This microscope is intended for use by ages 9 and 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.
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

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

<table>
<thead>
<tr>
<th>Objectives</th>
<th>“Compound” use (lower lighting)</th>
<th>“Stereo” use (upper lighting)</th>
</tr>
</thead>
<tbody>
<tr>
<td>4X</td>
<td>40X</td>
<td>40X</td>
</tr>
<tr>
<td>10X</td>
<td>100X</td>
<td>100X</td>
</tr>
<tr>
<td>40X</td>
<td>400X</td>
<td>N/A</td>
</tr>
</tbody>
</table>

**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 will 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: 4 ½” x 6 ½" x 11 ½" high; Net Weight: 1.95 lbs.

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

Study the picture below to become familiar with the different parts of your microscope.
My First Lab® DUO SCOPE™ is equipped with the following accessories:

1. 5 Plain Slides
2. 1 Concave Slide
3. 4 Prepared Slides
4. Cover Glass
5. Plastic Transfer Pipet
6. 2 Bottles of Non-Toxic Stain (Red & Blue)
7. Lens Paper
8. Forceps
9. Plastic Test Tube
10. Plastic 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!
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 lens 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!

IMPORTANT: BATTERY INFORMATION

Please retain this information for future reference. Batteries should be replaced by an adult.

CAUTION:

1. Always follow the instructions carefully. Make sure the power is off when inserting batteries. While replacing batteries be careful to not turn on the power supply.
2. Use only batteries specified and be sure to insert item correctly by matching the + and – polarity markings.
3. Do not mix old batteries and new batteries or standard (carbon-zinc) with alkaline batteries.
4. Remove exhausted or dead batteries from the product.
5. Remove batteries if product is not to be played with for a long time.
6. Do not short circuit the supply terminals.
7. Should this product cause, or be affected by, local electrical interference, move it away from other electrical equipment. Reset (switching off and back on again or removing and re-inserting batteries) if necessary.

8. RECHARGEABLE BATTERIES: Do not mix these with any other types of battery. Always remove from the product before recharging. Recharge batteries under adult supervision. DO NOT RECHARGE OTHER TYPES OF BATTERIES.

Insert and Replacing Batteries

The battery compartment is located under the base of the microscope. Carefully turn your microscope over, taking care the eyepiece does not fall out, to reveal the battery compartment. Open the compartment and insert 3 AA batteries (not included). Replace the battery compartment cover.

Preparation

Please read this section completely before using your microscope. Study the Components Diagram to learn the various parts of the microscope.

Proper Handling

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.

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 (stereo microscope) or the bottom (compound microscope). Notice the power switch located on the back of the scope. This is a 3 way switch to operate either the bottom light (set to the single line), both lights (set to the double line), or set to the off position (circle in between the two lines).

### Operation

#### Viewing 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.

**Focusing Tip:** 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 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 bottom light (single line on power switch) to shine the light up through the stage and through the 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 Tip** While focusing, if the stage stops moving, DO NOT FORCE IT. You may damage the microscope.

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.

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.

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. 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.)

When changing slides, move the stage to its lowest position by turning the focusing knob, push the clips to remove and replace slides and begin observing with the 4X objective again.
Viewing 3D Objects

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

Focusing Tip Only the 4X and 10X objectives may be used when viewing 3D objects. The 40X objective is not suitable for use with the upper lighting due to the focusing distance required.

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. When you are using the top light, it will not be 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 allows you to magnify and view countless everyday items like small rocks, leaves, insects, flower petals, coins, stamps, jewelry and more.

Focusing Tip A 3D specimen, like a small insect, 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 the My First Lab® DUO SCOPE™.
Ideas for Observation

Children: Always get an 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 transfer pipet to place a couple drops on a plain slide. Let it dry and observe the re-crystallized salt/sugar.

2. Shake some grains of pollen from a flower onto a plain slide. Now observe!

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 printer. 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 concave slide for observation.

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. You can also try soaking your specimens in a solution of ordinary food color and water for a couple of minutes to stain them. Use the plastic forceps to pick up the stained specimen. Allow the stained specimen to dry before mounting it to the slide. Caution: the stain will color anything else it touches, not just your specimen, so be careful with furniture and clothing.
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.

Mold Growth Observation

1. Get some water, a paper plate and one piece of bread.
2. Place the bread on the 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. Do not eat it.
5. Once mold has formed on the bread, place the plate with moldy bread under the microscope.

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 colors and shapes. After focusing you can move the plate left or right on the stage to observe different sections of the same specimen.
Mitosis in Onion Cells

**Mitosis** is part of the cell cycle when replicated chromosomes are separated into two new nuclei.

**Observation Steps**
1. With an adult’s supervision, cut a small piece of an onion (approximately \( \frac{1}{4} - \frac{1}{2} \) inch).
2. Using the forceps, peel off the membrane from the underside (the rough side).
3. Place the membrane flat on the surface of a microscope slide.
4. Add 1-2 drops of the non-toxic stain. Please wait for 2 to 3 minutes for the onion to absorb the stain. **Caution:** Protect surfaces & clothing when using stain!
5. Using the plastic transfer pipet rinse the excess stain with water.
6. Add one cover glass on top of the onion membrane. Make sure there are no air bubbles underneath.
7. Begin with the stage platform at its lowest position. Rotate the nosepiece to ensure 4X objective lens is being used. Turn on the bottom illuminator to shine the light up through the stage.
8. Place the onion cell slide onto the stage of the microscope.
9. Looking through the eyepiece, SLOWLY turn the focusing knob to allow the 4X objective to get closer to the slide until an image comes into focus.
10. Increase the magnification and repeat the process above; please allow enough space between objectives and specimen for proper viewing.

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

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