Teaching Goals, Learning Styles, and Activities/Assignments
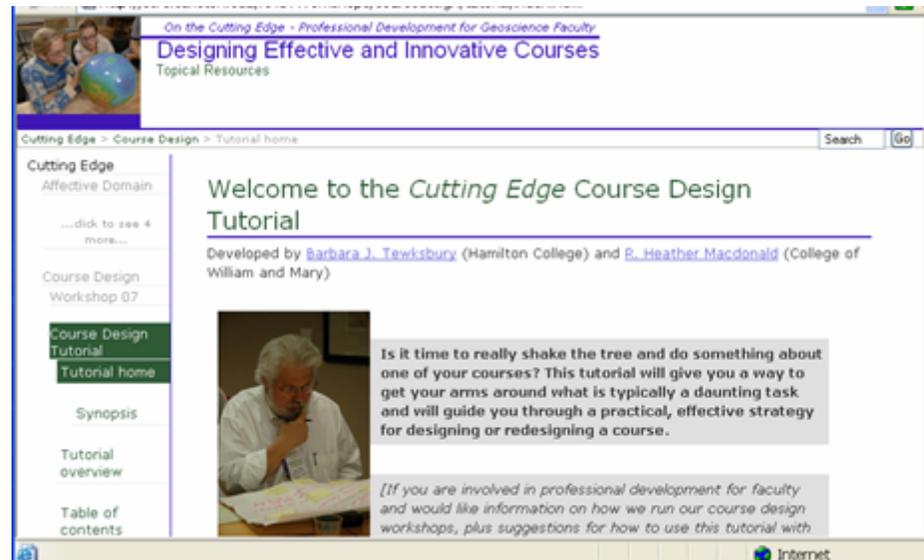
Heather Macdonald

Teaching Goals

Focus on a Course

- Content-centered
  - What will I cover?

- Learner-centered
  - What will they learn?

One Course Design Process

- Consider **course context and audience**
- Articulate your **goals** and objectives
- Develop a **course plan**

serc.carleton.edu/NAGTWorkshops/coursedesign/tutorial/index.html

Consider Course Context and Audience

- Context of course?
  - Pre-requisites?
  - General education course?
  - Course for majors?
  - Required course? Elective course?
- Characteristics of course?
- Your students?

Course Context and Students
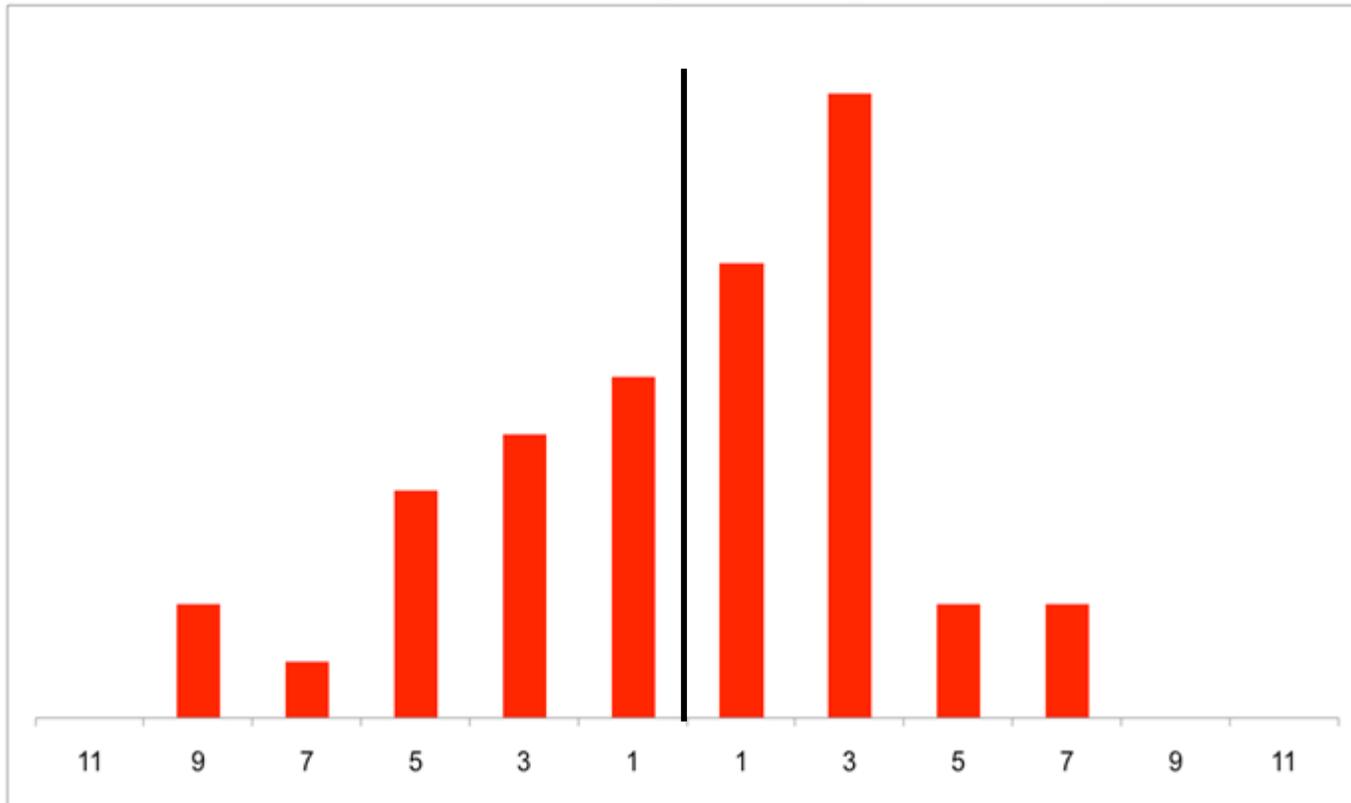
- Characteristics of your students?

