



Life Through a Microscope

Microscopes give you a view of the world quite unlike that of your naked eye. Take for example a dog. You probably have petted many of them. Think about what their hair looked like. Can you describe it? Try drawing it below:



Now lets look at a single dog hair under a microscope:



How does this look different than the picture you drew? Did you realize that a hair was not a solid object, but when looked at closer, it is made up of smaller

structures? In this lab we will use microscopes to look at some common objects and see how they differ from what you see with your naked eye.



To do the labs in this lesson gather the following equipment:

Standard equipment needed

1. microscope
2. hand lens
3. pencil
4. colored pencils
5. prepared letter *e* and cork slides
6. paper containing letter *e*'s
7. scissors

Equipment for optional activities:

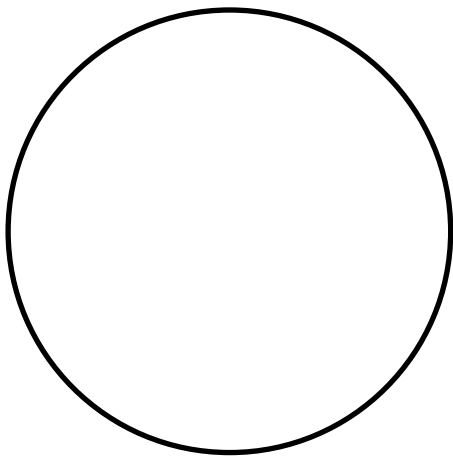
1. onion
2. blank slides and cover slips
3. forceps
4. water
5. toothpicks
6. pipette
7. Student Workbook from Carolina Biological Supply



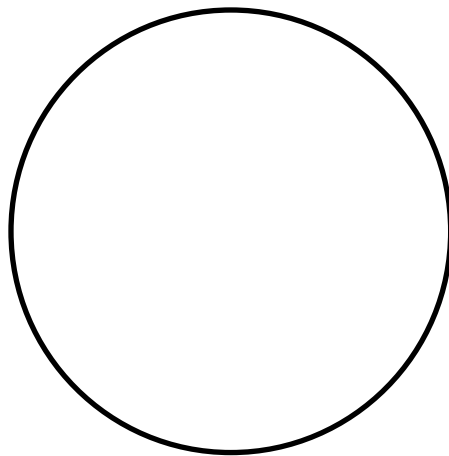
e

Lab #1: Letter *e*

The letter *e* is a great way to learn how a microscope works. In this lab you will set up your microscope and view what a simple letter *e* cut out from a piece of paper looks like. First let's examine the letter *e* with your naked eye and through a hand lens. Draw what you see in the circles below:



Naked Eye



Hand Lens

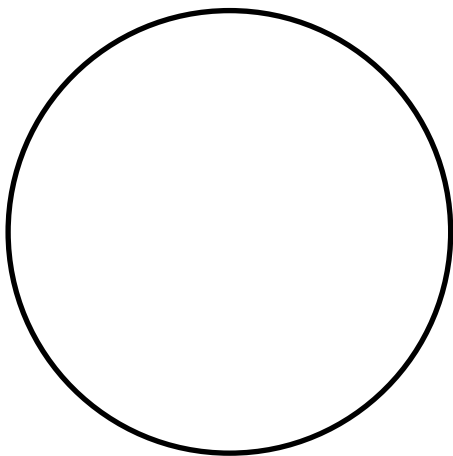
Unpack your microscope and place it on a flat desk or tabletop. Stop now and listen while your teacher shows you the following items on your microscope:

1. Eye piece and zoom control
2. Objectives (low, medium, and high)
3. Battery powered illuminator
4. Stage and stage clips
5. Focus control

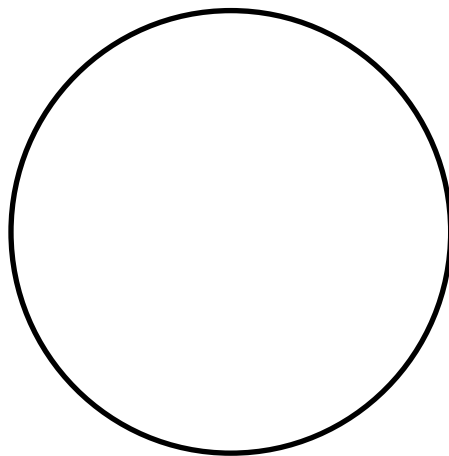
Follow these steps to use the microscope with a prepared slide:

