

## Physics by Inquiry

 Indicates a research-demonstrated benefit

### Overview

A laboratory-based guided-inquiry curriculum that helps future and current teachers develop deep understanding of physics content and scientific reasoning skills. Through in-depth study of simple physical systems and their interactions, students gain direct experience with the process of science. Starting from their own observations, they develop basic physical concepts, use and interpret different forms of scientific representations, and construct explanatory models with predictive capability.





**Type of Method**

Full curriculum





**Level**

**Designed for:** Teacher Preparation  , Teacher Professional Development  , Intro College Conceptual

**Can be adapted for:** Pre-intro course for underprepared students



**Setting**

**Designed for:** Lecture - Small (<30 students)  , Studio 

**Can be adapted for:** Recitation/Discussion Session, Lab



**Coverage**

Few topics with great depth



**Topics**

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



**Instructor Effort**

High




**Resource Needs**



Cost for students, Tables arranged for group work, Very well-trained instructors, minimal equipment for experiments








**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, Think like a scientist, Reflecting on one's own learning, Self-confidence around physics, Representing knowledge in multiple ways, Designing experiments, Ability to teach by inquiry

 **Research  
Validation**


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

**Demonstrated to improve:** scores on written conceptual tests  , teacher RTOP scores

**Studied using:** conceptual pre/post exams  , student interviews  , research conducted at multiple institutions  , research conducted by someone other than developers 

 **Compatible  
Methods**

[JITT](#), [SCALE-UP](#), [LA Program](#), [Diagnoser](#)

 **Similar  
Methods**

[UW Tutorials](#), [PET](#), [PSET](#)

 **Developer(s)**

Lillian C. McDermott, Peter S. Shaffer and the Physics Education Group at UW

 **Website**

<http://www.phys.washington.edu/groups/peg/pbi.html>