

D.I.Y. Microscope Kit

MODEL EDU-37723



Instruction & Assembly Manual

ELENCO®



WARNING:

CHOKING HAZARD - Small parts. Not for children under 3 years. This microscope kit is for use by children over 8 years old. Use only under adult supervision.

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PARTS LIST

Contact **ELENCO®** if any parts are missing or damaged. **DO NOT contact your place of purchase as they will not be able to help you.**

MAIN COMPONENTS

Qty.	Description	Part #
<input type="checkbox"/> 1	Lens Cover	P1
<input type="checkbox"/> 1	Eyepiece Lens	P2
<input type="checkbox"/> 1	Focusing Knob	P3
<input type="checkbox"/> 1	Revolving Turret	P4
<input type="checkbox"/> 1	Objective Lens	P5
<input type="checkbox"/> 1	Body Tube	P6
<input type="checkbox"/> 1	Arm	P7
<input type="checkbox"/> 1	Stage	P8
<input type="checkbox"/> 2	Clip	P9
<input type="checkbox"/> 1	Color Wheel	P10
<input type="checkbox"/> 1	Lamp Assembly	P11
	Mirror	P11A
	Screw 2.3 x 7.5mm Pan Head Black	P11B
	Case Top	P11C
	Case Bottom	P11D
<input type="checkbox"/> 1	Lamp Bracket	P12
<input type="checkbox"/> 1	Base Assembly	P13

HARDWARE

Qty.	Description	Part #
<input type="checkbox"/> 4	Screw 2.5 x 5.5mm Washer Head	P14
<input type="checkbox"/> 4	Screw 2.5 x 7.5mm Pan Head	P15
<input type="checkbox"/> 1	Screw 3 x 3.5mm Pan Head Black	P16
<input type="checkbox"/> 1	Screw 6 x 32mm Pan Head	P17
<input type="checkbox"/> 1	Locknut M6	P18
<input type="checkbox"/> 2	Ball Bearing	P19
<input type="checkbox"/> 1	Spring	P20
<input type="checkbox"/> 1	U-Bracket	P21

MISCELLANEOUS

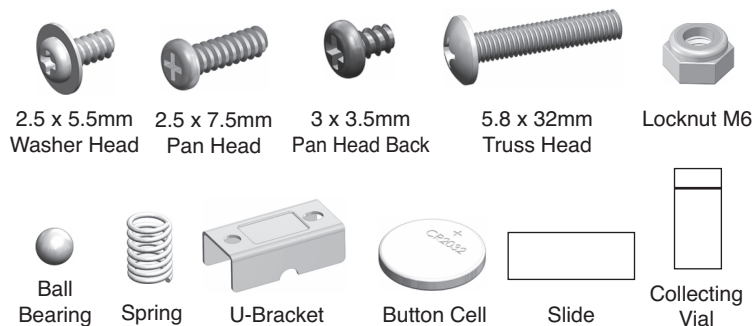
Qty.	Description	Part #
<input type="checkbox"/> 2	Collecting Vial	P22
<input type="checkbox"/> 4	Slide	P23
<input type="checkbox"/> 1	Battery CR2032	P24

PARTS IDENTIFICATION

Main Components



Hardware / Miscellaneous



SPECIFICATIONS

Model: EDU-37723

100x-750x Zoom Microscope Set with Light & Projector

Features:

- 9" Microscope
- Huygens Eyepiece 12x–18x
- 8x, 25x, 42x Objective Lenses
- Color Filters
- (4) Blank Slides
- (2) Collecting Vials
- Lens Cover
- Button Cell 3V
- Assembly Instruction

SAFETY RULES

- Read all the instructions before using and keep them for reference.
- Store microscope set out of the reach of young children.
- Clean microscope after use.
- Wash hands after using.
- Keep food and drinks away from experimental area.
- Discard old battery.
- Clean the stage and lenses after use.

CAUTION FOR HANDLING

- Hold the microscope firmly by the stand only.
- Use sufficient care when handling the lens.
- Don't let the microscope get too dirty.
- Always use the dust cover when not in use.
- Clean the lens using a clean lens tissue or soft cotton cloth. Do not rub the lens with your finger or dirty cloth.
- Store microscope in a moisture-free location.

