

LAB: Microscopes | Introduction to Cells

INTRODUCTION:

When you think of biology, there is probably one tool that comes to mind above all others. Almost all biologists need to examine organisms or parts of organisms that are too small to be seen with the unaided eye. To study small organisms, researchers have developed several kinds of microscopes.

The Compound Light Microscope (uses two sets of lenses)

To use a compound light microscope, you sandwich the object to be viewed between a transparent glass slide and a thin cover slip.



stage

This sandwich is then placed on the **stage** of the microscope so that light passing through it travels through two lenses. The lens at the bottom of the microscope tube, which is closest to the specimen being observed, is called the **objective lens**.



objective lens.

The lens at the top of the microscope tube, through which you look, is called the **ocular lens**. When you look through the ocular lens in a compound light microscope, you may see an image of the object magnified up to 400 times.



The magnification is the number of times the size of an object appears increased. If the magnification of an object is **10x**, it will appear 10 times larger than it really is.

The magnification of your microscope is equal to the product of the separate magnifications of the eyepiece and the objective. (The magnification of each lens is written on the lens case.) If the eyepiece is 10x and the low power objective is 10x, then the magnification under low power is **100x**.

In the equation form, this is written:

(Eyepiece magnification) x (Objective magnification) = Total magnification.

*Note: The lowest power objective lens (**4x**) is useful for locating a specimen on the slide and is always a good place to begin viewing an object.*

PROCEDURE:

Preparing a wet mount

1. Place a **thin** piece of onion, on a clean microscope slide.
2. Place a drop of iodine on the onion. Then place a cover slip on the onion.
3. To get rid of bubbles, raise and lower the cover slip until any trapped air is released.
4. **Remember always to start with the low power objective len (**4x**).** Then move up to 10x and then 40x. The total magnification would be 400X. Turn the nose piece so that the low power objective lens is in place. Focus on your low power, using the coarse focus knob first and then the fine focus knob. Then rotate the nose piece to the high-power objective. **Use only the fine focus knob on high power.** Note slides are

easily broken using the coarse focus knob due to the proximity of the lens and the slide. More importantly, the lens may be scratched by the broken cover slip.

5. Move your slide to the left and to the right. Which way does the image of the letter appear to move?

- In your lab notebook using colored pencils, draw what you observe under the microscope. Remember always to **title** your drawing to allow your picture to be identified by the observer. It is also very important in addition to a title to **include the magnification** of your drawing next to the title.