



# 40X-1600X MICROSCOPE

WITH USB EYEPIECE &  
SMARTPHONE ADAPTER

## INSTRUCTION MANUAL



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.



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



**WARNING:**  
**FUNCTIONAL SHARP POINT** – 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](http://www.P65Warnings.ca.gov).

**⚠ 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 11.** 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.

**Available Downloads Visit:**

[www.esmanuals.com](http://www.esmanuals.com)



## What's Included:



### Parts Overview

- 1) Eyepieces: WF10x / WF20x
- 2) Barlow Lens: 2x
- 3) Eyepiece Holder
- 4) Microscope Head
- 5) Set Screw
- 6) Objective Revolver
- 7) Objectives: 4x, 10x, 40x
- 8) Clips
- 9) Stage
- 10) Filter wheel with pinhole aperture
- 11) Illumination: Incident light (from above)
- 12) Illumination: Transmitted light (from below)
- 13) Focus Knob
- 14) Rotary Switch (on/off and transmitted/incident light)
- 15) Dimmer
- 16) Microscope Base
- 17) Battery compartment and locking screw (not shown)
- 18) Blank and prepared slides
- 19) Brine shrimp eggs, Yeast, Sea salt vials & 2 empty vials
- 20) Tweezers, Needle, Pipette, Scalpel, Shrimp Hatchery
- 21) Smartphone adapter
- 22) USB eyepiece

Congratulations! You've chosen one of the highest quality microscopes available for young explorers. Read the following instructions carefully to get the greatest benefit from your precision instrument. Then try out the experiments to begin your investigation of the fascinating world around you.

### What is a microscope?

A microscope contains 2 lens systems: the eyepiece and the objective. We're presenting this system as one lens each so that the concept is easier to understand. In reality, however, the eyepiece (1) and the objective in the revolver (6) are made up of multiple lenses.

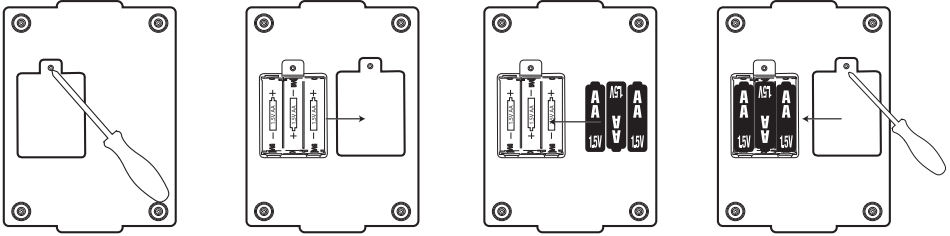
The lower lens (objective) produces a magnified image of the prepared specimen. The picture, which you can't see, is magnified once more by the second lens (eyepiece), which you can see as the "microscope picture".

### Location

Before you set up your microscope, it's important that you choose a spot with enough light for normal observation. Furthermore, you must make sure that your microscope is on a stable and solid surface, because a shaky surface will not lead to satisfactory results.

### Installing batteries

The battery compartment (17) is located at the bottom of the microscope. Loosen the locking screw of the battery compartment cover first with a screwdriver. Remove the cover. Insert three "AA" batteries.



Make sure that the polarities of the batteries are in the correct position as marked on the inner side of the battery compartment. Re-insert the battery compartment cover and tighten the locking screw, only hand-tight to avoid any damage of the cover.

### Electric illumination (11, 12)

The microscope is equipped with a battery-powered LED illumination. Therefore, the usage with an off-grid power supply (e.g. outside) is possible.

This microscope features both transmitted light and incident light, so that both transparent specimens and non-transparent specimens can be examined. If opaque specimens are being examined, the light from below goes through the specimen, lens and eyepiece to the eye and is magnified enroute.

Some small water organisms, plant parts and animal components are transparent by nature, but many others require pretreatment – that is, you need to make a thinnest possible slice of the object by hand cutting or using a microtome, and then examine this sample.

On/Off switch and Incident/Transmitted light switch are combined in a rotary switch (14). To power on the device, turn the rotary switch (14) to number "I" hearing the first "click", transmitted light (12) on; number "II" the second "click", incident light (11) on; and number "III" the third "click", both transmitted and incident light on.

How to select the right illumination regarding different objects? Transmitted light for transparent objects, incident light for non-transparent objects; and combination of transmitted and incident light for semi-transparent objects.

### NOTE!

**Do not operate the microscope with maximum brightness over a longer time. This will reduce the LED lifetime.**

### Observation

You begin each observation with the lowest magnification (eyepiece WF10x and objective 4x). So, the object to be viewed can easily be centered and properly focused. The higher the magnification the more light is required for good image quality.

Turn the objective revolver (6) onto the smallest magnification (4x) and insert the WF 10x eyepiece.

Place a preparation right above the transmission aperture on the microscope stage and fix it with the clips.

Look through the eyepiece, you can see the magnified preparation.

At this point, you might still see a blurry picture. Adjust the focus knob slowly and carefully until the image becomes visible and optimal sharpness is achieved.

