Name_____Date of Data Collection_____

Class Period _____ Lab Days/Period_____ Teacher_____

Introduction to the Compound Light Microscope Lab

Background: "Micro" literally means tiny, "scope" means to view or look at. Therefore, a microscope is a tool used to enlarge images of small objects so as they can be studied. The compound light microscope is an biological tool containing two lenses, which magnify, and a variety of knobs used to move and focus the specimen. 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 and some of the associated terminology.

Laboratory Safety Precautions: The following symbols represent the precautions that are required for this lab:

Purpose: The purpose of this laboratory experience is:

-to demonstrate the proper procedures used in correctly using the compound light microscope.
-to learn how to properly prepare and use a wet mount.
-to determine the total magnification of the microscope.
-to understand how to properly handle the microscope.
-to describe changes in the field of view and light when going from low to high power using the compound light microscope and how it affects what you actually see as you observe it.
-to learn how to properly focus when going from low power to high power..
-to recognize that there is a difference between seeing and observing.

Materials: The following materials are needed to perform this laboratory experience:

-Compound microscope
-Glass slides
-Cover slips
-Eye dropper
-forceps/tweezers
-Beaker of water
-letter "e" cut from newsprint
-Scissors
-probe

Procedure: The following procedure is utilized to perform this laboratory experience:

Microscope Handling

1. It is crucial that you make it a habit to 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. The other person in the group will pick up a pair of scissors, forceps, a probe, newsprint, a slide, and a cover slip.

Copyright 2007, Michael P. Comet, South Lewis High School

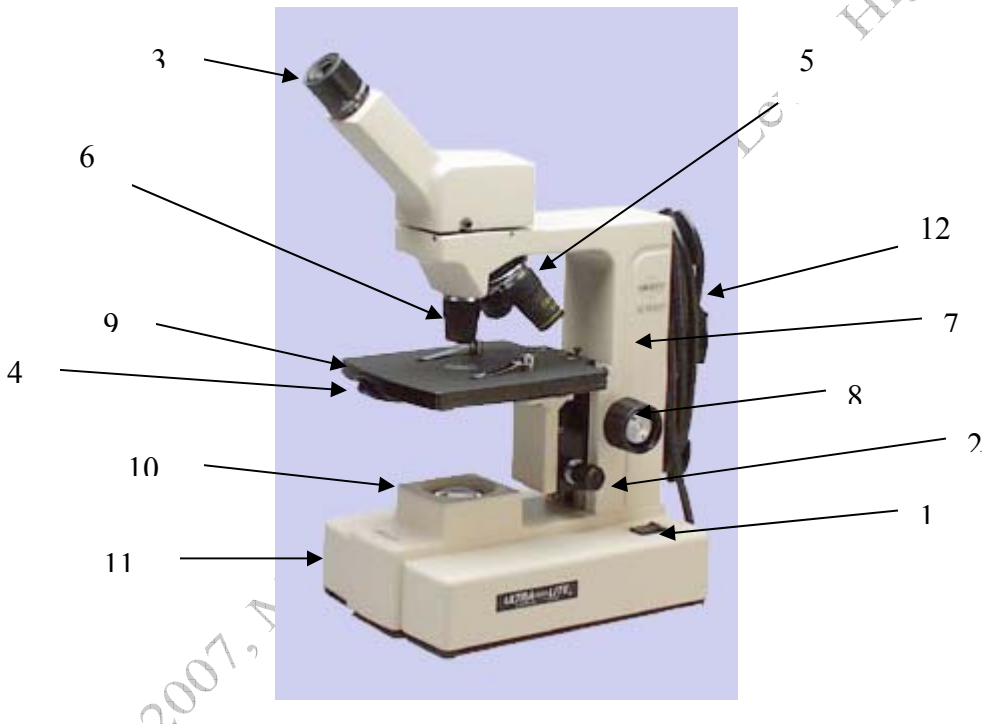
©Mr. Comet's Living Environment Laboratory Manual, 2007, South Lewis High School, Turin, New York 13473. Permission is granted for not-for-profit educational use by certified teachers.

Name_____Date of Data Collection_____

Class Period _____ Lab Days/Period_____ Teacher_____

3. Remove the dust cover and store it properly. Plug in the scope. Do not turn it on until told to do so. Wrap the loose cord around the gas jet twice to prevent the microscope from being pulled onto the floor if someone gets caught on the extra cord.
4. Examine the microscope and give the function of each of the parts listed on the right side of the diagram.

Names of parts and their functions of the microscope numbered below. This is the brand of microscope that we have in our laboratory (Swift M3500 series).



Copyright 2007, ... High School

Name of labeled part	Function
1.	
2.	
3.	
4.	
5.	
6.	

©Mr. Comet's Living Environment Laboratory Manual, 2007, South Lewis High School, Turin, New York 13473. Permission is granted for not-for-profit educational use by certified teachers.

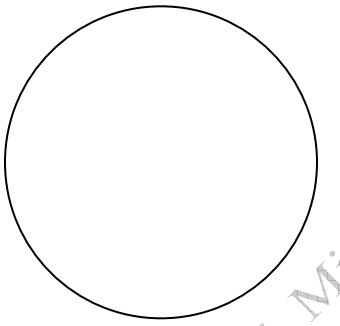
Name_____Date of Data Collection_____

Class Period _____ Lab Days/Period_____ Teacher_____

7.	
8.	
9.	
10.	
11.	
12.	

