



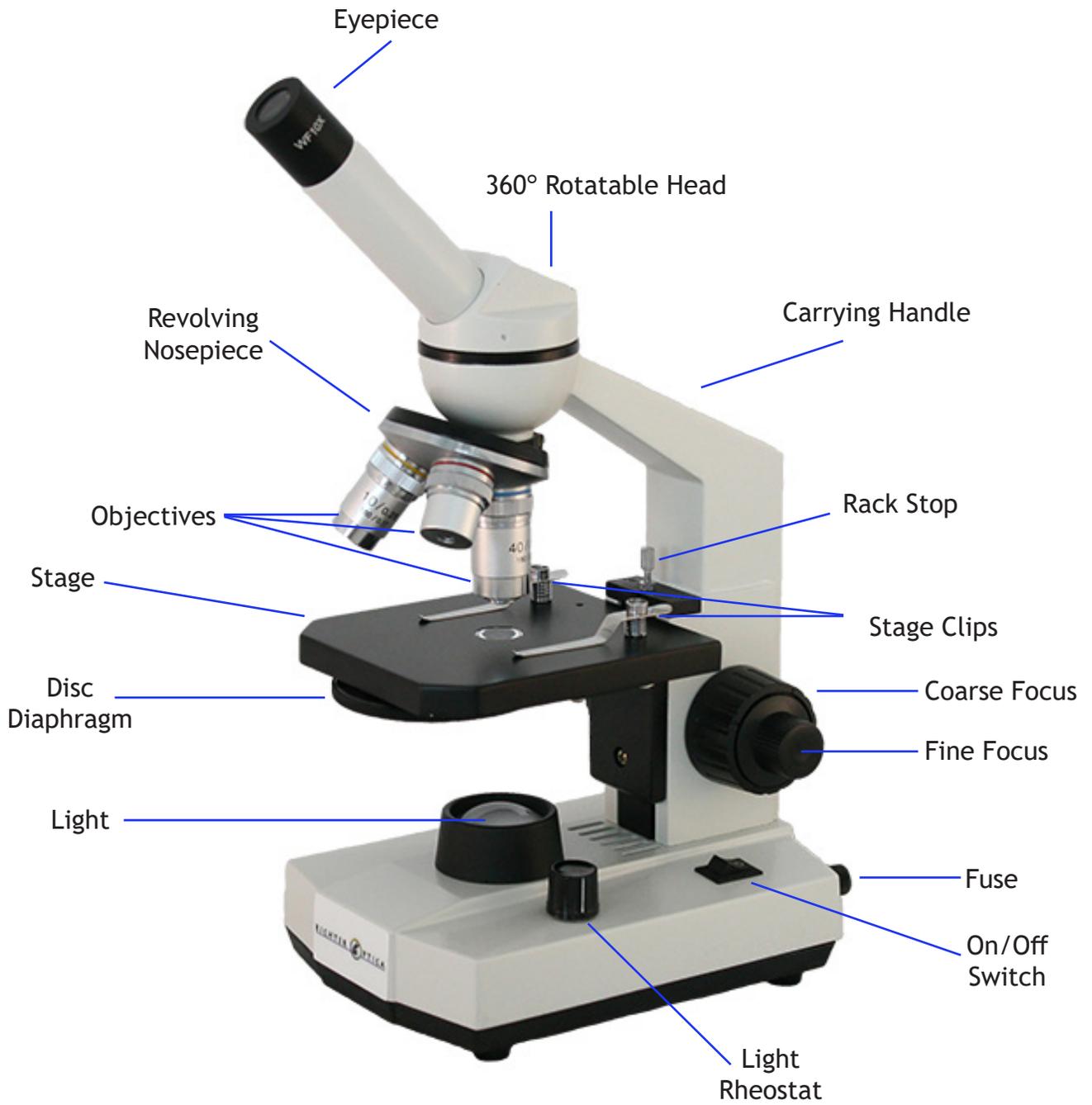
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Richter Optica

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Instructions for Model:  
MDS2  
Middle School Microscope



Thank you for your purchase of a Richter Optica microscope. The information in this manual is provided to answer most questions that can arise when operating your microscope and to help you avoid unnecessary maintenance expenses in the future.