TOOLS REQUIRED

- #0 Phillips screwdriver
- #2 Phillips screwdriver
- Pliers

INTRODUCTION

In this world there is an abundance of living things. Some are larger and easily seen with your own eyes but others are so minute that millions could be placed on the head of a pin. These can only be seen through microscope.

A magnifying glass is basically a simple microscope. When we talk about a microscope, we're referring to a "compound microscope". A compound microscope features two or more lenses connected by a hollow cylinder.

The microscope was invented by Zacharias Janssen and his father Hans, a Dutch spectacle maker around the year 1590. They placed lenses in a tube and discovered that the object near the end of the tube appeared larger, larger than any simple magnifying glass.

Their first microscope was 18" inches long when fully extended. It combined three long sliding tubes, two inches in diameter. When fully closed it had a magnification of 3x, and 9x when fully extended. The eyepiece lens was bi-convex and the objective lens was plano-convex. This was a very advanced compound design for this time period.

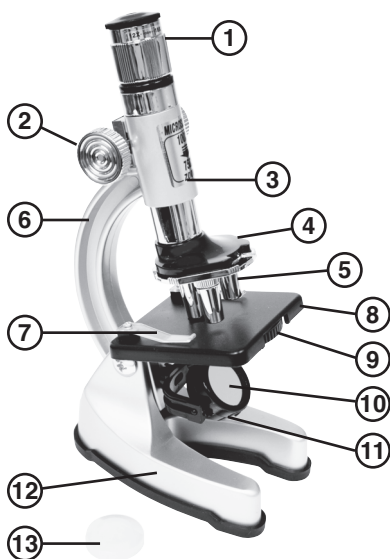
Jansen's microscope was an important advance from the magnifying glass. By the end of the seventeenth century, further developments, notably by Anton van Leeuwenhoek and Robert Hooke, allowed the observation of organisms such as fossils, diatoms, as well as the first cells.

Today, magnifications greater than 1000x using modern microscopes have been at the forefront of scientific development.

Your microscope will be a source of many hours of pleasure as a hobby or open the door to advanced knowledge in the varied field of science. We hope you enjoy your experience!

PARTS OF THE MICROSCOPE

- ① **Eyeiece Lens:** The lens at the top that you look through. The magnification is 8x - 12x power.
- ② **Focusing Knob:** You use it to move the objective lenses toward or away from the specimen.
- ③ **Body Tube:** Connects the eyepiece to the objective lenses.
- ④ **Revolving Turret:** Holds the three objective lenses and rotated to change the power.
- ⑤ **Objective Lenses:** There are three objective lenses 8x, 25x, and 42x powers. When coupled with a 12x or 18x eyepiece lens, we get a total of the magnifications as listed:
96x (8 x 12) 144x (8 x 18)
300x (25 x 12) 450x (25 x 18)
504x (42 x 12) 756x (42 x 18)
- ⑥ **Arm:** Supports the tube and connects it to the base
- ⑦ **Clips:** The two stage clips hold the slides in place. The clips move up and the slide is place underneath
- ⑧ **Stage:** The flat platform is where you place the slides.
- ⑨ **Diaphragm or Iris:** The diaphragm is a rotating disc mounted below the stage. It has four different sized holes and four colored holes. It is used to vary the intensity and size of the light that is projected upward into the slide. The setting is a function of the transparency of the specimen, the degree of contrast you desire and the particular objective lens in use.
- ⑩ **Mirror:** Used to reflect light from an external light source up through the bottom of the stage.
- ⑪ **Illuminator Lamp:** An LED (3V) light source used in place of a mirror.
- ⑫ **Base:** The bottom of the microscope, used for support.
- ⑬ **Lens Cover:** Protects the eyepiece lens from dust and debris.

