

The Study of Cells Lab

Name _____

Date _____ Period _____

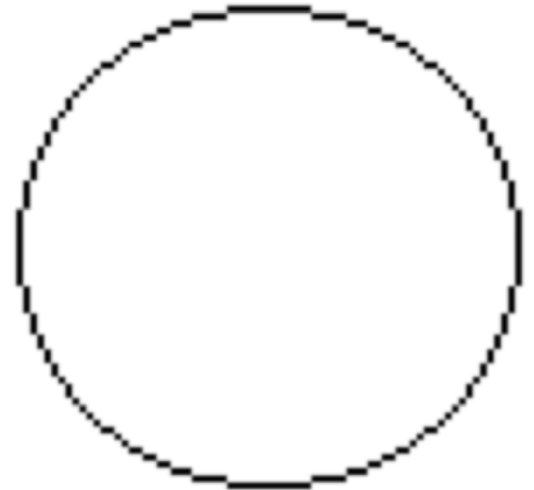
Introduction: In this investigation, we will examine three different types of cells under the compound microscope. Through the use of stains, we will hopefully be able to observe various cellular organelles and compare plant and animal cells.

Materials: slides coverslips Methylene blue stain Iodine onions toothpicks Elodea microscopes

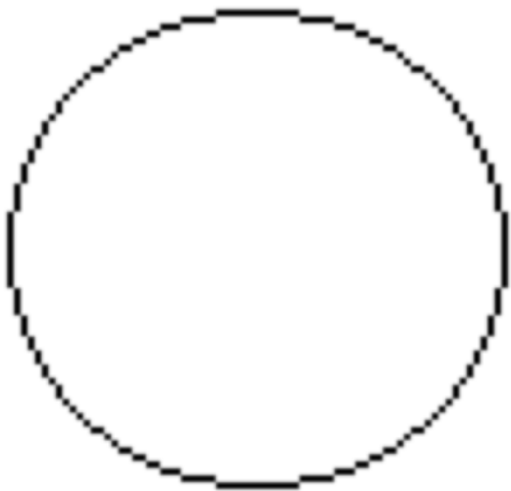
SPECIAL NOTE FOR LAB RECOVERY: If you are doing this where you do not have access to a microscope, you would have to view the appropriate images on www.mschien.com. Click on LE Biology Lab Recovery link on the top of the page. Follow all special directions on this lab that may be next to the links!

Part 1: Human Cheek Cells-

- Gently scrape the inside lining of your cheek with the flat end of a toothpick. With the collected cells, make a wet mount and add a very small drop of **methylene blue** stain.
- Focus the slide on low power and try to find some cheek cells. They will have varying shapes and should contain a visible nucleus.
- In the space to the right, draw at least one cell just as you see it. Label the cell membrane, nucleus, cytoplasm, and indicate what magnification was used.



Part 2: Onion Skin Cells-

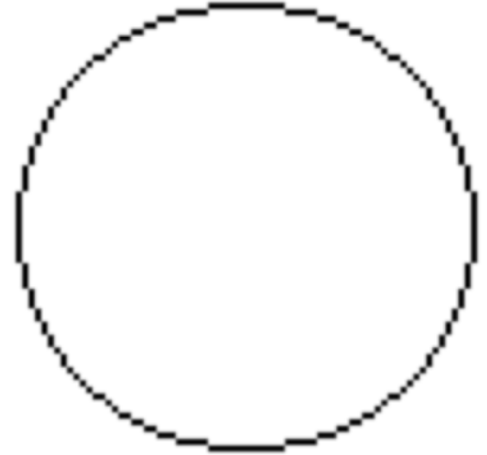


- Obtain some plant cells by carefully peeling off a very thin section of onion skin. With the collected cells, make a wet mount and add a drop of **iodine** stain. *Make sure that your onion skin is not thicker than a piece of paper, and make sure that the onion skin lies flat on the slide when you make a wet mount.*
- Focus the slide on low power and find some cells that are in clear view. Find one good cell, center it, and go to high power.
- In the space to the left, draw one cell just as you see it. Label the cell membrane, cell wall, nucleus, cytoplasm, and indicate what magnification was used.

1. What organelle was visible in the onion cell that is not present in the cheek cell? _____.
2. Name an organelle that is present in animal cells that is not present in plant cells. _____.

