

Introduction to the Microscope

- Definition
- Types
- Care
- Parts & functions
- Focusing

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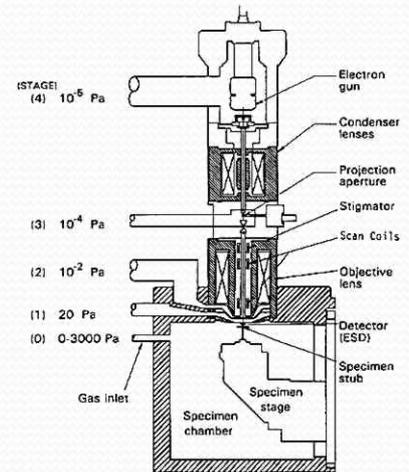
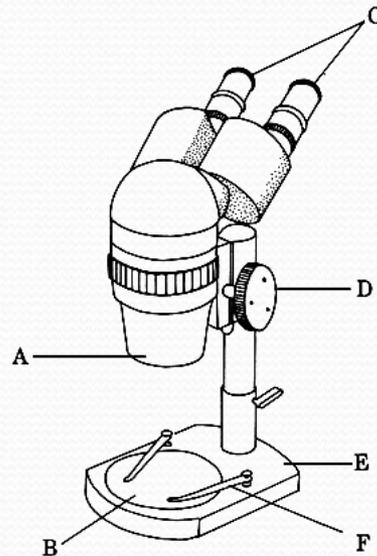
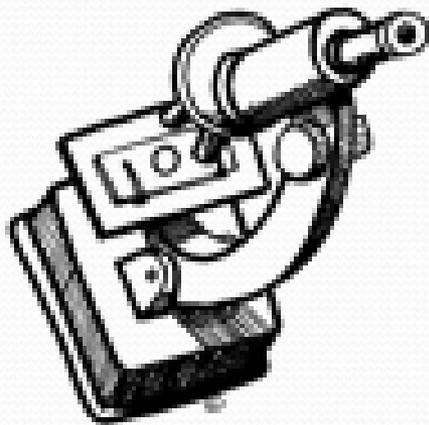


microscope

- A microscope is an instrument that uses visible light and magnifying lenses to examine small objects not visible to the naked eye, the word of microscope is combination of two words; "micro" meaning small and "scope" meaning view.

Types of Microscopes

- Compound Microscope
- Dissection Microscope
- Scanning Electron Microscope (SEM)
- Transmission Electron Microscope (TEM)

