




Socratic Dialog Inducing Laboratories

 Indicates a research-demonstrated benefit

Overview

"Guided construction" labs featuring hands-and-heads-on experiments in introductory mechanics. Designed to promote students' mental construction of concepts through (1) conceptual conflict, (2) kinesthetic involvement, (3) extensive verbal, written, pictorial, diagrammatic, graphical, and mathematical analysis of concrete Newtonian experiments, (4) repeated exposure to experiments at increasing levels of sophistication, (5) peer discussion, and (6) Socratic dialogue with instructors.






Type of Method

Curriculum supplement



Level

Designed for: High School , Intro College Calculus-based , Intro College Algebra-based , Teacher Preparation, Teacher Professional Development, Intro College Conceptual

Can be adapted for: Intermediate Undergraduate, Advanced Undergraduate



Setting

Designed for: Lab , Studio

Can be adapted for: Lecture - Small (<30 students)



Coverage

Few topics with great depth



Topics

Mechanics



Instructor Effort

High




Resource Needs

Teaching Assistants / Learning Assistants, Lab equipment for student use - professional, Tables arranged for group work








Skills

Designed for: Conceptual understanding of physics content , Connecting conceptual and mathematical understanding, Coherent framework for physics, Understanding how physics relates to the real world, Self-confidence around physics, Enjoyment of physics, Laboratory skills, Representing knowledge in multiple ways


Can be adapted for: Problem-solving skills, Reflecting on one's own learning

 **Research Validation**

Based on research into: how students learn  , student ideas about specific topics 
Demonstrated to improve: scores on multiple choice conceptual tests 
Studied using: conceptual pre/post exams  , research conducted at multiple institutions 

 **Compatible Methods**

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

 **Similar Methods**

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

 **Developer(s)**

Richard Hake

 **Website**

<http://www.physics.indiana.edu/~sdi/>

 **Intro Article**

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