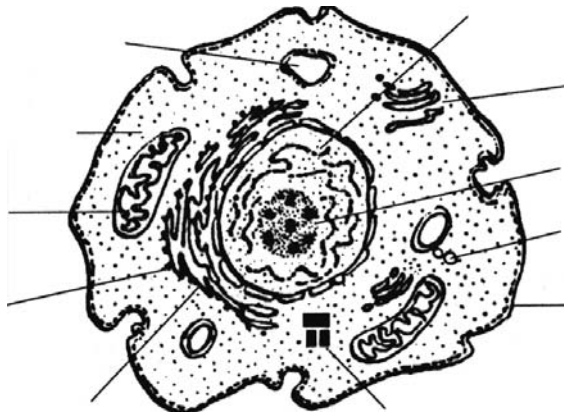
-Part 3: Elodea Leaf Cells-

- a. Obtain a small piece of an Elodea leaf and make a wet mount. *You do not need the whole leaf.*
- b. Bring the slide into focus on low power. Find a cell that's in clear view, center it, and switch to high power.
- c. In the space to the right, draw one cell just as you see it. Label the cell membrane, cell wall, chloroplasts, cytoplasm, and indicate what magnification was used.



Analysis:

-Label each organelle in the animal cell pictured to the right.



ANSWER KEY

<u>Cell Organelle Association</u>	<u>Multiple Choice Answers</u>	
1. _____	1. _____	11. _____
2. _____	2. _____	12. _____
3. _____	3. _____	13. _____
4. _____	4. _____	14. _____
5. _____	5. _____	15. _____
6. _____	6. _____	16. _____
7. _____	7. _____	17. _____
8. _____	8. _____	18. _____
9. _____	9. _____	19. _____
10. _____	10. _____	20. _____
11. _____		
12. _____		
13. _____		
14. _____		

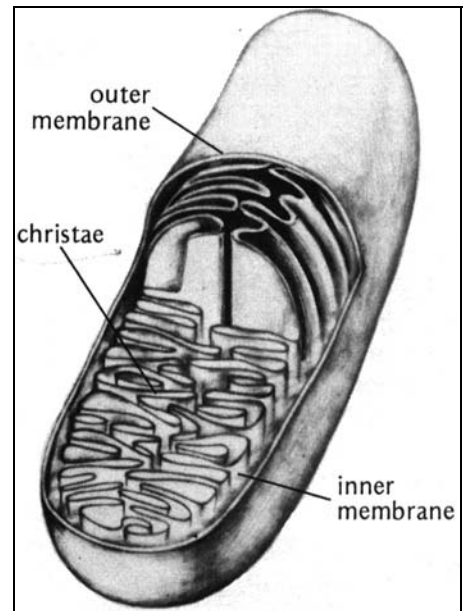
-Put all final answers in the answer key on the previous page-

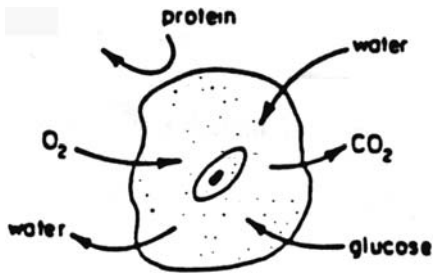
Cell Organelle Association: Name a cell organelle associated with each term. You can use the same organelle more than once and many questions will have more than one possible answer.

1. Cell reproduction-
2. Fluid mosaic model-
3. Cellulose-
4. Enzyme Synthesis-
5. Cyclosis-
6. Pinocytosis-
7. Cell respiration-
8. Semi-permeable-
9. Storage compartments-
10. Found only in animal cells-
11. Site of photosynthesis-
12. Made up of proteins and lipids-
13. Channels used for transport-
14. Contains enzymes for cell digestion-

Multiple Choice:

