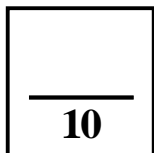


Science 10-Biology

Activity 2

The Compound Microscope Lab



Name _____

Due Date _____

Show Me Hand In

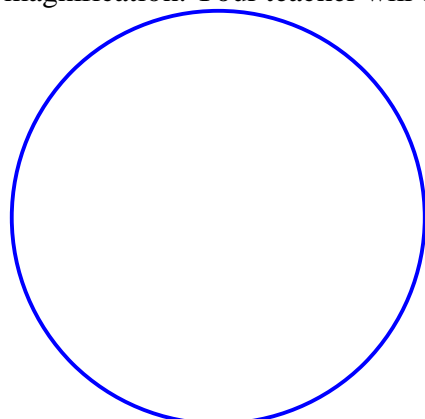
Correct and Hand In Again By _____

Purpose:

To study and learn how to use a stereo microscope and a compound monocular microscope.

Procedure:

1. Obtain a stereo microscope and observe as the teacher shows you its parts and how to operate it.
2. Examine a **feather** using both light settings (the light shining from the top and the light shining from the bottom). Sketch what you see in the circles below. Underneath the circles, note the **ocular** magnification, the **objective** magnification and the **total** magnification. Your teacher will explain how to find these.



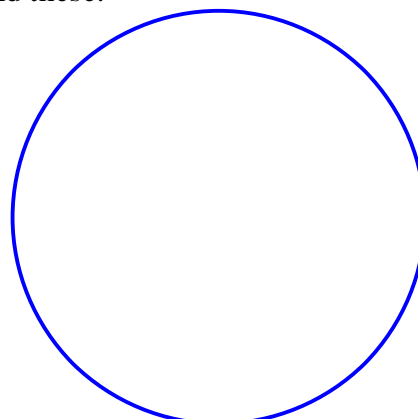
Feather

View with light shining from top

Ocular Magnification _____ **X**

Objective Magnification _____ **X**

Total Magnification _____ **X**



Feather

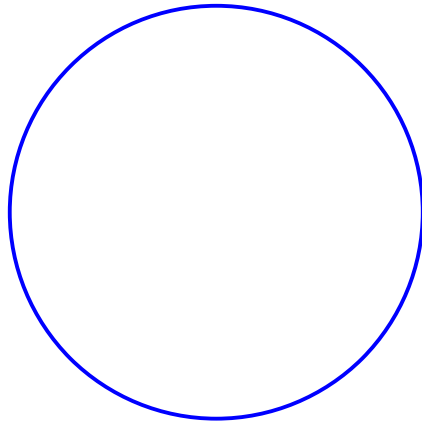
View with light shining from bottom

Ocular Magnification _____ **X**

Objective Magnification _____ **X**

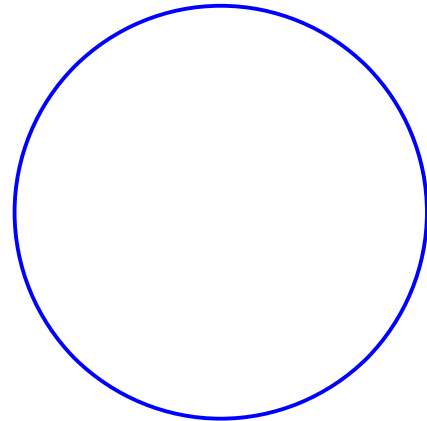
Total Magnification _____ **X**

3. Examine a **finger** and a **coin** using only the light shining from the top. Sketch what you see in the circles below. Underneath the circles, note the **ocular** magnification, the **objective** magnification and the **total** magnification.



