



INSTRUCTION MANUAL

MODEL #44123



Congratulations on your Celestron microscope purchase. Your new microscope is a precision optical instrument, made of high quality materials to ensure durability and long life. It is designed to give you a lifetime of enjoyment with a minimal amount of maintenance.

Before attempting to use your microscope, please read through the instructions to familiarize yourself with the functions and operations in order to maximize your enjoyment and usage. See the microscope diagrams to locate the parts discussed in this manual.

CAUTION!

NOTE: This kit may include chemicals that could be harmful if misused. This kit is NOT to be used by children under 8 years of age, and ALWAYS should be used under adult supervision.

The following chemicals may be included in this kit, and could be harmful if misused:

Eosin Dye - Harmful if swallowed. In case of an accident, call a doctor.
Keep away from young children.

Gum Media - Harmful if swallowed. In case of an accident, call a doctor.
Keep away from young children.

SAFETY INFORMATION

- A)** In case of eye contact, rinse eyes with fresh water.
Seek immediate medical attention.
- B)** If swallowed, wash out mouth with fresh water.
Do NOT induce vomiting. Seek immediate medical attention.
- C)** In case of inhalation, move to fresh air immediately.
- D)** In case of skin contact, wash affected area with fresh water for 15 minutes.
- E)** In case of serious injury, seek immediate medical attention.

SPECIFICATIONS- MODEL #44123

Stage - Plain Stage with metal clips - 66mm x 73mm (2.6" x 2.8")

Eyepiece - 10x power

Focuser - Coarse focus

Objectives - Three Objectives: 10X, 60X and 120X

Illuminator - Adjustable bottom illuminator with mirror and incandescent light bulb

Nosepiece - 3-position with click stop

Power - Runs on 2 AA batteries (not included)

WHAT'S IN THE BOX



I. Specimen Slides:
5 Prepared,
7 Blank



J. 2X Magnifier



K. Petri Dish



L. Extra Illuminator Bulb



M. 7 Slide Labels with 7 Statistical Slide Covers

N. 7 Slide Covers

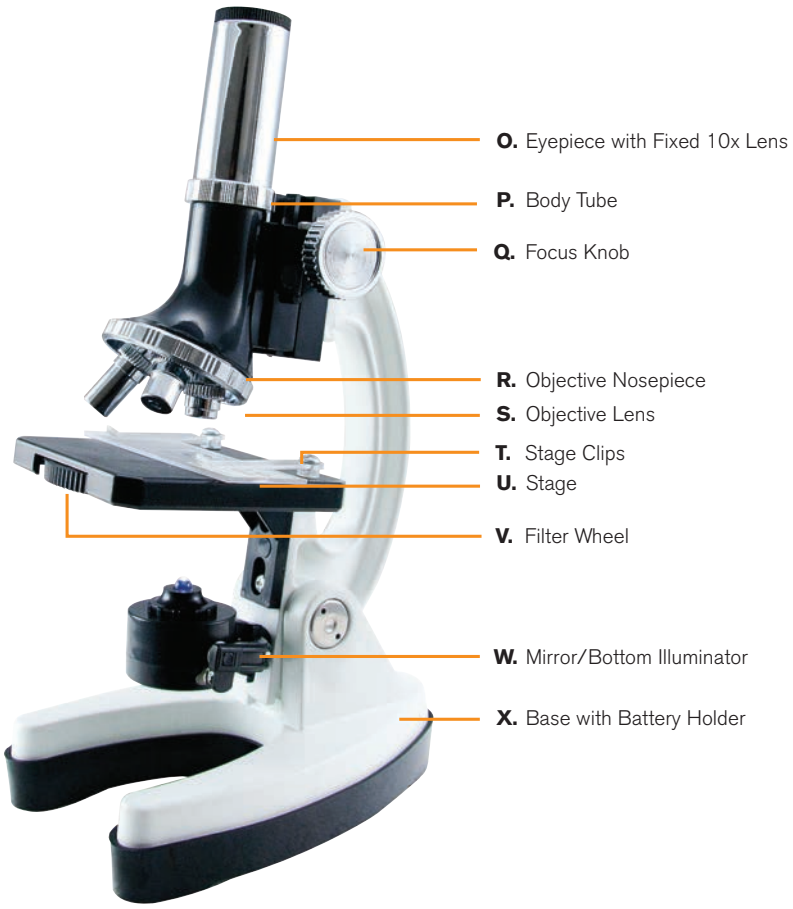


Figure 1

GETTING STARTED

Open the plastic case and carefully remove the microscope, placing one hand around the microscope arm and one under the base. Place on a flat, sturdy surface.

1. Remove the plastic dust cap from the eyepiece (O).
2. Unscrew at least one screw holding in the rubber cover on the base (X) and install the two AA batteries (not included) See Fig. 2.

CAUTION: Take care to install the batteries in the correct orientation. Follow battery manufacturer's precautions. Do not install batteries backwards, or mix new and used batteries. Do not mix alkaline, standard (carbon-zinc), or rechargeable batteries.

