

 **Discovery™**

AGES  
**10+**

# INSTRUCTION MANUAL



**Biological Microscope**  
1200x Magnification Microscope

**A x2**  
**NOT INCLUDED**

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



## Introduction

**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.

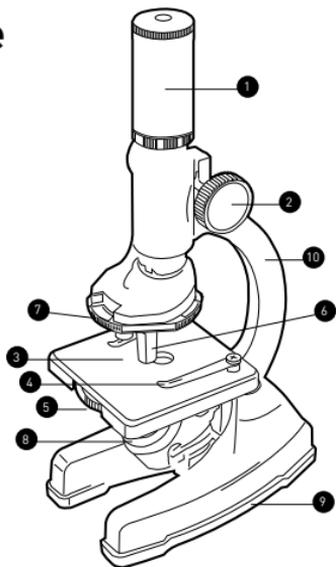
## Microscope Parts

- 1 Eyepiece
- 2 Focus Knob
- 3 Stage
- 4 Metal Stage Clips
- 5 Colour Filter Wheel
- 6 Objective
- 7 Objective Turret (15x, 30x, 60x)
- 8 Illumination On/Off Switch and Mirror
- 9 Rubber Base and Battery Case
- 10 Microscope Arm

## Additional Contents:

- 11 (5) Prepared Slides and (10) Blank Slides
- 12 (10) Extra Blank Slides
- 13 (10) Slide Covers/Labels
- 14 (5) Collection Vials
- 15 Petri Dish
- 16 Macro Viewer
- 17\* Tweezers/Scissors/Needle/Stirring Rod/Scalpel/Pipette
- 18 Magnifying Glass
- 19 Graduated Cylinders
- 20 Specimen Slicer
- 21 Shrimp Hatchery
- 22 Textile Fibres Vial
- 23 Yeast Vial
- 24 Sea Salt Vial
- 25 Blue Dye Vial

# 1200x Microscope



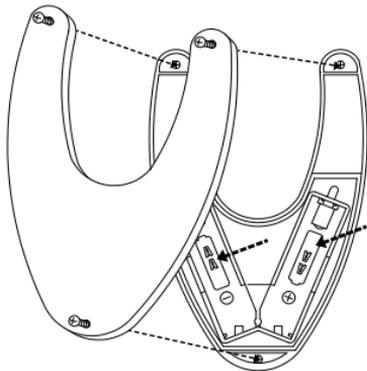
**\*Warning!**

Not suitable for children under 3 years of age. Contains functional sharp points.

# INSTRUCTION MANUAL

## How do I use my microscope?

Before you use your microscope, make sure that the table, desk, or surface that you place it on is stable and is not subject to vibration. If the microscope needs to be moved, hold it by the arm and base while carefully transferring it. 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 microfibre cleaning cloth to gently wipe the lenses off. If the stage is dirty with dust or oil, carefully clean it off. Make sure that you only raise and lower the stage using the focus adjustment knob.



## How do I operate the illumination?

Locate the mirror/light on the base of the microscope. Flip the mirror/light to the “on” position (with the light facing up) and the light will illuminate. This microscope is equipped with an incandescent light that illuminates the specimen from below. The colour filter wheel is located in the middle of the microscope stage. The filters help you when you are observing very bright or clear specimens. Using these filters, you can choose various brightness levels and colours. This helps you better recognize the components of colourless or transparent objects (e.g. sea salt).

## How do I adjust my microscope correctly?

Place the microscope in a suitable location as described above, and sit in a comfortable viewing position. Always start each observation with the lowest magnification. Adjust the distance of the microscope stage so that the stage is in the lowest position, farthest away from the turret head. Turn the objective turret until it clicks into place at the lowest magnification (Objective 15x / 300x). Note: Before you change the objective setting, always make sure the microscope stage is farthest away from turret by rotating the focus knob. Separating the stage and turret by rotating the focus knob will avoid causing damage to the specimen slide or microscope. When starting an observation, always start with the 15x / 300x objective in the rotating head.

### Did you know?

The highest magnification is not always the best for every specimen!

Magnification Guide		
Eyepiece	Objective	Power
20x	15x	300x
20x	30x	600x
20x	60x	1200x

### How do I observe the specimen?

Sitting in your location with adequate illumination chosen from the colour filter wheel, the following basic rules should be observed: Start with a simple observation at the lowest magnification. Position the object or specimen in the middle of the stage under the stage clips, centred over the lower light. Focus the image by rotating the focus knob until a clear image appears in the eyepiece.

Place the prepared slide directly under the objective on the microscope stage, and secure it with the stage clips. The prepared slide should be located directly over the lower illumination. 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 rotating to the 30x/600x objective turret. Higher levels of magnification can be achieved by turning the objective turret to a higher setting (600x or 1200x). Following this procedure creates a steady increase of magnification without overpowering the view of the object. The following magnifications should be considered: 300x, 600x, then 1200x. Each time the magnification changes [due to the objective change], the image sharpness must be readjusted with the focus knob. When doing this, be careful because if you move the microscope stage too quickly, the objective and the slide could come into contact and cause damage to the slide or microscope.

Troubleshooting Table	
Problem	Solution
No recognizable image	<ul style="list-style-type: none"><li>• Turn on light</li><li>• Readjust focus</li><li>• Start with the lowest power objective (15x)</li></ul>
No image	<ul style="list-style-type: none"><li>• Centre object on slide under lowest power objective (15x)</li></ul>
No light	<ul style="list-style-type: none"><li>• Replace batteries</li><li>• Check on/off position</li></ul>

For transparent objects (e.g. sea salt), light is projected by the lower light traveling from below the stage, through the objective and eyepiece, and finally into your eye. This process of light transmission is known as microscopy. Many micro-organisms found in water, plant components, and the smallest animal parts are 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 Microscope **E-5** Experiments booklet.

## **CLEANING TIPS**

To ensure your microscope has a long service life, clean the lens (objective and eyepiece) with only a soft, lint-free cloth, like a microfibre cloth. Do not press down too hard while cleaning, 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.

## **WARNINGS AND SAFETY**

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

This microscope set is intended for children older than age 8. Children should only use this device under adult supervision. Never leave a child unsupervised with this device. Accessories in this experimental 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.

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.

## **DANGER OF FIRES AND EXPLOSIONS!**

Do not expose the device to high temperatures. Use only battery types recommended. 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. Exposure to high temperatures or misuse of the device can lead to short circuits, fires, or even explosions. 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.

## **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 substances, and take the chemicals with you to the doctor.

## RISK OF MATERIAL DAMAGE

Never take the device apart. Please consult our customer service department and send the device in for repair if needed.

Do not subject the device to temperatures exceeding 60 °C (140 °F).

## TIPS ON CLEANING

Remove batteries from device before cleaning.

## MICROSCOPE CARE

Clean the exterior of the device with a dry cloth. To avoid causing damage to electrical components, do not use cleaning fluids. Clean the lenses (objective and eyepiece) with only a soft, lint-free cloth, like a microfibre cloth. Do not use excessive pressure—this may scratch the lens. Protect the device from dust and moisture. Store the device in its original packaging. Batteries should be removed from the device if it will not be used for a long period of time.

## 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.



### 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.



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