

The microscope

Microscopes are instruments designed to produce magnified visual or photographic images of small objects. The microscope must accomplish three tasks: produce a magnified image of the specimen, separate the details in the image, and render the details visible to the human eye or camera. The term "Micro" refers to **tiny or small** and "scope" refers to **view or look at**.

Microscope Vocabulary

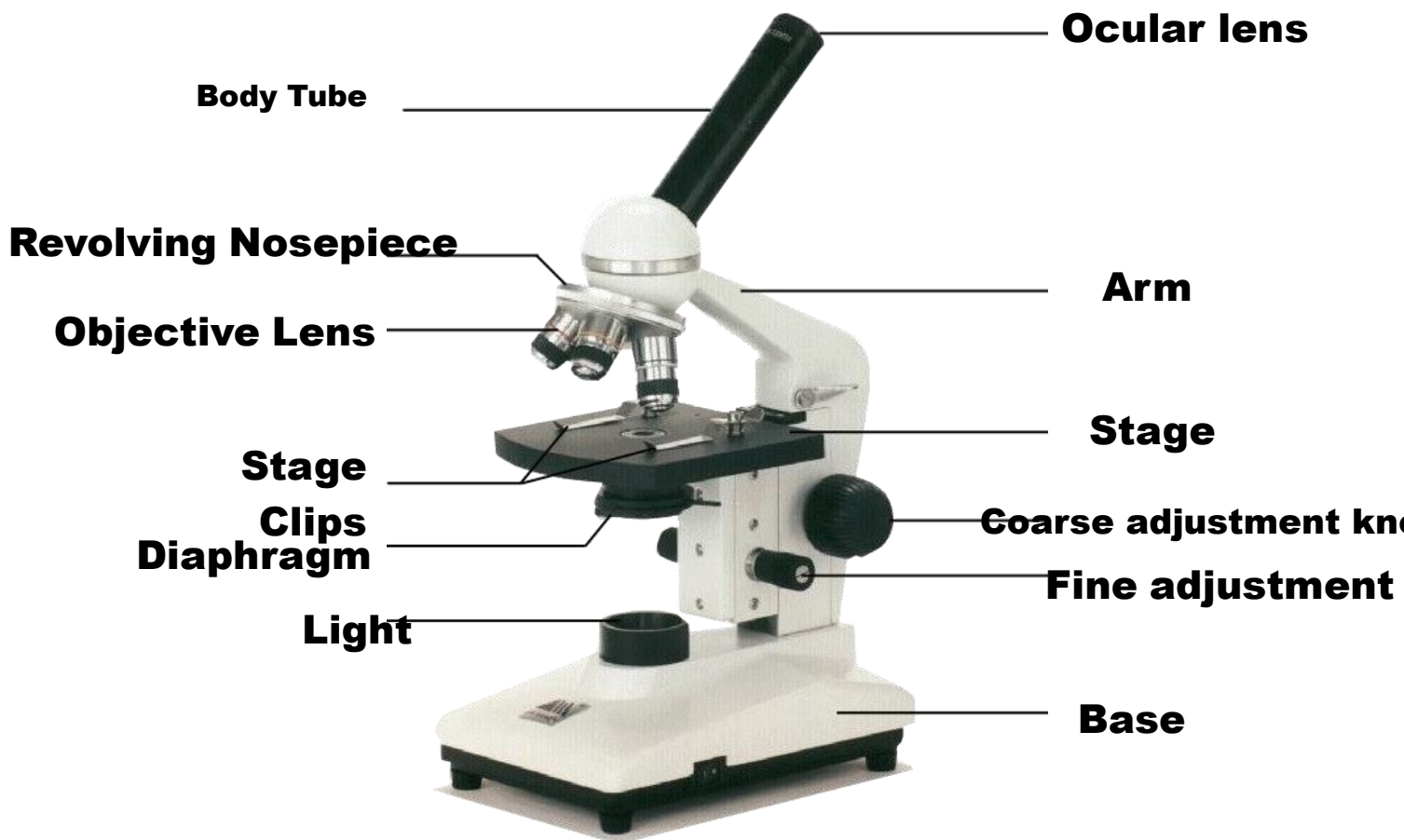
Magnification: increase of an object's apparent size

Resolution: power to show details clearly, both are needed to see a clear image

Types of microscopes

- ▣ Compound Light Microscope
- ▣ Electron Microscope
- ▣ Transmission Electron Microscope (TEM)
- ▣ Scanning Electron Microscope (SEM)

Microscope Parts



Microscope care

- 1- Carry the microscope with both hands — one on the arm and the other under the base of the microscope.
- 2- Never touch the lenses with your fingers.
- 3- Only use lens paper for cleaning

- 4- When you are finished with your "scope", roll the stage down to lowest level then replace the dust cover.

Using the microscope

The proper way to focus a microscope is to start with the lowest power objective lens first and while looking from the side, crank the lens down as close to the specimen as possible without touching it. Now, look through the eyepiece lens and focus upward only until the image is sharp. If you can't get it in focus, repeat the process again.

Once the image is sharp with the low power lens, you should be able to simply click in the next power lens and do minor adjustments with the focus knob. If your microscope has a fine focus adjustment, turning it a bit should be all that's necessary. Continue with subsequent objective lenses and fine focus each time.

Rotate to 40x objective, locate desired portion of specimen in the center of the field. Refocus very carefully so that the specimen is focused as sharply as possible. (*Do not alter focus for the Following steps*).

Place a small drop of oil on the slide in the center of the lighted area when using 100 x objective lens (take care not to dribble on the stage). Put the small drop of oil directly over the area of the specimen to be examined. Rotate so that the 100x oil immersion objective touches the oil and clicks into place. Focus only with fine focus hopefully the specimen will come into focus easily.

Clean up

Please use only lens paper to clean the lenses when you have finished examination, wipe the 100x oil immersion objective carefully with lens paper to remove all oil.

Magnification power

To calculate the power of magnification, multiply the power of the ocular lens by the power of the objective lens.

Total magnification

When the image travels through the objective lens and the ocular lens it magnifies the magnification of the objective lens by 10X.

| Ocular lens | Objective lens | Total magnification |
|--------------------|-----------------------|----------------------------|
| 10x | 4x | 40x |
| 10x | 10x | 100x |
| 10x | 40x | 400x |
| 10x | 100x | 1000x |