



## Scientific Community Laboratories

 Indicates a research-demonstrated benefit

### Overview

Design labs in which students learn how to produce, analyze, and evaluate scientific evidence. Each lab consists of a simple question for students to answer experimentally. There is no lab manual or instructions for how to answer the question. They work in groups to design an experiment, carry it out, analyze it, and present their results for discussion with the other students in the class. They critique each other's experiments and then evaluate how to improve their experiments.



#### Type of Method

Instructional strategy, Curriculum supplement



#### Level

**Designed for:** Intro College Algebra-based 

**Can be adapted for:** Teacher Preparation, Teacher Professional Development, High School, Intro College Calculus-based, Intro College Conceptual, Intermediate Undergraduate, Advanced Undergraduate, Astronomy, Other Science



#### Setting

**Designed for:** Lab 



#### Coverage

Few topics with great depth, Many topics with less depth



#### Topics

Mechanics, Electricity / Magnetism, Waves / Optics



#### Instructor Effort

High






#### Resource Needs

Lab equipment for student use - professional, Tables arranged for group work





#### Skills

**Designed for:** Reflecting on one's own learning  , Laboratory skills  , Designing experiments  , Conceptual understanding of physics content, Coherent framework for physics, Think like a scientist, Self-confidence around physics,

Enjoyment of physics, Creativity, Autonomy, engage in sensemaking  
**Can be adapted for:** Problem-solving skills, Connecting conceptual and mathematical understanding, Understanding how physics relates to the real world, Representing knowledge in multiple ways

 **Research Validation**


**Based on research into:** how students learn 

**Demonstrated to improve:** metacognitive skills  , laboratory skills 

**Studied using:** classroom observations  , video of students 

 **Compatible Methods**

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

 **Similar Methods**

[RealTime Physics](#), [Tools for Scientific Thinking](#)

 **Developer(s)**

Rebecca Lippmann Kung, Paul Gresser, and Joe Redish

 **Website**

<http://umdperg.pbworks.com/w/page/10511229/Scientific-Community-Labs>