

# Reflection Activities for Introductory Physics Students

Paul J. Emigh (he/him)  
Alfred DeAngelis

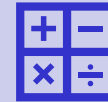
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Virtual AAPT



**Oregon State**  
University

<https://osuper.science.oregonstate.edu/content/refact>

# Background



Calculus-based  
introductory physics



Hybrid lecture/studio  
format



Diverse learning  
objectives



**Oregon State**  
University



Mechanics

Waves

Electromagnetism

# Written Homework



Quality over quantity



More than just a solution



Multiple Representations  
Physics Sensemaking



Match to assessment

## Written Homework Format

1. Understand and Plan
  - a) Understand the problem.
  - b) Represent the situation physically.
2. Solve the Problem
  - a) Represent concepts or laws symbolically.
  - b) Solve for the unknown quantity (or quantities) symbolically.
  - c) Plug in numerical values (if given).
3. Make Sense of Your Solution
  - a) Are the units correct?
  - b) Is your numerical answer (if given) reasonable for the problem?
  - c) Does your symbolic answer make *physical* sense?

# Something Missing

- Many students have told me they feel unprepared for quizzes
  - *“I do really well on the homework but I struggle with the quizzes.”*
- What do you tend to tell students who ask for this type of advice?

# Something Missing

- Many students have told me they feel unprepared for quizzes
  - *“I do really well on the homework but I struggle with the quizzes.”*
- What do you tend to tell students who ask for this type of advice?
  - I tell students to stop after each problem and figure out what they did and why

# Added Reflection Prompt

- Look back at the problems you solved on this homework and at the strategies you used to solve them.
- Reflect on how the problems this week were both *similar to* and *different from* the other activities that you have worked on.
- Cite specific problems and specific similarities or differences!
- End by commenting on what you feel you learned from all of these activities, and what you still have questions about.

# Added Reflection Prompt



Added to every homework



Worth 10-20%



Graded on effort



Echoed in class

# Other Reflections



Project Reflections



Quiz Preparation



Exam/Quiz Reflections



Final Project

**Reflect on how this situation is similar to or different from other physics problems you have solved—your reflection should reference specific problems and include specific reasons for any similarities or differences**



# Other Reflections



Project Reflections



Quiz Preparation



Exam/Quiz Reflections



Final Project

**Create a model that summarizes our discussion of forces in one page or less as a reference you can use to quickly and easily find the information (say, during a quiz) to answer the types of questions we've looked at in class and on homework. How you structure your model is up to you, but organization is important for quickly retrieving information.**

# Other Reflections



Project Reflections



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**In 2-3 paragraphs, reflect on your answer as well as the posted solution. Focus more on what you can learn from your own answer than on why the right answer is right.**

# Other Reflections



Project Reflections



Quiz Preparation



Exam/Quiz Reflections



Final Project

**Choose a real-world system, object, device, or phenomenon.**

**Research your chosen topic and apply the model we built to it.**

**Reflect on how your topic is similar to or different from other (specific) physics situations we have considered**

# Observations



Most students found it helpful



Other reflections improved



Graders provided feedback



Some students used it as a place to vent frustrations