

Abstract Submitted
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Teaching Optics to Biology Students Through Constructing a Light Microscope JENNIFER ROSS, Univ of Mass - Amherst — The microscope is familiar to many disciplines, including physics, materials science, chemistry, and the life sciences. It demonstrates fundamental aspects of ray and wave optics, making it an ideal system to help educate students in the basic concepts of optics and in measurement principles and techniques. We present an experimental system developed to teach students the basics of ray and wave optics. The students design, build, and test a light microscope made from optics components. We describe the equipment and the basic measurements that students can perform to develop experimental techniques to understand optics principles. Students measure the magnification and test the resolution of the microscope. The system is open and versatile to allow advanced projects such as epi-fluorescence, total internal reflection fluorescence, and optical trapping. We have used this equipment in an optics course, an advanced laboratory course, and graduate-level training modules.

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