Please carefully read instructions before operating microscope. Nomenclature used to describe components and controls are identified on opposite page.

## UNPACKING

Do not discard styrofoam container or packing materials until you are sure shipment is complete and undamaged (retain styrofoam shipping container to store your microscope when it is not in use). Remove all tape and packing material used to protect microscope during shipment. Make certain lens surfaces do not come in contact with dirt, fingerprints or oil. Damage of lens surfaces occur when they come in contact with such contaminants, and image quality is reduced.

## BEFORE USE

When moving the microscope, use both hands and only lay on flat, even surfaces. Damage will occur by holding the stage, focusing knobs or head when moving the microscope.

For safety, make sure the power switch is always turned to the off position “O” before replacing the bulb or fuse and wait until both the bulb and bulb holder have cooled down.

Replacement bulb: Single 3w LED bulb. Part # U2-001.

## SETTING UP THE INSTRUMENT

Avoid placing the instrument in locations exposed to direct sunlight, dust, vibration, high humidity and where it is difficult to unplug the power supply cord.

## MAINTENANCE

1. Wipe lenses only with lens paper.
2. Never disassemble the microscope other than to change the bulb (instructions on page 6). Disassembling the microscope will affect performance and void warranty.
3. Cover microscope with dust cover provided after each use.

## ASSEMBLING THE MICROSCOPE

1. **EYEPIECE:**  
Remove the cap from the eyetube and insert the 10x eyepiece into the eyetube.
2. **POWER CORD:**  
Connect the power cord to the wall outlet (110-240V).
3. **ADJUST ILLUMINATION:**  
Turn the main power switch to the on position. Adjust the light intensity by rotating the rheostat control knob.

## GETTING STARTED

1. **Coarse & Fine Focusing**  
Focusing is performed with the coarse and fine focus knobs located on the left and right of the microscope stand. The direction of vertical movement of the stage corresponds to the direction the focus knobs are turned.  
  
Never attempt either of the following actions, since doing so will damage the focusing mechanism:
  - Rotating the left or right knob while holding the other stationary.
  - Turning the coarse and fine focus knobs further than their limit.
2. **Using the Optional Mechanical Stage**  
Remove the stage clips using a screw driver. Place the pins of the mechanical stage into the slots on the stage and screw the center screw into the microscope stage. Push the silver finger of the specimen holder away from you and place the slide into the holder while holding it open. Once the slide is in place release the silver finger lever. Use the X and Y axis adjustment knobs to maneuver the slide into the proper position where it is centered above the light source.
3. **Adjust Focusing**  
Shift the 4x objective into the light path until it clicks into position.  
Rotate the coarse focusing knob until the image is clear in the field of view.  
Rotate the fine focus knob to achieve a finely focused image.
4. **Adjusting the Disc Diaphragm**  
The disc diaphragm has 5 different sized holes in it to allow light through. Use the largest hole to let the most light through when using the 4x (lowest) magnification objective. Use the smallest disc diaphragm hole when using the 40x (highest) objective. Use the mid range size holes when using the 10x objective lens.

## TROUBLESHOOTING: Optical

PROBLEM	POSSIBLE CAUSE
Dust or dirt in field of view.	Dust or dirt on objective, illuminator or eyepiece.
Poor image (low contrast or resolution)	Disc diaphragm is not set properly.
	No cover glass in place.
	Too thick or thin cover glass being used.
	Greasy residue on eyepiece or lens.
Uneven Focus	Illumination is set too low.
	Mechanical stage is not fixed securely to stage.
	Specimen is not secured in position under stage clips.
Focusing is not possible with high magnification objective lens.	Specimen is tilted on the stage.
	Slide is upside down.
High magnification objective (40x) strikes the specimen when changing from low to high magnification.	Cover glass is too thick.
	Slide is upside down.
	Cover glass is too thick.
Eye strain or fatigue.	Rack stop needs to be adjusted.
	Illumination needs to be adjusted with disc diaphragm and/or rheostat control.

## TROUBLESHOOTING: Electrical

PROBLEM	POSSIBLE CAUSE
Lamp does not turn on and light up.	Power cord not plugged in.
	Light is burned out.
	Fuse is burned out.
Inadequate brightness.	Rheostat knob needs adjustment.
Lamp blows out immediately.	Incorrect bulb being used.
Lamp flickers.	Connector wires are not secured.
	Lamp near end of life.
	Lamp not securely plugged into socket.

