

Microscopes Intro

Part 1 - Read page below

Section 3

Terms to Learn

compound light microscope
electron microscope
area
volume
mass
temperature

What You'll Do

- ◆ Describe the tools life scientists use for seeing.
- ◆ Explain how life scientists use computers.
- ◆ Explain the importance of the International System of Units.

Tools of Life Scientists

Life scientists use various tools to aid them in their work. These tools are used to make observations and to gather, store, and analyze information.

Tools for Seeing

If you look at a jar of pond water, you may see some scum and a few creatures swimming around. But examine that same water under a microscope or with a magnifying lens, and presto!—a complex community of organisms suddenly appears.

To make accurate observations of organisms and parts of organisms that are too small to be seen with the naked eye, life scientists use tools that can magnify. People have used glass as a magnifier for almost 3,000 years. Today life scientists use magnifying lenses and microscopes.

Compound Light Microscope One type of microscope commonly used today is the compound microscope, shown in **Figure 13**. The **compound light microscope** is made up of three main parts—a tube with lenses, a stage, and a light. Specimens viewed through a compound microscope are sometimes stained with special dyes, which enable the specimens to be seen more clearly.

Specimens are placed on the stage so that the light passes through them. The lenses at each end of the tube magnify the image, making it appear larger than it actually is.

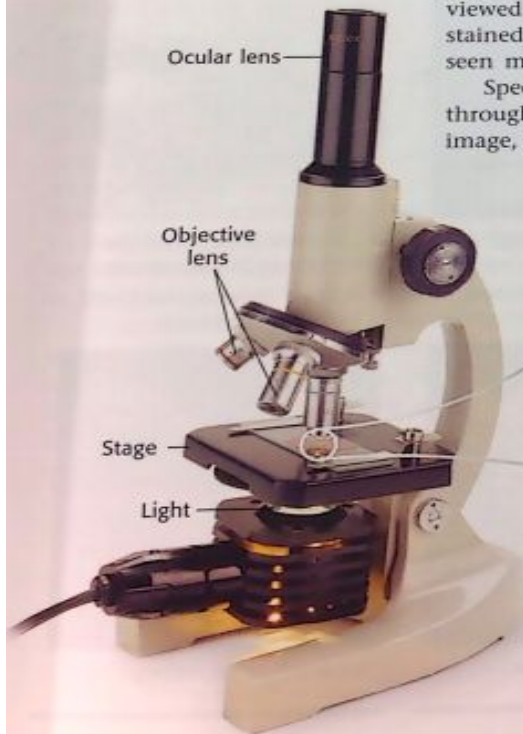
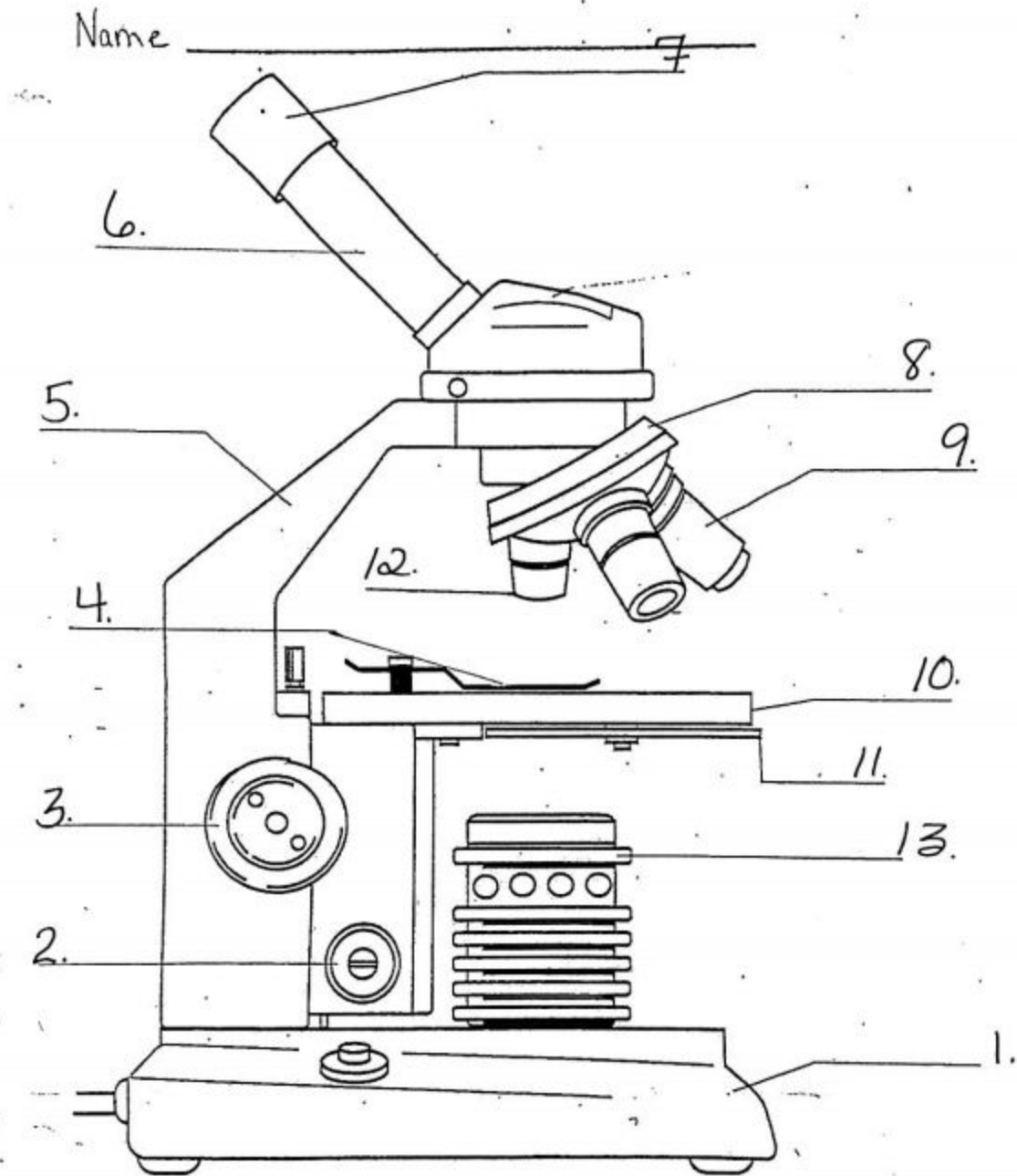


