

## **Investigative Science Learning Environment**

Indicates a research-demonstrated benefit

## **Overview**

Comprehensive learning system for introductory Physics that engages students in experiences that mirror experiences of practicing scientists.

Type of Method	Instructional strategy, Curriculum supplement
X Level	Designed for: Intro College Calculus-based ♠, Intro College Algebra-based ♠, High School  Can be adapted for: Teacher Preparation, Teacher Professional Development, Intro College Conceptual, Intermediate Undergraduate, Advanced Undergraduate, Graduate, Astronomy, Other Science, Any
	Designed for: Lecture - Large (30+ students)    , Lecture - Small (<30 students)  , Recitation/Discussion Session   , Lab   , Studio
Coverage	Few topics with great depth, Many topics with less depth
<b>Topics</b>	Mechanics, Electricity / Magnetism, Waves / Optics, Thermal / Statistical
Instructor Effort	Medium
Resource Needs	Projector in class, Lab equipment for student use - professional, Cost for students
<b>?</b> ∄ Skills	Designed for: Problem-solving skills , Conceptual understanding of physics content , Think like a scientist , Reflecting on one's own learning , Laboratory skills , Representing knowledge in multiple ways , Designing experiments , Autonomy , Coherent framework for physics, Self-confidence around physics  Can be adapted for: Connecting conceptual and mathematical understanding, Understanding how physics relates to the real world, Enjoyment of physics
	Based on research into: how students learn 🤏 , student ideas about specific topics
Research Validation	Demonstrated to improve: scores on multiple choice conceptual tests ♠ , traditional problem-solving ability ♠ , laboratory skills ♠ Studied using: conceptual pre/post exams ♠ , problem-solving pre/post exams

\$\instrum\_\text{, beliefs pre/post exams \$\instrum\_\text{, student interviews }\instrum\_\text{, classroom observations }\instrum\_\text{, video of students }\instrum\_\text{, analysis of written work }\instrum\_\text{, research conducted at multiple institutions }\instrum\_\text{, research conducted at multiple