




## PhET Interactive Simulations

 Indicates a research-demonstrated benefit

### Overview

PhET simulations provide interactive, game-like environments which enable scientist-like exploration, connect to the real world, and include key visual models that experts use by, for example, making the invisible visible and providing multiple representations. With an intuitive interface and minimal text, PhET sims are designed to give teachers control over how they are used in the classroom, allowing for use in lecture, recitation, lab, pre-class assignments, or homework. Available for free!







#### Type of Method

Curriculum supplement, Computer simulations






#### Level

**Designed for:** Intro College Calculus-based , Intro College Algebra-based , Intro College Conceptual , Intermediate Undergraduate , Teacher Preparation, High School, Advanced Undergraduate, Other Science, Math, Chemistry, Biology, Earth Sciences

**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

Access to computers either in or outside of class







#### Skills







**Designed for:** Conceptual understanding of physics content , Enjoyment of physics , Connecting conceptual and mathematical understanding, Coherent framework for physics, Understanding how physics relates to the real world, Think like a scientist, Representing knowledge in multiple ways

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

 **Research Validation**

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

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

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

 **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/>