**The Microscopic Image**

**Prediction**

In this activity, you will examine the small letter “r” under the microscope (you will be cutting out the word microscope on the bottom of this page). In the space below, draw the letter as it appears on the paper and what you think the image will look like when you view it through the microscope at its highest setting.

The letter as you see it appears on paper:

The letter as you think it will appear under the microscope:

**Materials**

Compound light microscope

Microscope diagrams

Microscope slide

Cover slip

Dropper

Water

Scissors

Textbook

microscope

**Part 1: Microscopes Parts and Functions**

1) Why do you think this is called a **compound** light microscope?

A microscope works by using a lens or multiple lenses to bend light rays so an object appears larger than it really is. Because more than one lens is used in a compound light microscope, you have to account for every lens light travels through when trying to figure out how large the object has been magnified. To calculate **total magnification**, you need to know the magnification of the eyepiece lens and the objective lens you are using. These two numbers are then multiplied together to give you the total magnification. Whenever drawing images seen through a microscope, you must indicate the total magnification power near your drawing.

2) In your own words, write a word formula for solving for total magnification of a compound light microscope.

 Total magnification =

3) Try calculating total magnification for your microscope.

1. What is the large, whole number (magnification power) written on the low-power objective?
2. What is the large, whole number (magnification power) written on the eyepiece?
3. What is the total magnification in low power?
4. What would be the total magnification for medium power? High power? Show your work.

**Part 2: Set Up and Use a Compound Light Microscope**

1. Using the “Proper Microscope Use” as your guide, correctly “set up” your microscope.
2. Prepare your slide using a wet mount prep (check off steps as you do them below):
* Cut out the word “microscope” from the bottom right corner of the first page of this lab. You and your partner(s) will only need to cut out one between the two/three of you.
* Place the object in the center of a clean microscope slide so you can read the entire word “microscope” from left to right.
* Use a dropper to place 3 to 4 drops of water over the “r” of the word microscope.
* Slowly lower the cover slip (coming in at an angle like you are landing a plane) onto the water. This was demonstrated by your teacher. The cover slip will use the water to adhere to the slide…it will not cover the entire word “microscope” but should cover the letter “r” which you will be examining.
1. Place your slide on the stage and fasten it with your stage clips. Make sure you can read the word “microscope” from left to right on the stage as demonstrated below.

 **microscope**

1. Move the slide around so the letter “r” is directly over the center of the hole in the stage where the light comes through.
2. Using the “Proper Microscope Use” as your guide, following the directions for “viewing your specimen” until your object (the letter “r”) is focused in low power. Draw the “r” exactly as you see it in low power.

**Magnification, \_\_\_\_\_\_X**

1. While you are looking at the “r” through the eyepiece of the microscope, gently move the entire slide to the right. Describe what happened to the “r”.
2. While you are looking at the “r” through the eyepiece of the microscope, gently move the entire slide away from you…pushing it up. Describe what happened to the “r”.
3. Continue to follow the “Proper Microscope Use” to focus in medium and high power. How does high power compare to low power?
4. Using the “Proper Microscope Use” as your guide, follow the “clean-up” instructions.

**Summary**

Describe the microscopic image. How did the “r” look without the microscope…how did it look in the various powers of the microscope?

**Application**

As you discovered, it is difficult to see an object perfectly without making some minor adjustments. For each of the following situations, tell what you would do to see the image more clearly.

1) The specimen appears fuzzy in low power.

2) The object is still too small to be seen.

3) You can only see part of the object at the very left edge when looking through the eyepiece.

4) The image is too dark.

**Reflection**

The invention of the microscope changed the way many scientists viewed the world and shed some light on how organisms are able to live and reproduce. After using the microscope just this once, predict ***why and how*** you think the microscope had such an impact on life in the early 1600s.