## Suggestions for Making Your Own
## Prepared Microscope Slides

Always begin with clean slides and cover glass. Handle slides carefully by the edges to avoid fingerprints. Use forceps (tweezers) to carefully handle cover glass.

**! Extreme caution and adult supervision recommended** when using the scalpel blade for cutting specimens. Keep scalpel covered and store in a safe place when not in use.

### Temporary or "Wet" Mounts

Tissue-type specimens such as plant sections:

1. Use the **scalpel** to carefully cut the specimen as thin as possible.
2. Place the specimen on the **slide**.
3. Use the **plastic dropper** to place one drop of water on the specimen.
4. Carefully place a **cover glass** over the specimen, allowing the water to spread under the glass.
5. The cover slip should be flattened against the specimen and slide as much as possible, avoiding air bubbles. Use caution, the thin cover glass will break if too much pressure is applied!
6. Blot any excess water carefully with paper tissues.
7. Carefully place slide on the microscope (cover glass side up) and observe.
8. Use the **slide labels** to identify your specimens.

You may want to try reversing steps 2 & 3; place a drop of water on the slide first, then put the specimen on the water before placing the cover glass. Experiment with each method to find the best results for each specimen. (Keep in mind these are only temporary mounts.)

***Tip:*** Slides may be carefully washed and re-used for future specimens. Cover glass is extremely fragile and not recommended for re-using. Carefully discard after use.



With the new **My First Lab**™ **DUO-SCOPE**, you finally have the ability to observe both microscope slides and solid objects, such as plants, coins and insects. The key is in the dual, cool LED illumination that provides both sub-stage and overhead lighting. Battery power eliminates the need for electricity or power cords and allows for portable use "in the field". The new **My First Lab**™ **DUO-SCOPE** combines two separate applications into one fantastic package that promises hours of fun and learning.

## Magnifications

Total magnification is calculated by multiplying the eyepiece magnification (always 10X) by the objective lens.

| *Objectives* | "Compound" use (lower lighting) | "Stereo" use (upper lighting) |
|---|---|---|
| 4X | 40X | 40X |
| 10X | 100X | 100X |
| 40X | 400X | N/A |

*Note: the 40X lens is not suitable for use with the upper lighting due to the focusing distance required. The lens must be too close to the specimen and does not allow enough light to reach the specimen.*

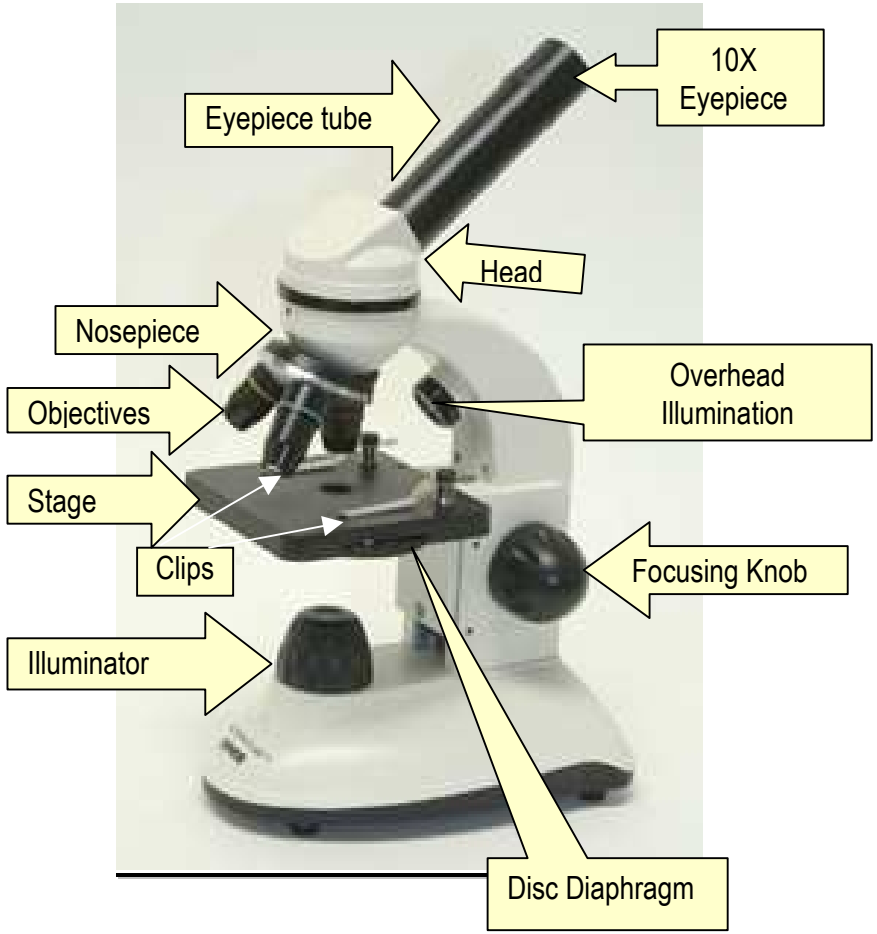
## Specifications

- 10X Eyepiece
- Rotatable Head
- 4X, 10X, 40X Objectives
- Dual LED illumination
- Dual focusing knobs
- Disc Diaphragm
- Real optical glass lenses

Dimensions: 4½" x 6½" x 11½" high
Net Weight: 1.95 lbs.
*Instrument is powered by 3 AA Batteries, (not included)

## Components of My First Lab™ DUO-SCOPE

Study the picture below to become familiar with the different parts of your microscope.






