



## Paradigms in Physics

 Indicates a research-demonstrated benefit

### Overview

Activities for upper-level physics that can be incorporated into a standard course or used as part of a restructuring of the undergraduate curriculum.



**Type of Method**

Instructional strategy, Full curriculum, Curriculum supplement, Computer simulations



**Level**

**Designed for:** Intermediate, Upper-level Undergraduate



**Setting**

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

**Can be adapted for:** Lecture - Large (30+ students), Studio



**Coverage**

Many topics with less depth



**Topics**

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



**Instructor Effort**

High





**Skills**

**Designed for:** Conceptual understanding, Problem-solving skills, Lab skills, Making real-world connections, Using multiple representations




**Can be adapted for:** Metacognition



**Research Validation**

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

**Demonstrated to improve:** retention of students 

**Studied using:** student interviews , classroom observations , analysis of written work 



**Compatible Methods**

[Peer Instruction](#), [PhET](#), [JiTT](#), [CGPS](#), [Physlets](#), [SCALE-UP](#), [OSP](#), [LA Program](#), [CAE TPS](#), [CPU](#), [TEFA](#), [CU Modern](#), [CU E&M](#), [CU QM](#), [QuILTs](#), [Thermal Tutorials](#), [Mechanics Tutorials](#), [PI QM](#), [Tutorials](#), [Clickers](#), [Responsive Teaching](#)



**Similar Methods**

[CU E&M](#), [CU QM](#)



**Developer(s)**

Oregon State University Physics Department



**Website**

<http://physics.oregonstate.edu/paradigms>

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## **Teaching materials**

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You can download activities and activity sequences from the Paradigms wiki page:

<http://physics.oregonstate.edu/portfolioswiki>