Digital Microscopes

Zoomy 2.0 Digital Microscope

Zoomy 2.0 is a handheld digital microscope that children can use to examine objects. Zoomy plugs into a computer using a built in USB cable. The computer can then be connected to an interactive whiteboard or projector, to display/demonstrate magnified images. Zoomy automatically downloads screenshots and videos to your computer, which can be uploaded to your class website, learning management system, or kept for assessment purposes. Zoomy has a built in LED lights which allow it to illuminate dark settings or objects once plugged into a computer.

What software/devices will I need to use a Zoomy?

- The software used is called Xploview, which is located on a CD included with the purchase of a Zoomy 2.0.
- Xploview is compatible with Windows-based PCs that run Windows XP, Vista, or Windows 7, 8, and 10.
- Xploview is compatible with Mac OS-based PCs that run Mac OS X 10.5.6-Mac OS X 10.11.x.
- The Zoomy 2.0 digital microscope and accompanying software is $59.99.

Connecting Zoomy 2.0

The USB cable attached to the Zoomy connects to the 2.0 USB port of PC and Mac computers. The computers can then be connected to an interactive white board or projector via a HDMI cable. The Zoomy 2.0 cannot connect directly to these projectors or interactive whiteboards because Zoomy requires Xploview software in order to display images. Images are displayed up to 40x magnified.

When you open Xploview on any PC or Mac with a built-in camera for the first time, the default recording device is the built-in camera. To change devices to the Zoomy, click on the settings button in the top left hand corner. In the drop-down box labeled "Device," select "USB2.0 Camera" or "USB Microscope." Then click "Apply" to save changes.

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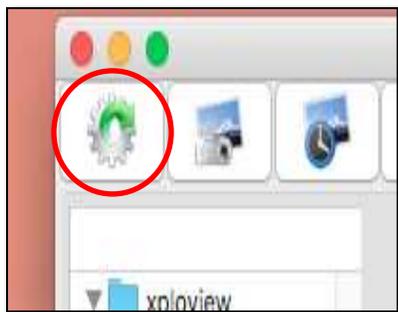
Using Zoomy 2.0

Connect Zoomy 2.0 to your computer via the built in USB cable that is attached to the Zoomy.

If installed, Open Xploview from the Start Menu.
Or use the enclosed CD to run the software on your computer.

Note: We do recommend installing the software if you will be using the Zoomy consistently on a specific computer.

Attach one of the adapters to the bottom of the Zoomy, and twist into place. These adapters allow Zoomy to be placed directly on the object or slide being examined, leaving both hands free to write down observations, control the camera, or record videos. The adapters are not required for use.

Place a slide or object on a flat surface near the Zoomy. Move the Zoomy over the slide or object and slowly lower the microscope until the image on the slide is magnified in the Xploview software.

Note: We recommend that if you are looking at a slide or flat object, that you place it on a white background so it is easier to see.

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To focus on the object under the microscope, rotate the top section to the left or right until the object is appropriately focused.


To take a screen shot of the image on the slide, press the camera button on the top of the Zoomy. The screenshot will show up in the Xploview window.

The file is saved automatically as a .JPG file on both Mac and Windows PCs in your documents folder.

To change the destination of saved images, timed shots, and videos, open "Settings" in Xploview and scroll to "Save Setting." Click on the "…" button and select the location where you want Xploview to save your files. Click "Open" to select location, then click "Apply" to save the changes.
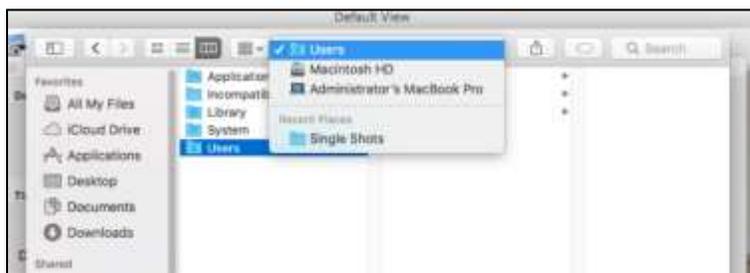
Using Xploview
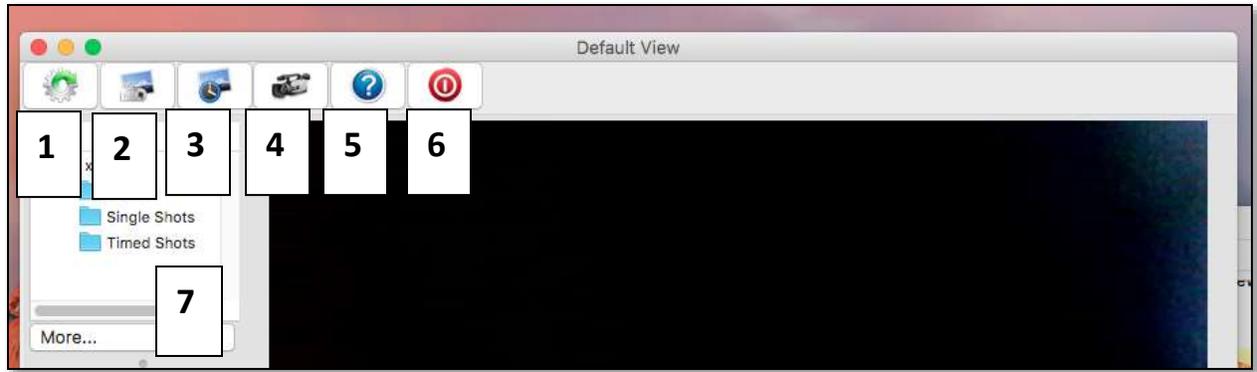
1. Settings – This menu button allows you to make changes to the resolution of the image being captured; changes to the "timed shot" feature and "movie setup"; and language settings. Within settings, you can also change the location of where images and videos are saved from Xploview to your device.

