

## The Stereomicroscope (Dissecting Microscope)

The stereomicroscope can be used to examine live specimens, large specimens, and objects through which light won't pass (light opaque). The specimen can be illuminated from above the stage, from below the stage or from both above and below the stage at the same time. The specimen appears three dimensional. The major drawback to using this microscope is that magnification of the specimen is lower than when using a compound light microscope.

The stereomicroscope can have one (monocular) or two (binocular) **oculars**. With a binocular scope, the oculars or eyepieces can be moved closer together or further apart to accommodate the user's interpupillary distance. The oculars are attached to the **head**. The ocular typically magnifies the image 10X. The head contains mirrors or lenses that bend the image toward the oculars. The head piece moves up and down during focusing. The head has a knob, **magnification control**, that when rotated changes the **objective** in place over the stage. An objective is a lens or series of lenses that magnify an image. The objectives are housed within the structure at the base of the head. The objectives also magnify the specimen. Many stereo microscopes use 1X, 4X or 10X objectives. The total magnification of the specimen achieved when using the 1X objective is 10X (1X (objective) x 10X (ocular)). The total magnification of the specimen achieved when using the 4X objective is 40X. The total magnification of the specimen achieved when using the 10X objective is 100X. The highest level of magnification of the stereomicroscope is much lower than the magnifying ability of a compound light microscope.

The **arm** connects the head to the base. The microscope should always be carried with two hands; one holding the arm, the other holding the base. The large knob on the arm is the **focus knob**. It focuses the specimen by raising and lowering the head. Suspended between the head and the arm is a light source. The light source may be built into the microscope or may be a separate piece that needs to be attached.

The microscope rests on its **base**. The base includes the light controls, on/off switch, stage, stage clips and power supply cord. The microscope lights are turned on by toggling the on/off button on the base. Separate toggles control the direction of illumination. The toggle may be a simple on off switch or it may be a three-way switch or there may be multiple switches that allow the user to control the direction from which light hits the specimen. In one position the light above the stage is turned on, in another the light below the stage is on and in the third position both lights are on at the same time. The base also has a **light control wheel or knob** to increase the intensity or amount of the light passing through the specimen. Which setting is used, i.e., light from above the specimen, light from below the specimen or light from above and below, is determined by the type of specimen and how best to illuminate the structure of interest. The **stage** is the glass plate built into the base. The glass may be clear or opaque. The stage of the stereo microscope does not move, unlike the stages found in most compound light microscopes where the coarse and fine adjustment knobs move the stage during focusing. The base has **stage clips** which hold the specimen or slide in place.