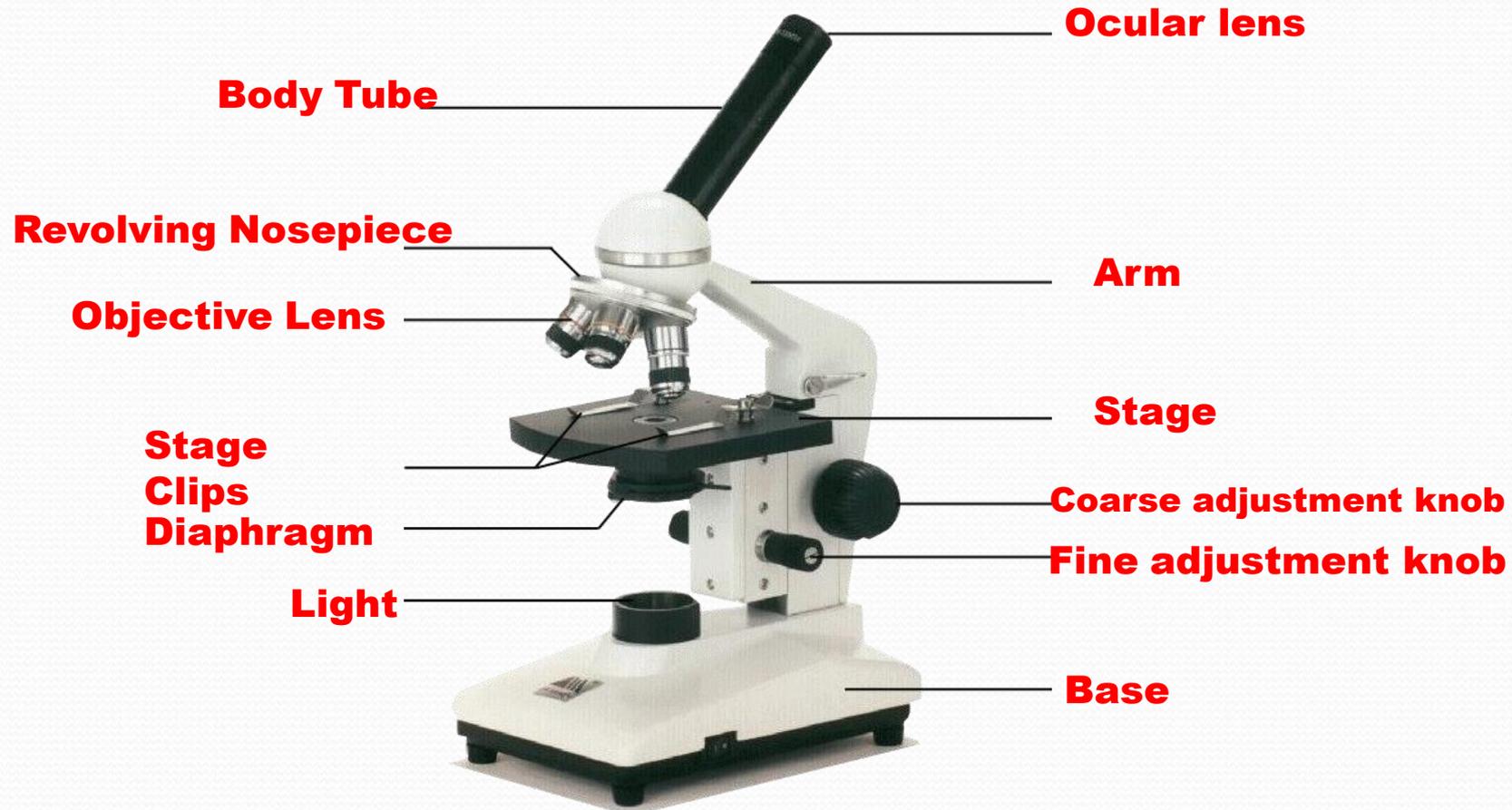


Microscope Care

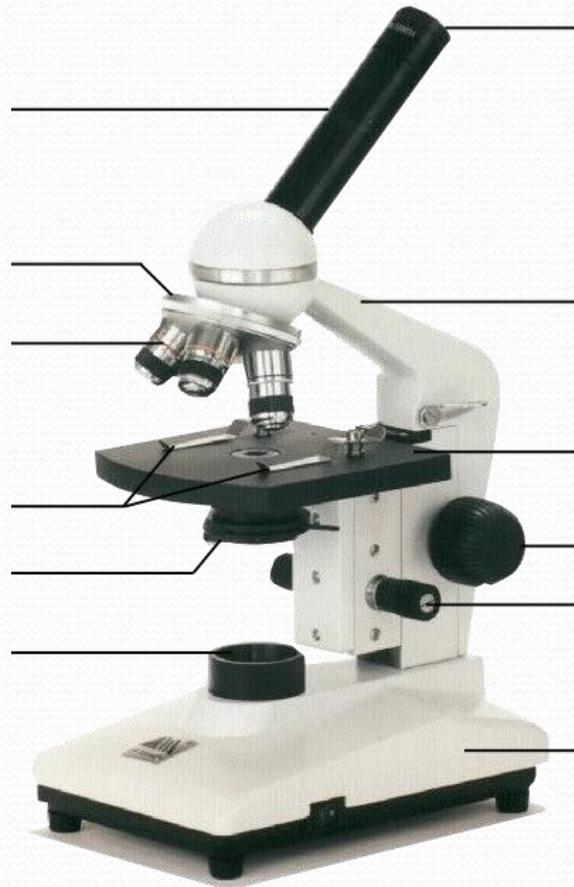
- Always carry with 2 hands
- Never touch the lenses with your fingers.
- Only use lens paper for cleaning
- Keep objects clear of desk and cords
- When you are finished with your "scope", rotate the nosepiece so that it's on the low power objective, roll the stage down to lowest level, rubber band the cord, then replace the dust cover.



