

Microscopes and “Protists”

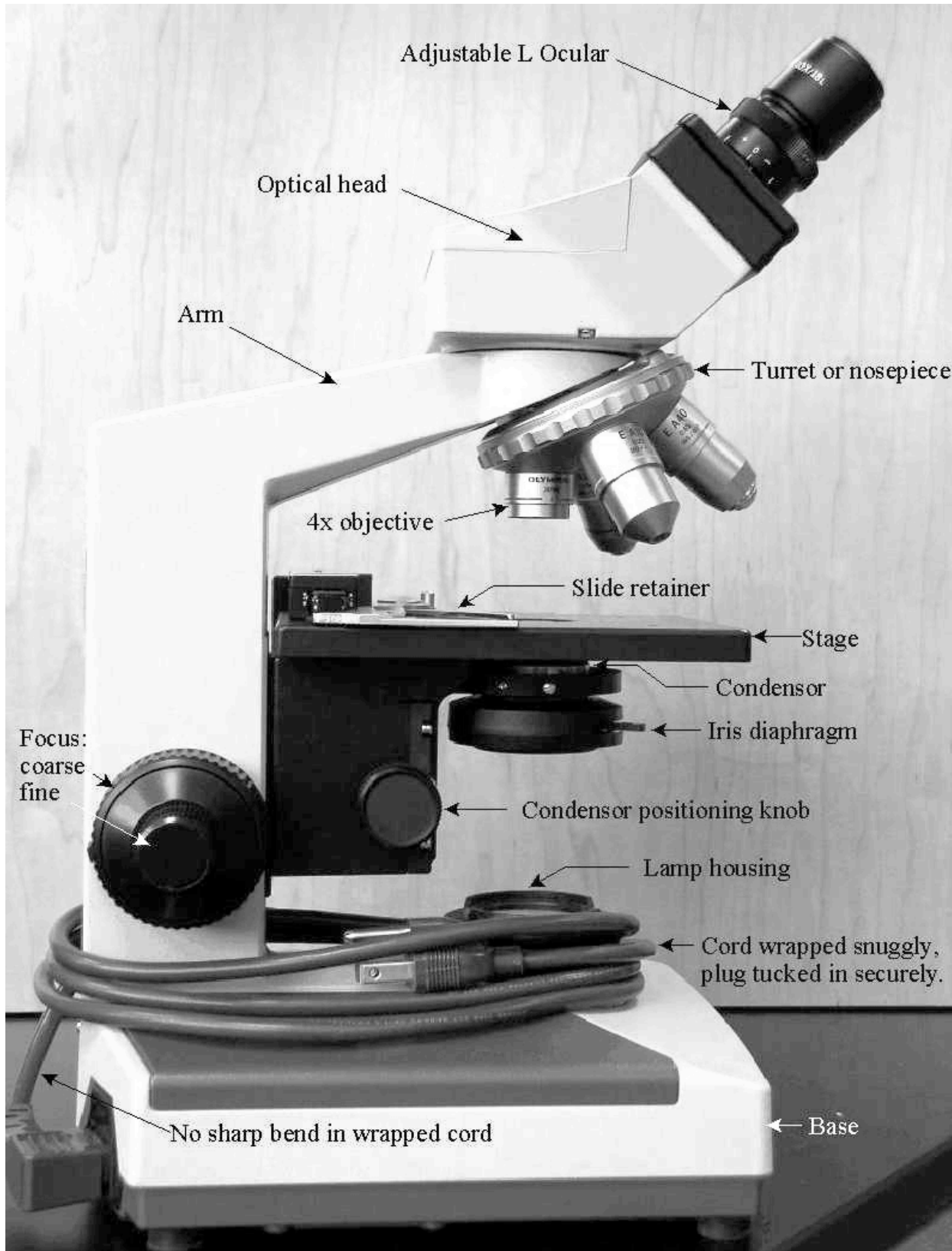
Objectives:

- Learn proper microscope use!!!
- Be able to calculate total magnification and be able to explain how your field of view changes with different powers of magnification
- Be able to explain why this group is not **monophyletic**.
- Be able to describe and identify the different modes of locomotion for protists, and the structures involved: **flagella**, **cilia**, and **pseudopodia**.
- Be able to make accurate biological sketches.
- Be able to recognize and identify the organisms you observe today.