2. Take a Photo – This button allows you to capture the image in the Xploview screen, just as you would use the camera button on the top of the Zoomy 2.0. The image is saved to the Xploview software, as well as the designated location on your PC as .JPG files.
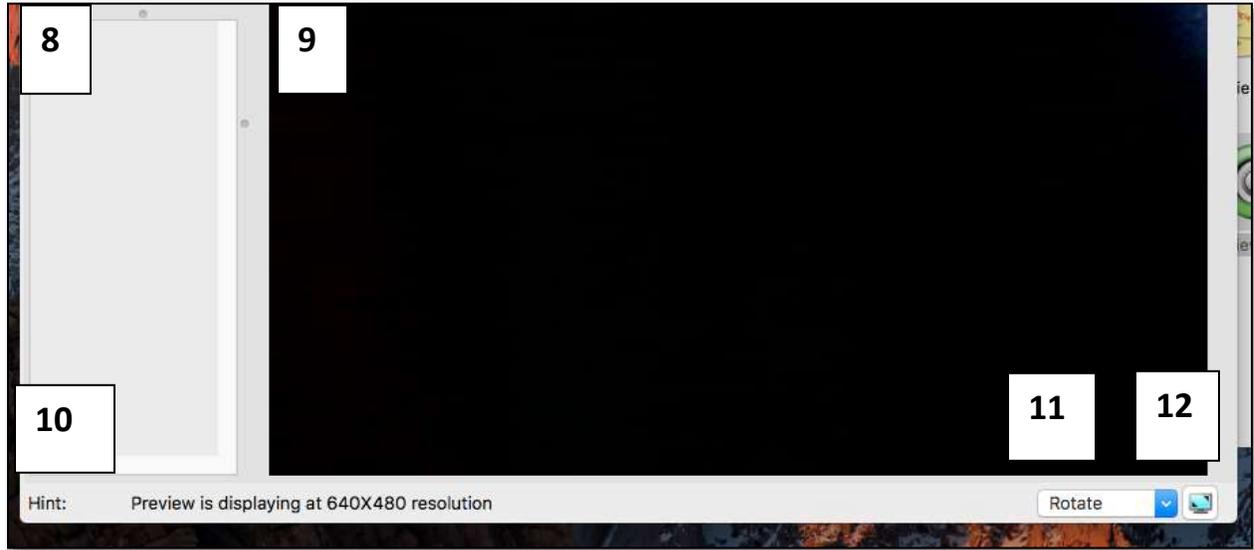
3. Start Timed Shot – This button allows Xploview to begin taking photos of the object being displayed at a certain rate of photos per minute. This tool is useful when documenting changes in the object being displayed, without taking a video or clicking the camera button on the Zoomy. Pressing the button once starts the timed shots; pressing the button again stops the timed shots. These images are saved as .JPG files.

4. Start Recording – This button allows you to record a video of the object being displayed. Pressing the button once starts recording; pressing the button again stops the recording. There is no audio for these videos, as Zoomy does not have audio capabilities. These videos are saved as .AVI files.

