

# *Writing Effective PBL Problems*



**Courtesy of  
Deborah Allen  
*University of Delaware***



# *Writing Your Own Problem Starter*





# *Step One:* *Identify Learning Objectives*

---

**Think of a learning objective in your course.**

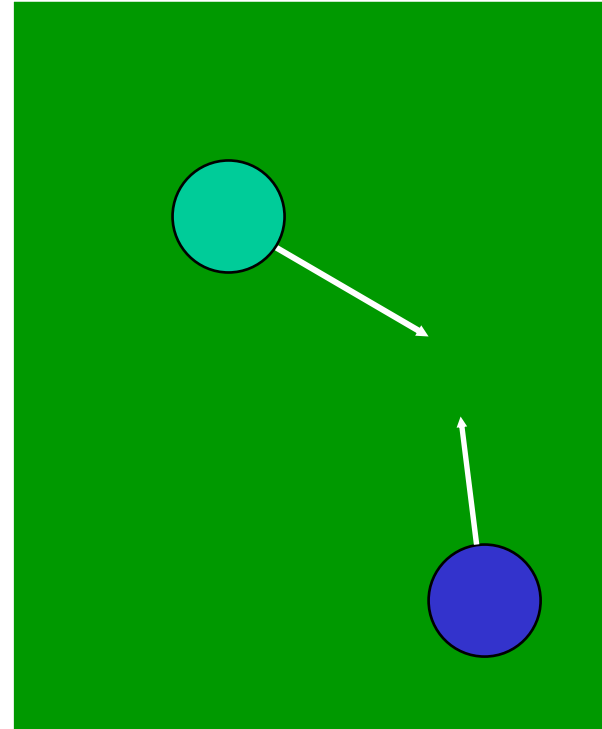
**How do you usually address this learning objective? What kind of problem or activity do you usually assign?**

- 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



# *Problem Writing Step One: Identify Learning Objectives*

---

**Think of a major learning objective that your problem can address.**

**Traditionally, how might this learning objective be addressed? What kind of problem or activity would you assign?**

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



## *Step Two: Identify Real-World Context*

---

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

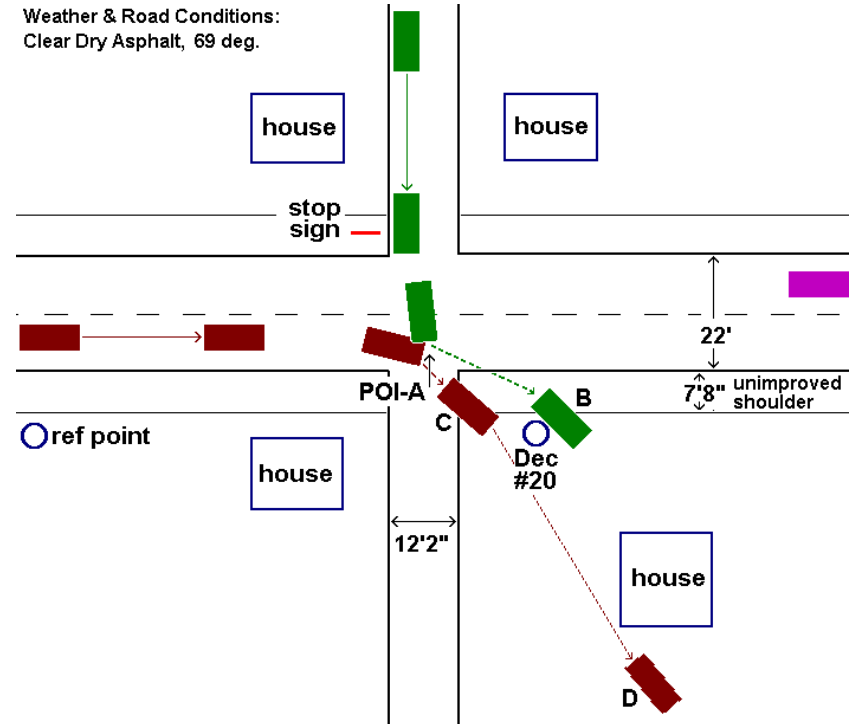
### **Ideas:**

- **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





## *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?**



# *Two Schemes for Writing Problems?*

---

**1. Think of one or more learning objectives in your course**

**2. Name a realistic application of the concept(s). Outline a scenario.**

**1. Think of a realistic scenario from the news, a videotape, or popular press article**

**2. What learning objectives for your course are evident in the scenario?**



## *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 - leave students guessing!**
- **Not all information given in chapter or text - students look for resources.**
- **Challenge students to come to consensus, reach conclusions, and make judgments.**



# *Consider the Following Problem Types:*

---

## **Explanation or Analysis Problems**

*‘What is going on here?’*

## **Decision or Dilemma Problems**

*‘What would you do?’ ‘What do you think?’*

## **Task-Oriented Problems**

*Doing an activity or carrying out a project - for example, interviewing patients or designing a brochure.*



## *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 - leave students guessing!**
- **Not all information given in chapter or text - students look for resources.**
- **Challenge students to come to consensus, reach conclusions, and make judgments.**