Learning Styles

How does the person prefer to process information?

- **Actively** – through engagement in physical activity or discussion
- **Reflectively** – through introspection

Questionnaire - Barbara Soloman & Richard Felder

http://www.engr.ncsu.edu/learningstyles/ilsweb.html

Your Learning Styles (n=38)
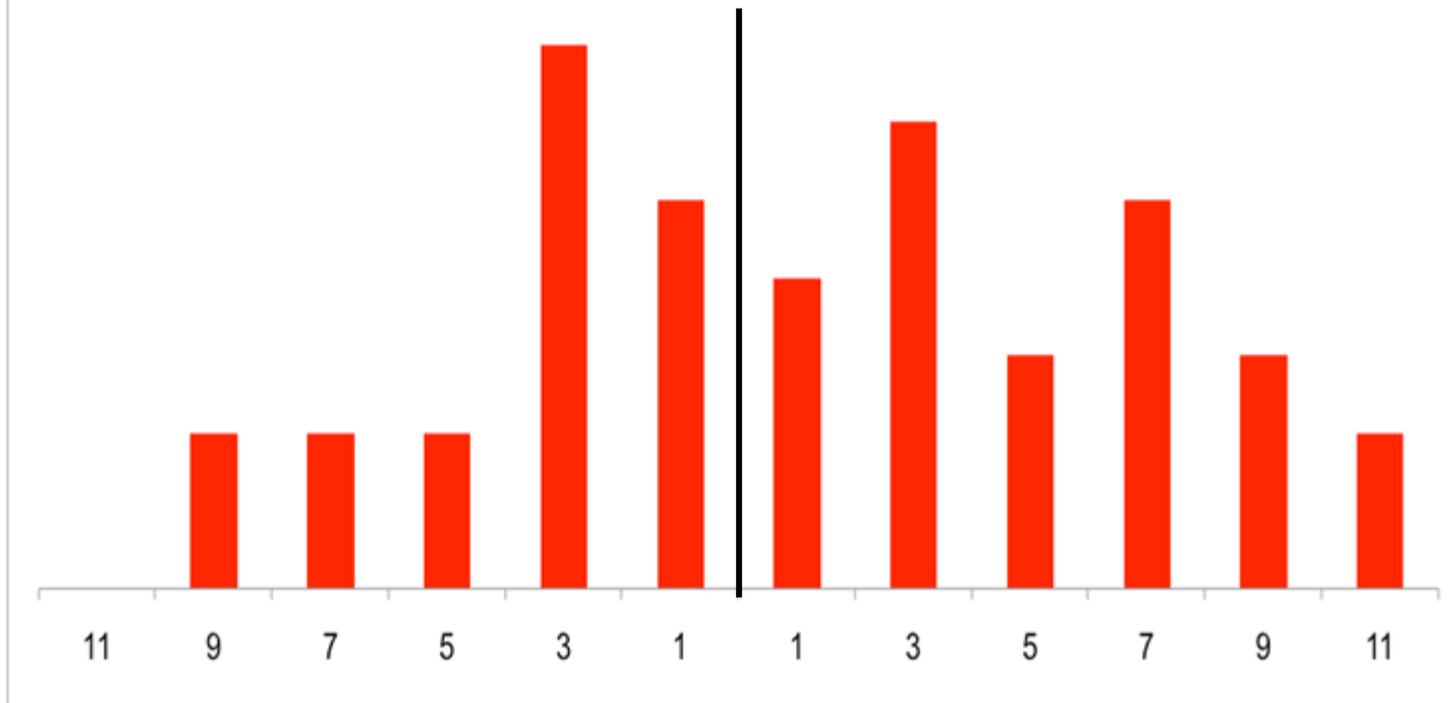
Active   **Reflective**

