“I have to really think:”
Using Inquiry-Based Learning to Encourage Student Exploration and Discovery

Our Plan for Today
1. Describe Inquiry-Based Learning to a colleague
2. Consider at least one aspect of your teaching that could be more inquiry focused
3. Increase our excitement about teaching

“Data Splash”
Replicates “knowledge-making”

- Look at some raw data
- Speculate as to its significance

Moving to Inquiry-Based Learning
- Convert a procedural question (“Explain how different kinds of stress are involved in breaking objects)...
  ...to an inquiry (thought experiment): “What will happen and how?”
- Authentic inquiry: Student is asked to “set” the problem, judging which factors are likely to be relevant, and what information is missing or has to be assumed.

Inquiry-Based Learning
- The art of teaching and engaging students by asking critical questions that encourage critical thinking.
- An array of classroom practices that promote student learning through guided and, increasingly, independent investigation of questions and problems for which there is no single answer (Lee, 2004).
- All inductive teaching methods are a form of inquiry-based learning (Prince and Felder, 2007).
Inquiry made simple

Question -> data -> significance

Start anywhere:

• What hypothesis can we make to explore the question?
• What data will be generated?
• What does this data signify?
• What question generated this data?
• What kinds of data were used to generate this significance?
• What new questions are generated by this significance?

The Power of Brainstorming

• Encourages participation
• Share our ideas
• Make predictions
• Follow up with analysis
• Find out what is supported by evidence

Reading as Inquiry

Read the article and make notes.

What idea is being suggested in this reading?

What questions emerge from the reading?

How do you encourage inquiry through reading?

• What could this imagery mean?
• How is this new detail related to earlier themes/readings?
• How does this new detail affect my thinking?
• What else would you want to know in order to believe the claims that the author makes?
• Where would you want to challenge the author’s inferences?
• Where do you see impreciseness of language or information provided?

Writing as Inquiry

1. Free writing (“I see…I wonder”)
2. Think/pair/share
3. Photo essays
4. Illustrations
5. Reflections (Know, Want to know, and Learned)
6. Portfolios
7. Research papers
Creating Visual Representations

- Evidence matrix
- Concept maps
- Mind maps

Structured Writing

- Objective: To foster critical thinking by identifying important concepts, synthesizing course material, and engaging yourself and other students with the material.
- Designed to encourage a structured, but insightful inquiry into the course materials
- QCCQ – Quotation, Concept/Idea, Comparison/Relation, and Question
- A detailed grading rubric is provided with an example.