

## SECTION

## 2

## Using the Microscope

There are many different kinds of microscopes. A magnifying glass is a simple microscope. The term *microscope* commonly refers to a compound microscope. These microscopes are called compound because they are made of two sets of glass lenses in a tube or tubes.

The total magnifying power of a microscope is the product of the magnifying power of the lens in the eyepiece and the magnifying power of the lens in the objective. Most compound microscopes can magnify a specimen up to 1,000 times its real size.

Microscopes allow you to see fine details. Spaces between objects that are closer together than 0.1 mm can be seen. The ability of a microscope to separate very small distances is called resolving power. If the resolving power of the lens is not good, the image will appear blurred.

When you look into the eyepiece of a microscope, the circular area you see is the field of view. When a ruler is placed across the opening on the stage, the field of view can be measured in millimeters.

**Directions:** Using the information above, complete the table by filling in the blanks.

	Eyepiece lens	Objective lens		Total	
<b>Microscope 1</b>	10x	Low 5x	High 40x	Low 1. _____	High 400x
<b>Microscope 2</b>	8x	10x	60x	2. _____	3. _____
<b>Microscope 3</b>	4. _____	10x	5. _____	50x	300x

**Directions:** Answer the following questions on the lines provided.

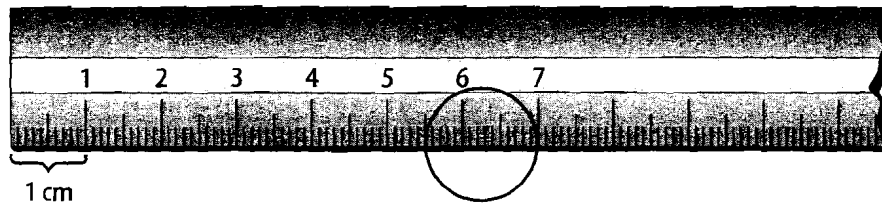
6. How do you find the total magnifying power of a microscope?

\_\_\_\_\_

7. What would cause an image to appear blurred?

\_\_\_\_\_

**Figure 1**



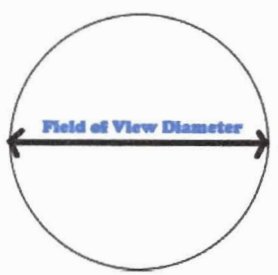
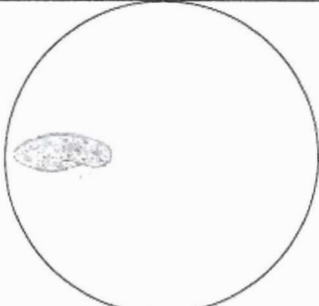
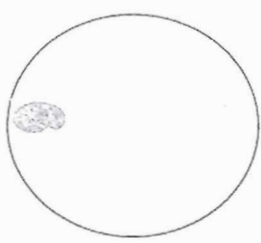
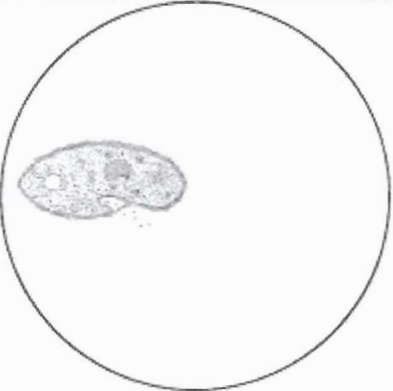
8. What is the width of the field of view shown above? In centimeters? \_\_\_\_\_

In millimeters? \_\_\_\_\_

## Field of View and Magnification

The microscopes we use in class have the following magnification and field of view.

Objective Lens	Eyepiece Lens	Total Magnification	Field of View
4X	10X		4 mm
10X	10X		1.8 mm
40X	10X		.4 mm

	
<p><b>How to measure an object under the microscope</b></p> <ol style="list-style-type: none"> <li>1. Note the objective used and the size of the field of view (see chart above)</li> <li>2. Count the # of times the object or organism can fit across the diameter</li> <li>3. Divide the field of view by the # of times the object or organism can fit across the diameter</li> </ol>	<p><b>Example :</b></p> <ol style="list-style-type: none"> <li>1. Objective used- 100X so field of view is 1.8mm</li> <li>2. The organism can fit 3 times across the diameter</li> <li>3. <math>1.8\text{mm} / 3 = .6 \text{ mm}</math></li> </ol>
<p><b>Find the size of the following organisms:</b></p>	
	
<ol style="list-style-type: none"> <li>1. Objective is 40X so field of view = _____ mm</li> <li>2. The # of times the organism can fit across the diameter= _____</li> <li>3. _____ / _____ = _____ mm</li> </ol>	<ol style="list-style-type: none"> <li>1. Objective is 400X so field of view = _____ mm</li> <li>2. The # of times the organism can fit across the diameter = _____</li> <li>3. _____ / _____ = _____ mm</li> </ol>