#5F60960

M1280X

BINOCULAR VIEWER MICROSCOPE
MICROSCOPE BINOCULAIRE
MICROSCOPIO DE VISOR BINOCULAR

SCIENCE + TECHNOLOGY + ENGINEERING + MATH
STEM
TOYSRUS.COM/STEM

With bonus mobile phone attachment!

En prime, fixation pour téléphone cellulaire

Fijación para teléfono móvil de regalo

AA x3
NOT INCLUDED
NON INCLUSES
NO INCLUIDAS

8+

⚠ WARNING:
KEEP MAGNIFYING GLASS AWAY FROM DIRECT SUNLIGHT AND WINDOWS.

⚠ MISE EN GARDE:
GARDER LA LOUPE À L'ABRI DE LA LUMIÈRE ET DES FENÊTRES.

⚠ ADVERTENCIA:
LUPA DEL MANTIENE LEJOS DE LA LUZ DEL SOL Y DE WINDOWS DIRECTOS.

TOTAL NET WT. OF ACCESSORIES/POIDS NET TOTAL DU ACCESSOIRES/ PESO NETO TOTAL DEL ACCESORIOS: 4.45 OZ (126 g)

Contents:

- Microscope
- Dark-field condenser
- Cell phone adapter
- 3 Prepared glass slides
- Slide case
- 10 Blank glass slides
- 10 Slide covers
- 10 Labels
- 3 Collection vials
- Pipette
- Stainless steel tweezers
- Graduated cylinder
- Shrimp hatchery

M1280x Microscope Set

Supervision by Adults

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

This Microscope set is intented for children over the age of 8 years. 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.

Fire/Danger of Explosion!

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) or rechargable batteries. Never short circuit the device or batteries or throw into a fire. Exposure to high temperatures or misuse of the device can lead to short circuits, fire or even explosion! 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 or 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 for treatment.

RISK of material damage

Never take the device apart. Please contact our service center and send the device in for repair as needed.

Do not subject the device to temperatures exceeding 140º F.

TIPS on cleaning

Remove batteries from device before cleaning.

Microscope Care

Clean the exterior of device with a dry cloth. Do not use cleaning fluids so as to avoid causing damage to electronic components. Clean the lens (objective and eyepiece) only with a soft lint-free cloth (e.g. micro-fibre). 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 not used for a long period of time.

DISPOSAL

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

Dispose of the 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.

Warning- The lens contains lead that may be harmful. Wash hands after touching.

Product Manual Visit

www.exploreone.com/pages/product-manuals

M1280x Microscope Set

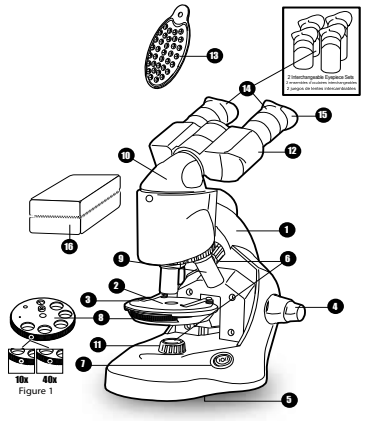
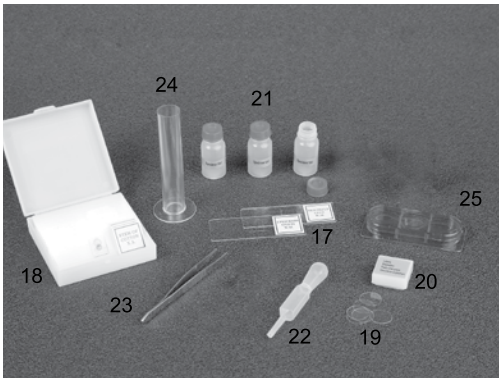


Figure 1



The Parts of Your Microscope:

1 Microscope Arm
2 Stage
3 Metal Stage Clips
4 Coarse & Fine Focus Knob
5 Base with Battery Compartment
6 Top & Bottom LED Illumination
7 3-Position Illumination Switch
8 Color Filter Wheel
9 4x, 10x, 40x Objectives
10 Revolving Eyepiece Head
11 Condenser Light
12 Adjustable Binocular Head
13 Mobile Phone Holder
14 2 Interchangeable Eyepiece Sets
15 Soft Rubber Eye Cups
16 Carrying Case

Additional Contents:

17 (3) Prepared Glass Slides
18 (10) Blank Glass Slides
19 (10) Slide Covers
20 (10) Labels
21 (3) Collection Vials
22 Pipette
23 Tweezers
24 Graduated Cylinder
25 Shrimp Hatchery

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.