3. You are now ready to use your microscope!



Figure 2

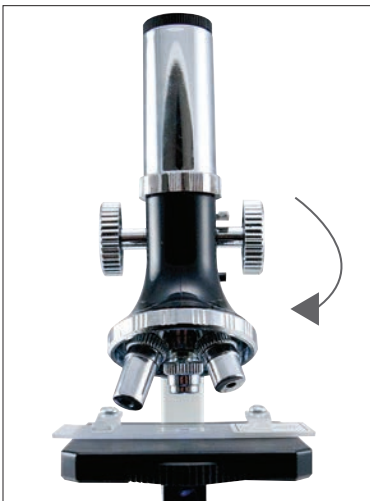


Figure 3

OBSERVING

1. Lower the Stage (U). Then rotate the Objective Nosepiece (R) until the shortest Objective (10X) is over the stage opening as shown in Fig. 2.
2. Place one of the Prepared Specimen Slides (I) under the Stage Clips (T). Position the specimen over the Stage opening.
3. Look through the Eyepiece (O) and slowly turn the Focus Knob (Q) until the specimen comes into focus.
4. Adjust the Mirror or Bottom Illuminator (W) to change the amount of light shining through the specimen to optimize the image.
5. To increase the magnification, lower the Stage once again and rotate the Nosepiece to line up either the 60X or 120X Objective.

HELPFUL TIPS

- Always make sure to lower the Stage before rotating the Nosepiece to change the Objective power. This will ensure the Objective will not be damaged by contacting the Stage.
- The view through the Eyepiece will appear upside down and reversed from left to right. Take this into consideration when moving the Specimen Slide around on the Stage.
- Do not always assume that increasing magnification will produce the best image for viewing. Each time you increase the magnification, the amount of light decreases, and the section of the image you are able to view also decreases. Experiment observing with all three Objectives for all specimens until you get a feel for the magnification levels.

CAUTION: When finished observing using the Light Bulb Illuminator, be sure to flip the Illuminator over 180°, turning off the lamp to ensure a long life of the bulb.

FUN OBSERVATIONS

1. Filter Wheel: Locate the Filter Wheel (V) on the Stage of the microscope. The Filter Wheel has 7 positions. There are 4 color filters (Red, Yellow, Blue and Green) and 3 aperture filters (9mm, 6mm and 3mm DIA). It's fun to see how the image will change with each filter.

2. Brine Shrimp Hatchery: Brine Shrimp are tiny crustaceans that are ideal to study with a microscope. Your microscope kit comes supplied with a Brine Shrimp Hatchery. Brine shrimp eggs are not included but can be obtained easily from many scientific supply businesses as well as online.

To hatch the Brine Shrimp for observing, follow these steps:

- a. Prepare a brine solution: Pour the entire contents of the Sea Salt vile into a quart of tap water. Add some brine shrimp eggs into the solution. Let the solution stand at room temperature (70°-80° F or 21° to 26°C) for 24 to 48 hours. The eggs will hatch in this time creating nauplius larvae.
- b. Place some of the larvae into a compartment on the Shrimp Hatchery (E).
- c. Place some fresh brine solution in a separate compartment of the Hatchery (E). Add a small amount of yeast (user supplied) to this solution. Using the Dropper (C), transfer some of the larvae into this compartment. The yeast will serve as food and produce oxygen for the larvae as they develop into maturity.
- d. Observe the life cycle of the Shrimp as they grow, through the microscope using the shortest objective. The steps in the lifecycle are: the Dried Eggs, the Hatching Eggs, the Developing Larvae, and finally the mature Shrimp.

3. Make Your Own Slides: It is easy to make slides! A section of almost any material can be placed on a slide and observed with a microscope. Your kit includes a lot of the items you will need, but you will also need to gather the following typical household items:

- Scissors
- Petroleum jelly
- Natural uncolored toothpicks
- A few small bottle caps
- A wide mouth jar with a lid
- Paper cups, or similar small disposable container
- Paper towels
- Measuring cup

Set up your work area on a flat open space, like a desktop. Label 3 cups as Clean, Flush and Waste. Fill the "Flush" cup with clean water. You are now ready to find a specimen. Here is a suggestion for a simple first slide - Crystals.

TIP: Start thinking like a scientist as you perform your experiments. Observe carefully, take notes, and keep your equipment and work environment clean. Experiments work best with clean and uncontaminated equipment.

4. Seeing Crystals: One of the easiest slides to make is a Crystal slide. Here's how it's done:

- a. Use your measuring cup to measure one or two ounces of hot (not boiling) water and pour it into a clean cup.
- b. Slowly add as much table salt to the water as will dissolve. Stir continuously while pouring.
- c. Use the plastic Dropper to place one or two drops of the salt solution onto a clean slide as shown in Figure 4.
- d. Set the slide aside and allow it to dry completely.

