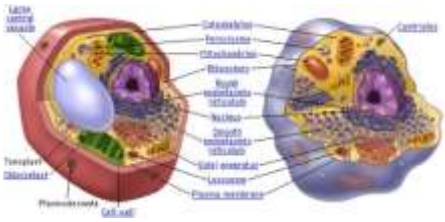
Name: _____ **Date:** _____



Gen Bio 1 Lab #4: Cells

Pre-lab Reading Assignment: Pages 81-96 (9th edition) or Pages 80-96 (8th edition) - pay particular attention to ***Table 4-1*** (p. 90 in 9th edition, p. 89 in 8th).

Pre-lab Vocabulary:

1. Prokaryote-
2. Eukaryote-
3. Endomembrane system-
4. Cytoplasmic streaming-
5. Plastids –
    a. Chromoplasts-
    b. Chloroplasts-
    c. Amyloplasts-
6. Pseudopods-

Pre-lab exercise: Below draw a picture of a typical animal cell and a typical plant cell and **label** the cytoplasm, nucleus and all of the organelles found in each type of cell. Use **Table 4-1** in your textbook as reference.

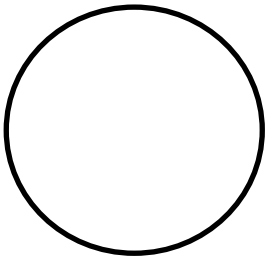
Procedure: Plant Cells

Materials

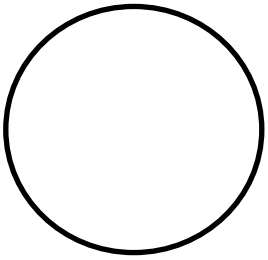
Microscope
4 microscope slides with coverslips
razor blade
thinly sliced carrot
thinly sliced onion
thinly sliced potato
tip of water plant leaf
water
iodine
methylene blue
pipette

Procedure: Wet Mount of water plant

1. Cut the tip off a water plant leaf.
2. Place a drop of water on a microscope slide.
3. Place the tip of water plant leaf in the water.
4. Place the coverslip on the leaf.
5. Observe the specimen under the microscope. **Remember**: **First** find water plant cells using 4X objective, **then change to 10X and focus, then turn to 40X and draw**.
6. Draw a few water plant cells below, labeling the nucleus, cytoplasm, cell wall, and the chloroplasts.
7. Leave under the microscope for 20 minutes then check to see if you can observe cytoplasmic streaming. Label your drawing if you see this.



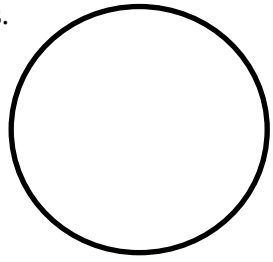
Before 20 min



After 20 min

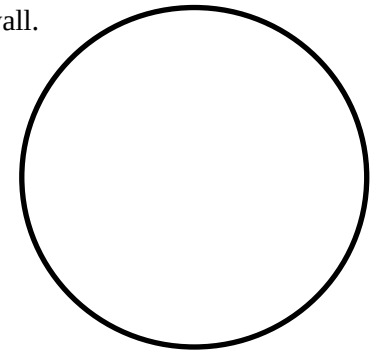
Procedure: Wet Mount of Carrot

1. Slice a very thin piece of carrot. When you think it's thin enough, you are wrong, slice **thinner**.
2. Place a drop of water on a microscope slide.
3. Place the *super-duper-almost-transparent* piece of carrot on the drop of water.
4. Place the coverslip on the carrot—if it wobbles your slice is too thick–slice again.
5. Observe the specimen under the microscope. **Remember**: **First** find water plant cells using 4X objective, **then change to 10X and focus, then turn to 40X and draw**. Draw a few carrot cells below, labeling the nucleus, cytoplasm, cell wall, and the chromoplasts.