Using the Microscope

Throughout today’s lab you will be using the microscope to observe protists. Therefore, you will first need to become familiar with the proper use of the microscope. Your instructor will go over proper microscope use. PAY ATTENTION!

Write important microscope instructions here:



The letter "e": Set the lowest powered objective on your microscope to the working position. Place the "e" slide on the stage and secure it using the specimen holder. Adjust the eye pieces such that you can comfortably see a single image when you look through the microscope. Use the Stage Travel Knobs to move the "e" into your field of view.

▶ **How does the orientation of the "e" when you observe it through the microscope compare to its orientation when observed with the naked eye?**

▶ **Move the slide to the left using the Stage Travel Knobs - What direction does the "e" move in your field of view?**

▶ **Move the slide to the toward you using the Stage Travel Knobs - What direction does the "e" move in your field of view?**

▶ **Bring the 10X powered objective into working position and adjust the focus USING ONLY THE FINE FOCUS KNOB. Can you still see the entire "e"?**

▶ **Bring the 40X powered objective into working position and adjust the focus USING ONLY THE FINE FOCUS KNOB. Can you still see the entire "e"?**

Magnification and Field of View: The following exercises will teach you how to calculate your magnification and the size of your field of view.

The total magnification is calculated by multiplying the magnification level of the objective along with the magnification of the eyepiece.

► **Set your microscope back to the lowest powered objective. Place a transparent ruler across the stage and focus on the edge that has millimeter markings.**

What is the total magnification? _____

What is the diameter of your field of view? _____

► **Swing the next higher power objective into working position.**

What is the total magnification? _____

What is the diameter of your field of view? _____

Depth of Focus: Because specimens are relatively thick with respect to the magnifications being used, you cannot bring the entire specimen into focus at once. Therefore it is useful to focus up and down (with the fine focus knob!) to bring different depths of the specimen into focus.

► **Set your microscope back to the lowest power objective. Place a slide with threads on it onto the stage. Observe this slide at different levels of magnification and describe how your ability to bring all of the threads into focus at the same time changes at different levels of magnification.**