## Some Ideas For Observation

**Children: get adult's permission before trying any experiments!**

1. Crystals: Place a few grains of dry salt or sugar on a slide to observe. Mix salt with a spoonful of warm water in the **test tube** and then use the **plastic dropper** to place a couple drops on a slide. Let it dry and observe the re-crystallized salt/sugar.
2. Shake some grains of pollen from a flower onto a **blank slide**.
3. Hairs, including pet hair, or pieces of feathers, can be observed. Try comparing hairs from various animals. You can use a small piece of tape at each end of the hair to hold it on the slide.
4. Observe fibers in different kinds of paper, printing from a newspaper or typewriter. Look at the color in comics. Threads or fibers from different types of fabric. Compare natural fibers such as cotton and wool to synthetics like polyester.
5. Stagnant water from a pond will contain live organisms. Place a drop into the well of a **concavity slide** for observation.
6. Very small insects may be seen completely under low power, or try looking at parts such as legs or wings of larger bugs. The **teasing needle** is useful for positioning or probing the specimen. Always handle insects with **tweezers** and wash hands thoroughly after working with your specimens.
7. Observe the mold on old bread or other food, or make your own mold by leaving a small piece of bread in the **Petri dish** for several days. A small amount of moisture will encourage the mold growth. (Again, be sure to wash hands thoroughly after.)
8. Many specimens may look transparent under the microscope. It's common to stain them to make the cells show up better. Iodine is a common **stain**. Or try soaking your tissue specimens in a solution of ordinary food color (included-add water to thin) for a couple of minutes to stain them. Use the tweezers to pick up the "stained" specimen. Allow the "stained" specimen to dry before using glue to mount it. Remember the stain will color anything else it touches, not just your specimen, so be careful with furniture and clothing.

# Preparation

Please read this section completely before using your microscope. Study page 2 to learn the various parts of the instrument.

Remove the eyepiece from the tube and invert the microscope to reveal the battery compartment. Open the compartment and insert 3 AA Batteries (not included) as indicated. (Base of battery-negative end-goes against the spring.) Replace the battery compartment cover and the eyepiece.

Always set up your microscope on a smooth surface, such as a desk or table.

Before using the scope**,** practice slowly turning the focusing knob and watching the stage move without looking through the eyepiece, so as to familiarize yourself with the direction you should turn the knob, when moving the stage closer to the objectives.

The **My First Lab**™ **DUO-SCOPE** has the capability to illuminate the specimen from the top or bottom. Notice the power switch, located at the back of the scope, operates both the top light and the bottom light (but not at the same time), depending on which way the switch is flipped. The eyepiece tube and head may be rotated to face the other side of the microscope if desired. If necessary, you may loosen the screw at the base of the head SLIGHTLY to allow the head to move with ease. For best results, only move the head when necessary.

# Operation

## Compound Microscope Use (for slides)

Begin with the stage platform at its lowest position. To observe specimens, check the **objective lens,** and if necessary, rotate the **nosepiece** so that the **4X objective lens** is in position for viewing. The lens will "click" when in place. Always start viewing any specimen with the 4X objective and increase accordingly.

Begin by selecting a prepared slide and placing it carefully on the **stage** (labeled side up). Push gently on the back of the **clips** to lift the arm enough to slip the slide under and hold it in place. The main part



of the specimen should be centered over the opening in the stage.

Turn on the lower **illuminator** to shine the light up through the stage and through the tissue specimen on the slide. Look through the **eyepiece** and SLOWLY turn the focusing knob until the image of the specimen becomes clear. Be careful not to let the slide touch the lens.

***Focusing Tips*** When focusing your microscope turn the knob only until the stage stops moving. DO NOT FORCE IT.

The **disc diaphragm**, located directly below the stage, has six different apertures (openings), which allow various amounts of light to pass through. Rotating this disc allows you to modify the amount of light that is transmitted. Try experimenting with various settings to get the best effective view. (Usually most effective at the 400X magnification.)

After focusing you can move the slide left or right on the stage to observe different sections of the same specimen. As you adjust the slide or the aperture disc, be careful not to put weight against the stage as this could push it out of focus. If this occurs, simply readjust the focusing knobs slightly until you again have a clear view.

