

Setting up a microscope

The subject of setting up the compound microscope for proper illumination is frequently misunderstood or not properly performed. This procedure will help you review certain basic steps should you have occasion to use the microscope.

Materials required

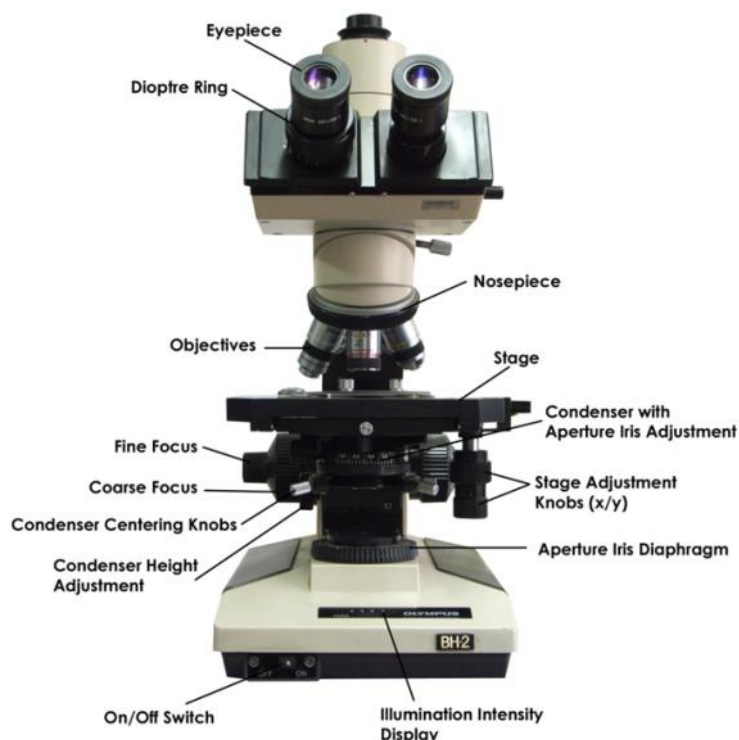
Microscope / sample on glass slide e.g. stained blood smear

How to:

1. Switching on

- > Ensure light intensity is at its lowest setting to help prolong bulb life.
- > Lower stage using coarse focus knob (Figure 1).
- > Swing lowest power objective into place.
- > Turn on at main switch.

Figure 1. Basic components of a standard light microscope.



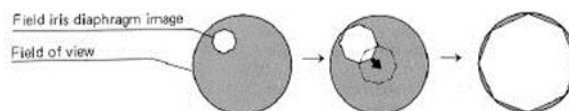
2. Binocular adjustment

- > Use a “control” slide (e.g. blood smear) as it can be helpful to know how your microscope should perform with a familiar specimen.
- > Take care to place slides sample side up on stage as you may not notice that the slide is upside down at low power, only to find it impossible to focus at high power!
- > Using low power (e.g. 10x objective lens), adjust light intensity to a comfortable level.
- > Adjust the oculars so that a single image can be seen when looking through both eyes at the same time.
- > See which ocular has an adjustable focus.
- > Cover that eye and looking only through the ocular with the fixed focus use the coarse and fine adjustment knobs to focus the image.
- > Now cover the opposite eye and looking only through the ocular with the adjustable focus use the focus ring on the ocular tube itself to focus the image.
- > Check with both eyes that image is well focussed.

3. Condenser – focussing and centering

- > Close the field (aperture) iris diaphragm at the base of the microscope.
- > Focus the image of the diaphragm as sharply as possible by raising/lowering the substage condenser with the condenser height adjustment knob.
- > Centre the image using the two condenser centering knobs (Figure 2).
- > Open the field iris diaphragm until it almost touches the edges of the visual field and adjust the screws to centre it again.
- > Open the iris until the diaphragm image just disappears (too far introduces “flare”).

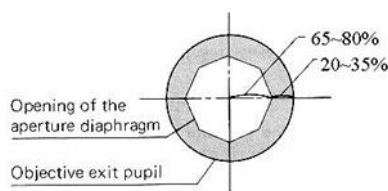
Figure 2. Centering the field iris diaphragm



4. Köhler Illumination

- > Remove one eyepiece and view down tube where you should see an image of the condenser aperture iris diaphragm.
- > Adjust iris using knurled ring at base of condenser until the image occupies about 65-80% of the visual field, too much will introduce “flare” (Figure 3).
- > A quick way to do this adjustment is to use the graduation marks on the condenser – set it at about 0.2

Figure 3 – Adjusting the iris diaphragm



5. Basic use

- > Always scan at lower power using a grid pattern before choosing a field or area to examine at higher magnification.
- > When focusing, start on low power (4 or 10x), then re-focus with each higher power
- > Only use fine focus knob on 40x and 100x as objectives are fragile and should not be rammed into the slide
- > When focussing, go slowly, start with stage and objective close (move together whilst looking from the side) and then slowly move apart whilst looking through the eyepieces.

6. End of use

- > Turn illumination to lowest setting to prolong bulb life and switch off at main switch.
- > Wipe off any immersion oil from lenses and wipe down stage.
- > Use only clean dry cotton buds or lens paper with methanol/lens cleaner to clean objectives and oculars. Kleenex, toilet paper, and paper towels with scratch the glass.
- > Always leave the scope on the shortest ocular (4x) with the stage lowered completely.
- > Remove oil or dust from the top of the condenser.
- > Replace the dust cover.

7. Basic maintenance

A microscope is a precision instrument and often represents a significant investment. Ideally it should be professionally serviced about every two years. It should be kept away from water, corrosive chemicals etc. and covered when not in use. Don't be tempted to use force, solvents or oil on stiff parts, rather get help, as mistakes can be costly. Clean stand and external parts regularly with a clean, soft, lint free cloth. Keep optical components free of dust and oil, and be very gentle as they are easily scratched. Camera shops can help with basic cleaning equipment which might include puffer brush, cotton swabs, soft cloth, lens tissue and cleaning fluid.

