

# Microscope Exploration





## Our Blue Marble: Microscope Exploration

**Objective:** Students will use a variety of microscopes to observe and distinguish between plant and animal cells.

### Materials Needed:

- ✓ 2 digital microscopes
- ✓ 2 compound light microscopes
- ✓ 2 digital tablets
- ✓ 3 containers of animal and plant cell slides
- ✓ 3 containers of additional slides designed for younger audiences

### Summary of Student Action:

Students will utilize the compound light microscopes and digital microscopes to observe slides of different plant and animal cell specimens. Students will differentiate between plant and animal cells.

### Setup Instructions:

- Download the [Max-see app \(from the Google Play Store\)](#) for the digital microscope onto the tablets.
- Set up the digital microscopes using instructions from the app.
- Set up the compound microscopes. Be certain to turn on the light.
- Select a slide and bring a cell into focus on each of the microscopes.

### Additional Notes:

- With the compound microscope, be careful not to use the coarse adjustment knob setting after changing the magnification past 40X.
- Do not raise the platform so that it touches the lens of the microscope.
- Do not touch any of the objective lenses.
- When moving the compound microscope, hold it by the arm and the base.
- Check the microscopes throughout the activity to make sure they are turned off when not in use.
- There is a detailed description of how to use the compound microscope attached. You can use this as a reference to pre-set the microscopes so students can simply turn them on when ready to begin.



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### Activate Your Knowledge:

Did you know the environment we live in is called a “biosphere”? The biosphere consists of all the living organisms present on Earth and in Earth’s atmosphere. Millions of different organisms live on our planet, but they are all made up of the same things – cells. Microscopes allow us to see cells and other organisms that are too small to see with our own eyes.

### Materials You will need:

- ✓ Digital microscope
- ✓ Compound light microscope
- ✓ Digital tablet
- ✓ Animal and plant cell slides
- ✓ Animal and plant cell example sheets

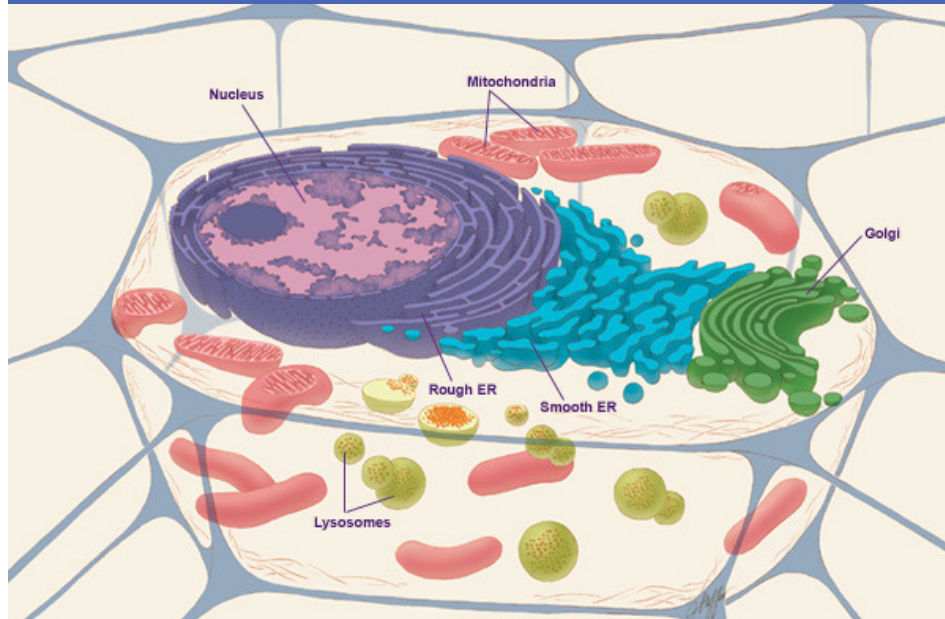
### Procedures:

1. Turn on one of the microscopes.
2. Look through the lens of the microscope (or the tablet attached to the digital microscope). What do you see?
3. Try looking through a different microscope. Are the samples the same? Why do different organisms have different cells?
4. When you are done making your observations, turn the microscope off using the switch on the base.

