12. The **Endosymbiotic Theory Of Eukaryotic Cell Origin** states that **mitochondria** and **chloroplasts** were at one time independent organisms that were "enslaved", so to speak, by an ancient precursor to modern eukaryotic cells. Give some structural evidence in these two organelles that would tend to support this hypothesis.

13. Give 3 characteristics you would expect to find in a Protein-secreting cell.