**Using Compound Light Microscopes**

 **PART A. FOCUSSING ON AN IMAGE**

1. Cut a lower case letter “e” 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.
5. ***Without changing the orientation*** of your letter and **USING A PENCIL**, draw what you see in the space below. It may look different than you expect. Keep the slide in position, you will draw it under medium and high power next.

Specimen: Letter “e”

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 “ e “ Total Magnification \_\_\_\_\_\_  | 1. Do the same for the highest power:

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

**PART B: DETERMINE THE FIELD OF VIEW (FOV)**

1. Remove your slide for the “e” from the stage and set aside for now. We will use it again later.
2. Obtain a small transparency ruler from the front.
3. Place the ruler (metric side) *directly on the stage*.

|  |  |
| --- | --- |
| 1. Determine Diameter of your Field of View (FOV): Count the spaces between the ruler lines. Draw what you see. Remember that your ruler lines should be straight and evenly spaced.
2. FOV under low power: \_\_\_\_\_\_\_\_\_\_\_ mm
 | 1. Switch to medium power and determine the diameter of your Field of View under medium power. Draw what you see.
2. FOV under medium power is \_\_\_\_\_\_\_\_\_mm
 |

1. Switch to the highest objective. Explain why you are unable to measure field of view if you move to the highest power:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
2. Remember these FOV’s as you will use them to estimate the size of specimens later.

**PART C: DETERMINE SIZE OF SPECIMEN USING FIELD OF VIEW**

1. With your letter on a slide, place the ruler over the letter like a coverslip. View it under *low or medium* power to determine how big is your letter.

Specimen: letter with ruler

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

Size of letter: \_\_\_\_\_\_\_\_ mm

1. Extra. Select a prepared slide of the unicellular paramecium. Draw what you see under high power.

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

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

1. Extending: 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).

Estimated size of paramecium: \_\_\_\_\_\_\_\_\_\_\_\_\_ mm

**Process and Analyze:**

1. When using a microscope, explain why we must 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.
5. Explain why you should only use the fine focus knob when using the high-power objective?
6. Explain why the specimen must be centered before switching to high power?