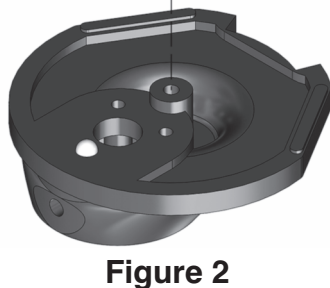
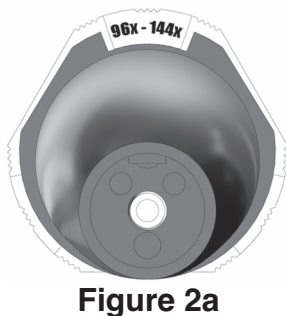
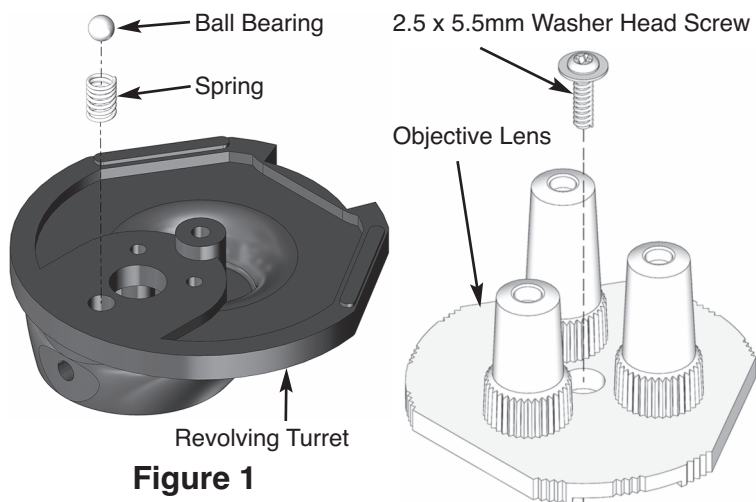


ASSEMBLY

1. Revolving Turret

- ☐ Insert the spring into the hole in the revolving turret as shown in Figure 1.
- ☐ Place the ball bearing on top of the spring as shown in Figure 1.
- ☐ Carefully attach the turret to the objective lens using a 2.5 x 5.5mm washer head screw (see Figure 2). Make sure the ball bearing does not fall off the spring.

Check the assembly by rotating the lenses, making sure they lock into the three positions (see Figure 2a).



2. Body Tube

- ❑ Slide the body tube into the arm as shown in Figure 3.
- ❑ Attach the turret assembly onto the body tube as shown in Figure 4 and make sure the holes line up.
- ❑ Rotate the body tube and turret assembly 90° and screw together with a 3 x 3.5mm pan head screw, as shown in Figure 5.

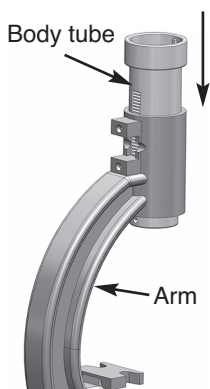


Figure 3

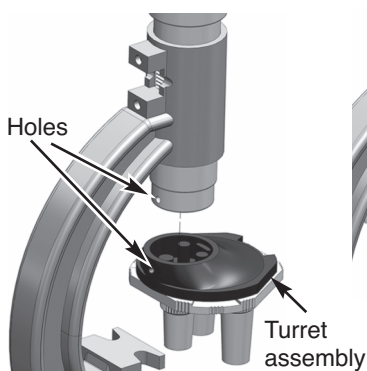


Figure 4

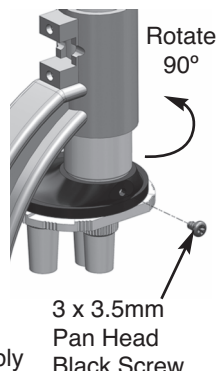


Figure 5

- ❑ Rotate the body tube back to its original position so the ridges are visible in the opening (see Figure 6).
- ❑ Position the focus knob on the arm so the gear is centered, as shown in Figure 7.
- ❑ Fasten the U-bracket across the two holes and attach using two 2.5 x 7.5mm pan head screws.

