Introduction to the Microscope Lab Activity
Note: this is your **working copy only**, you will transfer all of your work into your **Lab Book**(You can cut out your drawings and stick them into your lab book)

**Introduction**    "Micro" refers to **tiny**, "scope" refers to **view or look** at. Microscopes are tools used to enlarge images of small objects so as they can be studied. The compound light microscope is an instrument containing **two lenses**, which magnifies, and a variety of **knobs to resolve (focus)** the picture. Because it uses more than one lens, it is sometimes called the compound microscope in addition to being referred to as being a light microscope.  In this lab, we will learn about the proper use and handling of the microscope.

**Instructional Objectives**

* Demonstrate the proper procedures used in correctly using the compound light microscope.
* Prepare and use a wet mount.
* Describe changes in the field of view and available light when going from low to high power using the
compound light microscope
* Explain why objects must be centered in the field of view before going from low to high power using the compound light microscope.
* Explain how to increase the amount of light when going from low to high power using the compound light microscope.
* Explain the proper procedure for focusing under low and high power using the compound light microscope.

 **Materials**

* Compound microscope
* Glass slides
* Cover slips
* Eye dropper
* Beaker of water
* The letter "e" cut from newsprint
* Scissors

 **Procedures**

 **Microscope Handling**

1. **Carry the microscope with both hands** --- one on the arm and the other under the base of the microscope.
2. One person from each group will now go over to the microscope storage area and properly **transport one microscope to your working area.**
3. The other person in the group will **pick up a pair of scissors, newsprint, a slide, and a cover slip.**
4. **Remove the dust cover** and store it properly. Plug in the scope. Do not turn it on until told to do so.

**Part I. Preparing a wet mount of the letter "e”**

1. With your scissors **cut out the letter "e" from the newspaper.**
2. Place it on the **glass slide** so as to look like (e).
3. **Cover it with a clean cover slip**. See the figure below.



1. **Using your eyedropper, place a drop of water on the edge of the cover slip** where it touches the glass slide. The water should be sucked under the slide if done properly.

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| **Technique for Adding a Stain when making a Wet Mount** |
| http://www.ekcsk12.org/faculty/jbuckley/lelab/microscopeuselab_files/image004.jpg |

1. **Turn on the microscope and place the slide on the stage; making sure the "e" is facing the normal reading position** (see the figure above). Using the course focus and low power, move the body tube down until the "e" can be seen clearly. **Draw what you see** in the space below under low power. Every drawing needs a title and an observation.



1. Describe the relationship between what you see through the eyepiece and what you see on the stage.

7. Look through the eyepiece, move the slide to the upper right area of the
 stage. **What direction does the image move?**

8.      Now, move it to the lower left side of the stage. **What direction does the image move?

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9. Re-center the slide and change the scope to **40 power objective**. You will notice the "e" is out of focus. **Do Not** touch the coarse focus knob, instead use the fine focus to resolve the picture.    Draw the image you see of the letter e (or part of it) on high power.


10.  **Locate the diaphragm under the stage.** Move it and describe the changes in light intensity as you do so

**Part II:**

* 1. Using two different colours of yarn, cut each one about 1 cm long, cross them and place on a slide, place the cover slip on top and then add a drop of water at the edge of the cover slip.
	2. View through the 4X power objective and describe what you see. Then move up to the 10X and 40X powered objective, draw and describe what you see at the 40X objective, be sure to use the fine adjustment knob in order to record your observations.



* 1. Examine a prepared slide of a plant stem or root (located at the front of the room in the brown large box) at 10 power and 40 power. The small round shapes you see are cells. Use the FOV you calculated earlier to guesstimate the size of one cell **at 40 power by taking the largest cell in the FOV and using your best guess imagine a straight line across the FOV**. Draw and describe at 40 power, be sure to describe which cell you are using to guesstimate the size of a cell.



* 1. Using a slide out of the **Bacteria** slide box repeat step 3 with a prepared bacteria slide.



* 1. Using the Creek water stir it up gently, using an eye dropper place on drop of water on a slide, then place a cover slip over top. Using the 4X power objective describe what you see. Then view under 10X, 40X and 100X power objectives. Draw and describe what you see at 100X objective.



* 1. Using a small slice of a plant (you will have to obtain **this from Mrs. Mishra**.) Place the small slice of plant on a slide place a cover slip on it and then draw and describe what you see at 40X objective. Be sure to place a drop of Methylene Blue on the side of the cover slip tilt the slide and then place a drop or two of water on the same spot as the **Methylene blue** and place a piece of paper towel and draw the Blue and water towards the paper towel.



* 1. Using a drop of your saliva repeat step 6.



Conclusion Questions**: (Complete these in your lab book)**

**1.      State 2 procedures which should be used to properly handle a
 light microscope. (2)**

 **2.      Explain why the light microscope is also called the compound microscope. (2)**

**3.      Images observed under the light microscope are reversed and
 inverted.   Explain what this means. (3)**

**4.      Explain why the specimen must be centered in the field of view on low
 power before going to high power. (2)**

**5.       A microscope has a 10 X ocular (eyepiece) and four objectives of 4 X, 10X,
 40 X and 100 X respectively:**

**a. Describe what happens to the field of view when the objective is moved from lower to higher powers? (2)**

**b. Describe what happens to the detail that you can view an object with as you move from a low to higher power objective? (2)**

 **6.      In three steps using complete sentences, describe how to make
 a proper wet mount of the letter e. (3)

7.      How does the procedure for using the microscope differ under high power
 as opposed to low power? (2)**