



Thinking Problems

 Indicates a research-demonstrated benefit

Overview

Questions for homework, clickers, and exams that help students connect mathematical and conceptual reasoning and relate physics to the real world.



Type of Method

Curriculum supplement



Level

Designed for: Intro College Calculus-based, Intro College Algebra-based, Intro College Conceptual

Can be adapted for: Teacher Prep Course, Teacher Professional Development, High School, Intermediate



Setting

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

Can be adapted for: Lab



Coverage

Few topics with great depth, Many topics with less depth



Topics

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





Skills

Designed for: Conceptual understanding, Problem-solving skills, Making real-world connections

Can be adapted for: Metacognition



Research Validation

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



Compatible Methods

[Peer Instruction](#), [PhET](#), [UW Tutorials](#), [JiTT](#), [Ranking Tasks](#), [ILDs](#), [CGPS](#), [Physlets](#), [Context-Rich Problems](#), [TIPERs](#), [ABP Tutorials](#), [SCALE-UP](#), [OSP](#), [SDI Labs](#), [OST Tutorials](#), [Workbook for Introductory Physics](#), [LA Program](#), [CAE TPS](#), [MBL](#), [New Model Course](#), [CPU](#), [SCL](#), [TEFA](#), [CU Modern](#), [IQP](#), [M&I](#), [Tutorials](#), [Clickers](#), [Responsive Teaching](#)



Similar Methods

[Ranking Tasks](#), [TIPERs](#)



Developer(s)

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Website

<http://www.physics.umd.edu/perg/problems.htm>