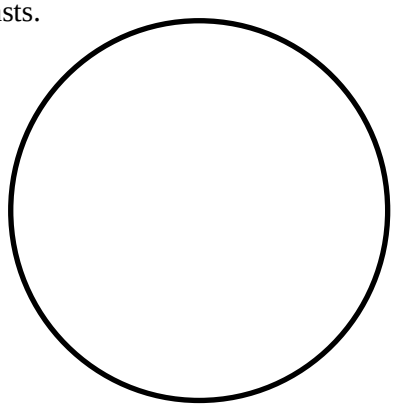
Procedure: Wet Mount of Onion

1. Slice a very thin, *super-duper-thin,* piece of onion. If you think it's thin enough, slice even thinner.
2. Place a drop of water on a microscope slide.
3. Place the *super-duper-almost-transparent* piece of onion on the drop of water.
4. Place the coverslip on the onion—if it wobbles your slice is too thick–slice again.
5. Observe the specimen under the microscope. **Remember**: **First** find water plant cells using 4X objective, **then change to 10X and focus, then turn to 40X and draw**. You may want to stain the onion cells with methylene blue (CAREFULL IT WILL STAIN DARK, AND IT WILL STAIN EVERYTHING-biology students, book bags, 85 dollar shoes)
    a. Hint: add a drop of stain to the right side of the coverslip after you have placed it on the onion and let the color be drawn under the coverslip slowly.
6. Draw a few onion cells below, label the nucleus, cytoplasm, and cell wall.



Procedure: Wet Mount of Potato

1. Slice a very thin, super-duper thin, piece of potato, if you think it's thin, slice again.
2. Place a drop of water on a microscope slide.
3. Place the wafer-thin piece of potato on the drop of water.
4. Place the coverslip on the potato—if it wobbles your slice is too thick–slice again.
5. You need to stain the potato using iodine:
    a. Reason for iodine: it stains starch.
    b. Hint: add a drop of stain to the right side of the coverslip after you have placed it on the potato and let the color be drawn under the coverslip slowly.
6. Observe the specimen under the microscope. **Remember**: **First** find water plant cells using 4X objective, **then change to 10X and focus, then turn to 40X and draw**. Draw a few potato cells below, label the nucleus, cytoplasm, cell wall, and amyloplasts.

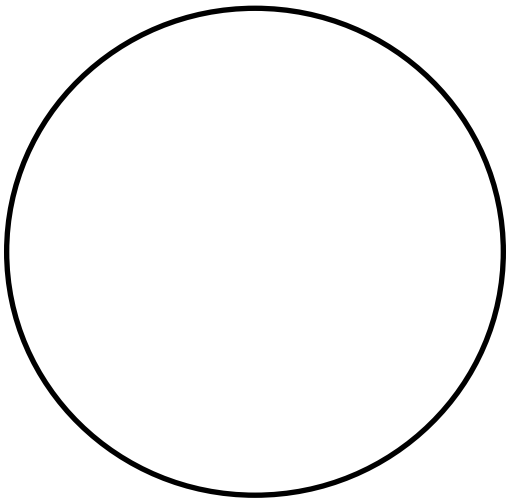


Procedure: Animal Cells

Materials
Microscope
Microscope slide and coverslip
toothpick
water
methylene blue

Procedure: Wet Mount Human Cheek Cells

1. Obtain a microscope slide and place a drop of water on the slide.
2. Gently scrape the toothpick on the inside of your cheek.
3. Swirl the end of the toothpick with cheek cells in the water, the more you swirl the more distributed the cells will be in the water.
4. Place the coverslip over your specimen.
5. You may want to stain the cheek cells with methylene blue (CAREFULL IT WILL STAIN DARK AND IT WILL STAIN EVERYTHING-biology students, book bags, lab instructors-who will get grouchy)
    a. Hint: add a drop of stain to the right side of the coverslip after you have placed it on the specimen and let the color be drawn under the coverslip slowly.
6. Observe the specimen under the microscope. **Remember**: **First** find water plant cells using 4X objective, **then change to 10X and focus, then turn to 40X and draw**. Draw a few cheek cells below, label the nucleus, cytoplasm, and plasma membrane.