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, use the arm and base for support while carefully transferring it.

Install three "AA" batteries (not included) in the battery compartment on the bottom of the microscope. Open battery door on the bottom of the microscope and insert the batteries according to the displayed +/- information. Snap-close the battery compartment door.

Once the microscope is in a suitable location and batteries installed, check the light sources to make sure that they both illuminate by toggling the light switch (Fig. 7) to the ALL position (indicated by the I,"0", and II). Use a cleaning cloth (e.g. microfiber) to gently wipe the lenses off. If the stage (Fig. 2) is dirty with dust or oil, carefully clean it off.

The stage is raised and lowered only by using the focus adjustment knob (Fig 4).

How do I operate the LED illumination?

This microscope is equipped with two modern LED lights (light-emitting diodes) that illuminate the specimen from the top and below the stage (Fig. 2) You can use different lighting techniques to illuminate objects and specimens from opaque to transparent. Locate the light switch (Fig. 7) on the base of the microscope. Toggle the switch to the first position (indicated by the I), and the lower LED light (Fig. 7) will illuminate. Move the Toggle to the second position (indicated by the 0) to turn off all illumination. Move the toggle to the final position (indicated by II), and both LED lights (Fig. 7) will illuminate.

The color filters wheel (Fig. 8) is located below the microscope stage (Fig. 2). Filter wheels help you observe very bright or clear specimens. Using these filters (red, green and blue), you can choose from various colors. The filters wheel also has three different size apertures so you can adjust the brightness levels on objects / specimens. Filter wheels help you better recognize components of colorless or transparent objects (e.g. grains of starch, protozoa). Rotating the filter wheel in combination with toggling the lower light or both lights on/off will allow you to view the object / specimen and achieve the desired effect.

In addition, the color filters wheel includes two dark scatter field filters 10x, 40x, which can be used along with the light condenser to help cover the shortage of optical energy and change the character of light, then focus of the light to the object.

How do I adjust my microscope correctly?

Place on a suitable location as described above and sit in a comfortable viewing position. This microscope includes a rotating head (Fig. 10), which allows for easy viewing in multiple positions as well as sharing with others the amazing images you have discovered with your microscope. Always start each observation with the lowest magnification. Adjust the microscope stage (Fig. 2) so that the stage is in the lowest position. Turn the objective turret (Fig. 9) until it clicks into place at the lowest magnification (Objective 4x). Note: Before you change the objective setting, always move the microscope stage (Fig. 2) to its lowest position by rotating the focus knob (Fig. 4). Lowering the stage by rotating the focus knob will avoid causing any damage to the specimen slide or microscope. When starting an observation always start with the WF 10X eyepieces (Fig. 14) in the rotating head (Fig. 10).

M1280x Microscope Set

Quick Fact *- The highest magnification is not always the best for every specimen!*

Magnification Guide (2x Bino Viewer)		
Eyepiece	**Objective**	**Power**
10x	4x	80x
10x	10x	200x
10x	40x	800x
16x	4x	128x
16x	10x	320x
16x	40x	1280x

How do I observe the specimen?

Sitting in your location with adequate illumination chosen from the color 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 (Fig. 3), centered over the lower LED light (Fig. 7). Focus the image by rotating the focus knob (Fig. 4) until a clear image appears in the binoviewer eyepiece.

NOTE: The higher the magnification, the more light you will require for a good image quality.

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

Place the prepared slide directly under the objective on the microscope stage (Fig. 2) securing with the stage clips (Fig 3). The prepared slide should be located directly over the lower illumination (Fig. 6). Look through the binoviewer eyepiece and carefully turn the focus knob (Fig. 4) until the image appears clear and sharp. Now you can select a higher magnification by changing the WF binoviewer eyepieces to the 16X (Fig. 14). When the WF 16X lenses are inserted in the barrel of the rotating head, the magnification is increased by 62%. Higher levels of magnification can be achieved by turning the objective turret (Fig. 9) to a higher setting (10x or 40x). For best results, return the WF 10x eyepieces to the lowest power of magnification before changing the power on the turret. Replacing the WF 10x eye pieces upon every rotation of the turret allows for easier transitions in magnification. Following this procedure creates a steady increase of magnification without overpowering the view of the object. The following magnifications should be considered: 80x, 128x, 200x, 320x, 800x, then 1280x.