Microscope Parts



Ocular Lens

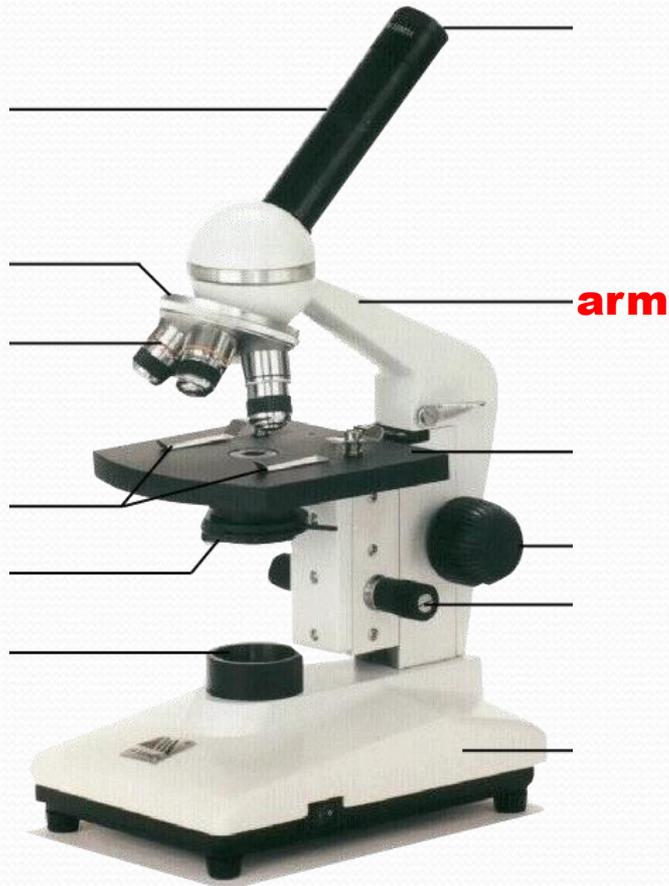


Ocular lens

magnifies; where you look through to see the image of your specimen.

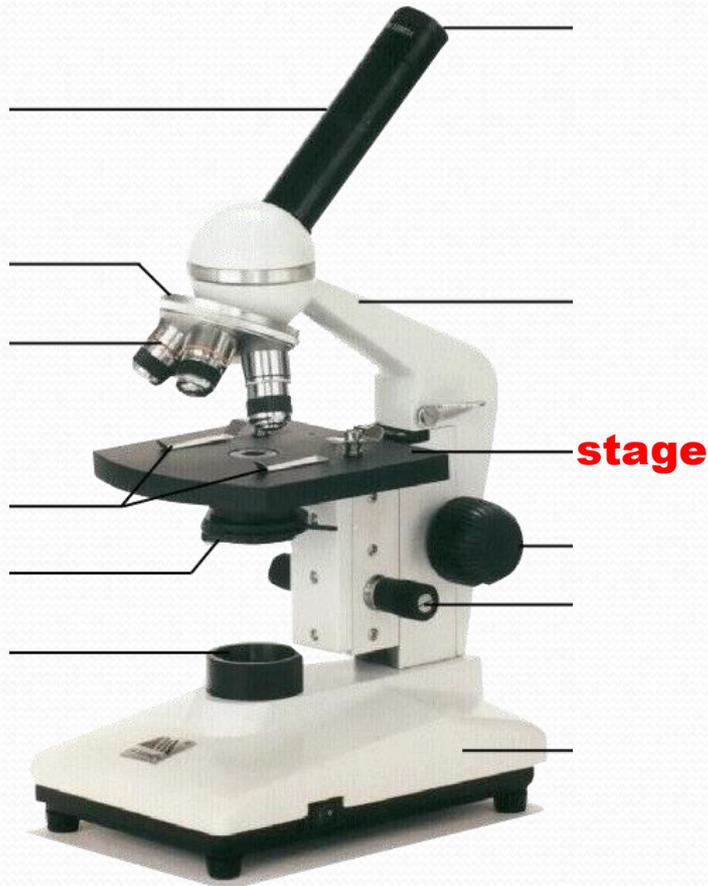
They are usually 10X or 15X power. Our microscopes have an ocular lens power of 10x.

