



**NATIONAL
GEOGRAPHIC**

8+
80-30640
EN



40X-640X MICROSCOPE

ZOOM MICROSCOPE KIT WITH
SMARTPHONE ADAPTER

INSTRUCTION MANUAL

 **WARNING:**
FUNCTIONAL SHARP POINT – Not for children
under 3 years.

 **WARNING:**
CHOKING HAZARD – Small parts.
Not for children under 3 years.

 **WARNING:**
The lens contains lead that may be harmful.
Wash hands after touching.

 **WARNING:**
This product can expose you to chemicals including lead,
which is known to the State of California to cause cancer
and birth defects or other reproductive harm. For more
information go to www.P65Warnings.ca.gov.

AA
x2
INCLUDED
1.5V

Do not mix old and new batteries.
Do not mix alkaline, standard (carbon-zinc), or
rechargeable (ni-cad, ni-mh, etc.) batteries.
Non-rechargeable batteries are not to be recharged.
Please recycle batteries responsibly.



IMPORTANT SAFETY INSTRUCTIONS


READ AND FOLLOW THE INSTRUCTIONS BEFORE USE.
KEEP THESE INSTRUCTIONS FOR LATER USE.

• **THIS MICROSCOPE SET IS INTENDED FOR CHILDREN OLDER THAN AGE 7.** CHILDREN SHOULD ONLY USE THIS DEVICE UNDER ADULT SUPERVISION. NEVER LEAVE A CHILD UNSUPERVISED WITH THIS DEVICE. ACCESSORIES IN THE EXPERIMENT KIT MAY HAVE SHARP EDGES AND TIPS. PLEASE STORE THE DEVICE AND ALL OF ITS ACCESSORIES AND AIDS OUT OF THE REACH OF YOUNG CHILDREN WHEN NOT BEING USED DUE TO A RISK OF INJURY.

• **CHEMICALS:** ANY CHEMICALS AND LIQUIDS USED IN CONJUNCTION WITH THE DEVICE SHOULD BE KEPT OUT OF REACH OF CHILDREN. DO NOT DRINK ANY OF THE CHEMICALS CONTAINED IN THIS SET. HANDS SHOULD BE WASHED THOROUGHLY UNDER RUNNING WATER AFTER WORKING WITH THESE CHEMICALS. IN CASE OF ACCIDENTAL CONTACT WITH EYES OR MOUTH, RINSE THE AFFECTED AREA WITH WATER. SEEK MEDICAL TREATMENT FOR AILMENTS ARISING FROM CONTACT WITH THE CHEMICAL SUBSTANCE, AND TAKE THE CHEMICALS WITH YOU TO THE DOCTOR.



• **CHOKING HAZARD:** CHILDREN SHOULD ONLY USE DEVICE UNDER ADULT SUPERVISION. KEEP PACKAGING MATERIALS LIKE PLASTIC BAGS AND RUBBER BANDS OUT OF THE REACH OF CHILDREN AS THESE MATERIALS POSE A CHOKING HAZARD.

 **BATTERY GUIDELINES:** THIS DEVICE CONTAINS ELECTRONIC COMPONENTS THAT ARE POWERED BY BATTERIES. BATTERIES SHOULD BE KEPT OUT OF CHILDREN'S REACH. WHEN INSERTING BATTERIES, PLEASE ENSURE THE POLARITY IS CORRECT. INSERT THE BATTERIES ACCORDING TO THE DISPLAYED +/- INFORMATION. NEVER MIX OLD AND NEW BATTERIES. REPLACE ALL BATTERIES AT THE SAME TIME. NEVER MIX ALKALINE, STANDARD CARBON-ZINC AND RECHARGEABLE NICKEL-CADMIUM BATTERIES. NEVER SHORT CIRCUIT THE DEVICE OR BATTERIES OR THROW EITHER INTO A FIRE. LEAKING OR DAMAGED BATTERIES CAN CAUSE INJURY IF THEY COME INTO CONTACT WITH THE SKIN. IF YOU NEED TO HANDLE SUCH BATTERIES, PLEASE WEAR SUITABLE SAFETY GLOVES. REMOVE BATTERIES FROM THE PRODUCT BEFORE EXTENDED STORAGE TO PREVENT LEAKING. DO NOT IMMERSE THE BATTERY COMPARTMENT IN WATER. NON-RECHARGEABLE BATTERIES ARE NOT TO BE RECHARGED. RECHARGEABLE BATTERIES ARE TO BE REMOVED FROM THE TOY BEFORE BEING CHARGED. RECHARGEABLE BATTERIES ARE ONLY TO BE CHARGED UNDER ADULT SUPERVISION. EXHAUSTED BATTERIES ARE TO BE REMOVED FROM TOY. THE SUPPLY TERMINALS ARE NOT TO BE SHORT-CIRCUITED. PLEASE RECYCLE BATTERIES RESPONSIBLY.

