

## **Pre-Lab Problems**

- 1) Describe, step-by-step, how you would focus your microscope on an object that required high magnification to see.
  
- 2) What is the correct way to carry a microscope? To put away a microscope?
  
- 3) Name the parts of the microscope, in order, through which light passes from the lamp to the observer's eye.
  
- 4) What parts of the microscope are involved in changing the focus to obtain a clear image?
  
- 5) Explain the differences in how the coarse and fine adjustment knobs are used.
  
- 6) If you are using the 10x objective lens, how many times has the object been magnified?

Name: \_\_\_\_\_ Date: \_\_\_\_\_ Block: \_\_\_\_\_

### Field of View Lab (Life Sciences 11)

In the previous activities, you have learned that the size of the image changes as you go from the low magnification to the high magnification. The purpose of this activity is to have you determine the DIAMETER OF FIELD of each objective lens, and how it changes as you change magnifications.

#### Apparatus:

- compound microscope
- plastic ruler
- slide and cover slip

#### Procedure:

1. Carefully slide the ruler under the mechanical stage, and position the metric side under the low power (RED, "4") objective lens.
2. Examine the ruler and move it so that one of the millimeter marks is at the far left side of the field.

*What is the diameter of the low power field in millimeters?*

3. Rotate the nose piece to medium power (YELLOW, "10"). Position the ruler again so that one of the millimeter marks is on the far left side of the field.

*What is the diameter of the medium field in millimeters?*

4. Rotate the nose piece to high power (GREEN, "40"). Position the ruler again so that one of the millimeter marks is on the far left side of the field.

*What is the diameter of the high field in millimeters?*

**The normal unit in the metric system that is used to measure objects using a microscope is the micrometer ( $\mu\text{m}$ ). A micrometer is 1/1000 of a millimeter.**

*What is the diameter of the low power field in  $\mu\text{m}$ ?*

*What is the diameter of the medium power field in  $\mu\text{m}$ ?*

*What is the diameter of the high power field in  $\mu\text{m}$ ?*

5. How thick is human hair? Prepare a wet mount of your hair and examine it under low, medium, and high magnifications Using the high power (GREEN, "40"), *estimate how many hairs would have to be placed side by side to fill the field.*

My hair: \_\_\_\_\_ hairs to fill the field.

My partner's hair: \_\_\_\_\_ hairs to fill the field.

6. Using the data from above, calculate the thickness of your hair in micrometers.

My hair is \_\_\_\_\_  $\mu\text{m}$  thick.

My partner's hair is \_\_\_\_\_  $\mu\text{m}$  thick.

### **More Practice**

1. If an object is estimated to be  $1/3$  of the diameter of the low power field, what is its actual size? Give your answer in  $\mu\text{m}$ , mm, and cm.

2. If an object is swimming across the medium power field and takes 12 seconds to cross, what speed is it swimming?

3. How long would it take this organism to swim the length of this page?