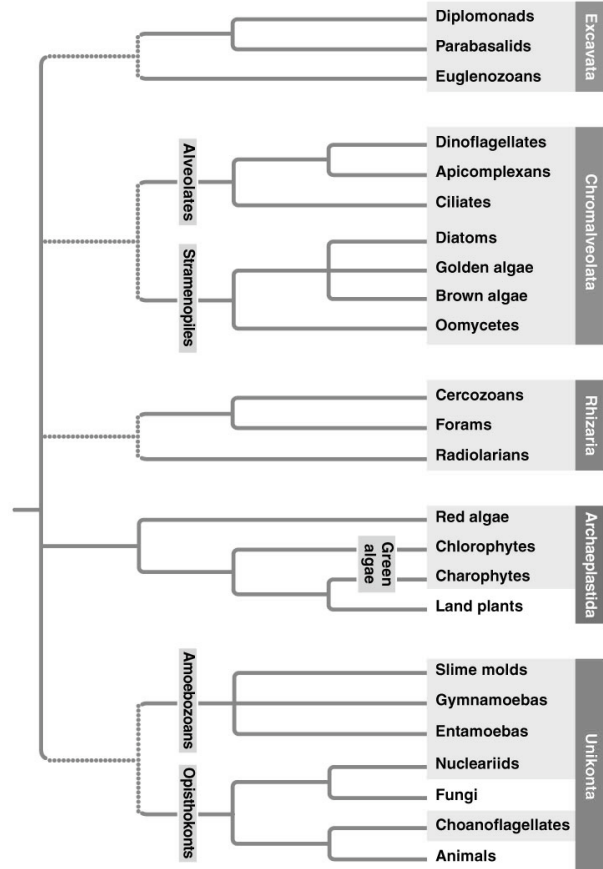
Observation of Protists

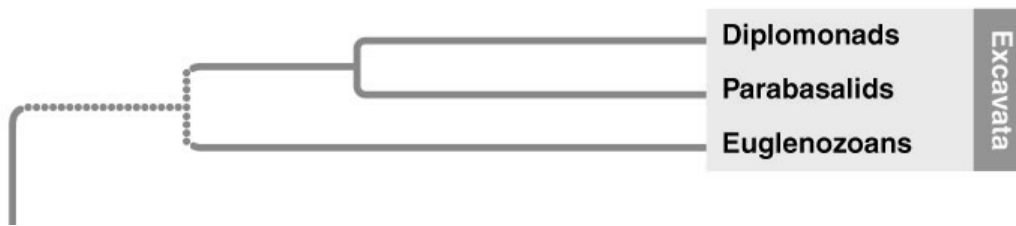
You will use the microscopes to observe examples of protists both as prepared slides and live material that you will make wet mounts of.

General Instructions for your Sketches

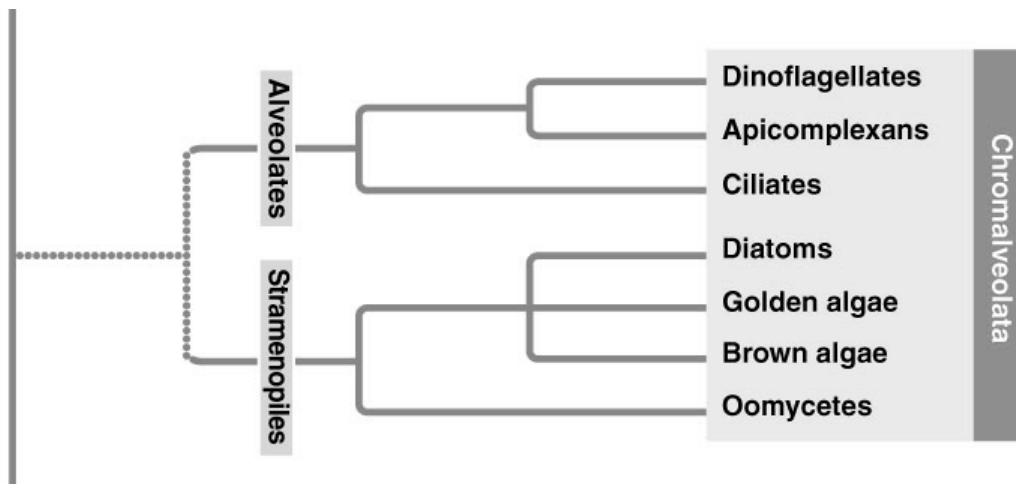
You do not need to be a great artist to make biological sketches. You do, however, need to make your best attempt to accurately represent what you are looking at through the microscope. This means that you need to draw things to scale. Your drawing should not be much bigger or smaller than what you are actually seeing through the microscope. For all of your sketches you need to include the total magnification (objective x eye piece). You also need to include the name of the organism. You should identify their **mode of locomotion**; are they **autotrophs** or **heterotrophs**? Also, be sure to record any relevant information your instructor may impart with regards to the organisms you observe! Please be aware that you will be asked to identify these organisms and relevant structures on a practical exam!

Phylogeny of Eukarya with Protist groups highlighted.