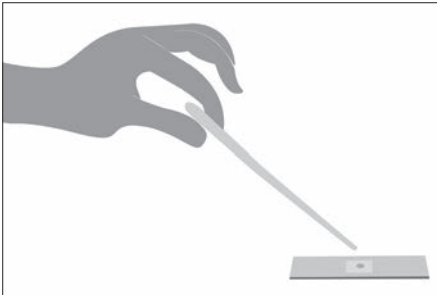


Figure 4

- e. Clean your tools, using the "Flush" cup.
- f. When the slide is completely dried, it should be covered in a white substance. Now place the slide on the Microscope Stage and center it over the hole in the Stage.
- g. Flip the Illuminator over to turn on the light bulb. Set the objective to the shortest. Look through the microscope eyepiece and focus in on the specimen. You should see crystals!
- h. Experiment with different objectives and note the changes.

- i. If you wish to save the crystal slides, use a toothpick to put one or two small drops of Gum Media on the slide and gently place a Side Cover (M) and press down flat to spread the media evenly under the slip.
- j. Attach a label (M) and set aside the slide to let the Gum Media dry (2 days).
- k. If you do not wish to save the slides, simply wash the slides clean with clean water and soap.
- l. Try other salts and sugars in the same manner to create other Crystal Slides!

5. Creating Smears:

- a. Using your Scalpel (B) gently scrape off small shavings from the surface of a freshly cut potato.
- b. Smear the shavings onto a clean slide as shown in Figure 5.

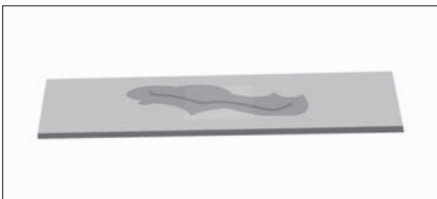


Figure 5

- c. This creates a very thin specimen that is ready to view under the microscope.
- 6. Preparing a Mount:** Preparing a mount refers to larger objects like the petal of a plant or an ant leg.
- a. Dip your Scalpel in some clean water and make a smear across a clean slide.
 - b. Use your Tweezers (A) to place a portion of an insect wing, or other part, on the slide.

- c. Attach a Cover Slide (N) over the specimen and place the slide onto the microscope stage, align and focus.
- d. If you wish to save the slide, place Gum Media on a clean dry slide before placing the specimen on the slide, and into the media. Place a Cover Slide over the media and allow to dry.

7. Staining Smears: Staining a smear can help observing specimens that may be hard to see. The first step in staining a smear is creating the stain.

- a. Your kit comes with Eosin Dye in powder form. Locate the plastic container with the Eosin Dye.
- b. Carefully remove the cap of the container. Use your plastic Dropper to add water to the container until it is full.
- c. Gently stir the mixture until the powder is infused with the water. The Dye is now ready to use.
- d. Create a Smear as described previously and do not place any water or a cover slip on the specimen.
- e. Set the slide aside to dry.
- f. Once dry, use the Dropper to place one drop of the liquid Dye on the slide.
- g. Tilt the Slide from side to side to spread the stain over the specimen.
- h. Remove the excess fluid to the "Waste" cup.
- i. Let the slide dry for a several minutes.
- j. Once dry, you are ready to observe.

8. Life Under Glass:

- a. Fill the wide mouthed jar with fresh water.
- b. Drop a handful of grass and a pinch or two of dirt into the water.
- c. Put the lid on the jar and place it in an area that will get moderate sunlight.
- d. Let it stand for 3-4 days.
- e. After 5 days, it is time to examine the water.
- f. Make a specimen slide by using a clean slide and petroleum jelly.
- g. Use a toothpick to make a ring with the petroleum jelly on the slide surface.
- h. The ring should be smaller than a cover slip and half as thick as the slide thickness.
- i. Put a drop of the jar water inside the ring.
- j. Using the lowest power on the microscope (shortest objective), observe the specimen.
- k. Take note of any microbial movement in the water.
- l. Have fun and write down your observations.

CARING FOR YOUR MICROSCOPE: Your microscope is a precision optical instrument and when treated with care, should provide years of use. Here are a few tips to keep your microscope in top shape:

- Always carry the microscope with two hands.
- Always remove slides from the stage before putting the microscope away.
- Cover the microscope or place it in the plastic carrying case, when not in use.
- Use lens cleaning tissue ONLY when cleaning the lenses.
- Never allow the objective lenses to touch the slide or the stage.
- Remove the batteries before storing the microscope for extended periods of time (30 days or longer).



FCC Statement:

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Product design and specifications are subject to change without prior notification. This product is designed and intended for use by those 8 years of age and older.

▲WARNING:

**CHOKING HAZARD. Small parts.
Not for children under 8 years.**

Warning: This kit contains chemicals that may be harmful if misused.
Read the cautions in the instruction manual and on the individual containers carefully.

NOT TO BE USED WITHOUT ADULT SUPERVISION.

Do not come in direct contact with chemicals. Do not put in mouth or in eyes.

Always wear eye protection when using. Keep small children and pets away from chemicals.



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celestron.com/pages/technical-support

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