




Microcomputer-based Laboratories

 Indicates a research-demonstrated benefit

Overview

Lab activities to collect and present data graphically in real time, giving an intuitive sense of physics concepts that can't be observed directly.





Type of Method

Instructional strategy



Level

Designed for: Intro College Calculus-based  , Intro College Algebra-based  , High School



Setting

Designed for: Lab  , Studio  , Lecture - Large (30+ students)

Can be adapted for: Lecture - Small (<30 students), Recitation/Discussion Session



Coverage

Few topics with great depth, Many topics with less depth



Topics

Mechanics, Electricity / Magnetism, Waves / Optics, Thermal / Statistical



Instructor Effort

Medium





Resource Needs

Computers for students, Advanced lab equipment





Skills


Designed for: Conceptual understanding  , Using multiple representations  , Lab skills

Can be adapted for: Designing experiments



Research Validation

Based on research into: theories of how students learn  , student ideas about specific topics 

Demonstrated to improve: conceptual understanding 

Studied using: research at multiple institutions  , research by multiple groups 



Compatible Methods

[Peer Instruction](#), [PhET](#), [UW Tutorials](#), [JiTT](#), [Ranking Tasks](#), [ILDs](#), [CGPS](#), [Physlets](#), [Context-Rich Problems](#), [RealTime Physics](#), [Workshop Physics](#), [TIPERs](#), [ABP Tutorials](#), [SCALE-UP](#), [Modeling](#), [OSP](#), [SDI Labs](#), [OST Tutorials](#), [ISLE](#), [Thinking Problems](#), [Workbook for Introductory Physics](#), [LA Program](#), [CAE TPS](#), [CPU](#), [SCL](#), [TEFA](#), [EiP](#), [Tools for Scientific Thinking](#), [M&I](#), [Tutorials](#), [Clickers](#), [Responsive Teaching](#)

 **Similar
Methods**

[ILDs](#), [RealTime Physics](#), [Workshop Physics](#), [ABP Tutorials](#), [EiP](#), [Tools for Scientific Thinking](#)

 **Website**

<http://physicsed.buffalostate.edu/danowner/whyMBL.html>