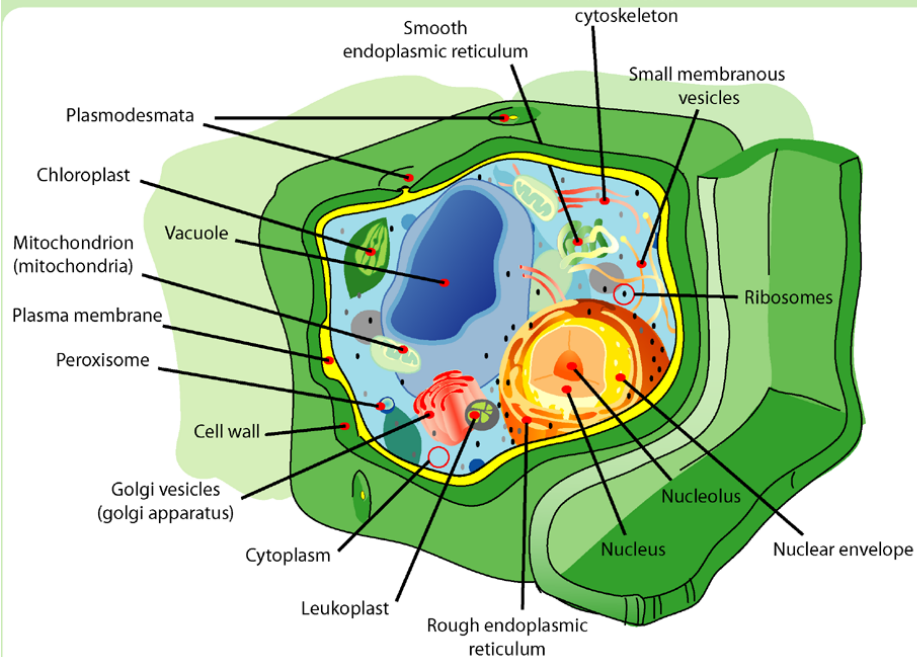


# Under the Microscope

## Animal Cell Structure



## Plant Cell Structure







## Check Your Observations:

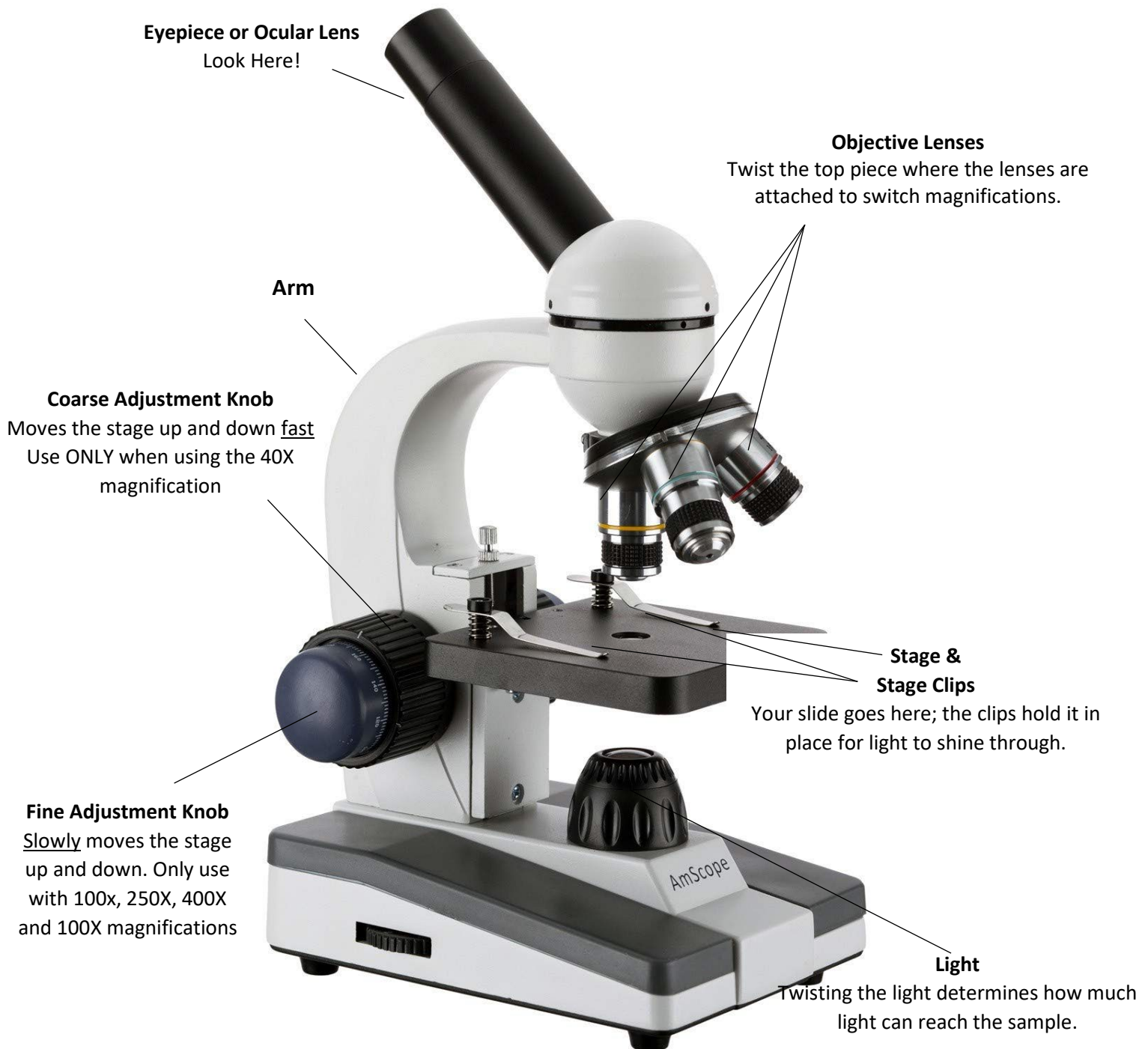
Based on your observations of the cells under the microscope and the illustrated pictures, do all cells have the same components? Review this table and see if you can locate these differences between the two sample cells.

Organelle	Animal Cells	Plant Cells
Vacuole	Multiple, smaller vacuoles (Stores water and completes other smaller functions)	One large vacuole (Stores water and creates pressure inside cell)
Plastids	Not Present	Present as chloroplasts (Use energy from the sun to create food for the plant in a process called photosynthesis)
Cell Wall	Not Present	Present (Provides structural support and protection)

# Digital Microscope Controls



# Compound Microscope Controls



Source: [Amazon](#)



## Using the Compound Microscope

1. Plug in your microscope and turn it on using the switch on the back of the base.
2. Check to make sure the objective lenses are positioned so that 40X magnification is facing the stage. Lower the stage away from the objective lenses using the coarse adjustment knob (the larger knob). Now, slowly start adjusting the knob to ensure you are moving the stage in the correct direction.
3. Place a microscope slide on the stage and position the clips over the slide to hold it in place. Try to position the microscope so that the specimen is directly over the hole in the stage.
4. Look through the eyepiece to see if you can see the specimen. Adjust the microscope slide as necessary so that you can fully see the specimen.
5. Once the microscope slide is in place, raise the stage using the coarse adjustment knob until the specimen is in focus in the microscope. You can adjust the level of light that is reaching the specimen using the light adjustment located around the top of the light
6. To magnify your view, twist the top of the objective lens connection to the next highest magnification setting. Use the fine adjustment knob (the smaller knob) to bring the specimen into focus.
7. Repeat Step 6 to see the specimen at higher magnifications.
8. When you are done observing your specimen, twist the objective lenses so the 40X magnification is facing the specimen. Lower the stage, remove the microscope slide with the specimen inside, and turn off the microscope.