Finger

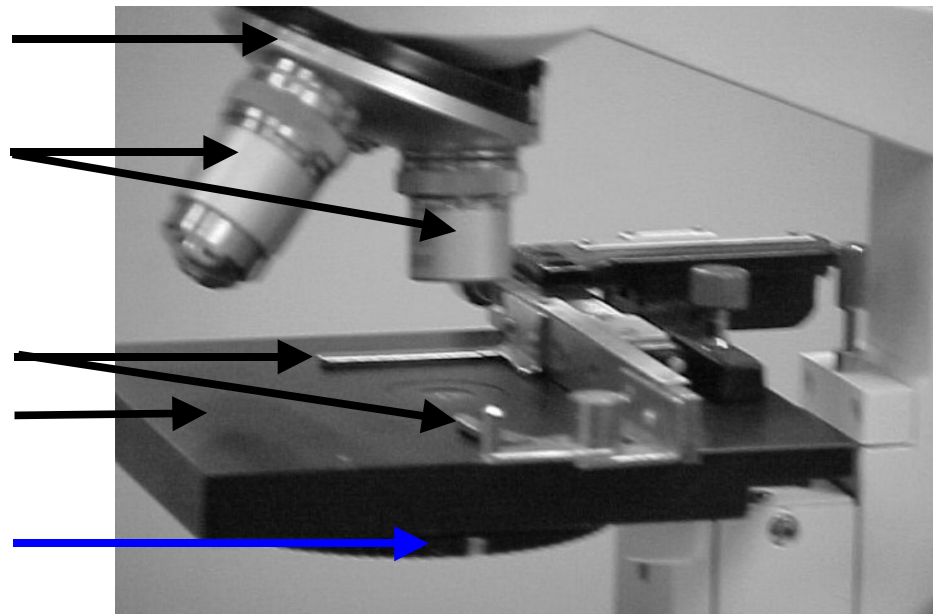
Ocular Magnification	_____	X
Objective Magnification	_____	X
Total Magnification	_____	X



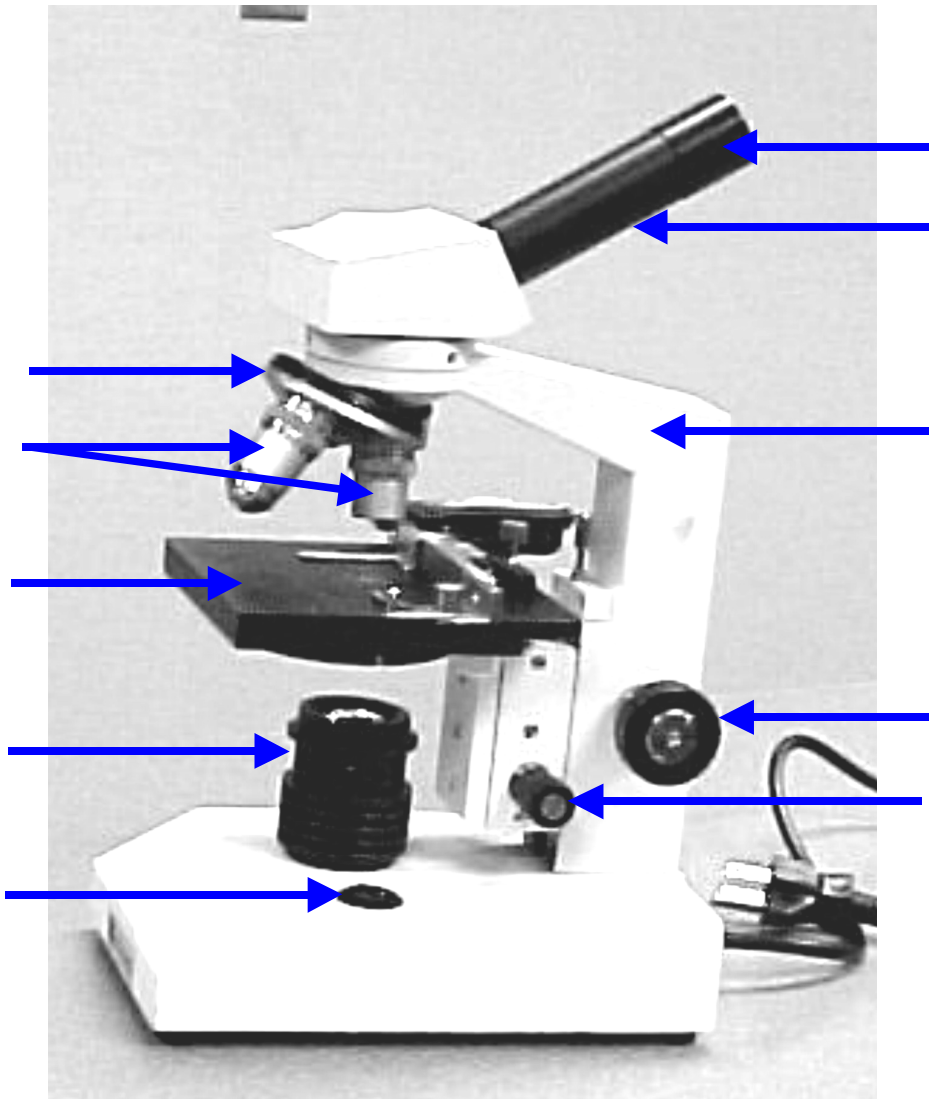
Coin

Ocular Magnification	_____	X
Objective Magnification	_____	X
Total Magnification	_____	X

