



CPU Computer Simulators

 Indicates a research-demonstrated benefit

Overview

A suite of 24 computer simulators available online covering many areas of physics and physical science. Each simulator allows one to create many different situations to explore phenomena, conduct simulated experiments to test your own models, and to get feedback including multiple representations.






Type of Method

Computer simulations




Level

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



Setting

Designed for: Studio , Lecture - Large (30+ students), Lecture - Small (<30 students), Recitation/Discussion Session, Lab, Homework



Coverage

Few topics with great depth, Many topics with less depth



Topics

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



Instructor Effort

Low




Resource Needs

Projector in class, Computers for student use in class, Computers for student use outside of class










Skills

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



Research Validation

Based on research into: how students learn , student ideas about specific topics 
Demonstrated to improve: scores on written conceptual tests , beliefs about physics 
Studied using: conceptual pre/post exams , classroom observations , video of students 



Compatible Methods

[Peer Instruction](#), [PhET](#), [UW Tutorials](#), [JiTT](#), [Ranking Tasks](#), [ILDs](#), [CGPS](#), [Physlets](#), [Context-Rich Problems](#), [RealTime Physics](#), [Workshop Physics](#), [TIPERs](#), [ABP Tutorials](#), [SCALE-UP](#), [Modeling](#), [OSP](#), [SDI Labs](#), [OST Tutorials](#), [ISLE](#), [Thinking Problems](#), [Workbook for Introductory Physics](#), [LA Program](#), [PET](#), [PSET](#), [LEPS](#), [CAE TPS](#), [Lecture-Tutorials](#), [Astro Ranking Tasks](#), [MBL](#), [SCL](#), [TEFA](#), [CU Modern](#), [Energy Project](#), [SGSI](#), [Paradigms](#), [PUM](#), [EiP](#), [Tools for Scientific Thinking](#), [M&I](#), [Tutorials](#), [Clickers](#), [PRISMS PLUS](#), [Responsive Teaching](#)



Similar Methods

[PhET](#), [Physlets](#), [OSP](#),



Developer(s)

Fred Goldberg and many others



Website

<http://cpucips.sdsu.edu/simulators.html>