ARM



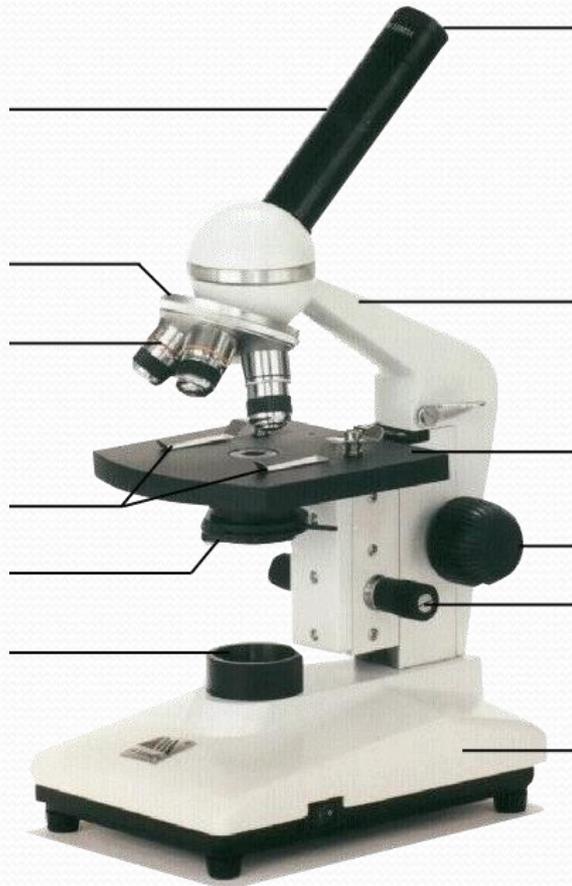
supports the tube and
connects it to the
base

