

My First Lab™

DUO-SCOPE™

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 from 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.

Microscope Service Department
7241 Gabe Court
Manassas, VA 20109-2434
703-330-1413

(22/4)

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Made in China



USER 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.

History and Awards

My First Lab™ is our most popular educational and hobby brand. For over 10 years the **My First Lab™** line has enjoyed high praise in the global market. **My First Lab™** microscopes have received several awards by Creative Child Magazine and numerous other awards.



DUO-SCOPE



i-explore scope



Whodunni t?



MEGA DUO-SCOPE

Maintenance

To prolong the life of your batteries, turn off the power immediately when not in use (be sure all 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 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 keep out of reach of young children.

When lights seem dim, replace the batteries with fresh AA batteries. *Be sure to dispose of used batteries properly.* The LED light 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!

Some More 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. Compare threads or fibers from different types of fabric.
5. Stagnant water from a pond will contain live organisms. Place a drop into the well of a **concavity slide** for observation.
6. 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. **Caution:** Remember the stain will color anything else it touches, not just your specimen, so be careful with furniture and clothing.

With the **My First Lab™ DUO-SCOPE** you 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 **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.

<i>Objectives</i>	“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
- 4X, 10X, 40X Objectives
- Real optical glass lenses
- Dual LED lights (above and below)
- Dual focusing knobs
- Disc Diaphragm

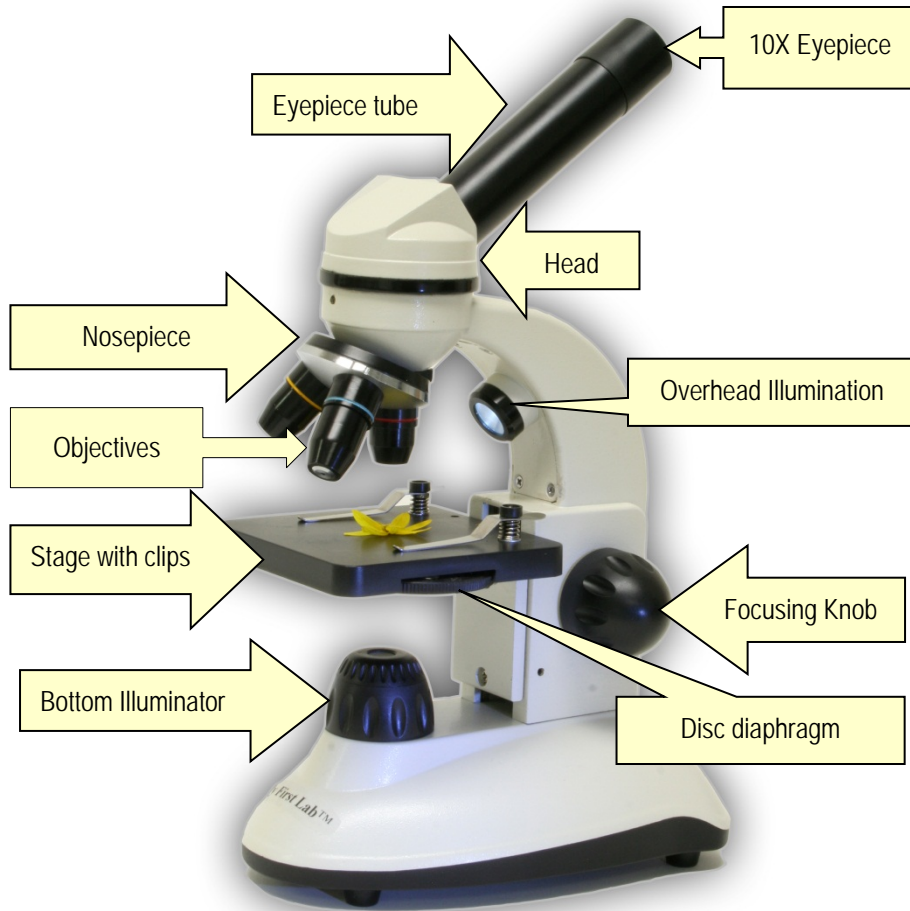
Dimensions: 4½" x 6½" x 11½" high; Net Weight: 1.95 lbs.

