



PER User's Guide

Physics Education Research

Evidence-based resources for teaching physics



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








Level

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

Can be adapted for: Teacher Prep Course, Teacher Professional Development, Intro College Conceptual, Intermediate, Upper-level Undergraduate, Graduate School, Any



Setting

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



Topics

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



Instructor Effort

Medium









Resource Needs

Projector, Advanced lab equipment, Cost for students





Skills




Designed for: Conceptual understanding , Problem-solving skills , Lab skills , Using multiple representations , Designing experiments , Metacognition 





Can be adapted for: Making real-world connections



Research Validation

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

Demonstrated to improve: conceptual understanding , problem-solving skills , lab skills 

Studied using: student interviews , classroom observations , analysis of written work , research at multiple institutions 



Compatible Methods

[PhET](#), [JiTT](#), [Physlets](#), [SCALE-UP](#), [Modeling](#), [OSP](#), [LA Program](#), [MBL](#), [CPU](#), [PUM](#), [Clickers](#), [Responsive Teaching](#)



**Similar
Methods**

[PUM](#)



Developer(s)

Eugenia Etkina, Alan Van Heuvelen



Website

<http://www.islephysics.net/>