## CARE AND MAINTENANCE

### Do Not Disassemble

1. Disassembly may significantly affect the performance of the instrument, may result in electric shock or injury, and will void the warranty.
2. Never attempt to dismantle any parts other than described in this manual. If you notice any malfunction, contact your Richter Optica representative.

### Cleaning the Microscope

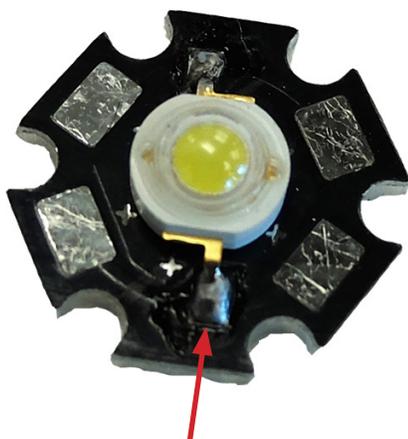
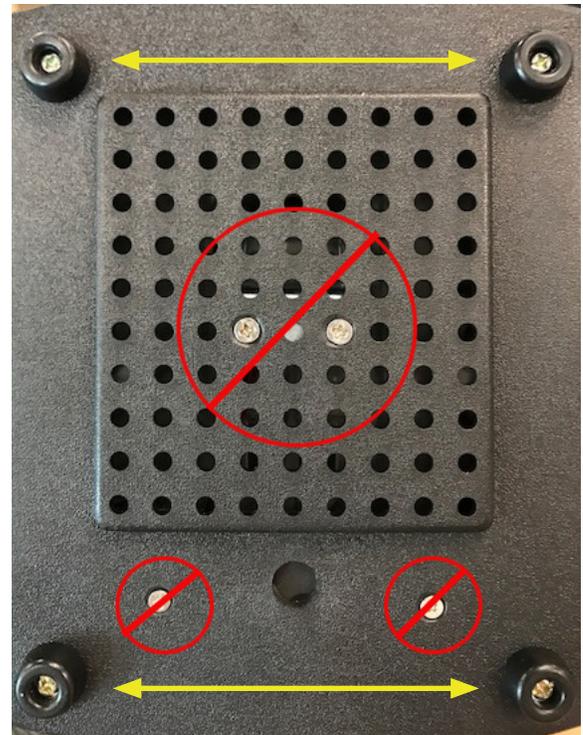
1. Do not use organic solvents such as ether, alcohol or paint thinner on painted surfaces or plastic components. Doing so could result in discoloration of surfaces.
2. When cleaning lenses do not use any solvents other than absolute alcohol, as they may damage lens bonding cement.
3. Do not use petroleum benzene when cleaning components such as lenses.
4. Absolute alcohol and petroleum benzene are highly flammable. Keep away from open flames and when turning power switch on and off.
5. For stubborn dirt, dampen a piece of gauze with diluted neutral detergent and wipe gently.

### When Not In Use

1. When not in use, cover the instrument with a dust cover and store in a place low in humidity where mold is not likely to form.
2. Proper handling of the microscope will ensure years of trouble free service.
3. If repair becomes necessary, please contact Richter Optica at [info@richter-optica.com](mailto:info@richter-optica.com).

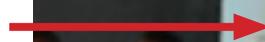
## LED Light Bulb Replacement

1. Unplug the microscope.
2. Unscrew the 4 screws in the corners of the bottom of the base plate. The screws are holding rubber feet onto the microscope. (See image at right).
3. When opening the base take care as wires will be connected to the microscope frame and pulling the frame too far from the base could disconnect wires.
4. The LED bulb has 2 wires soldered to it: a black wire and a red wire.
5. Unscrew the bulb from its base and remove the soldered wires.
6. Take the new bulb and located the “+” symbol next to the bulb joint (see image below).
7. Solder the red wire to the silver joint next to the “+” symbol.
8. Solder the black wire to one of the rectangular silver positions next to a “-” symbol.
9. Screw the bulb back into place.
10. Replace the base plate and screw the rubber feed back on.



Red wire solders to this joint next to the “+” symbol.

Red Wire



Black Wire