For comparison: Active 60%; Reflective 40%

Learning Styles

What type of information does the person preferentially perceive?

- **Sensory** – sights, sounds, physical sensations, data …
- **Intuitive** – memories, ideas, models, abstract …
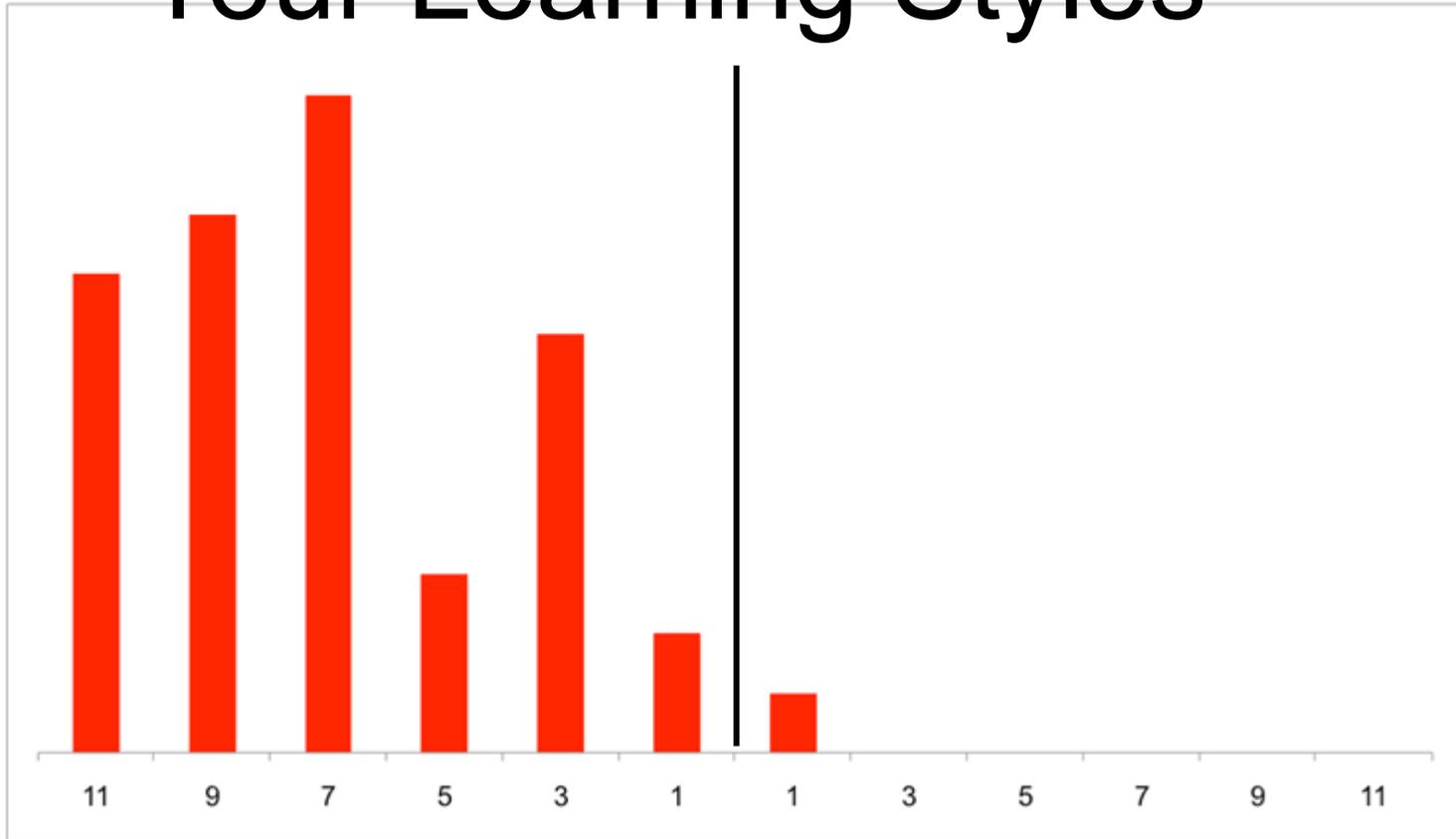
Your Learning Styles

