**Using Compound Light Microscopes**

 **Part A. Focussing on an Image**

1. Cut a lower case letter “e” or “a” out from a newspaper provided.
2. Place letter “e” in the center of a glass slide and cover it gently with a cover slip. It should look like the diagram on the right.
3. Place the slide on the stage so that the “e” is **right side up as if you were “reading” it**, secure with clips.
4. Focus under LOW POWER. The easiest way to initially focus is to move the microscope stage as far as it will go towards the LOW POWER objective and then slowly back it off using the coarse focus until you see what you are looking for. It is likely that you will focus on dust before you focus on the letter you actually want to see.
5. ***Without changing the orientation* of** your letter and **USING A PENCIL**, draw what you see in the space provided. It may look different than you expect. Keep the slide in position, you will draw it under medium and high power next.

Specimen: Letter “ ”

Total Magnification: \_\_\_\_\_\_

1. Compare the orientation of the letter from what you see on the stage to what you see through the microscope. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. Looking through the eye piece, move your slide to the RIGHT. Which way does the image move?

 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Move your slide up. Which way does the image move?

What you are seeing is known as “ **lateral inversion”.**

|  |  |
| --- | --- |
| 1. Change the lens to **medium power** and focus the image.

Draw and label what you observe Specimen: The letter “ “ Total Magnification \_\_\_\_\_\_  | 1. Do the same for the highest power:

**(Remember to only use fine focus here)**Specimen: The letter “ “  Total Magnification \_\_\_\_\_\_  |

**Part B: Determine the Field of View (FOV)**

1. Obtain a small square of transparency ruler from the box.
2. Remove your slide with the letter and place the ruler (metric side) directly on the stage.
3. Determine the size of your Field of View at *low power by counting the lines across the FOV*. Draw what you see. Remember that your ruler lines should be evenly spaced. Make **sure your Field of View measurement matches what you had drawn in your diagram.**

Specimen: Ruler

Magnification: \_\_\_\_\_\_\_\_\_

FIELD OF VIEW (FOV) under lowest power is: (length of ruler you can see across the diameter of the circle): \_\_\_\_\_\_\_\_\_\_\_\_.

1. Now try measuring the field of view under *medium power*. Draw what you see in the next circle.

Specimen: Ruler

Magnification: \_\_\_\_\_\_\_

Field of View: \_\_\_\_\_\_\_\_

1. Are you able to measure field of view if you move to the highest power? Explain. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. Remember these FOV’s as you will use them to estimate the size of specimens later.

**Part C: Determine Size using Field of View**

1. Now try placing the ruler over the slide of your letter specimen and view it under low power. Draw what you see:

Specimen: Ruler

Magnification: \_\_\_\_\_\_\_

Field of View: \_\_\_\_\_\_\_\_

1. How big is your letter? \_\_\_\_\_\_\_\_\_\_\_mm. If you are unsure how to do this go back to your notes or last worksheet.
2. Select two different prepared slides, draw what you see under low or medium power. E*stimate the size of the specimen* using the **FOV’s you found in Part B**. Approximate Size = (FOV/ number of times object fits across FOV). Remember, FOV will depend on the magnification you used.

Specimen: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Specimen: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Magnification: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Magnification: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Approximate Size: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Approximate Size: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Part D Questions:**

1. When using a microscope, why must we start with the lowest objective first?
2. When you increase the magnification, what happens to the **size** of the image you see?
3. When you increase the magnification, what happens to the size of the **Field of View**?
4. In your own words, define the term “**lateral inversion**”. Hint: re read the first page.