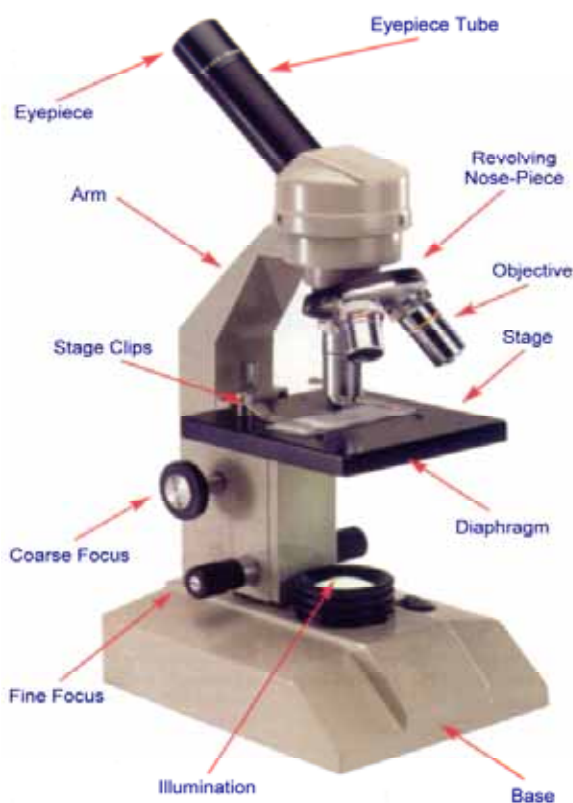


# MICROSCOPES GLOSSARY



## **ACHROMATIC**

Achromatic Objectives bring light of different wavelengths to a focus producing a clearer image with less distortion and reducing chromatic aberration.

## **BODY TUBE Length**

Distance between the objective and the top of the body tube (usually 160mm). Objectives are designed to fit specific microscope and incorrect choice will result in aberration.

## **COAXIAL FOCUS**

A focusing arrangement where the fine and coarse focus knobs are situated together and share a common axis.

## **CONDENSER**

The condenser focuses light upon a specimen under observation. A built-in condenser has a fixed focal length and a numerical aperture of 0.65. The ABBE condenser has a spiral focusing system and a numerical aperture of 1.25. The numerical aperture (NA) of the condenser should be equal to, or greater than the highest objective NA - usually 1.25 (for a 100x objective).

## **COMPOUND MICROSCOPE**

The "Classic". Used to observe specimens and slides in 2D. Using either transmitted or reflected light.

## **CHROMATIC ABERRATION**

When a lens fails to bring light of different wavelengths to a common focus, colour fringes will be apparent around the edges of the image. This is known as Chromatic Aberration and can be prevented by using Achromatic Objectives.

## **DISK DIAPHRAGM - See also IRIS DIAPHRAGM**

A rotating disk situated beneath the stage. The disk contains 5 or 6 apertures of different sizes which are selected to control light levels.

## **DIN**

An German Industry Standard indicating High Quality Lens.

## **EYEPIECE**

The primary image is formed by the objective lens - the eyepiece then forms a secondary image. There are two common eyepieces which differ in lens arrangement and consecutively in the field of view. The Huyghenian eyepiece has a narrower field of view than the Ramsden or Wide view.

# MICROSCOPES GLOSSARY

## EYEPIECE DIAPHRAGM

The diaphragm defines the round field-of-view seen when looking down the microscope. It accepts graticules and is positioned at a point that ensures the graticule scale is in focus with the specimen image.

## FIELD OF VIEW

Area that is visible through the eyepiece when the microscope is in focus.

## FLUORESCENT ILLUMINATION

Bulb cooler than Tungsten but not bright as Tungsten with an even illumination making it better for viewing live specimens.

## GRATICULE

A glass or plastic disk with printed on scale, Graticules are mounted in the eyepiece, calibrated using a stage micrometer and allow accurate measurement of subjects under observation.

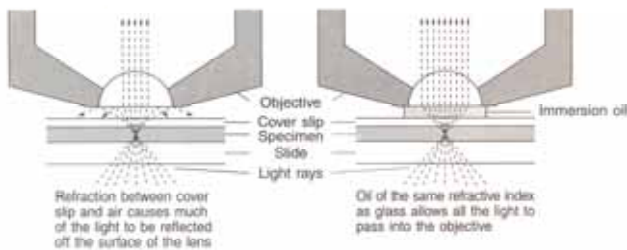
## HALOGEN ILLUMINATION

Typically found on High End microscopes. Extremely bright and white light ideal for high magnifications (x1000). Not recommended for live specimens.

## HUYGHENIAN - See EYEPIECE

## IMMERSION OBJECTIVE

In high magnifications and resolution air between the objective lens surface and the upper surface of the slide is excluded by using a drop of immersion oil thus preventing reflections. Must be used with ABBE condenser.



## IRIS DIAPHRAGM

Fully adjustable leaf diaphragm used to control the amount of light converging on the specimen.

See also [DISK DIAPHRAGM](#)

## LED ILLUMINATION

New type of illumination, found on High Specification microscopes. Provides a more even illumination giving better contrast. Cooler than Halogen

## MAGNIFICATION

The factor by which the image is larger than the object.

**Total Mgn. = Objective Mgn. X Eyepiece Mgn.**

See also [RESOLUTION](#)

## PLANO-CONCAVE MIRROR

Two sided mirror (usually 50mm), with one flat (Plano) side and the other Curved (concave)

Use the flat side with a microscope lamp and the concave surface with very low NA objectives and natural light.

## NUMERICAL APERTURE (NA)

The Numerical Aperture of the lens determines its ability to resolve fine detail. The greater the NA value of the optical system (condenser and objective lens), the greater the power of resolution. NA are marked on both the condenser and the objective.)

NA's of Various Optical Elements:

x10 Achromat 0.25

x100 Achromat 1.25

ABBE Condenser 1.25

## OBJECTIVE LENS

These form the primary image of the object, which is further magnified by the eyepiece.

On the right are the markings existing on the objective lens body and their meanings.



## PARCENTRED

The Optical System (condenser, eyepiece and objective) are directly aligned to minimise aberration.

## PARFOCALITY (PARFOCAL)

Microscope stays in focus when objectives are changed.

## POLARISER

Transfers only light waves on a single plane. Allows vivid polar spectrum colours to be viewed. Ideal for use with rock or other crystalline specimens.

## RESOLUTION

The minimum distance between two points that can be distinguished by the microscope. High magnification doesn't mean High Resolution. See also Numerical Aperture.

## RETRACTABLE OBJECTIVE

Spring-loaded objective that prevents damage to microscope slides should the objective be lowered too far.

## SLIP CLUTCH

A safety mechanism to prevent gear damage if the coarse focus is racked down beyond the normal stop position.

## STAGE

A platform upon which the microscope slide is placed. If the stage has clips, the slide can be moved around manually. For more accurate positioning of slides a mechanical stage can be used.

## STEREO MICROSCOPE

Produces 2 images. Used to observe specimens and larger objects (such as fungi, fossils and crystals) in 3D. Also used in microdissection. Magnification range typically x20 to x80.

## TUNGSTEN ILLUMINATION

The most common form of school microscope illumination and the least expensive. Bright and even, but darkens with age.