5. About – This button allows you to see software information for Xploview.

6. Exit – This button quits the application.

7. More… - This tab allows you to open the Folder where Xploview photos and videos are saved.

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Hint: Preview is displaying at 640X480 resolution   Rotate

8. Sidebar – Photos, timed shots, and videos are displayed in this area. You cannot delete, edit, or send files from the sidebar. The sidebar can be adjusted by clicking and holding the mouse down over the dot (Mac) or arrow (PC) and dragging the sidebar to the desired size.

9. Window – This area is where the image from the Zoomy microscope displays. Photos or videos capture the image that is within this area.

10. Hint – The hint displays information about the current state of Xploview including video record times, image resolutions, and problems with either the Zoomy or Xploview.

11. Rotate/Flip – This drop down menu allows you to rotate the image 90, 180, or 270 degrees, or flip the image over its horizontal or vertical axis.

12. Full Screen - This button allows you to display Xploview in full screen. To exit full screen, press the ESC button on the keyboard.

Zoomy Activities

AmScope MD200 Digital Camera and M150 Microscope

The AmScope M150 Microscope is a regular microscope that converts to a digital microscope by adding a digital camera to the eyepiece. The microscope allows for 40x, 100x, and 400x magnification of items and has an LED light below the stage in order to help illuminate objects being viewed. The digital camera allows for the image in the microscope to be live streamed to a computer, and the accompanying software allows for still images or video to be captured as you are viewing the objects through the computer. The computer can be connected to a projector or interactive whiteboard for students to see further magnification of the objects.

What software/devices will I need to use the AmScope Digital Microscope?

- The microscope can be purchased with or without the digital camera. If you choose to purchase the digital camera, be sure the camera will fit within the eyepiece of your microscope. We have the MD200 digital camera which is connected to the M150 Microscope.
- The MD200 digital camera comes with a USB cable that connects from the top of the camera to the computer.
- The MD200 digital camera also came with the AmScope software which allows you to capture images from the microscope. This can also be downloaded from amscope.com/software-download.
- The software is compatible with Windows XP, Vista, and Windows 7, 8, 10. There is also a Mac version of the AmScope software which runs on machines with OS 10 and higher.
- If you already have a microscope, the MD200 digital camera can be purchased for about $80.
- The microscope will need to be plugged into a power outlet, so be sure to place it near one.

Connecting the AmScope Digital Camera

To use the digital camera, the first step is to remove the regular eyepiece from your microscope and replace it with the digital camera.

Be sure to plug the USB cable into the computer so that the computer will recognize the camera.

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Using the Digital Camera, Microscope, and AmScope Software

Open the AmScope software on your computer.

Two windows will open. To the left will be the camera window and to the right will be the Amscope software window.

In the Camera window to the left, there will be a list of cameras available to use. Click on the MD200 camera so that the live streaming will begin in the right window. When you see the Video tab open in the window on the right, you should begin to see an image.
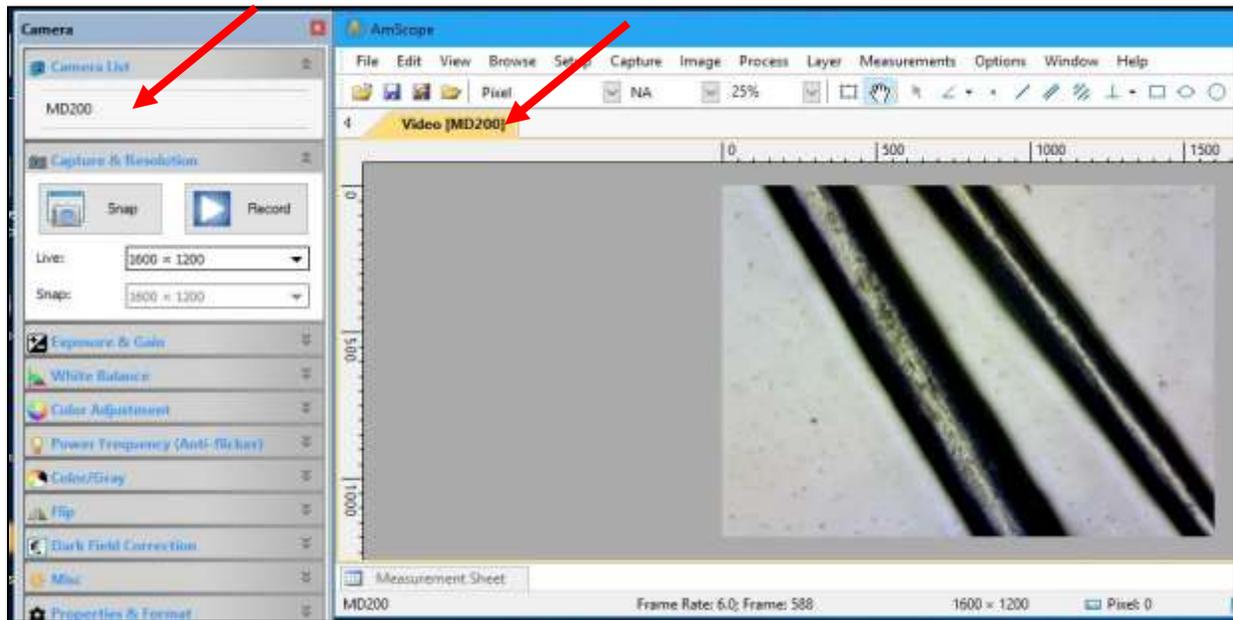
You will still need to manually adjust the microscope in order to view the images correctly, but instead of looking through the eyepiece you will be looking at the image on the computer screen as you adjust the magnification and focus.