# *Problem Progress Report*

---

*For presentation:*

Basic features of course

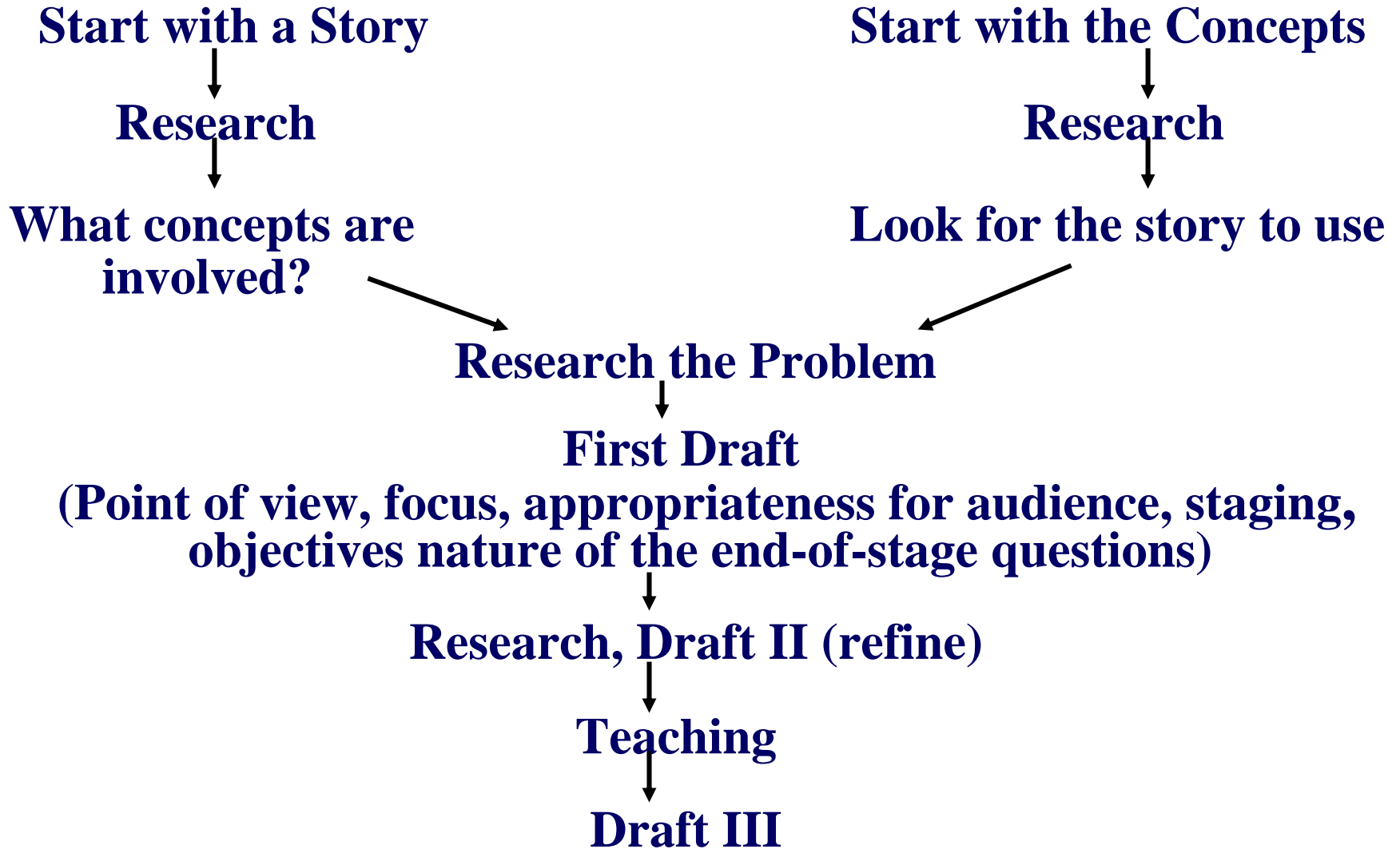
Objectives for student learning

Synopsis of problem

Scenario for first page, including guiding questions

What comes next?

# *Writing PBL Problems*



*From C. F. Herreid, SUNY Buffalo & W. Welty, Pace University*





# *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?



[www.udel.edu/pblc](http://www.udel.edu/pblc)

**An online database of PBL articles and problems.**

All material is peer-reviewed by PBL practitioners for content and pedagogy.

All problems are supported by learning objectives and resources, teaching and assessment notes.

Holdings are searchable by author, discipline, keywords, or full text.

Fully electronic submission, review, and publication cycle.

Controlled access by free user subscription, students excluded.



PBL Clearinghouse - Netscape

File Edit View Go Communicator Help

Bookmarks Go to: <http://www.udel.edu/pblc> What's Related

## Problem-Based Learning Clearinghouse

University of Delaware

[Exit PBLC](#)

### About the Clearinghouse

Welcome to the PBL Clearinghouse, a collection of problems and articles to assist educators in using problem-based learning. The problems and articles are peer reviewed by PBL experts in the disciplinary content areas. Teaching notes and supplemental

### What's in the Clearinghouse?

[View sample problems and articles.](#)

### Logon to the Clearinghouse

Enter your Clearinghouse Email-ID and password.

**Email-ID:**

**Password:**

[Logon](#)

[www.udel.edu/pblc](http://www.udel.edu/pblc)

Clearinghouse collection is limited to educators who register via an online application, but is free and carries no obligation.

### For more information

[About Us](#)  
[Read the Clearinghouse FAQ.](#)  
[Question and comment form](#)  
Institute for Transforming Undergraduate Education  
Problem-Based Learning at the University of Delaware





## *Problem Writing Step 4*

---

**Continue to draft the storyline beyond a sketchy scenario – begin to write the first stage**

*Think about point-of-view, nature of the end-of-stage questions, suitability for ‘audience,’ alignment with problem and course objectives*



## *Some Additional Considerations for Step 4*

---

A good PBL problem leaves just the right information out!

Challenge students to come to consensus, reach conclusions, and make judgments.