You can now select a higher magnification by using Barlow lens 2x (2), the WF20x eyepiece or turning the objective revolver to choose the higher 10x to 40x. Insert the eyepiece into the barlow lens, then place the barlow lens all the way into the eyepiece holder (3), and make sure it is not pulled out.

When you do so, please note that the sharpness must be adjusted again for the higher magnification. Also, the higher magnification, the more light is required for good illumination of the picture.

The filter wheel with pinhole aperture (10) below the microscope stage (9) will help you viewing very bright or clear-sighted preparations. Turn the wheel till the best contrast is achieved.

**NOTE!**

**Make sure that you never over-tighten the focus knob. Always move the stage to the lowest position before changing the objective setting to avoid any damage!**

**IMPORTANT TIP: The highest magnification is not always the best for every specimen!**

**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.

**Storage**

Store the microscope properly when not using it and keep it in a dry and fungus-free place. In the case of non-use for a long time, you should stow the microscope and the accessories in their correct containers again. We suggest the storage of all objectives and eyepieces in a closed container with drying agent. Remove the batteries from the unit if it is not used for a long time. A well maintained microscope will keep its optical quality for years and thus maintain its value.

**Calculating the magnification:**

**Formula:**

Eyeiece magnification x Objective magnification x Barlow lens magnification = Total magnification

**Example:**

10x (eyepiece) x 4x (objective) x 2x (barlow lens) = 80x total magnification

Magnification Guide			
Eyeiece	Objective	Power	2x Barlow Lens
10x/20x	4x	10x/80x	20x-160x
10x/20x	10x	100x/200x	200x-400x
10x/20x	40x	400x/800x	800x-1600x

### Using The Smartphone Adapter:

#### **SUPERVISION BY ADULTS**

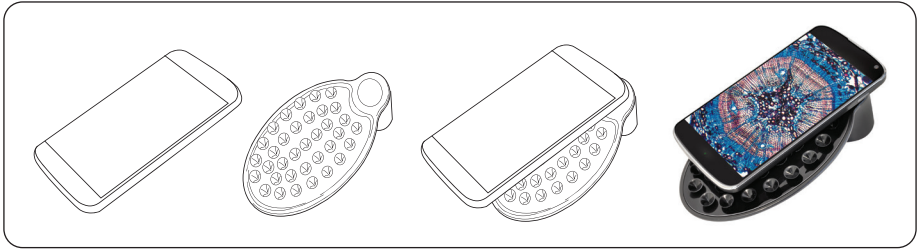
#### **Read and follow the instructions, safety rules and first aid information**

The smartphone adapter will allow you to connect almost any “smart” device to a microscope eyepiece.

To use the adapter, slide it directly onto the microscope eyepiece.

The camera lens on your smart device will need to be centered over the small hole in the center of the eyepiece connector. 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.

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.

## Installation and usage of the software

### Installing the software

You find the capturing software for Win 7 / 8.1 / 10 on the CD. Double click on the exe file and follow the instructions in the installation manager. **NOTE:** It is not necessary to install a specific driver. The camera will be recognized automatically from suitable Windows operating systems.

### Capturing images

Connect the camera to a USB port on your computer. Start the software “CamLabLite” and activate the MikrOkularHD in the camera list of the software. Switch on the microscope and place a sample with good contrast on the microscope stage. Look through the eyepiece and use the lowest magnification to focus on the sample. Now insert the camera as described above. Normally only slight re- focussing is needed to see a sharp image of your sample in the software preview. The software preview will always show the full frame of view. **NOTE:** The camera will show a smaller field of view as can be seen in the eyepiece, which is normal. Maybe choose a different magnification on the microscope to adjust the field of view of the camera.

You can save images and video by clicking on the button “Snap” (single image) or “record” (Video) respectively. The folder to save files and the language settings of the software can be adjusted. Click the button to enter the options menu. Choose the resolution of the camera from the “Live” dropdown menu. The resolution of the capture will be adjusted accordingly. The brightness of the image will be adjusted automatically. For best results adjust the microscope illumination to maximum brightness. To adjust the exposure time individually, remove the tick mark from “Auto Exposure” and choose a different exposure time from “Exposure target”.

For a good result you can adjust further values from the menu “Color Adjustment”. Depending on the exact model of your camera, certain menu points in the software might be inactive if not supported by the camera hardware.

### Using the USB eyepiece

#### Preparation

1. Slide a specimen under your microscope and focus on it.
2. Remove the eyepiece from the eyepiece holder (3) and the dust cap from your USB eyepiece (22) and insert it in the eyepiece holder (3). **NOTE:** The USB eyepiece is not intended to be used with the Barlow Lens.
3. Start your PC if you haven't yet and connect your USB eyepiece to a USB port of your computer.

#### System requirements (PC Ocular)

PC with dual core processor (2.8 GHz minimum) or higher; Operating system Windows 7/8/10; 4 GB RAM minimum; 2 GB free HDD space minimum; free USB 2.0 port; CD/DVD drive.



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