First, turn on the light switch at the back of the microscope to illuminate the object on the stage.

Adjust the intensity of the light by turning the dial on the left side of the microscope. 1 is the dimmest setting, and 8 is the brightest setting.

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After the light has been adjusted, then you will need to choose the magnification level.

To do this, turn the magnifiers to either 40x zoom, 100x zoom, or 400x zoom.

Then you will need to adjust the focus to be able to properly see the object.

Use the focus knobs on either side of the microscope to bring the object into focus.

Taking a picture of the Image Under the Microscope

Once the item is lit, magnified, and you have focused in on it then you can begin using the software to capture more specific information.

The Camera Window on the left is where you can quickly and easily begin to capture images or video of the object(s) under the microscope.

To take a picture of what is being displayed, simply click **Snap**. The image will be displayed on the window to the right.

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The more images you snap, the more tabs you will see at the top of the window to the right.

(In this example, there is the original live video feed and four tabs of images.)

Note: When a new image tab opens, the image will automatically be named 0001, 0002, etc. The image name will also have an asterisk after it to show that is has not yet been saved.

To save an image, from the **File** menu, drop down to **Save As**, and then give the file a name and choose where you would like to save it. (In this example, the second tab has been renamed. Notice the asterisk after the file name and the name itself has been changed to reflect that I have saved it somewhere.)

Recording the Image Under the Microscope

To record what is displayed under the microscope, use the same Camera window, but choose **Record**.

Once you click Record, a new window will open asking you to name the recording and to choose where to save it before you begin. There are several steps to this process, including what file format to save the recording as.

We suggest saving a recording as **H264.** This saves the recording as an .MP4 file which is viewable either on a Mac or PC device. The rest of the settings can remain the same unless you choose to change them.

To view the recording, navigate to the place where you saved it on your computer and open it from there.

The rest of the camera menu allows you to fine tune the image displayed on your screen. By default, all setting are set to automatically choose the best adjustments so you should not need to make any manual adjustments. However if you do, click the down arrows to the right of each group in the menu and then make whatever changes are necessary.

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AmScope Software

The AmScope software has many menu items that you can modify and change. Several of these are mirrored in the Camera menu either within the groups on the main screen or within the tabs across the bottom of the Camera window.
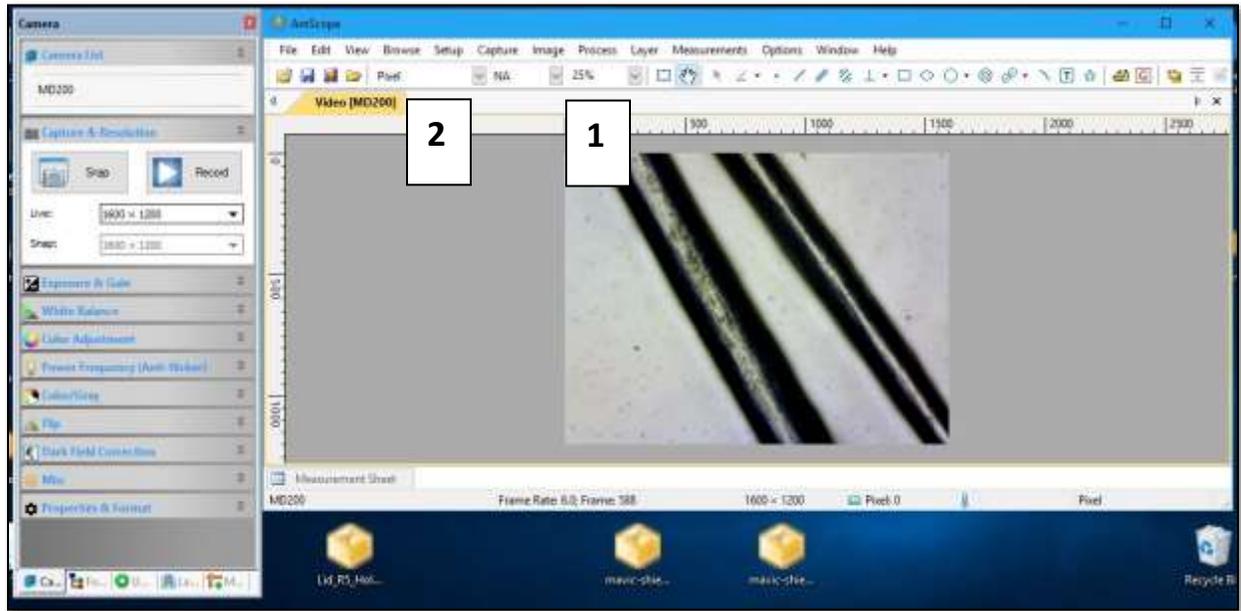
This software allows for some complicated changes so we will only be looking at the settings that might be helpful for us now.

