



Activity-Based Tutorials, Volume 1: Introductory Physics

 Indicates a research-demonstrated benefit

Overview

A set of worksheet-driven small-group learning activities emphasizing the connection between mathematics and physics and using computer-based tools to help in easy data gathering. Designed to supplement traditional instruction in introductory calculus-based physics. Instructors engage with students using Socratic dialog.



Type of Method

Curriculum supplement, Tutorials



Level

Designed for: Intro College Calculus-based 

Can be adapted for: High School, Intro College Algebra-based



Setting

Designed for: Recitation/Discussion Session 

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



Coverage

Many topics with less depth



Topics

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



Instructor Effort

Medium








Resource Needs



Teaching Assistants / Learning Assistants, Computers for student use in class, Lab equipment for student use - professional, Cost for students, Tables arranged for group work



Skills


Designed for: Conceptual understanding of physics content  , Connecting conceptual and mathematical understanding  , Understanding how physics relates to the real world  , Representing knowledge in multiple ways 





Can be adapted for: Coherent framework for physics  , Problem-solving skills, Reflecting on one's own learning, Self-confidence around physics

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



Research Validation

Demonstrated to improve: scores on multiple choice conceptual tests  , scores on written conceptual tests 

Studied using: conceptual pre/post exams  , problem-solving pre/post exams  , beliefs pre/post exams  , student interviews 

 **Compatible Methods**

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

 **Similar Methods**

[UW Tutorials](#), [OST Tutorials](#), [New Model Course](#), [QuLLTs](#), [Thermal Tutorials](#), [Mechanics Tutorials](#), [Tutorials](#), [MBL](#), [Lecture-Tutorials](#)

 **Developer(s)**

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 **Website**

<http://perlnet.umaine.edu/abt/>