1. Iodine was added to a wet mount of onion cells that was being observed with the compound light microscope. The iodine was probably used to aid in the observation of the
a) chloroplasts b) ribosomes c) nuclei d) contractile vacuoles
2. In plant and animal cells, most enzymes involved in aerobic cellular respiration are located
a) throughout the cytoplasm c) within the ribosomes
b) on the endoplasmic reticulum d) within the mitochondria
3. Which organelles can only be observed only with the aid of an electron microscope?
a) ribosomes b) chloroplasts c) nuclei d) cell walls
4. Which structure includes all the others?
a) nucleolus b) nucleus c) chromosomes d) genes
5. Which cell organelle is involved most directly in the digestion of large particles brought into the cell by phagocytosis?
a) ribosome b) mitochondria c) lysosome d) nucleolus
6. Which metabolic process is most closely associated with the organelle represented in the diagram to the right?
a) intracellular digestion c) cellular respiration
b) synthesis of glycogen d) hydrolysis of lipids
7. An organelle found in most plant cells, but absent from animal cells, is the
a) contractile vacuole c) centriole
b) chloroplast d) Golgi complex
8. Which organelles are usually found in both plant and animal cells?
a) cell walls b) centrioles c) mitochondria d) chloroplasts
9. Which structures are found in every living cell?
a) plasma membrane and cytoplasm c) chloroplasts and mitochondria
b) cell wall and nucleus d) centrioles and chromosomes

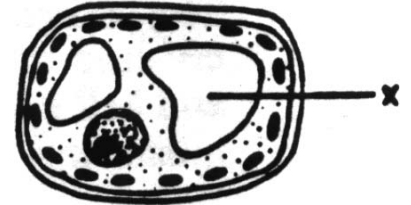




10. Which cell part selectively regulates the entry and exit of substances, as shown in the diagram to the right?
 a) plasma membrane b) ribosome c) nucleolus d) nuclear membrane
11. Which molecules are most commonly used as building blocks for the synthesis of new cell membranes?
 a) glucose, fructose, and ribose c) sucrose, maltose, and starch
 b) cellulose, glycogen, and insulin d) amino acids, glycerol, and fatty acids

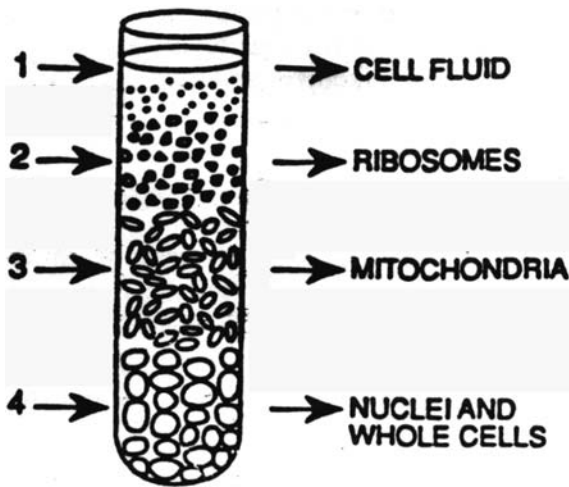
12. Which organelle is present in the cells of a mouse but not present in the cells of a bean plant?
 a) cell wall b) chloroplast c) cell membrane d) centriole

13. In the diagram of a cell at the right, the structure labeled X enables the cell to
 a) release energy c) store waste products
 b) control nuclear division d) manufacture proteins



14. Which organelle must be present within a cell of a geranium leaf for respiration and photosynthesis to occur?
 a) cell wall and lysosome c) mitochondria and chloroplast
 b) centrosome and nucleus d) endoplasmic reticulum and ribosome

15. In a cell, the selective permeability of the cell membrane is most closely associated with the maintenance of
 a) homeostasis b) hydrolysis c) phagocytosis d) pinocytosis



Cells and cell components were dispersed in layers as illustrated. The organelles that act as the sites of protein synthesis are found in the greatest concentration within layer

- a) 1 b) 2 c) 3 d) 4

17. Which statement regarding the functioning of the cell membrane of all organisms is not correct?

- a) The cell membrane forms a boundary that separates the cellular contents from the outside environment.
 b) The cell membrane is capable of receiving and recognizing chemical signals.
 c) The cell membrane forms a barrier that keeps all substances that might harm the cell from entering the cell.
 d) The cell membrane controls the movement of molecules into and out of the cell.

16. The diagram to the left represents a sample of crushed onion cells that was centrifuged.

18. In multi-cellular organisms, cells must be able to communicate with each other. Structures that enable most cells to communicate with each other are known as

- a) pathogenic agents b) chloroplasts c) antibiotics d) receptor molecules

19. Which organelles outside the cell nucleus contains genetic material?

- a) lysosomes and cell walls c) cell membranes and vacuoles
 b) chloroplasts and mitochondria d) vacuoles and Golgi complex

20. The development of the cell theory was most directly related to

- a) improvement of the microscope and microscope technologies.
 b) use of a five-kingdom classification system.
 c) development of the gene-chromosome theory.
 d) discovery of bacteria and viruses.