stage



the flat platform
where you place
your slides

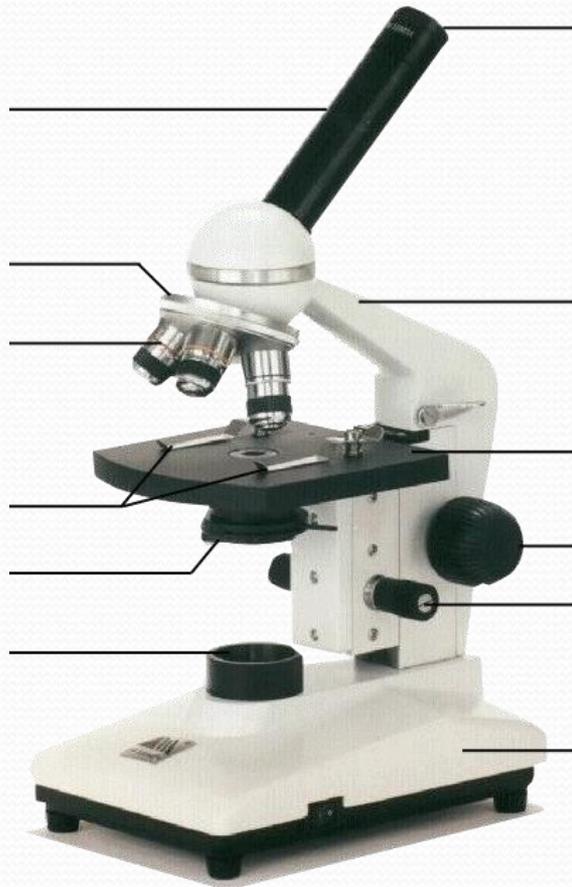
coarse adjustment knob



moves stage (or body tube) up and down

coarse adjustment knob

fine adjustment knob

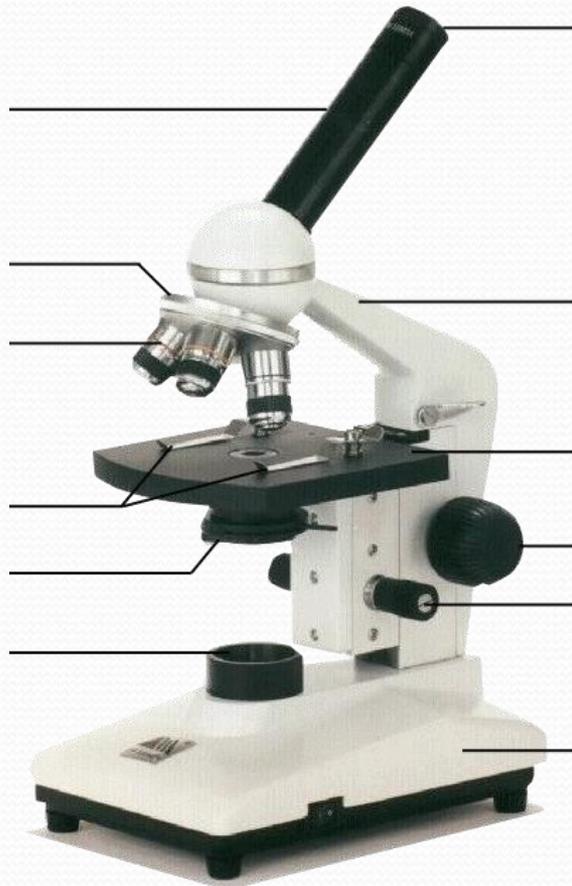


small, round knob on the side of the microscope used to fine-tune the focus of your specimen

fine adjustment knob

after using the coarse adjustment knob

base



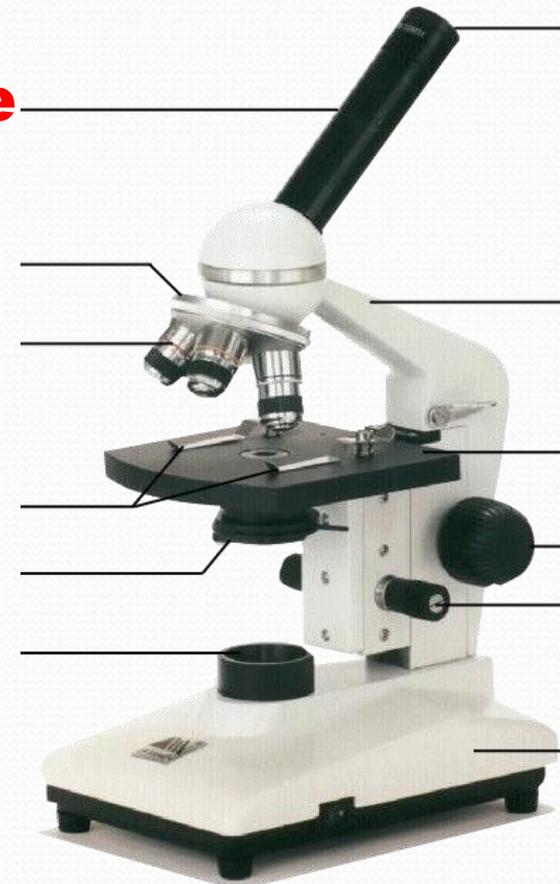
the bottom of the microscope, used for support