Sensing ——— Intuitive

For comparison: Sensing 65%; Intuitive 35%

Learning Styles

Through which modality is sensory information most effectively perceived?

- **Visual** – pictures, diagrams, graphs, demonstrations, field trips

- **Verbal** – sounds, written and spoken words, formulas

Your Learning Styles

Visual   **Verbal**
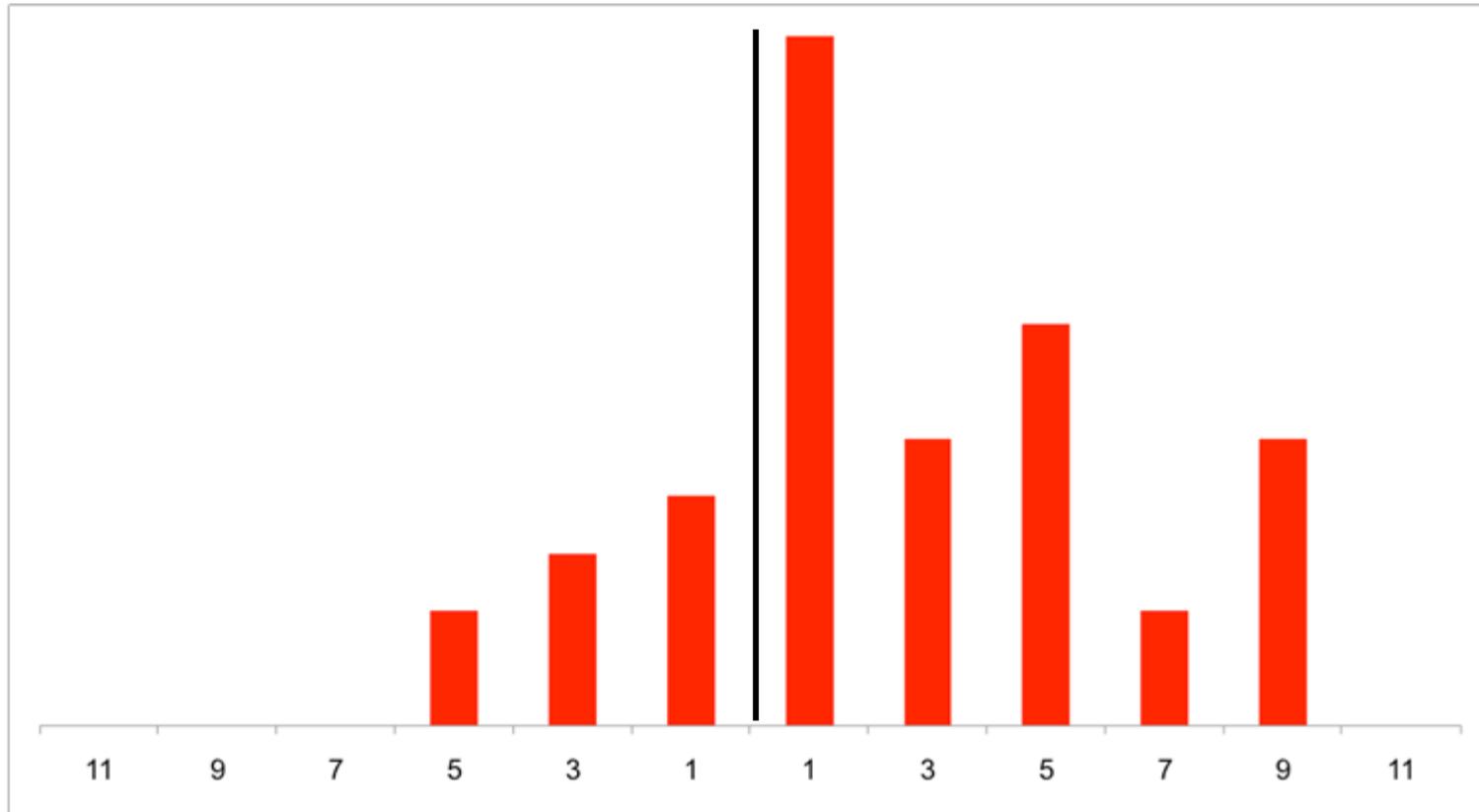
For comparison: Visual 80%; Verbal 20%