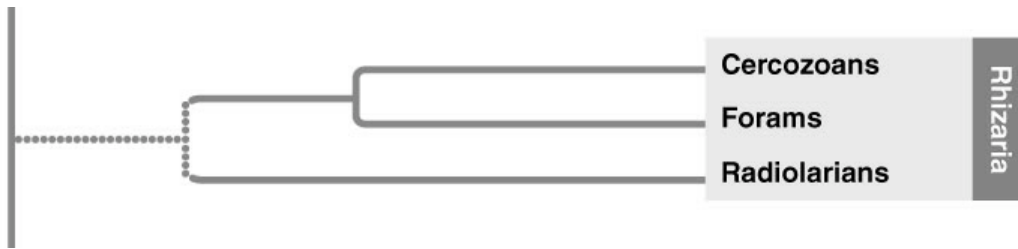


Protists Checklist:

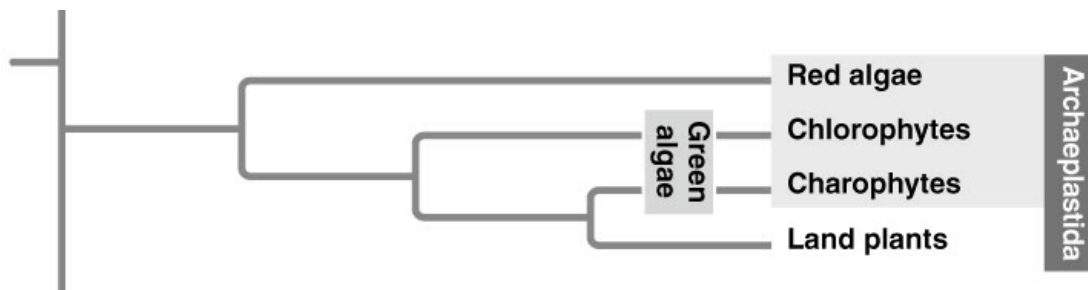
- Live
 - *Euglena gracilis* (Euglenozoans)
- Prepared
 - *Trypanosoma* (Euglenozoans)
 - *Euglena* (Euglenozoans)



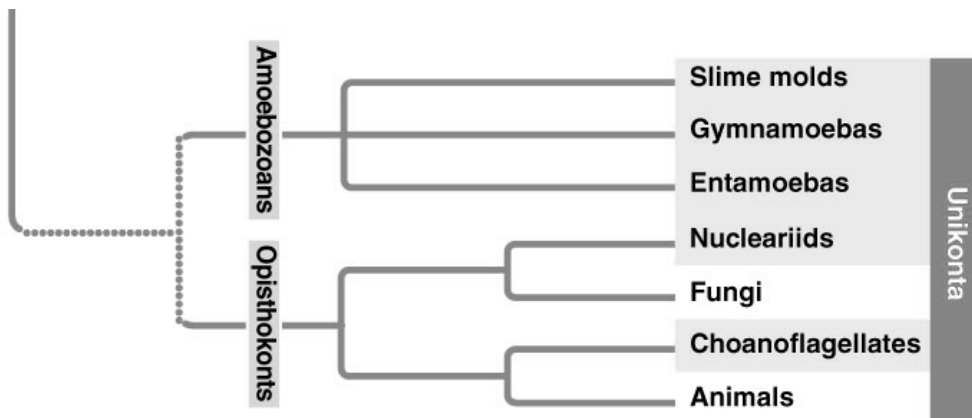
- Live
 - Prepare a slide of Diatomaceous Earth – stain with iodine (Diatoms)
 - *Paramecium caudatum* (Ciliates)
 - *Spirosotomum* (Ciliates)
- Prepared
 - Diatoms
 - *Stentor* (Ciliates)
 - *Didinium* (Ciliates)
 - *Paramecium* (Ciliates)
 - *Toxoplasma* (Apicomplexans)



