Microscope Lab

2. Carry a microscope to your lab table as shown by your teacher. *Note: A microscope is expensive and fragile. It is important to use it correctly to avoid damaging it and avoid breaking slides or destroying specimens. When you use a microscope, be sure it rests securely on your lab table away from the edge.*

3. Locate each microscope part listed in the data table and shown in the diagram on the previous page. Observe the magnification power (a number followed by an ×) of the eyepiece and the low- and high-power objectives. Record these numbers in your data table.

4. If your microscope has a built-in lamp, plug it in and turn it on. If your microscope has a mirror, adjust the mirror to reflect light through the hole in the center of the stage. **CAUTION: If your microscope has a mirror, never use direct sunlight as a light source. Direct sunlight will damage your eyes.**

5. Raise the objectives (or lower the stage) as far as possible by turning the coarse-adjustment knob toward you. Secure a prepared slide to the stage using the stage clips. Turn the low-power objective into position over the stage. While observing the stage from eye level, use the coarse-adjustment knob to position the objective as close to the slide as it will go without touching the slide.

6. Look through the eyepiece. Always keep both eyes open as you look into the eyepiece. Keeping both eyes open avoids eye strain. If the lens is dirty, ask your teacher to demonstrate the correct way to clean it. *Note: Never use anything other than lens paper to clean the lenses of the microscope.* Focus with the coarse-adjustment knob by turning it away from you. *Note: Never focus objectives downward. You may run the objective into the slide and break the slide or damage the objective.*

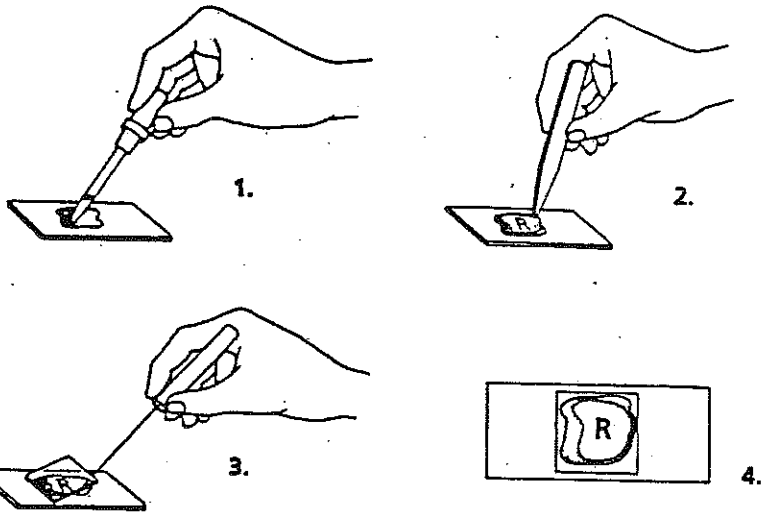
7. Complete focusing by slowly turning the fine-adjustment knob back and forth. When the object you are viewing is in focus and exactly in the middle of your field of vision, switch to high power. *Note: Never use the coarse-adjustment knob at high power.*

Part 2—Making a Wet Mount

8. Use scissors to cut out a capital letter *R* from a piece of newspaper. *Note: Do not use one from a headline.* **CAUTION: Handle scissors carefully. Notify your teacher of any cuts.**

9. With a medicine dropper, place one drop of water in the middle of a clean glass microscope slide. **CAUTION: Glassware is fragile. Notify your teacher promptly of any broken glass or cuts. Do not clean up broken glass or spills unless your teacher tells you to do so.** With forceps, place the letter *R* in the drop of water as seen in the diagram on the next page.

10. Hold a coverslip at a 45° angle to the slide at the edge of the drop of water as seen in the diagram on the next page. Lower the coverslip slowly to avoid forming air bubbles. Under the microscope, air bubbles look round and have dark edges.



11. Place your wet mount on the microscope stage with the letter *R* facing you. Using the low-power objective, center and focus the microscope on the letter *R*. Then switch to high power.

- What happens to the image of the letter *R* as you go from low to high power?

*position:

* resolution:

*magnification:

12. As you look through the eyepiece, slowly adjust the diaphragm to obtain the appropriate light for viewing.

- What happens as you adjust the diaphragm?

13. As you look into the microscope, use your fingers to move the slide to the right and then to the left.

- What happens to the image as you move the slide to the right?

- What happens to the image as you move the slide to the left?

- Move the slide away from you, and record what happens to the image.

Part 3—Depth-of-Field Focusing

14. Obtain a prepared slide of 3 colored threads. Under low power, adjust the slide on the microscope stage so that the point where the threads cross is in the center of your field. Bring the threads into focus and draw them. Can you see all the threads in focus at the same time?