*Instrument is powered by 3 AA Batteries (not included)

Components of

My First Lab™ DUO-SCOPE

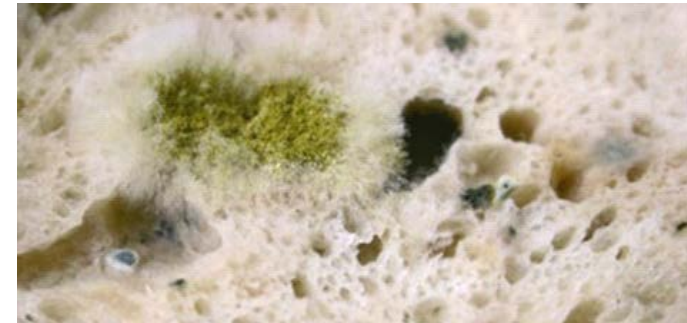
Study the picture below to become familiar with the different parts of your microscope.



Mold Growth

1. Get some water, paper plate and one piece of bread.
2. Place the bread on a plate and drop a little water on the bread to make it damp (not soaked).
3. Place the bread in a cool dark location (such as a cupboard).
4. Observe the bread daily.

Put the plate with the moldy bread under the microscope and notice the mold's interesting shape. Fungal spores exist all around us. These spores settle on the bread and use the water and food from the bread to grow. Mold may have different color and shapes.



Insect Observation

Below are some screen shots to compare the wings of several different insects. Notice the difference in the shape and structure. Use your microscope to compare other similar common household items.



Honeybee Wing (40X)



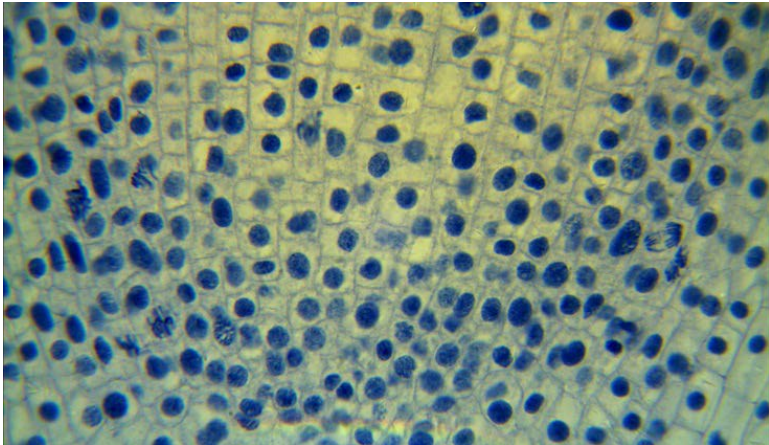
Fly Wing (40X)



Mosquito Wing (40X)

6. Begin with the stage platform at its lowest position. Rotate the nosepiece to ensure 4X objective lens is being used. Turn on the lower LED illuminator to shine the light up through the stage.
7. Place the onion cell slide onto the stage of the microscope.
8. Looking through the eyepiece SLOWLY turn the focusing knob to let 4X objective get closer to the slides until an image comes into focus.
9. Increase the magnification and repeat the process above; please allow enough space between objectives and specimen.

In the picture below, the dark blue images are the chromosomes of the onion root. In some cells you can see the chromosomes being pulled apart to create the new cells.



Accessories

This model **My First Lab™ DUO-SCOPE** is equipped with the following accessories:

- 5 Blank Slides
- 4 Prepared Slides
- 1 Double Well Slide
- Slide Labels
- Cover Glass
- Plastic Dropper
- 2 Bottles of non-toxic “stain” (red and blue)
- Forceps
- Lens Paper
- Test Tube
- Petri Dish

Save the plastic bag the microscope comes packed in to use as a dust cover when your microscope is not in use.