1. **Change Window Size and Zoom**

This window opens rather small, so be able to see the image a little better, we recommend dragging the bottom right corner of the window to make the window as large as can be on the screen. Once this change is made, then you can also change the Zoom of the image to be able to see it in a larger format. To change the Zoom, use the down arrow next to the percentage in the button bar and change the size to a larger size.

2. **Change the Measurement**

You have the option to change how the items are measured from Pixel to something else like millimeter or centimeter. Use the down arrow next to the Pixel setting in the button bar to change the size of the grid on the page to show in another measurement size.

Then use the tools in the button bar like the line tool or the angle tool to measure the items on the screen. Using the **Measurements** tab from the Menu also allows you to change the measurement size or modify the measurement settings even more.

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Some other options for measuring the object(s) in the window include adding a grid overlay to the image so that the viewer can define certain areas in the image in terms of the location within the grid.

This is a great way to incorporate some math into the lesson. This could also be used as an informal way to measure the object(s) under the microscope.

Adding a Grid

In the menu bar go to **Options > Preferences**. In the window that opens, choose **Grids** and choose the grid you would like to have overlaid on the image.
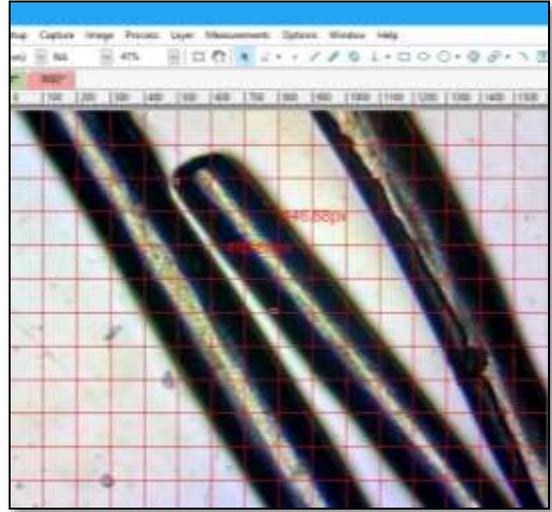
Note: If you choose the grid option, the grid will be displayed on all of the images in each of your tabs. Removing the grid will remove it from all images in those tabs as well.

You can even use the text tool to add text to the image. Any changes that you make to the image can be saved with the image.

A few Other Menu Items of Interest

Capture Menu- Use this to set the Time Lapse settings and begin taking pictures in intervals as objects are moving under the microscope.

Image Menu and Process Menu- Use these menus to set the properties for how the images are viewed through the computer. These changes can also be made in the groups menus within the Camera window as mentioned previously.

Layer Menu- This menu can be used to create new layers on top of the image. When you create a layer, and then add a measurement or text, you can hide those layers or move the overlay around on the screen.

Help Menu- This contains a document of over 100 pages that explains how to use the software.

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Digital Microscope Activities

Try completing one of the following activities using either the Zoomy microscope, digital microscope, or both.

- View the pre-made slides
- Look at everyday objects
- Look at organic vs. inorganic materials
- Look at solids vs. liquids
- Create a document that explains parts of the items you see under the microscope using the microscope software capturing tools and collecting images
- Create a video that explains parts of the items you see under the microscope using the microscope software capturing tools
- Draw what you see and then color and label it
- Describe what you see under the microscope to someone else and see if they can determine what the object is by just your description
- Categorize objects by similarities, differences, properties
- Guess what other objects will look like based on what you see under the microscope