- Place your letter *e* slide, coverslip side up, on the stage. Use the lowest power (short, redlined) objective. Secure the slide with the stage clips. (If your instructor wants you to make your own letter *e* slide, then you will receive a supplemental set of instructions to follow.)
- Turn on the light by rotating the mirror system so that the small penlight is facing upwards, toward the sample. You will need to snap the illuminator into position in the bracket so that the light turns on.
- Focus on the letter *e* using the large black focusing knob.

Draw what you see in the circle below. Try using the medium objective. After focusing, draw what you see.



low power

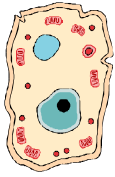


medium power

Discussion Questions:

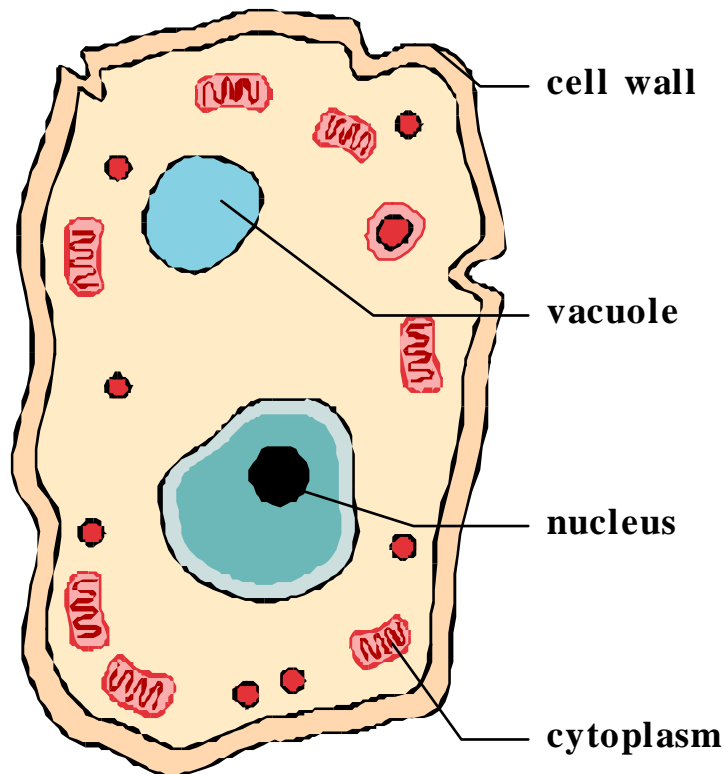
1. What are some of the ways the *e* you see with the microscope is different from the *e* you see with the hand lens?
2. If you are looking at the *e* through the microscope and you push your slide to the left, which way does the *e* in the microscope move? (Try this!)
3. If you push the slide away from you, which way does the *e* in the microscope move? (Try this!)





Lab #2: Examining plant cells

Cells are the fundamental unit of life. They are the simplest organism unit capable of independent existence. All living things are made up of cells. A typical plant cell is shown below.



Each part of the cell serves a distinct purpose.

Cell wall:	Portion of the cell which gives it structure. Plants have thick cell walls to strengthen the plant stem
Nucleus:	Control center for heredity and cell division
Cytoplasm:	A clear liquid where most of the cells life functions occur.
Vacuole:	Waste product storage location for the cell.

In this lab, you will use your microscope to view a cork cell. (If you are doing the optional activities you will make a slide of an onion cell and examine it instead of the cork cell.) Mount your prepared cork cell slide on the microscope stage.

Look at the cork cell under low power.



Web Connections:

Check out the following web sites:

- Microsoft Encarta Concise, look up the entry for cell:
<http://encarta.msn.com/introedition>
- Clickable Plant Cell. This is from East Connecticut State University's Plant Biology web page. You can click on any major part of the cell and details about that part are given.
<http://koning.ecsu.ctstateu.edu/cell/cell.html>