base

body tube

body tube

connects the eyepiece
to the objective
lenses

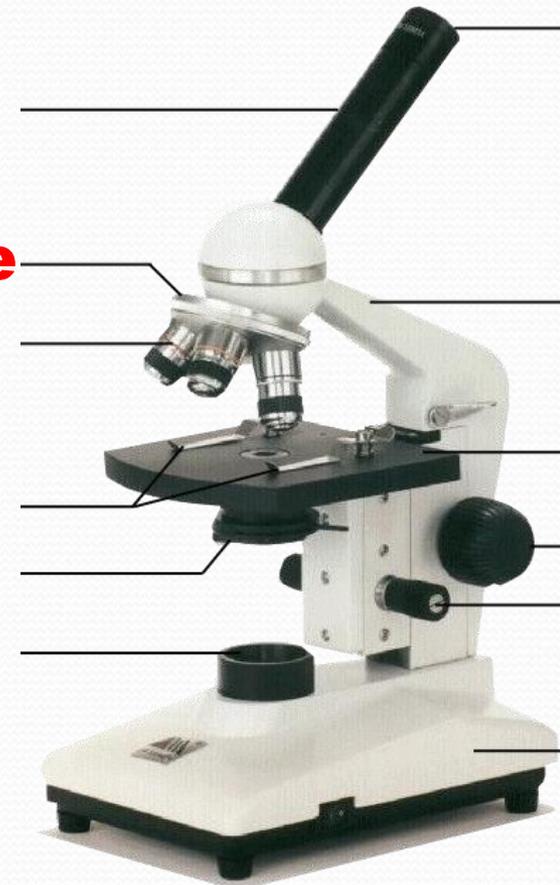


revolving nosepiece

the part that holds two
or more objective lenses

revolving nosepiece

and can be rotated to
easily change power



objective lenses

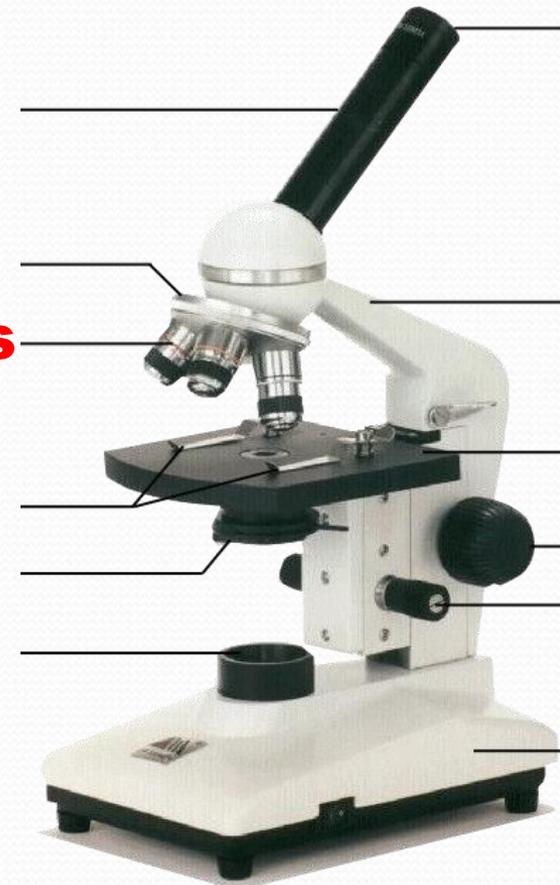
Adds to the magnification

Usually you will find 3 or 4 objective lenses on a microscope. They almost

objective lens

always consist of 4X, 10X, 40X and 100X

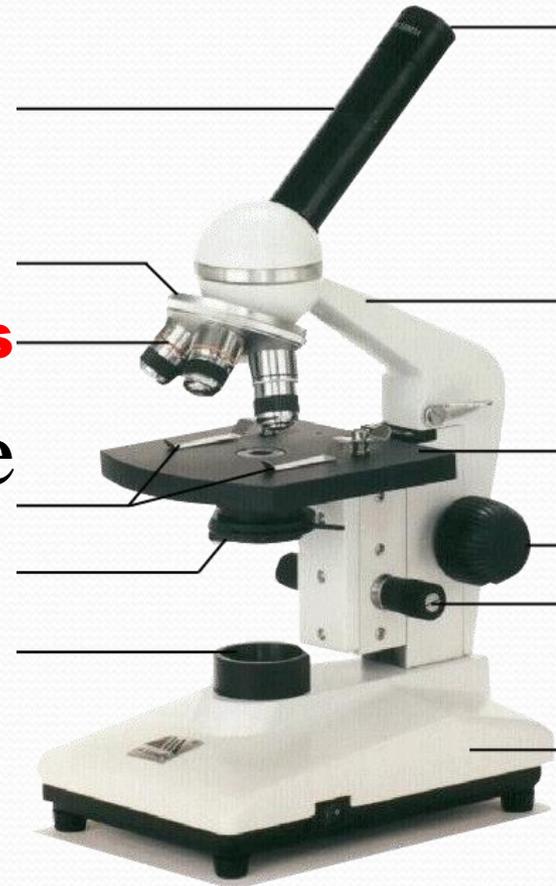
powers. When coupled with a 10X (most common)