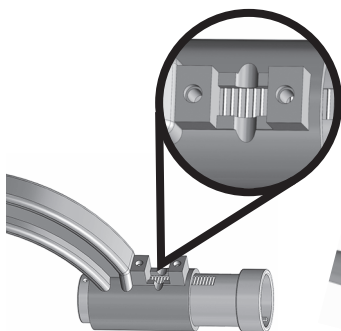


Figure 6

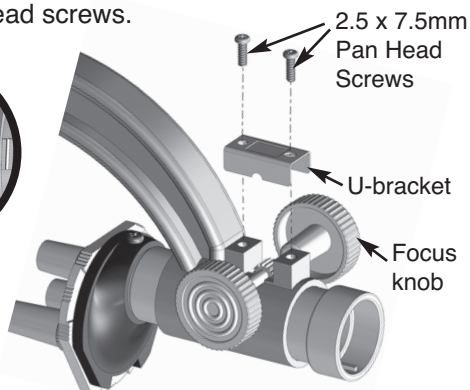


Figure 7

- ❑ Check that the gear is meshed properly by turning the focus knob.

3. Stage

- ❑ Position the stage so the bottom is facing up, as shown in Figure 8. Place the color wheel onto the shaft with the flat side up. Attach the wheel using the a 2.5 x 5.5mm washer head screw. Check that the wheel rotates and locks into each positions.
- ❑ Mount the clips onto the square posts using 2.5 x 7.5mm pan head screws, as shown in Figure 9.

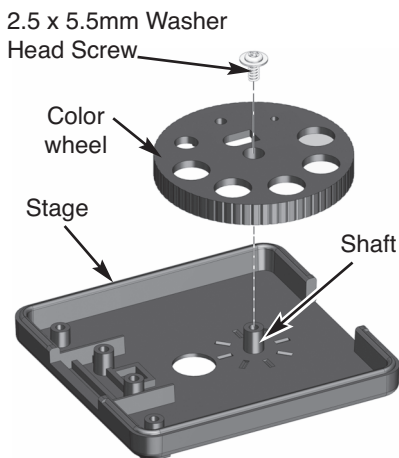


Figure 8

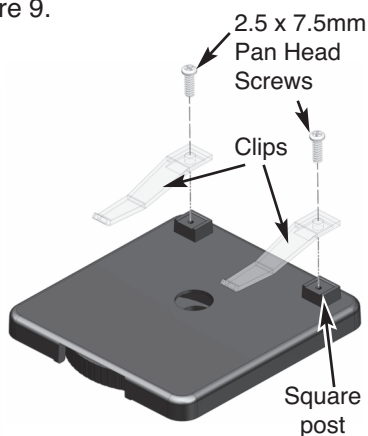


Figure 9

- ❑ Using two 2.5 x 5.5mm washer head screws, attach the stage assembly onto the arm (see Figure 10).

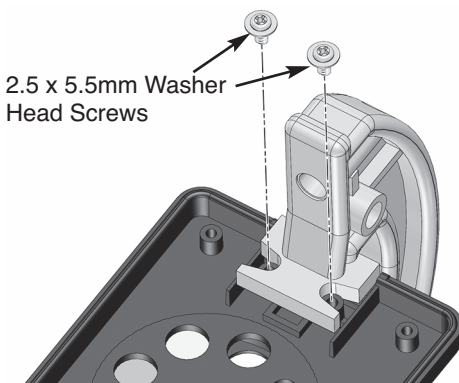


Figure 10

4. Mirror/Light

- ❑ Install the battery using the instructions on page 13.
- ❑ Check the light by pressing the metal tab in. If it doesn't light, check the battery polarity.
- ❑ Snap the lamp bracket onto the round mounting ball, as shown in Figure 11.

Caution: The round posts on the lamp assembly are not the same size. The same is true for the holes in the lamp bracket.

- ❑ Install the larger post into the side of the bracket with the larger hole. Then, pull slightly on the lamp bracket, spreading it apart, and slip the smaller post into the smaller bracket hole.

