



Guide *Modeling Instruction*

 Indicates a research-demonstrated benefit

Overview

Instruction organized around active student construction of conceptual and mathematical models in an interactive learning community.




Type of Method

Instructional strategy





Level

Designed for: Teacher Professional Development , High School , Intro College Calculus-based , Intro College Algebra-based, Intro College Conceptual, High School Chemistry

Can be adapted for: Teacher Prep Course, Intermediate, Upper-level Undergraduate, Graduate School, any science or mathematics course



Setting

Designed for: Lecture - Small (<30 students) , Studio 

Can be adapted for: Recitation/Discussion Session



Coverage

Few topics with great depth, Many topics with less depth



Topics

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



Instructor Effort

High, Training and practice (a Modeling Workshop) are required to implement this method effectively as the learning environment is discourse-rich and this discourse must be encouraged and managed effectively.






Resource Needs

Computers for students, Advanced lab equipment, Tables for group work



Skills



Designed for: Conceptual understanding , Problem-solving skills , Using multiple representations , Designing experiments, Metacognition





Can be adapted for: Lab skills, Making real-world connections, scientific argumentation, scientific reasoning



Research Validation

Based on research into: theories of how students learn 

Demonstrated to improve: conceptual understanding , problem-solving skills 

Studied using: student interviews , classroom observations , research at multiple institutions , research by multiple groups 



**Compatible
Methods**

[PhET](#), [JiTT](#), [Physlets](#), [SCALE-UP](#), [OSP](#), [ISLE](#), [LA Program](#), [MBL](#), [CPU](#), [PUM](#),
[Clickers](#), [MOP](#), [PRISMS PLUS](#), [Responsive Teaching](#)



Similar Method

None



Developer(s)

David Hestenes and Malcolm Wells



Website

<http://modelinginstruction.org/>

