Microscopy and Cell Measurement

By Peter White

Name of Course	Chemical and Cellular Basis of Life (BIO106)

Course Level	100

Possible subject Areas	Intro cell biology; Microbiology

Quantitative concepts/skills that students will develop	- Fractions, percentages, proportions, unit conversion, scientific notation, metric units - Solving algebraic equations - Mathematical constants - Size estimation, concept of scale - Geometric concepts: length, height, diameter, area

Overview	This activity is designed for an introductory laboratory exercise in the principles of microscopy and cell measurement. Basic algebraic skills, i.e. solving for a single variable in a linear equation, are reinforced, and the concept of cell size using metric measures (micrometers (µm)) is introduced. The activity requires access to light microscopes with low and high power objectives, micrometer slides or transparent metric rulers with millimeter, and prepared slides. While slides are interchangeable for purposes of this study, the activity employs commonly available slides such as blood smears, nerve tissue preparations, and epithelial tissue.

Background	Students should be introduced to the parts of the microscope and practiced using the microscope to focus an image prior to starting this exercise.

Measurable outcomes or learning goals of your activity	At completion of this activity, students should: 1. Be able to solve for the variable in the equation Magnification=Image size/Actual size. 2. Understand that lens systems have a multiplicative effect on image size. 3. Relate to units of metric length, and estimate various cell sizes in appropriate units, µm. 4. Recognize that view field diameter and magnification are inversely proportional in a lens system.