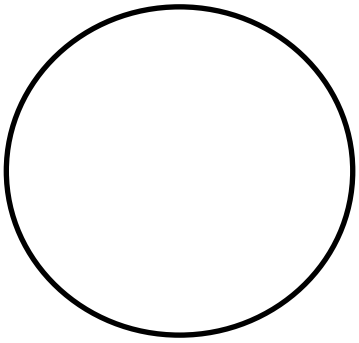
Procedure: Single Cell Eukaryotes

Materials

Microscope
Microscope slide and coverslip
Prepared slide of *Amoeba*
Pond water
Protoslo®
pipette

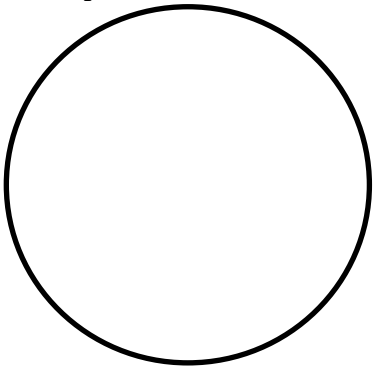
Procedure: Prepared Amoeba Slide-look at atlas for pictures

1. Obtain a prepared *Amoeba* slide.
2. **Remember**: **First** find water plant cells using 4X objective, **then change to 10X and focus, then turn to 40X and draw**.
3. Draw several Amoebas below labeling, nucleus, cytoplasm, and pseudopods.



Procedure: Wet mount Paramecium from pond water—look at atlas for pictures

1. Obtain a microscope slide, and place a drop of Protoslo® onto the center of your slide.
2. Using pipette, obtain a sample of pond water to look for paramecium, carefully from the sample jar.
3. Place the sample on the drop of Protoslo® and cover with a coverslip.
4. Observe under microscope: these are tiny unicellular organisms that even with Protoslo® will move around pretty fast.
5. **Note—If another lab group finds a paramecium and your lab group does not, ask to observe their sample.**
6. Draw a picture of a paramecium below and observe (make notes) on their movements.

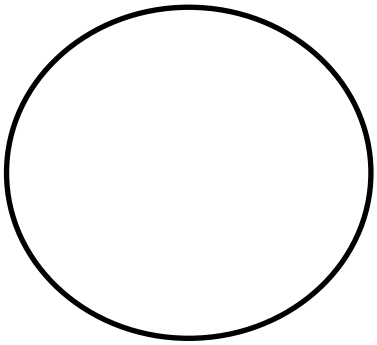


Procedure: Prokaryotes (Cyanobacteria)

Materials
Microscope
Microscope slide and coverslip
Prepared slide of *Gleocapsa* or *Anabaena*
Prepared slide of *Oscillatoria*

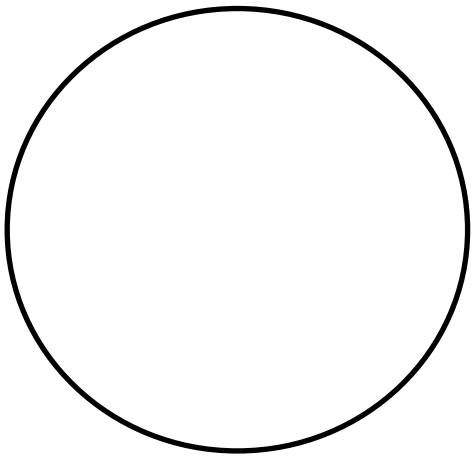
Procedure: Prepared *Gleocapsa* Slide-look at atlas for pictures

1. Obtain a prepared *Gleocapsa* slide.
2. **Remember**: **First** find water plant cells using 4X objective, **then change to 10X and focus, then turn to 40X and draw**. Draw several *Gleocapsa* or *Anabaena* below labeling cytoplasm, and plasma membrane.



Procedure: Prepared *Oscillatoria* Slide-look at atlas for pictures

1. Obtain a prepared *Oscillatoria* slide. (These are tiny organisms that look like small blades of green grass)
2. **Remember**: **First** find water plant cells using 4X objective, **then change to 10X and focus, then turn to 40X and draw**. Draw several *Oscillatoria* below labeling cytoplasm, and plasma membrane.



Questions to e x p a n d your mind.

1. Why is methylene blue necessary to observe some of your samples?

2. The light microscope used in the lab is not powerful enough to view most organelles in the cheek cell. What parts of the cell were visible? If we had a transmission electron microscope, what organelles might we be able to see?

3. Our mouths are the first site of chemical digestion in humans. Digestive enzymes, like amylase, in saliva begin the process of breaking down the food you eat. Keeping this in mind, what organelle do you think would be most numerous inside the cells of your mouth? (**HINT: What organelle makes and secretes enzymes in our cells?**)

4. Compare and contrast plant and animal cells, mentioning at least 3 primary differences.