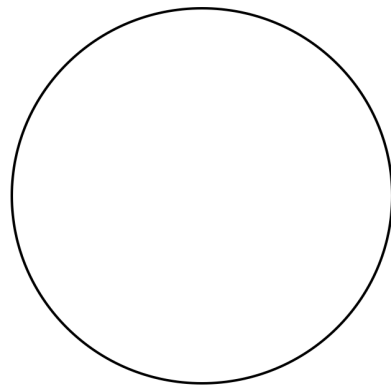
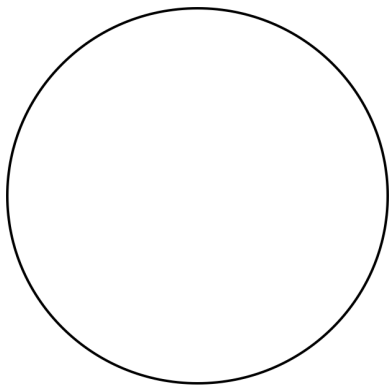
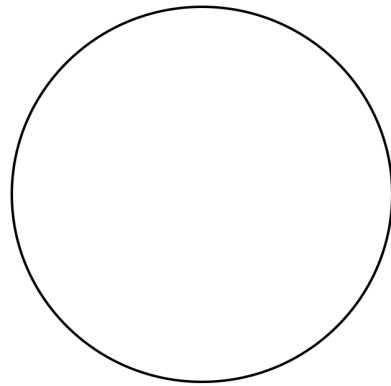
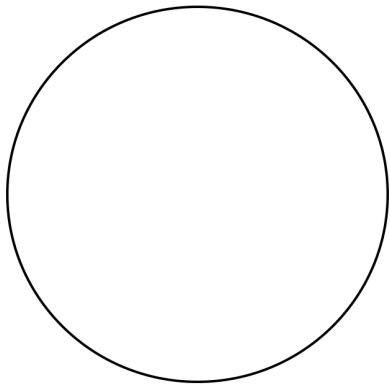
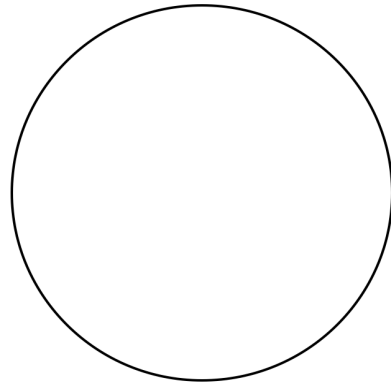
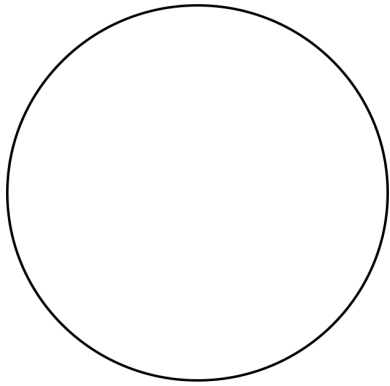
- Prepared
 - Foramineferans (Forams)
 - *Radiolaria* (Radiolarians)

