



PhET Interactive Simulations

 Indicates a research-demonstrated benefit

Overview

Open-ended game-like simulations that include expert visual models, enabling scientist-like exploration and real-world connections.







Type of Method

Curriculum supplement, Computer simulations






Level

Designed for: Intro College Calculus-based  , Intro College Algebra-based  , Intro College Conceptual  , Intermediate  , Teacher Prep Course, High School, Upper-level Undergraduate

Can be adapted for: Grade School to Grad School



Setting

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



Coverage

Few topics with great depth, Many topics with less depth



Topics

Mechanics, Electricity / Magnetism, Waves / Optics, Thermal / Statistical, Modern / Quantum, Mathematical, Astronomy, Other Science



Instructor Effort

Low




Resource Needs

Computers for students, Access to computers either in or outside of class





Skills




Designed for: Conceptual understanding  , Making real-world connections, Using multiple representations








Can be adapted for: Lab skills  , Problem-solving skills, Designing experiments



Research Validation

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

Demonstrated to improve: conceptual understanding  , lab skills  , beliefs and attitudes 

Studied using: cycle of research and redevelopment  , student interviews  , classroom observations  , analysis of written work  , research at multiple institutions  , research by multiple groups  , peer-reviewed publication 

 **Compatible Methods**

[Peer Instruction](#), [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](#), [New Model Course](#), [CPU](#), [SCL](#), [TEFA](#), [CU Modern](#), [CU E&M](#), [CU QM](#), [QuILTs](#), [IQP](#), [Thermal Tutorials](#), [Mechanics Tutorials](#), [Energy Project](#), [SGSI](#), [Paradigms](#), [EiP](#), [Tools for Scientific Thinking](#), [PI QM](#), [M&I](#), [Tutorials](#), [Clickers](#), [MOP](#), [Responsive Teaching](#)

 **Similar Methods**

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

 **Developer(s)**

PhET Interactive Simulations, University of Colorado - Boulder

 **Website**

<http://phet.colorado.edu/>

 **Intro Article**

10747

 **Intro Article**

[Factors promoting engaged exploration with computer simulations](#)

Teaching materials

You can find over 100 simulations available for free on the [PhET website](#).

PhET also has an [activity database](#) where PhET team members and teachers from around the world can contribute teaching activities using PhET simulations. The database contains hundreds of activities that you can download for free, including labs, homework assignments, lectures, activities, concept questions, and more.