Each time the magnification changes (due to eyepieces or objective change), the image sharpness must be readjusted with the focus knob (Fig. 4). 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.

For transparent objects (e.g. protozoa), light is projected by the lower LED light, traveling from below the stage, through the objective and eyepieces, and finally into your eye. This process of light transmission is known as microscopy. Many microorganisms 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 experiment sections.

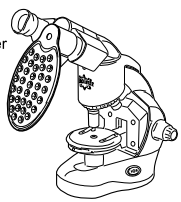
Dark field observation describes a technique of illumination using your dark scatter field filters (10x, 40x) and your light condenser that allows you to enhance the contrast of your objects / specimens. By transmitting the scattered light from your specimen and blocking all directly transmitted light, a unique visual effect is created where your object / specimen stands out against a dark, almost black, background.

How do I take photos of the specimen?

Your microscope has a special mobile phone adapter so that you can take photographs of an object / specimen. First make sure your object / specimen is in focus and at the desired magnification. Then simply remove one of the eyepieces, attach the adapter and mount your mobile phone on it so that the camera lens is pointing down through the eyepiece barrel. Focus your camera and take the picture. You can then save these photos and / or share them with your friends through email, texting or social networking.

If you have access to compatible imaging software, you can also use a method called “False Color Imaging“ to create three-color images that show your object / specimen in colors different from reality or from what you would observe in a full-color (true-color) photograph. This technique is used to help certain features of an object or specimen stand out and be more distinct, so they can be more easily observed and studied.

NOTE: For better balance (when using heavier phones) rotate head 180º from focus knobs.



Troubleshooting Table	
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

Cleaning Tips

Ensure your microscope has a long service life. Clean the lenses (objective and eyepieces) 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. Then return it to the carrying case provided.

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. Allowing 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.

Experiment Instructions

WARNING!

- Keep chemicals and corrosive liquids out of the reach of children!
- Do not ingest any chemicals!
- Wash your hands with soap thoroughly under running water after use!

Introduction

Here are a few tips about how to take a better look at the wonderful world of microorganisms and crystals. For example, you’ll learn how to prepare your object / specimen so that you can look at it with the microscope. The numerous experiments described should make you curious and want to use your microscope more.

What Kind of Objects?

With a magnifying glass, you can look at non-transparent (i.e. opaque) objects, for example, small animals, parts of plants, tissues, etc. Here, the light falls onto the object and is reflected back through the magnifying lens and into your eye. With your microscope, however, you can also observe transparent objects, in which the light from the lamp goes through the opening on the stage and the prepared

specimen. Then, it passes through the objective, the body of the microscope and through the binoviewer eyepiece into the eye. Many microorganisms in water, parts of plants and the tiniest animal parts are naturally transparent. For other things, you must make them transparent through a treatment or penetration with the right materials (media), or by taking the thinnest slices from them using your hand or a specimen slicer (not included) to be able to examine them with your microscope. You'll now find out how this is done.

How to Produce Thin Specimen Slices

WARNING:
Only do this with an adult's supervision! Ask your parents to help you! As already mentioned, you need to get the thinnest slices possible from an object so that they are transparent and can be looked at under the microscope. First, you'll need a simple candle. Place the wax from the candle in an old pot and heat it on the stovetop until it becomes liquid. Now, use tweezers (Fig. 25) to dip the object in the liquid wax a few times. Attention: The wax is very hot! Be careful. After each dip, allow the wax to harden and then dip the object into the wax again. When the wax around the object has hardened completely, you can use a specimen slicer to cut thin slices from it. These slices are to be laid on a slide and covered with a cover slip or slide cover (Fig. 19).

The Production of Specimens

There are two basic types of specimens: Permanent specimens and short-term specimens.

Short-term Specimens

Short-term specimens are produced from objects that you want to look at, but don't want to keep in your specimen collection. These specimens are only meant to be observed for a short period of time, after which they are disposed of. For short-term specimens, place the object on the slide and place a cover slip on top of it. After looking at the object, clean the slide and the cover slip. One of the secrets of successful observation with your microscope is the use of clean slides and cover slips. Spots or stains would only distract you when looking at an object.

Permanent Prepared Specimens

Permanent specimens are those produced from objects that you would like to look at again and again. The preparation of dry objects (pollen, the wings of a fly, etc.) can only be done with special glue. You'll find such glue at a local hobby store, identified as "gum media." Objects that contain liquid must first have the liquid taken out of them.