Microscope discussion questions:

1. Calculate the total magnification for each power

High power	Medium power	Low power

2. Under which power is the largest field of view seen? (Which power gives you the most of your object to look at?)

3. What will happen to the field of view when you switch from low to high power?

4. When making a wet mount, why must you always use a cover slip?

5. Why is it necessary to be able to focus at different depths?

6. If a microorganism were swimming from right to left across your field of view under a compound light microscope, which way would you move the microscope slide to keep it in view? Why?

Identify the type of microscope used for each illustration shows in class:
A _____ B. _____ C. _____

Function of the Parts of a Compound Light Microscope

Microscope part	Function
Eyepiece (magnification: _____)	
Body tube	
Arm	
Stage	
Coarse adjustment	
Fine adjustment	
Lamp or mirror	
Revolving nosepiece	
Low-power objective (magnification: _____)	
High-power objective (magnification: _____)	
Diaphragm	
Base	

Biology
Mrs. Cameron

A Micromystery

Objectives:
Attempt to solve a mystery
Analyze evidence related to a crime
Use the scientific method to make a conclusion about what occurred in the lab.
Manipulate a compound microscope properly.

Background Information:

The word forensic means, "pertaining to the courts of law", and thus forensic science means science applied to legal matters. Forensic science not only covers criminal & civil courts, but also quasi-judicial processes such as Veteran's Affairs appeals & insurance claims.

The sciences involved in forensic science include chemistry, physics, botany, zoology, biology, & especially medicine. Forensic medical science, which is especially concerned with pathology, is a very old branch of forensic science going back thousands of years to the Greek courts.

In 1920, Frenchman Edmund Locard founded a small police laboratory dedicated to forensic science. Locard was the first to put forward the theory that a criminal almost always leaves behind a physical clue at the scene of a crime – a fiber, a fingerprint, a bullet – all of which are vital pointers to the criminal's identity.

From Locard's research springs the modern study of forensic science. As crimes themselves have grown more complex, so has the technology used to solve them. The popular image of the forensic scientist who can unravel anything from a shoot-out to a poison case is a myth, largely perpetuated by crime fiction, TV, & movies. In fact, forensic science is multidisciplined, calling on the very specialized skills of the pathologist, the forensic toxicologist, the ballistics expert, the forensic biologist, & the chemist.

Forensic Investigation: Make as many scientific observations as possible. Use the microscope as one of your tools. Follow the appropriate procedures for mounting slides. Begin with the evidence bag and expand from there. Think about what kind of controls you can utilize. (Remember unlined paper, color, data tables, magnification, etc)

Discussion: Describe at least 2 practical uses of the microscope other than the classroom & forensics.

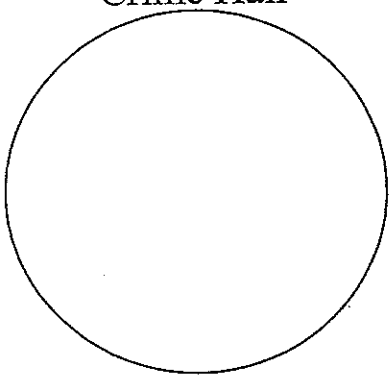
Conclusion: Summarize the data collected to propose an explanation for the evidence. Describe the evidence that supports your conclusion. Is there any evidence that doesn't support it? What other kinds of tests could be done to improve your investigation? Note errors/improvements in your investigation.

A Micromystery

Name_____
Class _____ Date_____

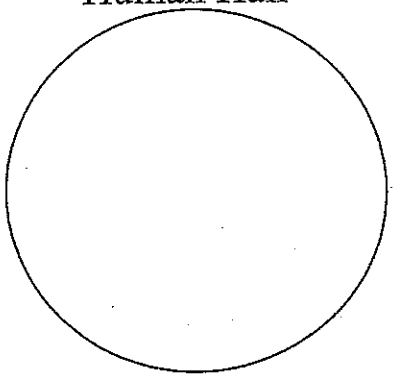
Crime Scene	Police Report	Sketch of note piece/phrase

Crime Hair



x

Human Hair



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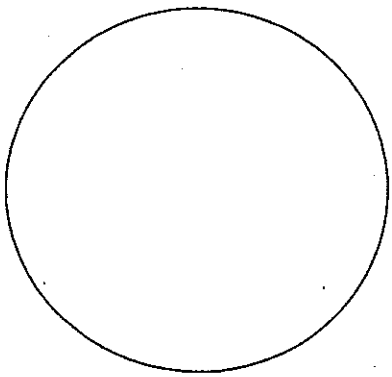
Crime Blood



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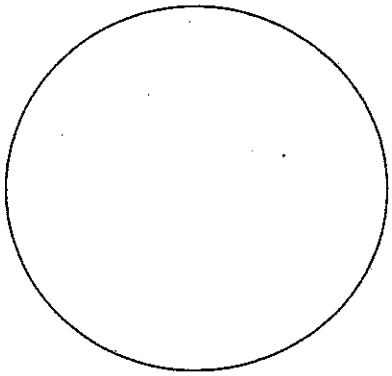
Human Blood



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