4. Obtain a **compound monocular microscope**. Listen while the teacher points out and explains the various parts and how to use them. Label the parts on the following close-up of the stage of a compound monocular microscope:



5. Label each of the following parts on this **compound monocular microscope**:



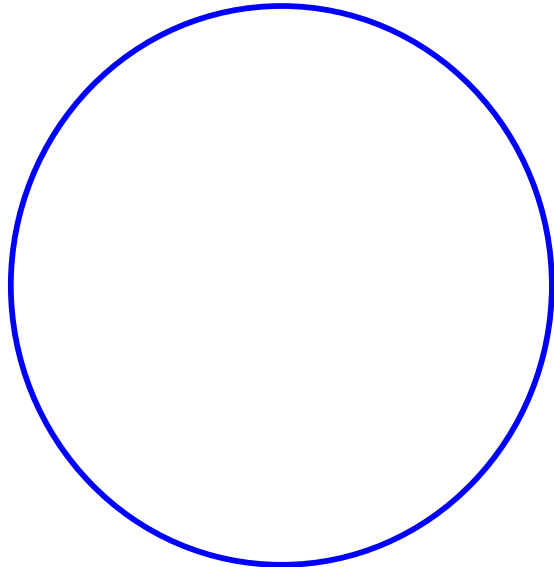
6. Give the function of each of the following microscope parts: (see p. 316-318 in Text)

a) **Ocular Lens** –

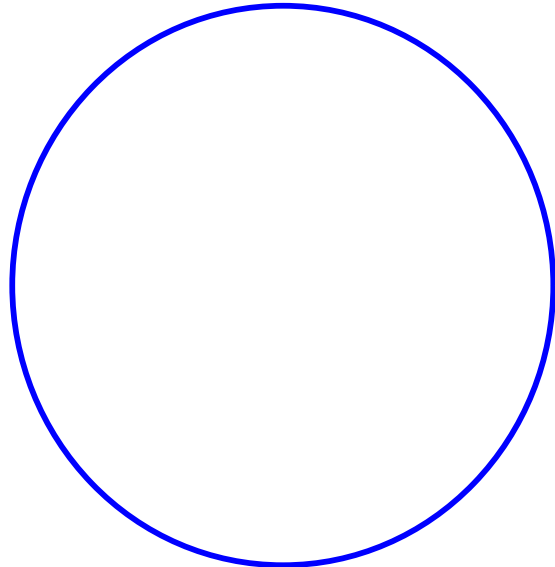
b) **Body Tube** –

- c) **Low Power Objective Lens** (___ X) –
 - d) **Medium Power Objective Lens** (___ X) –
 - e) **High Power Objective Lens** (___X) –
 - f) **Revolving Nose Piece** –
 - g) **Arm** –
 - h) **Stage** –
 - i) **Stage Clips** –
 - j) **Disk Diaphragm (Light Control Disk)** –
 - k) **Course Adjustment Knob** –
 - l) **Fine Adjustment Knob** –
 - m) **Light** –
7. Obtain a prepared slide with the letter “e”. Place the slide on the stage and move it so that the “e” is right over the little piece of glass in the center. Position the **Low** Power Objective Lens right above the center (so that it “clicks in”)
- Look into the microscope and adjust the Coarse Adjustment Knob until the “e” is in focus. Use the little knobs on the stage to move the “e” right in the center of the circle that you see. (Field of View). Move the **light control disk** to give you the best image.
- Now adjust the Fine Adjustment Knob until the “e” is as sharp as you can get it. In the first circle on the next page, sketch exactly what you see in the field of view. Make sure the sizes are relative to how you see them. Next switch to the **Medium** Power Objective Lens and sketch what you see in the middle circle on the next page. Repeat with **High** Power and sketch in the bottom circle. Record the Objective Lens magnification in each case.

