

Writing Effective PBL Problems

Courtesy of Deborah Allen
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Step One: *Identify Learning Objectives*

Think of a learning objective in your course.

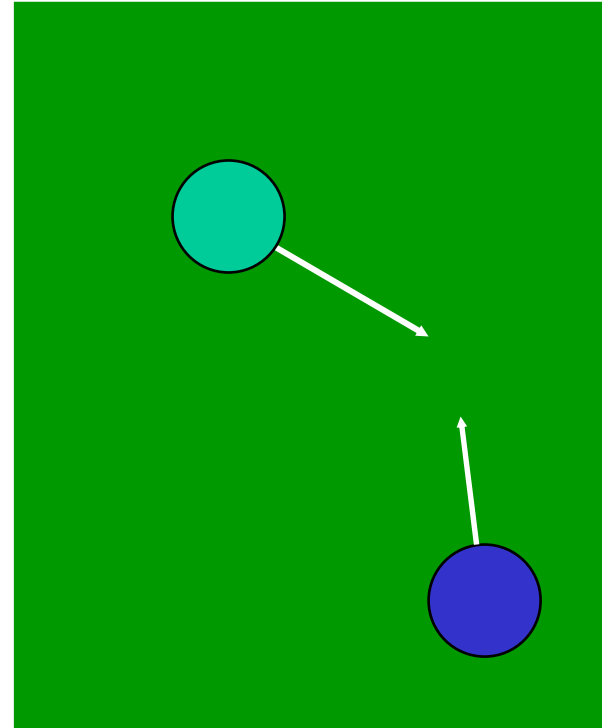
How do you usually address this learning objective? What kind of problem or activity do you usually assign?

- Typical end-of-chapter problem?**
- A reading?**
- Other?**

Example from Physics: Solving Problems Using Conservation of Momentum

Traditional examples:

- **Pool balls colliding**
- **Bullets hitting blocks of wood**





Example from Physics: Traditional End-of-Chapter Problem

A 1500-kg car traveling east with a speed of 25 m/s collides at an intersection with a 2500-kg van traveling north at a speed of 20 m/s. Find the direction and magnitude of the velocity of the wreckage after the collision, assuming that the vehicles undergo a perfectly inelastic collision (ie, they stick together).



Serway and Faughn. 3rd ed. College Physics, Saunders, 1992.





Types of Learning Objectives

Content-oriented: subject specific

- Basic knowledge and understanding of specific concepts, techniques, etc. in the discipline

Process-oriented: global skills

- Effective communication: oral and written
- Acquiring and evaluating information
- Working effectively with others
- Higher order, critical thinking



Step 1: Writing Learning Objectives

- Identify several learning objectives for your PBL development; consider both content and process goals.
- Traditionally, how might these learning objectives be addressed? What kind of problem or activity would you assign?



Step Two: Identify Real-World Context

**Name a realistic application of the concept.
Outline a scenario.**

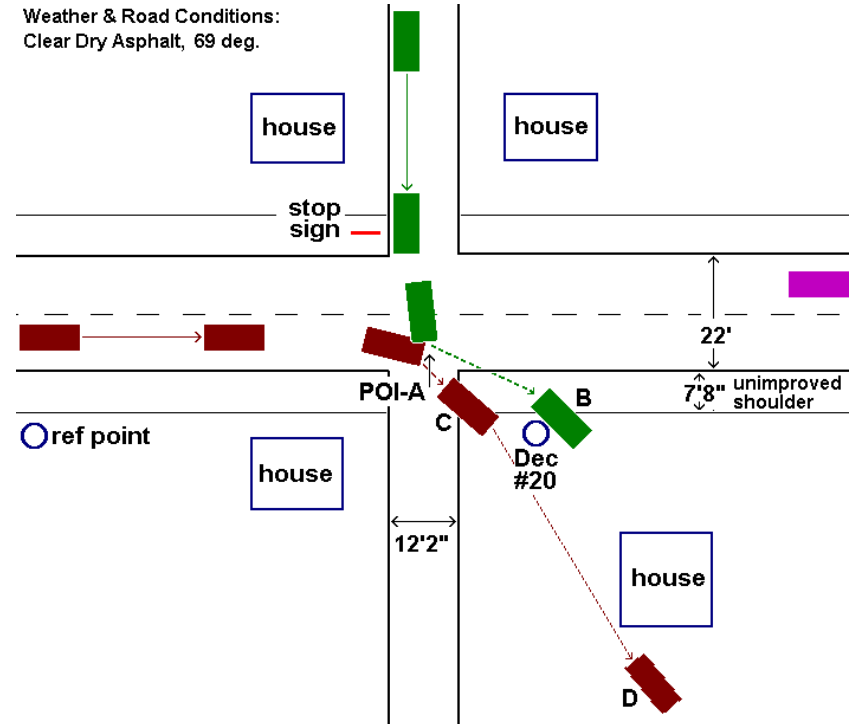
Ideas:

- **Add story-telling to end-of-chapter problem.**
- **Add motivation, require students to go beyond rote learning, do research.**
- **Include decision-making, analysis, or both.**
- **Other?**



A Real Traffic Accident

- Based on police sketch
- Students need to make assumptions and approximations
- Information given gradually throughout problem





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Step Three: Draft the problem

Outline the problem (create a ‘story board’) First consider, “What will be on the first page?”

Suggestions:

- **Good PBL problem has multi-page, multi-stage construction – progressive disclosure.**
- **Not all information given in chapter or text - students look for resources.**
- **Challenge students to come to consensus, reach conclusions, and make judgments.**



Sources and Strategies for Writing Problems

Newspaper articles, news events

Popular press in the discipline

Make up a story – based on content objectives

Adapt a case to a problem

Research papers

Other?



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