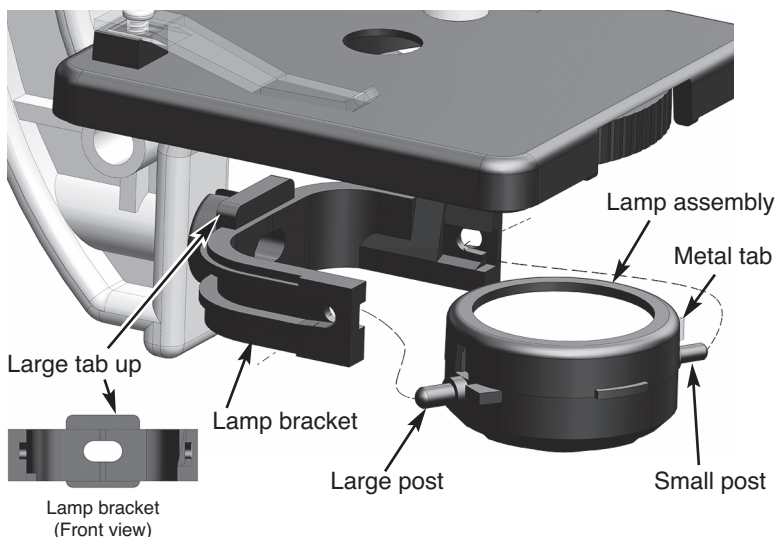


Figure 11

5. Final Assembly

- ❑ Mount the arm assembly onto the base, as shown in Figure 12, and secure into place with the M6 x 32mm screw and locknut. Do not overtighten the locknut.
- ❑ Place the eyepiece lens onto the barrel, making sure the slot on the eyepiece lines up with the guide on the barrel, and press down.

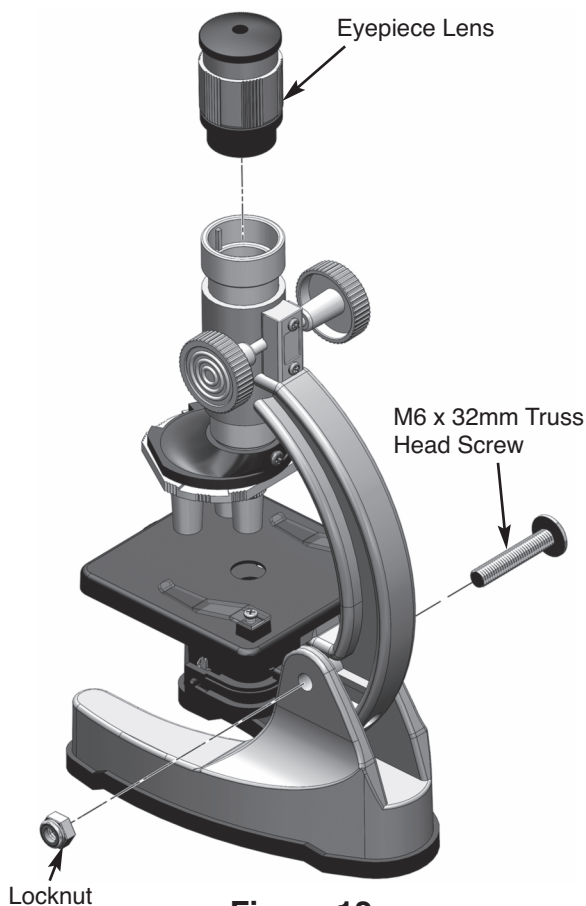


Figure 12

INSTRUCTIONS

Lens Care

Do not touch any lens with your fingers, this can leave oil and small particles on the lens. The lens can be cleaned using a lens cloth or a lens pen. Do not use your shirt or a towel.

Step 1: Turn the revolving turret to the lowest power objective lens position and make sure that it clicks into place. The low power lens gives the widest field of view, making it easier to find the specimen.

Step 2: Rotate the diaphragm (circular plate under the stage with different size and color holes) so the largest clear hole is centered under the stage.

Step 2a: Turn the Focusing knob so the Objective Lens is all the way up.