• **RISK OF FIRE:** DO NOT PLACE DEVICE, PARTICULARLY THE LENSES, IN DIRECT SUNLIGHT. THE CONCENTRATION OF LIGHT RAYS COULD CAUSE A FIRE.

• **DO NOT DISASSEMBLE THIS DEVICE.** IN THE EVENT OF A DEFECT, PLEASE CONTACT YOUR DEALER. THE DEALER WILL CONTACT THE CUSTOMER SERVICE DEPARTMENT AND CAN SEND THE DEVICE IN TO BE REPAIRED IF NECESSARY.

• **DO NOT SUBJECT THE DEVICE TO TEMPERATURES EXCEEDING 60 °C (140 °F).**



• **DISPOSAL:** KEEP PACKAGING MATERIALS, LIKE PLASTIC BAGS AND RUBBER BANDS, AWAY FROM CHILDREN AS THEY POSE A RISK OF SUFFOCATION. DISPOSE OF PACKAGING MATERIALS AS LEGALLY REQUIRED. CONSULT THE LOCAL AUTHORITY ON THE MATTER IF NECESSARY AND RECYCLE MATERIALS WHEN POSSIBLE.



• THE WEEE SYMBOL IF PRESENT INDICATES THAT THIS ITEM CONTAINS ELECTRICAL OR ELECTRONIC COMPONENTS WHICH MUST BE COLLECTED AND DISPOSED OF SEPARATELY.

• NEVER DISPOSE OF ELECTRICAL OR ELECTRONIC WASTE IN GENERAL MUNICIPAL WASTE. COLLECT AND DISPOSE OF SUCH WASTE SEPARATELY.

• MAKE USE OF THE RETURN AND COLLECTION SYSTEMS AVAILABLE TO YOU, OR YOUR LOCAL RECYCLING PROGRAM. CONTACT YOUR LOCAL AUTHORITY OR PLACE OF PURCHASE TO FIND OUT WHAT SCHEMES ARE AVAILABLE.

• ELECTRICAL AND ELECTRONIC EQUIPMENT CONTAINS HAZARDOUS SUBSTANCE WHICH, WHEN DISPOSED OF INCORRECTLY, MAY LEAK INTO THE GROUND. THIS CAN CONTRIBUTE TO SOIL AND WATER POLLUTION WHICH IS HAZARDOUS TO HUMAN HEALTH, AND ENDANGER WILDLIFE.

• IT IS ESSENTIAL THAT CONSUMERS LOOK TO RE-USE OR RECYCLE ELECTRICAL OR ELECTRONIC WASTE TO AVOID IT GOING TO LANDFILL SITES OR INCINERATION WITHOUT TREATMENT.

What's Included:



Parts Overview

- 1) Zoom eyepiece
- 2) Focus knob
- 3) Stage
- 4) Metal stage clips
- 5) Color Filter wheel
- 6) 4x, 10x, 40x objectives
- 7) Objective turret
- 8) LED illumination
- 9) Base with battery compartment
- 10) Microscope arm

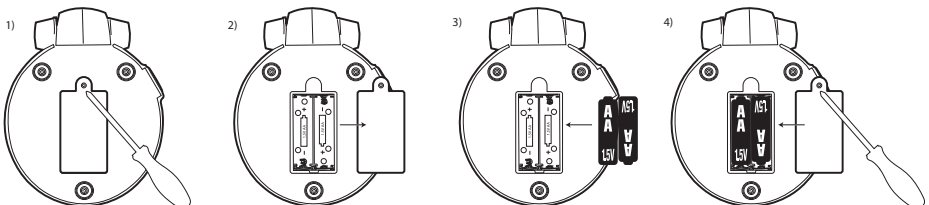
Additional Contents:

- 11) 3 Prepared Slides
- 12) 8 Blank Slides
- 13) 8 Slide Covers
- 14) 3 Specimen Vials
- 15) Graduated Cylinder
- 16) Pipette
- 17) Tweezers
- 18) Magnifying Glass
- 19) Round Cutter
- 20) Hatchery
- 21) Yeast
- 22) Brine Shrimp Eggs
- 23) Smartphone Adapter
- 24) Rubber Eyepiece Cup

How Do I Use My Microscope?

Before you use your microscope, make sure that the table, desk or whatever surface that you want to place it on is stable, and is not subject to vibration. If the microscope does need to be moved handle the microscope by the arm and base while carefully transferring it.

Install two "AA" batteries (included) in the battery box, located in the base of the microscope. Open battery door and insert the batteries according to the displayed +/- information. Close the battery compartment door.



Once the microscope is in a suitable location and the batteries are installed, check the light source to make sure that it illuminates. Use a cleaning cloth (e.g., microfiber) to gently wipe the lenses off. If the stage is dirty with dust or oil, carefully clean it off. Make sure that the stage is raised and lowered only by using the focus adjustment knob.

How Do I Operate the LED Illumination?

Locate the ON/OFF switch on the base of the microscope. Flip the switch to the on position and the light will illuminate. This microscope is equipped with modern LED lighting (a light-emitting diode) that illuminates the specimen from below. The aperture wheel is located in the middle of the microscope stage. They help you when you are observing very bright or clear specimens. Using these filters, you can choose from various brightness levels. This helps you better recognize the components of colorless or transparent objects (e.g., grains of starch, protozoa).

How Do I Adjust My Microscope Correctly?

Place in a suitable location as described previously and sit in a comfortable viewing position. Each observation starts with the lowest magnification. Adjust the microscope stage so that the stage is at the lowest position. Then turn the objective turret until it clicks into place at the lowest magnification (objective 4x). **Note:** Before you change the objective setting, always move the microscope stage to its lowest position. This way, you can avoid causing any damage to the slide or microscope. Make sure the zoom eyepiece is also in the fully lowered position.

Magnification Guide		
Zoom Eyepiece	Objective	Power
10-16x	4x	40-64x
10-16x	10x	100-160x
10-16x	40x	400-640x

Note: The highest magnification is not always the best for every specimen.

How do I observe the specimen?

Sitting in your location with adequate illumination chosen from the aperture filter wheel, the following basic rules are to be observed: Start with a simple observation at the lowest magnification. This way, it is easier to position the object in the middle (centering) and make the image sharp (focusing). The higher the magnification, the more light you will require for good image quality.

Quick Fact - The item you want to observe with the microscope is known as the object or specimen.

Now place the prepared slide directly under the objective on the microscope stage securing with the stage clips. The object/specimen should be located directly over the illumination. At this point, take a look through the eyepiece and carefully turn the focus knob until the image appears clear and sharp. Now you can select a higher magnification by slowly turning the zoom eyepiece. When the zoom lens is completely turned out, the magnification is increased by 62%. If you would like an even higher level of magnification, turn the objective turret to a higher setting (10x or 40x).

Note: You should return the zoom to lowest power of magnification.

Note: You should always lower the stage and return the zoom to lowest power when rotating the objective turret.

Each time the magnification changes (eyepiece or objective change), the image sharpness must be readjusted with the focus knob. When doing this, make sure to be careful; if you move the microscope stage too quickly, the objective and the slide could come into contact and cause damage to the slide or the microscope.

For transparent objects (e.g., protozoa), the light shines from below, through the opening in the microscope stage and then through the object. The light travels further through the objective and eyepiece, where it is also magnified, and finally goes into the eye. This is transmitted light microscopy. Many microorganisms in water, many plant components and the smallest animal parts are already transparent in nature. Opaque specimens, on the other hand, will need to be prepared for viewing. Opaque specimens can be made transparent by a process of treatment and penetration with the correct materials (media), or by slicing. You can read more about creating specimens in the following sections.