Everything is ready, so let's start the scientific study and adventure.

Note: *Adult supervision required for experiments and slide preparation.*

Preparation

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



When carrying the microscope hold the microscope by the “arm” and have the other hand firmly under the “base” for support.

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

Invert the microscope (taking care the eyepiece does not fall out) 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.

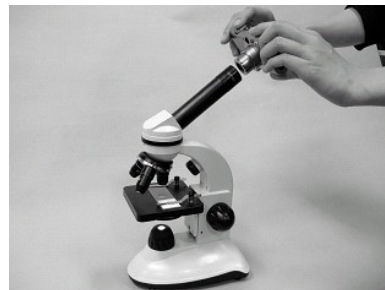
Before using the scope, practice slowly turning the focusing knob (you can use either knob on the left or right side of the scope) and watching the stage move without looking through the eyepiece, this will help to familiarize yourself with the direction you should turn the knob to move the stage closer to the objectives.



The **My First Lab™ DUO-SCOPE™** has the capability to illuminate the specimen from the top or the bottom. Notice the power switch located at the back of the scope. This is a 3 way switch to operate either the top light, the bottom light, or set to the off position.

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

Try This:



Use your camera to take the picture through the eyepiece of microscope



Or purchase a professional digital eyepiece to capture and view the picture on your computer

Some Ideas for Observation

Onion Cells – Mitosis

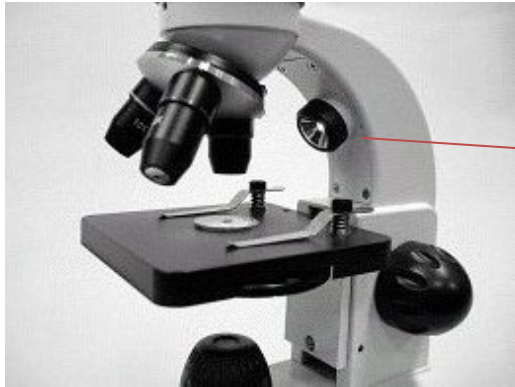
Mitosis is the process where cells separate into 2 identical cells.

1. Take a small piece from the inside of an onion (approx. ¼ - ½ inch)
2. Use the forceps (from accessory set); peel off the membrane from the underside (the rough side).
3. Place the membrane flat on a microscope slide, and then add one/two drops of blue stain. Please wait for 2 to 3 minutes for the onion to absorb the stain.

Caution: *Protect surfaces & clothing when using stain!*

4. Using the transfer pipet rinse the excess stain with water.
5. Add one thin cover glass onto the slide (surface of onion membrane). Make sure there are no air bubbles underneath.

Stereo Microscope Use (for solid objects)



Remember to turn on the overhead illuminator

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 40X 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 it 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.

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.



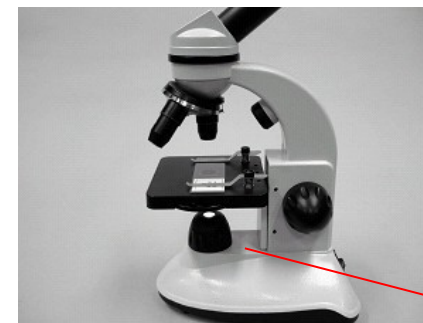
Rotate the nosepiece

4X Objective

Rotate the nosepiece to 4X objective for viewing and your image is magnified 40X

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 clips 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.



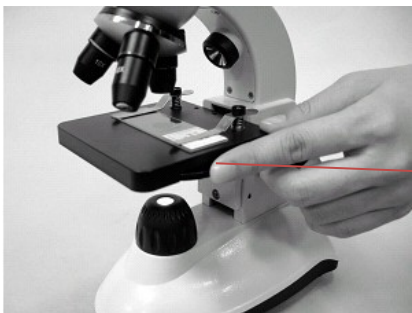
Use lower light for viewing slides

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 most effective view.



disc diaphragm

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.



Nosepiece

Finally, you can turn the nosepiece to the **40X objective**, 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.