

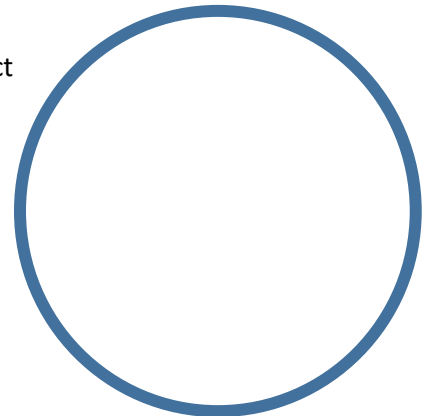
Depth of Field and Field of View

The depth of field refers to the thickness of a specimen and the plane of focus. Think of the specimen as if it were a multistory building, like a skyscraper. The skyscraper has many floors, just like a biological specimen will have many layers of cells. While riding the elevator up and down the skyscraper you would expect to see a different office suite or view at each floor on which you stopped. A similar thing happens when looking at a specimen. What is seen along the upper surface may be different than structures observed as you focus down through the specimen.

The field of view includes the area of the specimen that you see is the circle of light when you look into the oculars. As magnification increases, the field of view decreases, i.e., the area of the specimen visible in the microscope decreases. A smaller section of the specimen is seen, but it appears much larger. The center of the field of view is the center of focus. That center point remains the center point as magnification increases. Components of the image along the periphery can be “lost” and magnification increases.

Depth of Field

1. Select a slide of either silk threads or a flea. If both are available select one slide and have your partner use the other.
2. Place the slide on the microscope.
3. Use the mechanical stage controls to move the slide over the light source.
4. Rotate the 4X objective over the stage and move the stage to its highest position.
5. Grasp the coarse adjustment knobs and focus down until the specimen begins to come into focus. Grasp the fine adjustment knobs and sharpen the image. Adjust the light levels if necessary.
6. Move the specimen (crossed silk threads or flea head) to the center of the circle of light.
7. Draw the image of the specimen in the box to the right.
8. Rotate the 10X objective over the stage. REMEMBER do not move the stage while rotating the objectives.
9. Grasp the fine adjustment knobs and bring the image into sharp focus. Adjust the light to achieve good contrast.
10. Turn the fine adjustment knobs so that the plane of focus moves through your specimen. What happens?



Specimen as viewed at 40X.

11. Which color of silk thread is on top? Which thread is on the bottom?

12. Observe the bristles on the flea body. How does the orientation of the bristles appear to change as you focus through the flea?

Field of View

1. With the 4X objective in place, move the crossed-center of the silk threads or flea head to the edge of the circle of light.
2. Rotate the 10X objective over the stage.
3. Observe the slide at this magnification. Is the flea head or crossed-center of the silk threads still visible in your view? _____ If not move the slide so that these back in the field of view.
4. Why did the flea head or crossed-center of the silk threads disappear?