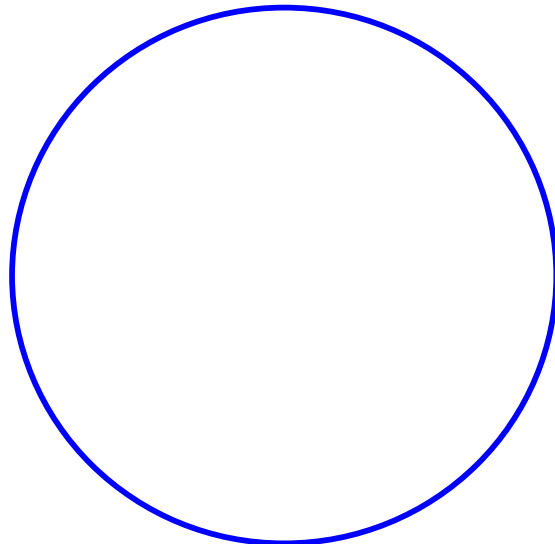
The Letter "e" on **Low Power**
Ocular Magnification ____X
Objective Magnification ____X
Total Magnification ____X



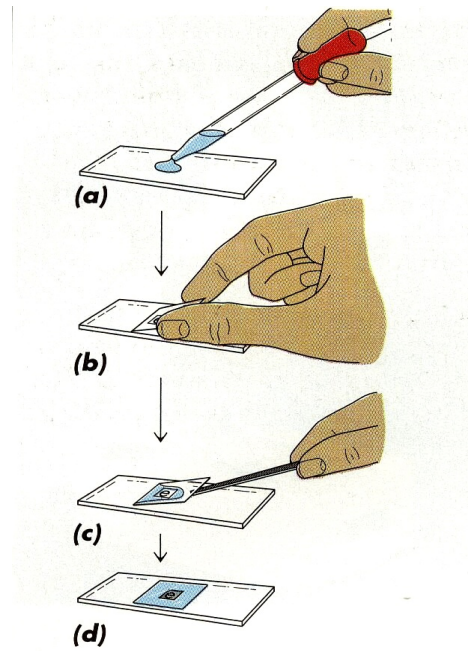
The Letter "e" on **Medium Power**
Ocular Magnification ____X
Objective Magnification ____X
Total Magnification ____X



The Letter "e" on **High Power**
Ocular Magnification ____X
Objective Magnification ____X
Total Magnification ____X



8. Cut a small, very thin piece of a feather and prepare a **wet mount**. Use the following diagram as a guide:



9. Place the slide on the stage and move it so that the feather is right over the little piece of glass in the center. Position the **Low** Power Objective Lens right above the center (so that it “clicks in”)

Look into the microscope and adjust the **Coarse** Adjustment Knob until the feather is in focus. Use the little knobs on the stage to move the feather right in the center of the circle that you see. (Field of View).

Experiment with the **light control disk** to give you the best image.

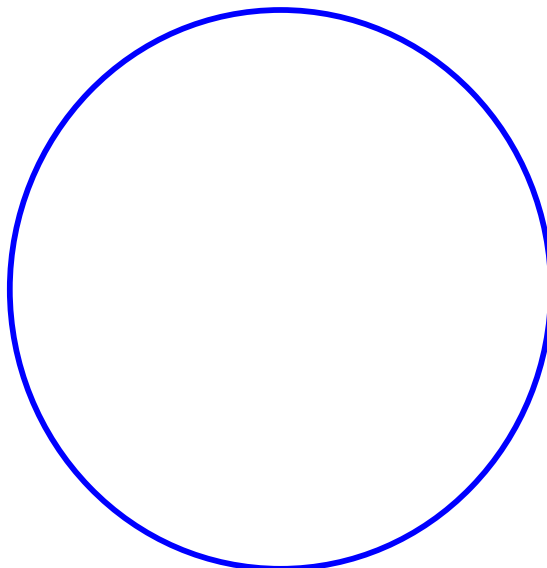
Now adjust the **Fine** Adjustment Knob until the feather is as sharp as you can get it.

On the next page, sketch exactly what you see in the field of view. Make sure the sizes are relative to how you see them.