After observing with the 4X objective (which shows you the image magnified 40X), rotate the nosepiece to the **10X objective** lens (leave the slide in place on the stage). SLOWLY turning the focusing knob will enable you to get a clear view of your specimen at 100X magnification. Always use caution since the focusing knob actually moves the stage closer to the objective lens.

Finally, you can turn the nosepiece to the **40X** lens, giving you a 400X magnification of your slide. When increasing magnification, always remember that the higher the magnification, the closer the objective must be to the specimen being observed.

***Focusing Tips*** The 40X lens will appear to be almost touching the slide, this is normal. Always move the focusing knobs very slowly

to avoid breaking the slide with the objective.

When changing slides, move the stage to its lowest position, lift the clips to remove and replace slides and begin observing with the 4X objective again.

**Stereo Microscope Use (for solid objects)**

Turn on the **overhead illuminator** to shine light onto the stage.

As with the compound microscope, always begin your observation with the 4X objective and increase magnification accordingly.

Note: Only the 4X and 10X objectives may be used when viewing solid specimens. The 40X lens is not suitable for use with the upper lighting due to the focusing distance required. The lens must be too close to the specimen and does not allow any light to reach the specimen.

For contrast, you may find it necessary to place certain specimens on an index card or small piece of paper before centering them on the stage. Since you are using the upper light, it is not necessary for the opening in the stage to be exposed for the lower light to shine through. Also, you do not want your specimen to fall through the hole!

This application can allow you to magnify countless everyday items: for examples, small rocks, leaves, insects, flower petals, coins, stamps, jewelry and more.

***Focusing Tips*** You will notice that with a three dimensional specimen, for example, a small insect, you will have different levels to focus on; therefore the entire image may not seem clear at the same time. Compare to a flat field, such as a postage stamp, where the specimen is all at the same level which allows the microscope to focus on the entire field.

With a little practice, you can soon become an expert at observing all types of specimens with **My First Lab** ™ **DUO-SCOPE**.



## Accessories

This microscope is equipped with the following accessories.

- 5 Blank Slides
- 4 Prepared Slides
- 1 Concavity Slide
- Slide Labels
- Cover glass
- Plastic Dropper
- 2 Bottles of non-toxic “stain”
- Scalpel
- Forceps
- Lens Paper
- Test Tube
- Petri Dish
- Straight Teasing Needle
- Vinyl dust cover

***Note:***
***Contains glass, food coloring, and sharp instruments.***
****Adult supervision required for experiments and slide preparation.****

**Simple Semi-Permanent Mounts:**

Follow the same basic procedure as above but try using CLEAR GLUE instead of water to hold the specimen and cover glass to the slide. Allow the glue to dry before observing the specimen. Use the slide labels to identify your specimen.

***Hint***: You may enjoy keeping notes of your various observations or even sketching the magnified images you see in the scope.

## Maintenance

To prolong the life of your batteries, turn off the power immediately when not in use (be sure both lights are off--switch in the center position.) Dust the unit with a soft dry cloth or soft brush. Fingerprints and debris may be removed with a damp cloth. If glass lenses require cleaning, try a cotton swab **very slightly moistened** with alcohol. Dry with a clean swab or lens paper.

Store your microscope in a cool dry place. Always cover with the vinyl dust cover provided or return to the box when not in use. If used "in the field" take care to keep the unit upright as the eyepiece can fall out if tipped. Eyepieces and lenses should remain in place to avoid dust in the tubes. Keep microscope slides in their proper storage unit when not in use. Always use care with real glass and sharp instruments and keep out of reach of young children.

When lights seem dim, replace the batteries with fresh AA batteries. The LED bulbs have a long life span and should not require replacing. If either bulb does not work, even after installing fresh batteries, please call for service.

Proper care and use of this product can result in years of scientific study and adventure. Enjoy!

**LIMITED ONE YEAR WARRANTY**

The manufacturer warrants this instrument to be free from defects in material and workmanship under normal use for one year from the date of purchase. It does not cover damage resulting form abuse or misuse, repairs or alterations performed by other than authorized repair technicians, or damage occurring in transit.

For warranty service, microscope should be well packed to avoid damage in transit, preferably in original box and packing. Include your complete return address and telephone number as well as a description of the difficulty, and ship, postage prepaid, to the address below. It will be repaired or replaced at no charge and returned. If misuse, alterations, accident or abnormal conditions of operation caused failure, an estimate for repairs will be provided for your approval prior to work being performed.

If you have questions concerning this product or warranty, contact the dealer from whom it was purchased.

# My First Lab™

# DUO-SCOPE

Two Microscopes in One!

# USER'S MANUAL

## Model MFL-06

This microscope is intended for use by ages 9 & older. Parents are reminded this is a scientific tool and contains glass microscope slides and sharp instruments. Proper handling and parental supervision is required. Always follow the appropriate safety procedures.