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.
4. 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.
5. 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 exactly what you observe in the space below.



Drawing of: _____

Magnification: _____

Drawn by: _____

Date: _____

6. How does what you see through the eyepiece and what you see on the stage compare? Why is this so?

_____

_____

_____

_____

Copyright 2007, Michael Comet; South Lewis High School

©Mr. Comet's Living Environment Laboratory Manual, 2007, South Lewis High School, Turin, New York 13473. Permission is granted for not-for-profit educational use by certified teachers.

Name_____Date of Data Collection_____

Class Period _____ Lab Days/Period_____ Teacher_____

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

_____

_____

_____

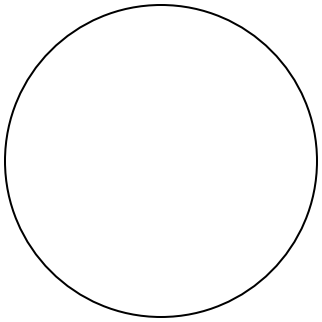
_____

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

_____

_____

10. Re-center the slide and change the scope to high power. 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.



Drawing of: _____

Magnification: _____

Drawn by: _____

Date: _____

11. Locate the (iris) diaphragm under the stage. Move it and record the changes in light intensity as you do so.

_____

_____

Copyright 2007, Micha South Lewis High School

©Mr. Comet's Living Environment Laboratory Manual, 2007, South Lewis High School, Turin, New York 13473. Permission is granted for not-for-profit educational use by certified teachers.

Name_____Date of Data Collection_____

Class Period _____ Lab Days/Period_____ Teacher_____

Determining Total Magnification

Locate the numbers on the eyepiece and the low power objective and fill in the blanks below. There are usually two numbers, a "DIN" and a decimal number indicating the size of the lens. You want to record the number after the "DIN".
For each of the objectives, record their magnification in the space provided below:

	Eyepiece Magnification	Multiplied by	Objective magnification	Equals	Total magnification
Low Power		X		=	
Medium Power		X		=	
High Power		X		=	

12. Write out the "rule" for determining total magnification of a compound microscope.

_____

_____

13. Remove the slide and clean it up. Turn off the microscope and wind up the wire so it resembles its original position. Place the low power objective in place and lower the body tube. Cover the scope with the dust cover. Place the scope back in its original space in the cabinet.

Data: The following data was collected during this laboratory experience:

Data collected is recorded in the spaces provided in the procedure.

Conclusion: The following can be concluded from this laboratory experience:

1. Discuss three procedures which should be used to properly handle a compound light microscope.

_____

_____

_____

_____

Copyright 2007, Michael H. Comet; South Lewis High School

©Mr. Comet's Living Environment Laboratory Manual, 2007, South Lewis High School, Turin, New York 13473. Permission is granted for not-for-profit educational use by certified teachers.

Name_____Date of Data Collection_____

Class Period _____ Lab Days/Period_____ Teacher_____

2. Explain why the light microscope is also called the compound microscope.

_____

_____

_____

_____

3. Images observed under the light microscope are reversed and inverted. Explain what this means. Explain why the specimens you observe must be very thin and nearly transparent.

_____

_____

_____

_____

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

_____

_____

_____

_____

Analysis Questions: Answer the following questions related to this laboratory experience in the space provided.

5. A microscope has a 20 X ocular (eyepiece) and two objectives of 10 X and 43 X respectively:

a.) Calculate the low power magnification of this microscope. Show your formula and all work.

b.) Calculate the high power magnification of this microscope.

Copyright 2007, Michael H. Comet; South Lewis High School

©Mr. Comet's Living Environment Laboratory Manual, 2007, South Lewis High School, Turin, New York 13473. Permission is granted for not-for-profit educational use by certified teachers.

Name_____Date of Data Collection_____

Class Period _____ Lab Days/Period_____ Teacher_____

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

_____

_____

_____

_____

_____

_____

_____

_____

7. Describe the changes in the field of view and the amount of available light when going from low to high power using the compound microscope.

_____

_____

_____

_____

8. Explain what the microscope user may have to do to combat the problems incurred in question # 7.

_____

_____

_____

_____

Copyright 2007, Michael H. Comet, South Lewis High School

©Mr. Comet's Living Environment Laboratory Manual, 2007, South Lewis High School, Turin, New York 13473. Permission is granted for not-for-profit educational use by certified teachers.

Name_____Date of Data Collection_____

Class Period _____ Lab Days/Period_____ Teacher_____

9. How does the procedure for using the microscope differ under high power as opposed to low power?

_____

_____

_____

_____

10. Indicate and describe two major ways the stereomicroscope differs from the compound light microscope in terms of its structure and use.

_____

_____

_____

_____

Bibliography of Images Used

Microscope Image: http://www.takahashiamerica.com/ Micro_Swift_4000D.htm
Sharp Instrument Safety Symbol: http://www.beckman.com/customersupport/images/sharpobj.gif
Electrical hazard Symbol: http://www.ce-mag.com/archive/2001/media/01CE28C.jpg

Copyright 2007, Michael P. Comet; South Lewis High School

©Mr. Comet's Living Environment Laboratory Manual, 2007, South Lewis High School, Turin, New York 13473. Permission is granted for not-for-profit educational use by certified teachers.