How to Prepare a Dry Object

First, place the object in the middle of a clean slide and cover it with a drop of glue (gum media). Then place a cover slip on the object. Lightly press the cover slip, so that the glue spreads to the edges. Then let the specimen harden for 2-3 days. When the specimen is firmly glued, you will be able to use it.

How to Prepare a Smear Specimen

For a smear specimen, a drop of the liquid to be observed (e.g, water from a puddle in the forest) is placed on the end of the slide using a pipette (Fig. 24). Then smear the liquid across the slide with the help of a second slide. Before observing, let the substance dry for a few minutes.

Experiments

Experiment No. 1:
Black and White Print
Objects:
1. A small piece of paper from a newspaper with a black and white picture and some text
2. A similar piece of paper from a magazine

In order to observe the letters and the pictures, produce a short-term slide from each object. Now, set your microscope to the lowest magnification and use the specimen from the newspaper. The letters on the newspaper look frayed and broken, since they are printed on raw, low-quality paper. The letters on the magazine look smoother and more complete. The pictures in the newspaper are made up of many tiny dots, which appear slightly smudgy. The pixels (halftone dots) of the magazine picture are clearly defined.

Experiment No. 2:
Color Print
Objects:
1. A small piece of color printed newspaper
2. A similar piece of paper from a color printed magazine

Make short-term specimens from the objects and observe them with the lowest magnification. The colored halftone dots of the newspaper often overlap. Sometimes, you'll even notice two colors in one dot. In the magazine, the dots appear clear and rich in contrast. Look at the different sizes of the dots.

Experiment No. 3:
Textile Fibers
Objects and accessories:
1. Threads from various fabrics (e.g. cotton, linen, wool, silk, rayon, nylon, etc.)
2. Two needles

Each thread is placed on a slide and frayed with the help of the two needles. Next, wet the threads and cover them with a cover slip. Set the microscope to one of the lower magnifications. Cotton fibers come from a plant, and look like a flat, twisted ribbon under the microscope. The fibers are thicker and rounder at the edges than in the middle. Cotton fibers are basically long, collapsed tubes. Linen fibers also come from a plant, and they are round and run in one direction. The fibers shine like silk and exhibit countless bulges on the thread. Silk comes from an animal and is made up of solid fibers that are small in diameter, in contrast to the hollow plant-based fibers. Each fiber is smooth and even and looks like a tiny glass tube. The fibers of the wool also come from an animal. The surface is made of overlapping sleeves that look broken and wavy. If possible, compare wool from different weaving mills. In doing so, take a look at the different appearance of the fibers. Experts can determine which country the wool came from by doing this. Rayon is a synthetic material that is produced by a long chemical process. All the fibers have solid, dark lines on the smooth, shiny surface. After drying, the fibers curl into the same position. Observe the differences and the similarities.

Experiment No. 4:
Table Salt
Object: normal table salt.

First, place a few grains of salt on a slide and observe the salt crystals with the lowest setting of your microscope. The crystals are tiny cubes and are all the same shape.

Experiment No. 5:
Production of Salt Crystals
Objects and accessories:
1. Table salt
2. Test tube filled halfway with warm water to dissolve salt
3. Cotton thread
4. Paper clips
5. Matchstick or pencil

Add salt to the water until it no longer dissolves. We now have a saturated salt solution. Wait until the water has cooled. Fix a paper clip to the end of the cotton thread. The paper clip serves as a weight. Tie the other end of the cotton thread into a knot, stick

the match through and dip the end with the paper clip in the salt solution. Place the match horizontally on top of the test tube. It prevents the cotton thread from slipping all the way down into the test tube. Now, place the tube in a warm place for 3-4 days. If we take a look at the glass after a few days under the microscope, we can see that a little colony of salt crystals has formed on the cotton thread.

Experiment No. 6:
How do You Raise Brine Shrimp?
Accessories (from your microscope set):
1. Shrimp eggs (not included)
2. Sea salt
3. Hatchery
4. Yeast (not included)

Brine shrimp, or "Artemia Salina", as they are called by scientists, have an unusual and interesting life cycle. The eggs produced by the female are hatched without ever being fertilized by a male shrimp. The shrimp that hatch from these eggs are all females. In unusual circumstances, e.g. when the marsh dries up, the male shrimp can hatch. These males fertilize the eggs of the females and from this mating, special eggs come about. These eggs, so-called "winter eggs," have a thick shell, which protects them. The winter eggs are very resistant and capable of survival if the marsh or lake dries out, killing off the entire shrimp population. They can exist for 5-10 years in a "sleep" status. The eggs hatch when the proper environmental conditions are reproduced. These are the type of eggs you have in your microscope set.