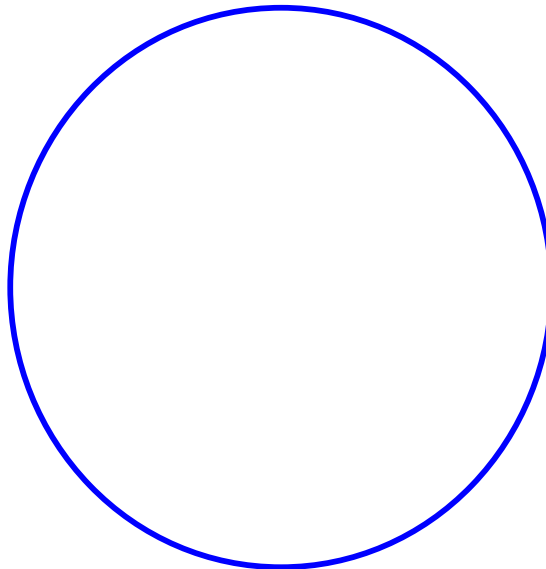
Next switch to the **Medium** Power Objective Lens and sketch what you see in the middle circle on the next page. You may have to adjust the position using the knobs on the slide holder on the stage. Experiment to get the best view of the feather.

Repeat with **High** Power and sketch in the bottom circle. Record the Objective Lens magnification in each case.

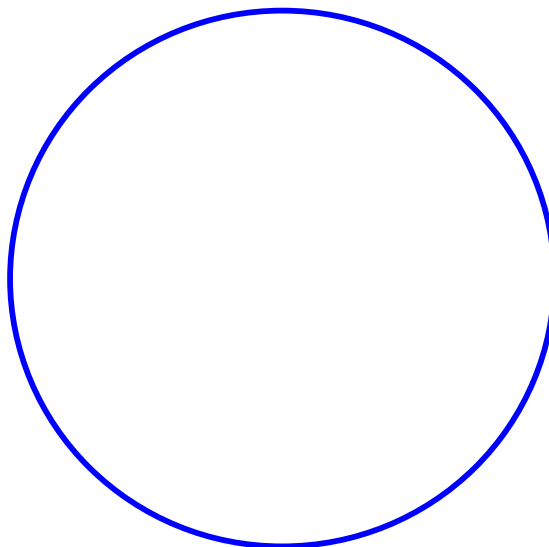
The Feather on **Low Power**
Ocular Magnification ____X
Objective Magnification ____X
Total Magnification ____X



The Feather on **Medium Power**
Ocular Magnification ____X
Objective Magnification ____X
Total Magnification ____X



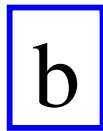
The Feather on **High Power**
Ocular Magnification ____X
Objective Magnification ____X
Total Magnification ____X



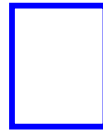
Questions: (Do these right on this paper)

1. What is the advantage of using a **stereo** microscope rather than a **monocular** microscope to view some objects?
2. What gives a greater total magnification, our **stereo** microscopes or our **monocular** microscopes?
3. A particular stereo microscope has an **ocular** lens magnification of **15X** and an **objective** lens magnification of **4X**. Calculate the total magnification.
4. A monocular microscope must always be carried using one hand on the _____ and the other hand on the _____.
5. When storing a monocular microscope, the _____ power objective lens must always be positioned over the center of the stage.
6. Lenses on a microscope should ONLY be cleaned with _____.
7. Explain what is meant by "**field of view**" in a microscope.
8. When you move an object to the **right** on the stage, the image in the field of view moves to the _____. When you move an object **up** on the stage, the image in the field of view moves _____.
9. How does the **light control disk** change the amount of light reaching the object?
10. What is meant by the **depth of field**? (See p. 323 or 523 of the Text)
11. Which gives you a greater (better) **depth of field**, a **lower** power magnification or a **higher** power magnification? (Think back to your procedure with the wet mount of the feather.)

12. Which can you see **more** of an object in, a **lower** power magnification or a **higher** power magnification? _____
13. When you move an object on the stage, it will appear to move (*faster/slower*) _____ in the field of view with a higher magnification than it does with a lower magnification.
14. Give **two** advantages to viewing an object in a **lower** power magnification.
1. _____
2. _____
15. Give **one** advantage to viewing an object in a **higher** power magnification.
1. _____
16. The letter “b” is placed on a stage so it appears as “**b**” from the outside. Draw what it would look like when viewed under the microscope.



View from Outside



View under the microscope