Step 3:

Mirror: If using an external light, adjust the light such that it shines on the mirror. Now, adjust the mirror so the light can be seen through the eyepiece.

LED: Rotate the housing so the LED is pointing up and position it so the light can be seen through the eyepiece.

Step 4: Place a slide on the stage and secure it with the stage clips. The clips will keep the slide in place.

Step 5: Look through the eyepiece and adjust the focus knob until the image comes into focus. Focus slowly so you don't pass the focus point. Adjust the light if needed.

Step 6: Once you have the specimen in focus and in the field of view, start reducing the light until you see the most amount of detail. The brightest setting is typically not the best for contrast and detail.

Step 7: You can change to the next objective lens by rotating the turret. You'll need to adjust the focus, condenser, and light intensity. Do not let the objective lens touch the slide!

You will soon discover that using your first microscope at high power is much more difficult than at low power.

Have fun with your new microscope. There's a whole other world waiting for you to see!

ADJUSTING ZOOM

The eyepiece has a magnifications of 12x-18x. In the fully clockwise position the magnification is 12x. Rotating it clockwise the eyepiece power will zoom to 18x.

Example:

The turret is set to 8x with the eyepiece at 12x the total magnification is 96x ($8 \times 12 = 96$).

The turret is set to 8x with the eyepiece at 18x the total magnification is 144x ($8 \times 18 = 144$).

Below list the minimum and maximum magnification of each the objective lenses:

96x	(8 x 12)	144x	(8 x 18)
300x	(25 x 12)	450x	(25 x 18)
504x	(42 x 12)	756x	(42 x 18)

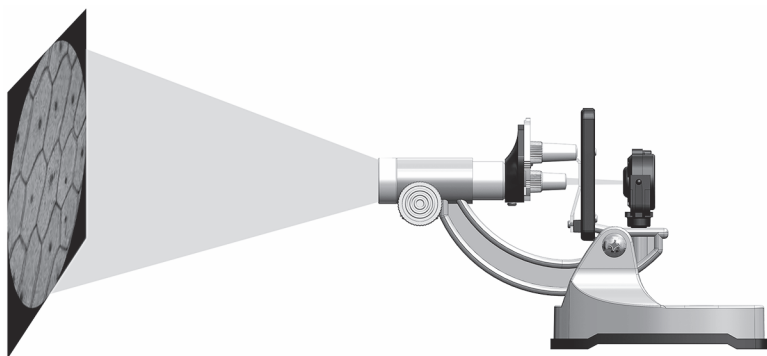
HOW TO USE THE MICROSCOPE AS A PROJECTOR

The microscope can be used as a projector display the image on a flat surface.

Turn the turret to the lowest power objective lens.

Place a slide on the stage of the microscope, securing it with the stage clips.

Adjust the lamp for the maximum amount of light seen through the eyepiece. Remove the eyepiece and tilt the microscope so that the body tube is pointing at a white surface not more than 3 feet away and turn the room lights off. Then, focus slowly until you see a clear image on the wall.



BATTERY INSTALLATION

1. Unscrew the lamp cover and remove the mirror housing.
2. Remove the button cell battery and insert a new CR2032 with the + side facing up as shown.
3. Reinstall the mirror cover and secure it with the black 2.3 x 7.5mm pan head screw.
4. Check the light by pressing the metal tab in. If it doesn't light, check the battery polarity.

Note: Properly dispose the older battery.



TROUBLESHOOTING GUIDE

1. Image is too dark!

- Make sure the diaphragm and turret are clicked into position.
- Readjust light.

2. I can't see anything under high power.

- Make sure the objective lens is clicked into position.
- Set to the lowest power and focus, then check the higher power again.

If you can't focus under low power, you won't be able to focus anything under high power.

3. Only half of my viewing field is lit; it looks like there's a half-moon in there.

- Check diaphragm and turret positions.

4. Turning the focus knob does not move the tube.

- Make sure the two U-bracket screws are tight.

5. The light does not turn on.

- Check that the battery is held in by the clips.
- Check the polarity; + side up.

If you need additional assistance or replacement parts, contact:

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