objective lenses

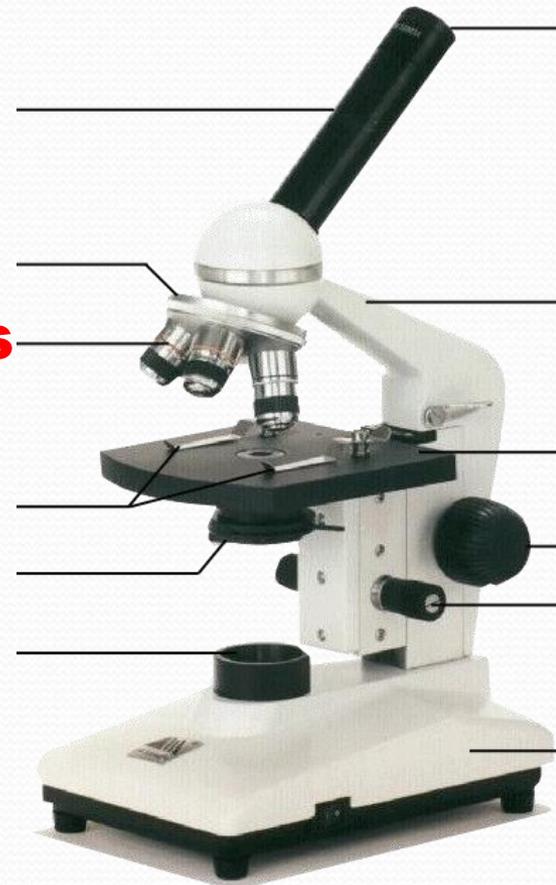
eyepiece lens, we get total magnifications of 40X (4X times 10X), 100X , 400X and 1000X.

The shortest **objective lenses** lens is the lowest power, the longest one is the lens with the greatest power. Lenses are color coded.



objective lenses

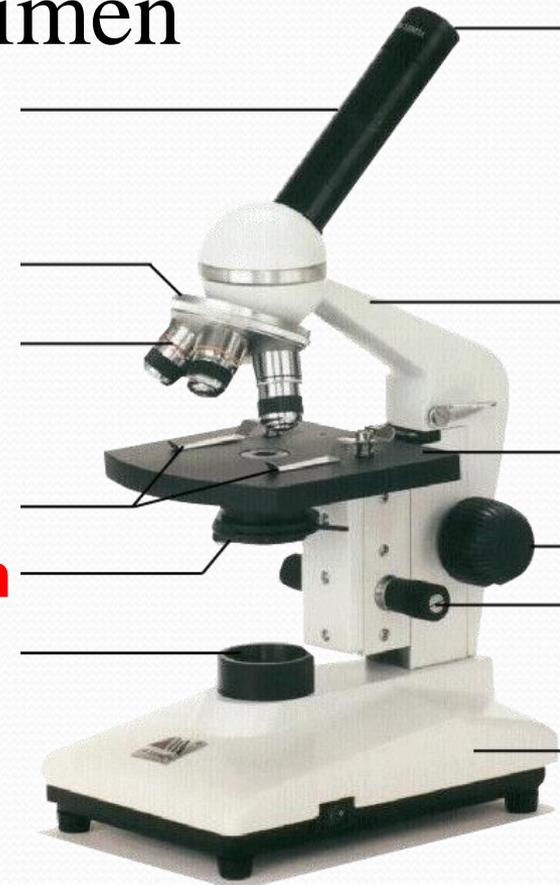
The high power objective lenses are retractable (i.e. 40XR). This means that if they hit a slide, the end of the lens will **objective lenses** push in (spring loaded) thereby protecting the lens and the slide.



diaphragm

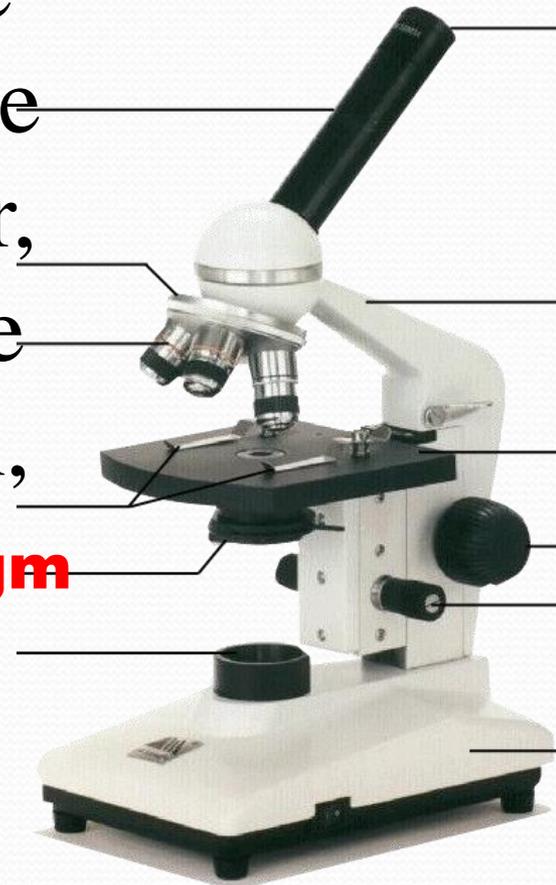
controls the amount of light going through the specimen