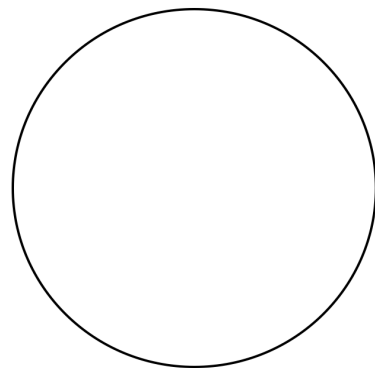
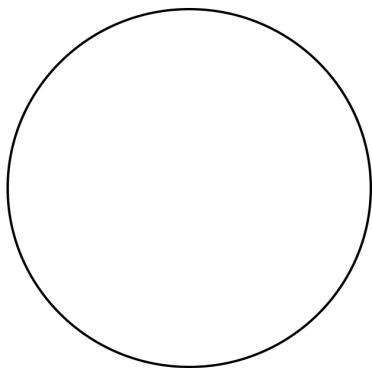
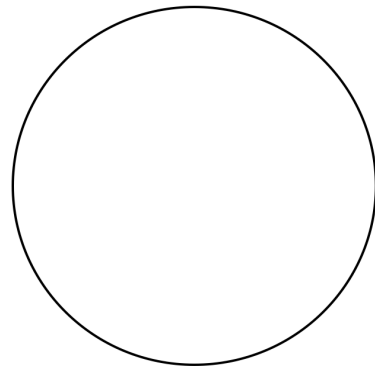
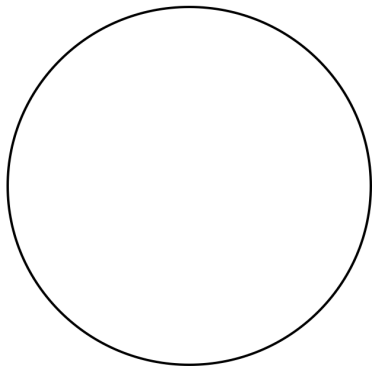
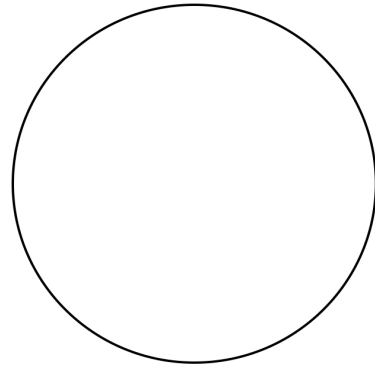
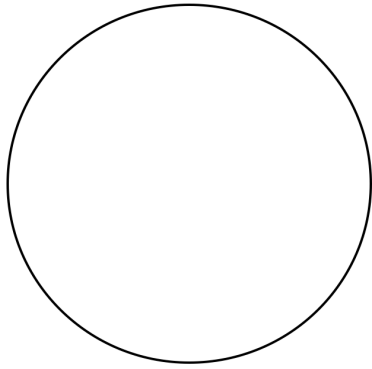


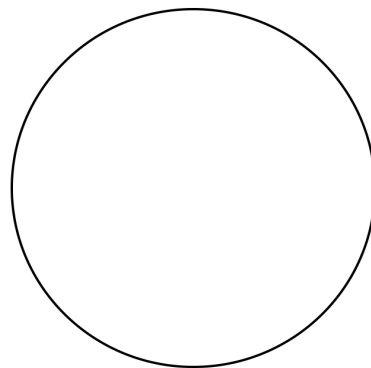
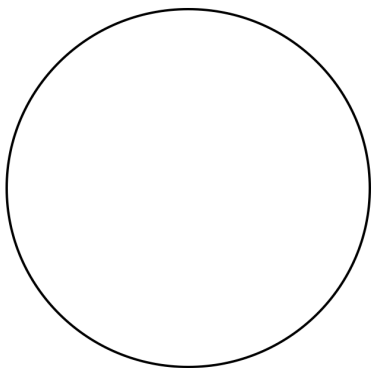
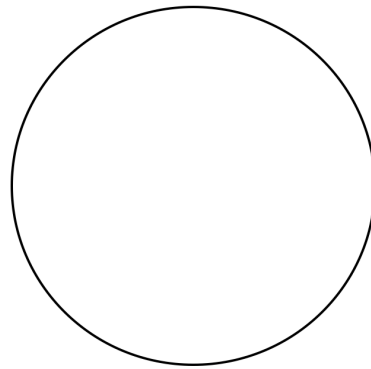
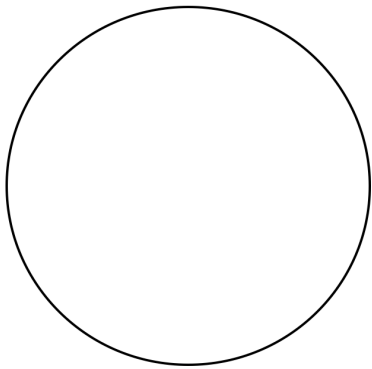
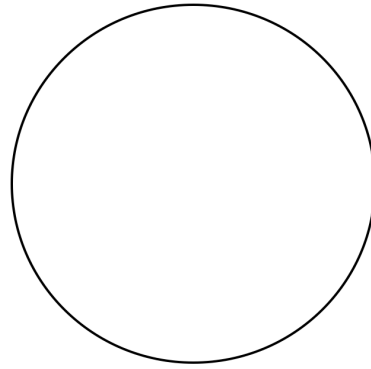
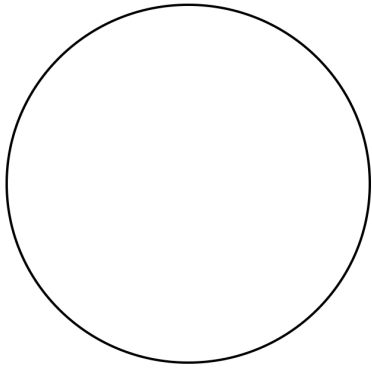
- Live
 - *Volvox* (Chlorophytes)
- Prepared
 - *Pandorina* (Chlorophytes)
 - *Volvox* (Chlorophytes)

