Name: _____ Period: _____ Date: _____

Honors Biology
Mr. Croft

Lab: Introduction to the Microscope

50 Points

Part I: Define the function of the following parts of a compound light microscope:

1. Eyepiece

2. Body Tube

3. Revolving Nosepiece

4. Coarse Adjustment

5. Fine Adjustment

6. Arm

7. Low-power Objective

8. High-power Objective

9. Stage Clip

10. Diaphragm

11. Stage

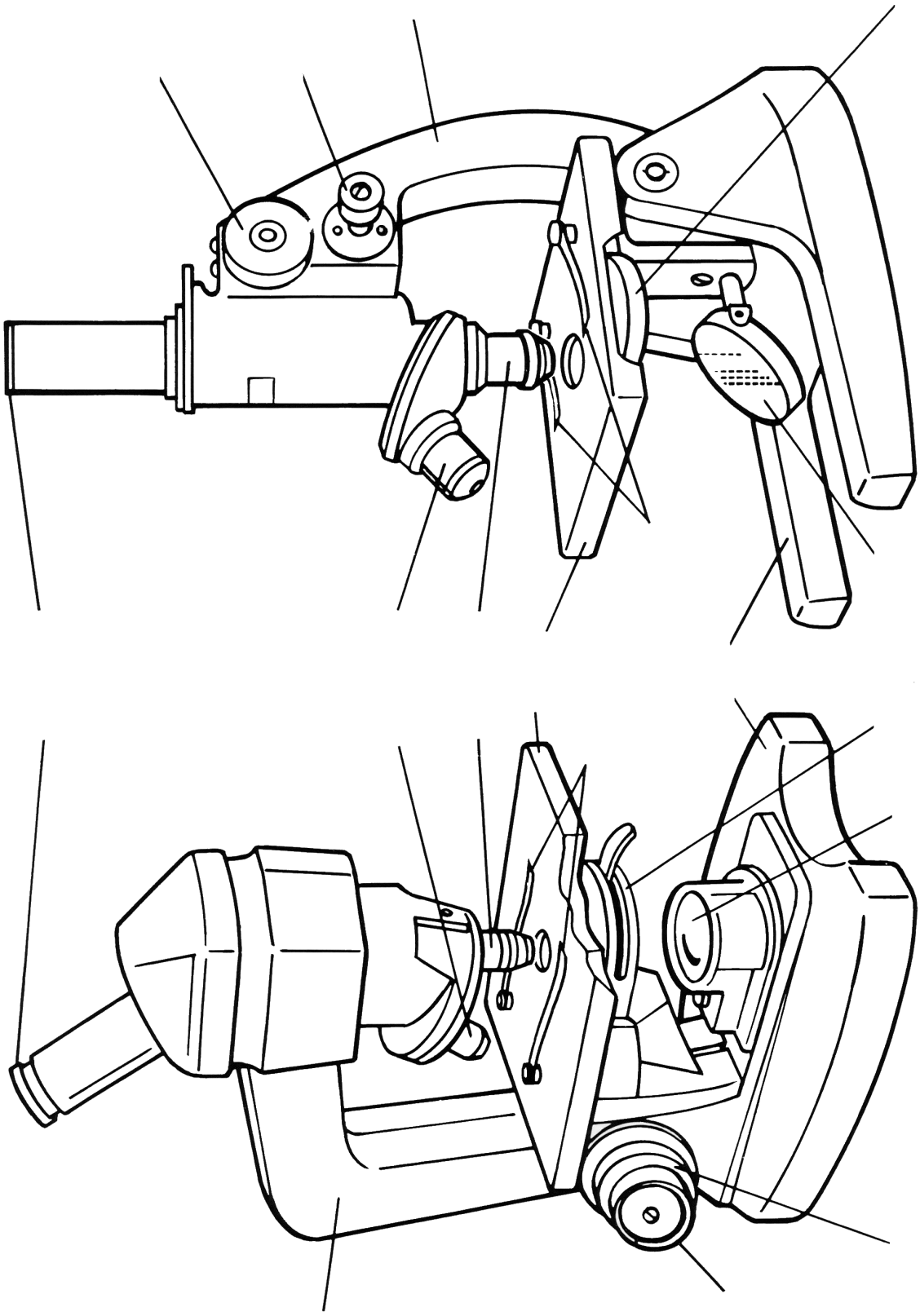
12. Light Source

13. Base

Also, compare and contrast magnification and resolution.

Part II: Label the picture of the microscopes below.

Parts of the Microscope



Part III: Calculation of the Field of Vision

1. Place a transparent metric ruler under the low power (LP) objective of a microscope.

2. Focus the microscope on the scale of the ruler, and measure the diameter of the field of vision in millimeters (mm). Record this number.

3. Convert this measurement to micrometers (μm) by using the following equation:

$$\textbf{diameter in } \mu\textbf{m (LP)} = \textbf{diameter in mm} \times \frac{\textbf{1000 } \mu\textbf{m}}{\textbf{mm}}$$

4. Calculate the diameter in μm of the field of vision under high power (HP) using the following formula:

$$\textbf{diameter in } \mu\textbf{m (HP)} = \frac{\textbf{diameter (LP) x mag. of LP objective}}{\textbf{mag. of HP objective}}$$

Results: diameter of the LP field of vision (mm) = _____

diameter of the LP field of vision (μm) = _____

diameter of the HP field of vision (μm) = _____

Part IV: The letter "e"
Cut out the small letter "e" from a newspaper. Place a drop of water onto a clean microscope slide. Place the letter on the drop of water using forceps. The letter should be placed so that it can be read without turning the slide. View the letter under the microscope and answer the following questions:

1. Draw the letter "e" as it appears under the microscope.

2. Describe the position of the "e."

3. What happens to the "e" as you move the slide to the right?

4. What happens if you push the slide away from you?

5. What is the total magnification of the low-power lens?

6. What happens when you change to the high-power lens?

7. What is the total magnification of the high-power lens?

8. About how many times was the magnification increased when you changed from low-power to high-power?

9. How does this change the area of the slide included in the high-power field?

Part V: Thread

Cross two pieces of different colored thread on a slide. Place a drop of water where the two strands cross. Place a cover slip on the slide using the previously described procedure. View the slide under the microscope and answer the following questions:

1. Draw what you see under low power.

2. Describe any changes in the appearance of the position of the fibers when you turn the adjustment knob back and forth.

3. Explain why these apparent changes occur.

4. How can you determine which fiber is on top when you look through the microscope?

5. What happens to the resolution when you change from low-power to high-power?

6. What happens to the field of vision when you change from low-power to high-power?

Part VI: Hair

Pull a piece of hair from someone's head making sure that you obtain an entire strand. Place a drop of water on a clean slide and then place the strand of hair on the slide so that the end is in the water. Draw and describe what you see under low power. Create another slide using the other end of the same strand of hair. Draw and describe what you see under low power.

Part VII: Measurement Using a Microscope

To estimate the size of an object seen with a microscope, first estimate what fraction of the diameter of the field of vision that the object occupies. Then multiply the diameter you calculated in micrometers by that fraction.

1. The height of the letter "e" under LP & HP: _____

2. The width of one of the strands of thread under LP & HP: _____

3. The width of the strand of hair under LP & HP: _____