Many microscopes have a rotating disk under the stage. This diaphragm has different sized holes and is used to vary the intensity and size of the cone of light



diaphragm

that is projected upward into the slide. There is no set rule regarding which setting to use for a particular power. Rather, the setting is a function of the transparency of the specimen, the degree of contrast **diaphragm** you desire and the particular objective lens in use.



Magnight

makes the specimen
easier to see



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.

Using the Microscope

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.

Using High Power

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)*



Using High Power

Partially rotate so that 40x and 100x objectives straddle the specimen.



Using High Power

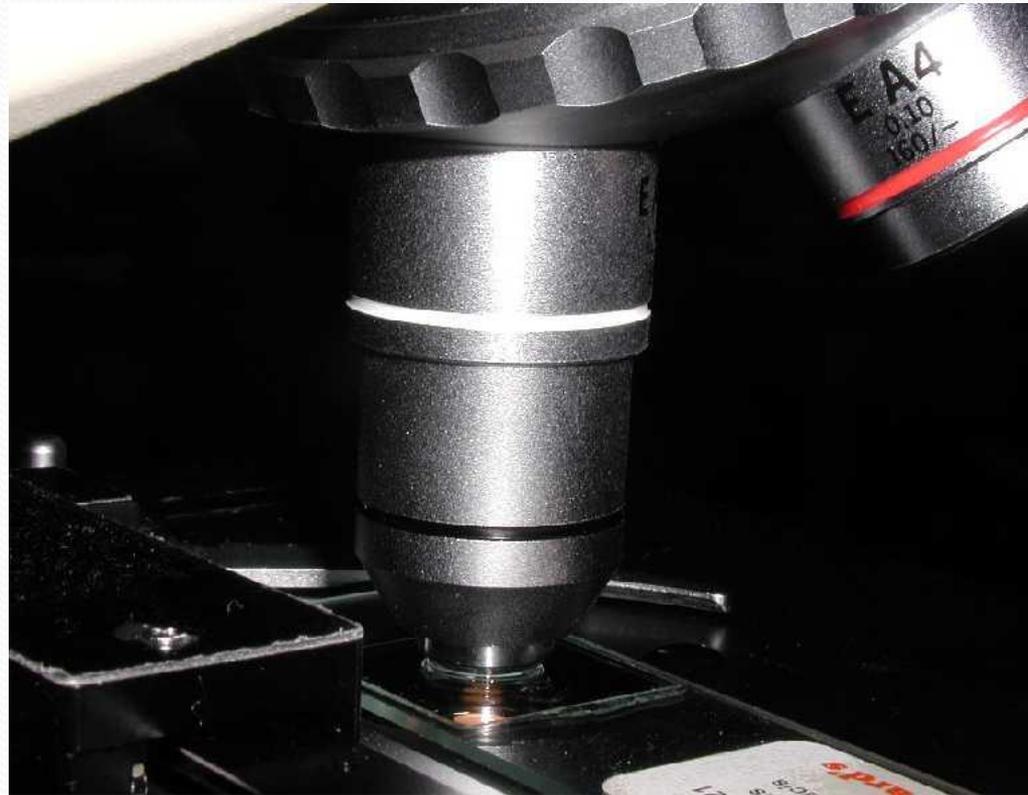
Place a small drop of oil on the slide in the center of the lighted area. (Take care not to dribble on the stage.)

Put the small drop of oil directly over the area of the specimen to be Examined.



Using High Power

Rotate so that the **100x oil immersion objective** touches the oil and clicks into place.



Using High Power

Focus **only** with fine focus. Hopefully, the specimen will come into focus easily. Do not change focus dramatically.



Using High Power

Clean up!: When you have finished for the day, wipe the 100x oil immersion objective carefully with lens paper to remove all oil. Wipe oil from the slide thoroughly with a Kimwipe. Cleanse stage should any oil have spilled on it. Recap the immersion oil container securely, replace in drawer.