



SCALE-UP

 Indicates a research-demonstrated benefit

Overview

An integrated learning environment in which the space is carefully designed to facilitate interactions between teams of students who work on short, interesting tasks. Students work in small groups around round tables on hands-on activities, questions, simulations, or laboratories. All course components are mixed together; there is no separate lab class and most of the "lectures" are actually class-wide discussions.








Type of Method

Classroom structure



Level

Designed for: Teacher Preparation , High School , Intro College Calculus-based , Intro College Algebra-based , Astronomy , Teacher Professional Development, Intro College Conceptual, Intermediate Undergraduate, Other Science



Setting

Designed for: 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

High











Resource Needs

Studio classroom
















Skills

Designed for: Problem-solving skills , Conceptual understanding of physics content , Reflecting on one's own learning , Self-confidence around physics , Enjoyment of physics , Laboratory skills , Representing knowledge in multiple ways , Designing experiments , Connecting conceptual and mathematical understanding, Coherent framework for physics, Understanding how physics relates to the real world, Think like a scientist, working in groups

 **Research Validation**

Based on research into: how students learn 

Demonstrated to improve: scores on multiple choice conceptual tests  , scores on written conceptual tests  , traditional problem-solving ability  , beliefs about physics  , metacognitive skills  , laboratory skills  , retention of students 

Studied using: conceptual pre/post exams  , beliefs pre/post exams  , student interviews  , classroom observations  , video of students  , research conducted at multiple institutions 

 **Compatible Methods**

[Peer Instruction](#), [PhET](#), [UW Tutorials](#), [JiTT](#), [Ranking Tasks](#), [CGPS](#), [Physlets](#), [Context-Rich Problems](#), [RealTime Physics](#), [Workshop Physics](#), [TIPERs](#), [ABP Tutorials](#), [Modeling](#), [OSP](#), [SDI Labs](#), [OST Tutorials](#), [ISLE](#), [Thinking Problems](#), [Workbook for Introductory Physics](#), [LA Program](#), [PBI](#), [PET](#), [PSET](#), [LEPS](#), [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](#), [PUM](#), [EiP](#), [Tools for Scientific Thinking](#), [PI QM](#), [M&I](#), [Tutorials](#), [Clickers](#), [ILDs](#), [CAE TPS](#), [MOP](#), [Responsive Teaching](#)

 **Similar Methods**

[Workshop Physics](#), [EiP](#)

 **Developer(s)**

Robert Beichner

 **Website**

<http://scaleup.ncsu.edu/>