Figure 13 A compound light microscope can produce an image that is 1,000 times (1,000x) larger than the actual specimen. The paramecium shown here has been magnified 200x.

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Part 2 - Label a diagram ...again...to practice:



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Part 3 - Carrying Microscopes:

Microscopes are expensive, so we must be careful using them and moving them from place to place.

1) How many microscopes can you carry at one time? _____

2) Name the two parts of the microscope you use to carry it.

_____ and _____

3) Why is it a good idea to keep your microscope at least 10 cm from the edge of the table?

4) Why must you be careful when focusing with the high power objective lens? What precautions should you take?

Part 4 - Magnification

1) What is the magnification power of the lens in the eyepiece (ocular) of our classroom microscopes?

_____ X

2) Our microscopes have three objective lenses. Give the magnification power of each objective lens:

- Shortest objective lense= low power = _____ X

- Medium objective lense= middle power = _____ X

- Longest objective lense= high power = _____ X

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3) To calculate the total magnification of each objective, you must multiply:

$$\text{magnification power of ocular} \times \text{magnification power of objective lens} = \text{TOTAL magnification}$$

Calculate the total magnification of each objective.

	Ocular Magnification	Objective Magnification	Total Magnification
Low Power			
Medium power			
High Power			

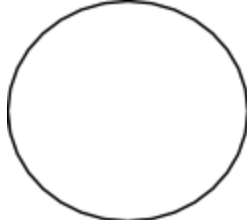
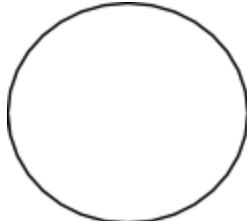
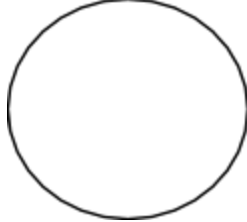
4) Why should you always use the low power objective to locate objects on the slide, even if you plan to observe with medium or high power?

5) When switching to high power, which adjustment knob should you use to focus? Explain.

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Part 5 - Field of View Circles:

1. **Ruler** - Place the ruler on the stage of the microscope. Millimeter marks should be over the light source. Secure it with stage clips. Follow the steps of microscope use below:

<p>Microscope Use Steps <small>(walk through using small gray box of interesting slides)</small></p> <ol style="list-style-type: none">1. Carry to arm2. Start with Low Power (shortest objective lens)3. Start with the stage all the way UP4. Use the Coarse Adjustment Knob to focus5. Make sure object is centered on pointer6. Rotate revolving nosepiece to Medium power7. Use Fine Adjustment knob to focus (use coarse only if needed)8. Rotate revolving nosepiece to High power9. Use Fine Adjustment knob ONLY to focus (any lens over 20X)	<p>Draw what you see on Low Power:</p>  <p>Draw what you see on Medium power:</p>  <p>Draw what you see on High Power</p> 
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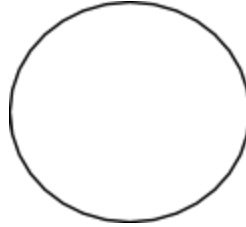
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2. **Other slide** - Place the slide on the stage of the microscope. Millimeter marks should be over the light source. Secure it with stage clips. Follow the steps of microscope use below:

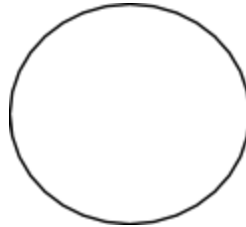
Microscope Use Steps

1. Belly to arm
2. Start with Low Power (shortest objective lens)
3. Start with the stage all the way UP
4. Use the Coarse Adjustment Knob to focus
5. Make sure object is centered on pointer
6. Rotate revolving nosepiece to Medium power
7. Use Coarse Adjustment knob to focus
8. Rotate revolving nosepiece to High power
9. Use Fine Adjustment knob **ONLY** to focus

Draw what you see on Low Power:



Draw what you see on Medium power:



Draw what you see on High Power