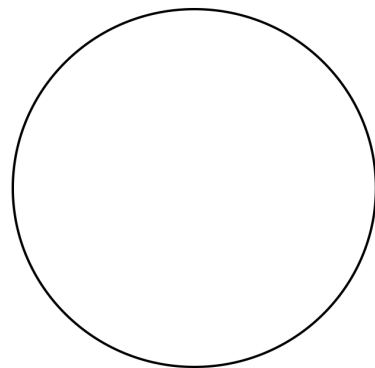
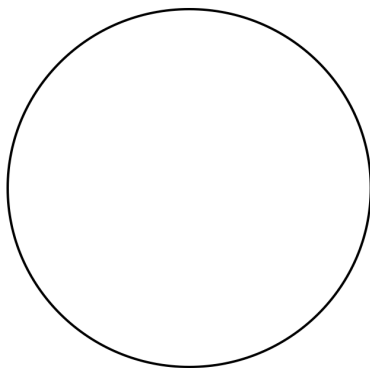
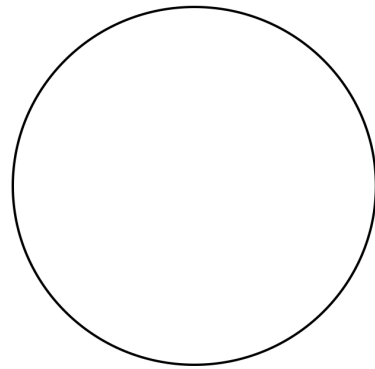
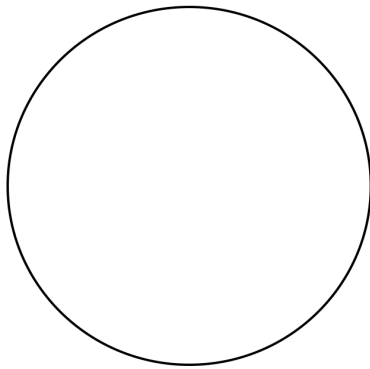
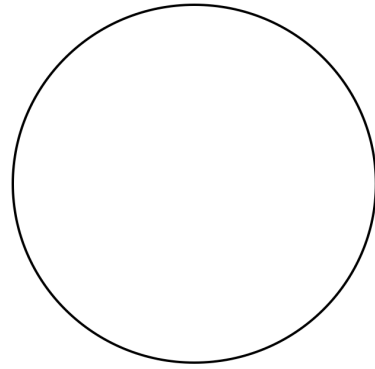
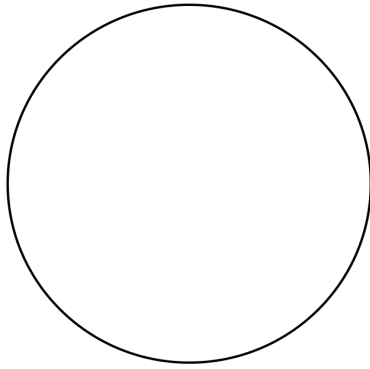


- Live
 - *Physarium* (Slime molds)
 - *Amoeba proteus* (Gymnamoebas)
- Prepared
 - *Amoeba* (Gymnamoebas)









Notes:

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