The Incubation of the Brine Shrimp

In order to incubate the shrimp, you first need to create a salt solution that corresponds to the living conditions of the shrimp. For this, put a half liter of rain or tap water in a container. Let the water sit for approx. 30 hours. Since the water evaporates over time, it is advisable to fill a second container with water and let it sit for 36 hours. After the water has sat stagnant for this period of time, add half of the included sea salt to the container and stir it until all of the salt is dissolved. Now, put a few eggs in the container and cover it with a dish. Place the glass container in a bright location, but don't put it in direct sunlight. Since you have a hatchery, you can also add the salt solution along with a few eggs to each of the four compartments of the tank. The temperature should be around 77º F (25ºC). At this temperature, the shrimps will hatch in about 2-3 days. If the water in the glass evaporates, add some water from the second container.

The Brine Shrimp under the Microscope

The animal that hatches from the egg is known by the name "Nauplius Larva". With the help of a pipette, you can place a few of these larvae on a glass slide and observe them. The larvae will move around in the salt water by using their hair-like appendages. Take a few larvae from the container each day and observe them under the microscope. In case you've hatched the larvae in a hatchery, simply take off the cover of the tank and place the tank on the stage. Depending on the room temperature, the larvae will be mature in 6-10 weeks. Soon, you will have had raised a whole generation of brine shrimp, which will constantly grow in numbers.

Feeding your Brine Shrimp

In order to keep the brine shrimp alive, they must be fed from time to time, of course. This must be done carefully, since overfeeding can make the water become foul and poison our shrimp population. The feeding is done with dry yeast in powdered form. A little bit of this yeast every second day is enough. If the water in the compartments of the hatchery or your container turns dark, that is a sign that it is gone bad. Take the shrimp out of the water right away and place them in a fresh salt solution.

Warning! The shrimp eggs and the shrimp are not meant to be eaten!

Experiment No. 7:
How does bread mold develop?
Object: An old piece of bread.

Put the bread on a slide and lightly moisten it with water. Place the bread into a sealed container, and keep it warm and out of harsh light. Within a short time, the black bread mold forms. When the mold takes on a white, shining appearance, observe it with your microscope. It will look like a complicated mass of thread, forming the fungus body, which is called the mycelium. Each thread is known as a hypha. These threads, or hyphae, grow like long, slim stacks, ending in a small, white ball, called a sporcap. Inside the sporcap is a spore that will eventually be released to start new colonies of mold. With your microscope you can watch this amazing transformation unfold.

Experiment No. 8:
Observing stem and root sections
Objects:
1. A celery stalk
2. A carrot

With an adult's supervision, cut several very thin slices from the middle of the celery (a stem) and from the middle of the carrot (a root). Make a "wet mount" by placing a drop of water on the slide. Then put the specimen on the water-covered slide, and top with a cover slip. The water will help support the sample. It also fills in the space between the cover slip and the slide. Start by viewing them at the lowest magnification and then increase the magnification for more detailed observation.

Experiment No. 9:
Observing cork cells
Object: A small cork

With an adult's supervision, cut a very thin slice from the cork, the thinner the better. Prepare a wet mount of this cork slice as you did with the celery and carrot in Experiment 8. When applying the cover slip over the slide, the water and the cork, make sure no air bubbles are trapped beneath it. Begin with the lowest power and increase the magnification as desired. The cells you see, called lenticels, are actually the air pockets that have been left after the plant material inside has decayed.

Experiment No. 10:
Observing leaf cells
Objects: A fresh leaf, clean and dry, without holes or blemishes

With an adult's supervision, cut a one-inch cross section out of the center of the leaf, from one side of the leaf to the other. Tightly roll that section up starting from one uncut edge of the leaf. The central vein of the leaf will be in the center of the roll and not be visible. Then make several very thin slices off one end of the roll. The central vein will be in the middle of this almost transparent slice. You'll be observing the cells around that central vein. Using a droplet of water, make a wet mount (as in Experiments 8 and 9), placing the leaf segment so that the inner part faces up. Start with the lowest power and gradually increase the magnification for more detail.

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No mezcle pilas nuevas con pilas usadas.
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