Cleaning Tips

To ensure your microscope has a long service life, clean the lens (objective and eyepiece) only with a soft lint free cloth (e.g., microfiber). Do not press hard as this might scratch the lens. Ask your parents to help if your microscope is really dirty. The cleaning cloth should be moistened with cleaning fluid and the lens wiped clean using very little pressure. Make sure your microscope is always protected against dust and dirt. After use, leave it in a warm room to dry off.

This microscope can be the gateway to a fun, creative, learning process and will open the door to advanced knowledge of the world around you. It allows you to explore the various fields of science from Biology to Botany to Chemistry and beyond, so have fun exploring the exciting world of science.

Troubleshooting Guide:

Problem	Solution
No recognizable image	Turn on light Readjust focus Start with the lowest power objective (4x) & lowest power eyepiece (10x)
No image	Center object on slide Start with the lowest power objective (4x) & lowest power eyepiece (10x)
No light	Replace batteries Check ON/OFF position

Using The Smartphone Adapter: SUPERVISION BY ADULTS

Read and follow the instructions, safety rules and first aid information

The Smartphone Adapter will allow you to connect almost any “smart” device to a 1.25” eyepiece.

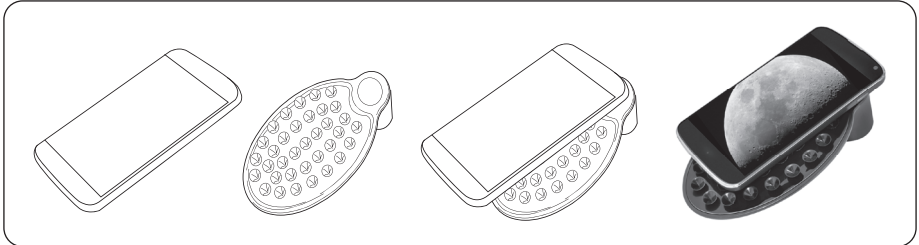
To use the adapter, place it directly onto the selected eyepiece and secure it by tightening the set screw until snug.

Be careful not to overtighten because this could damage the adapter and/or the eyepiece.

The camera lens on your smart device will need to be centered over the eyepiece. This alignment is best done by opening the camera function and viewing the image while you center the device. Once you have positioned the device correctly, carefully press it onto the suction cup/non-skid surface of the adapter pad. Never allow the adapter pad to hold your device without you supporting the item as well.

The point at which you secure the eyepiece/adapter combination into the diagonal/focuser depends largely on the dimensions of your device. For smaller devices like smart phones, it may be easier to secure it to the eyepiece/adapter combination before inserting the entire unit into the diagonal on the telescope. For larger devices, such as tablets, it may be easier to secure the eyepiece/adapter combination into the diagonal, and then align and attach your device.

After positioning your device and capturing images, you can enhance and edit the photos using the imaging software of your choice. One option can be found at <https://www.getpaint.net/>.



WARNING: Do not leave your device unsupported or unattended on the adapter pad.

Though the surface of the adapter pad is designed with suction cups and is non-skid, the manufacturer cannot assure that the pad will support the weight of various devices or guarantee that it will adhere to all surfaces on various smart devices. The pad is not intended to secure, balance or support the device on its own, and the operator should not let the device rest solely on the adapter pad. Leaving the device unattended or allowing it to balance on its own without operator support may result in the device falling, unbalancing the entire instrument and possibly damaging the telescope or your smart device.

CHEMICALS

Any chemicals and liquids used in preparing, using, or cleaning should be kept out of reach of children. Do not drink any chemicals. Hands should be washed thoroughly under running water after use. In case of accidental contact with the eyes or mouth rinse with water. Seek medical treatment for ailments arising from contact with the chemical substances and take the chemicals with you to the doctor.

Keep packaging materials (plastic bags, rubber bands, etc.) away from children. There is a risk of

SUFFOCATION.

Dispose of packaging materials as legally required. Consult the local authority on the matter if necessary.

DISPOSAL

Dispose of the packaging materials properly, according to their type, such as paper or cardboard. Contact your local waste-disposal service or environmental authority for information on the proper disposal. Please take the current legal regulations into account when disposing of your device. You can get more information on the proper disposal from your local waste-disposal service or environmental authority.

Notes:



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