Learning Styles

How does the person progress toward understanding?

- **Sequentially** – in logical progression of small incremental steps

- **Globally** – in large jumps, holistically

Your Learning Styles
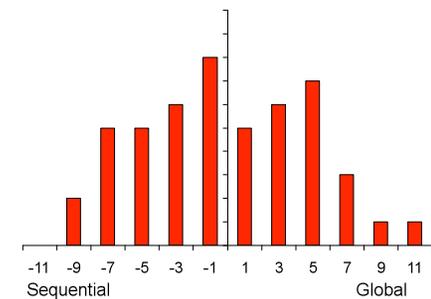

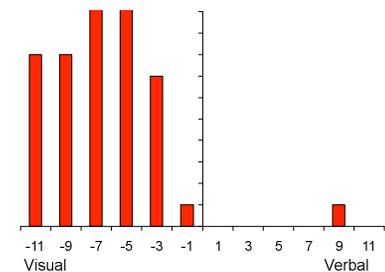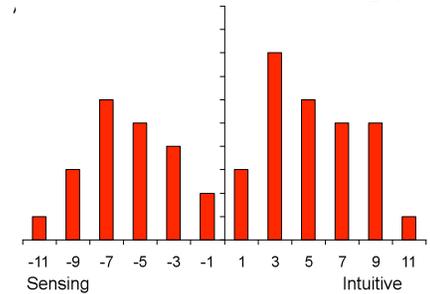**Sequential**   **Global**

For comparison: Sequential 60%; Global 40%

Learning Styles

- Different people are most comfortable learning in different ways

- Design instruction to address a broad spectrum of learning styles
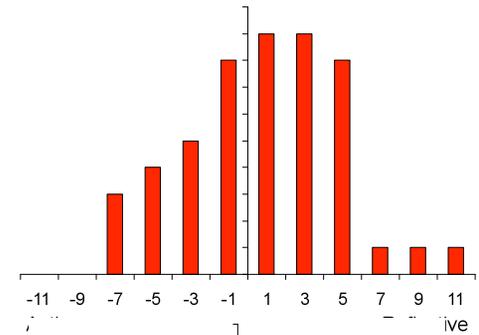
2007 workshop participants

Course Design

- Consider **course context and audience**

- Articulate your **goals** and objectives
  - Overarching goals
  - Ancillary goals
    - Writing, oral communication, working in a team, quantitative, research, field, lab, …

Overarching Goals

- ## What do you want students to be able to **do** as a result of having taken your course?

  - ### What kinds of problems do you want them to be able to tackle?

  - ### How might students apply what they have learned in the future?

  - ### What is it that you do as a professional that you want your students to be able to do?

Focus on goals that involve higher-order thinking skills

Evaluation

Synthesis

Analysis

Application

Comprehension

Knowledge
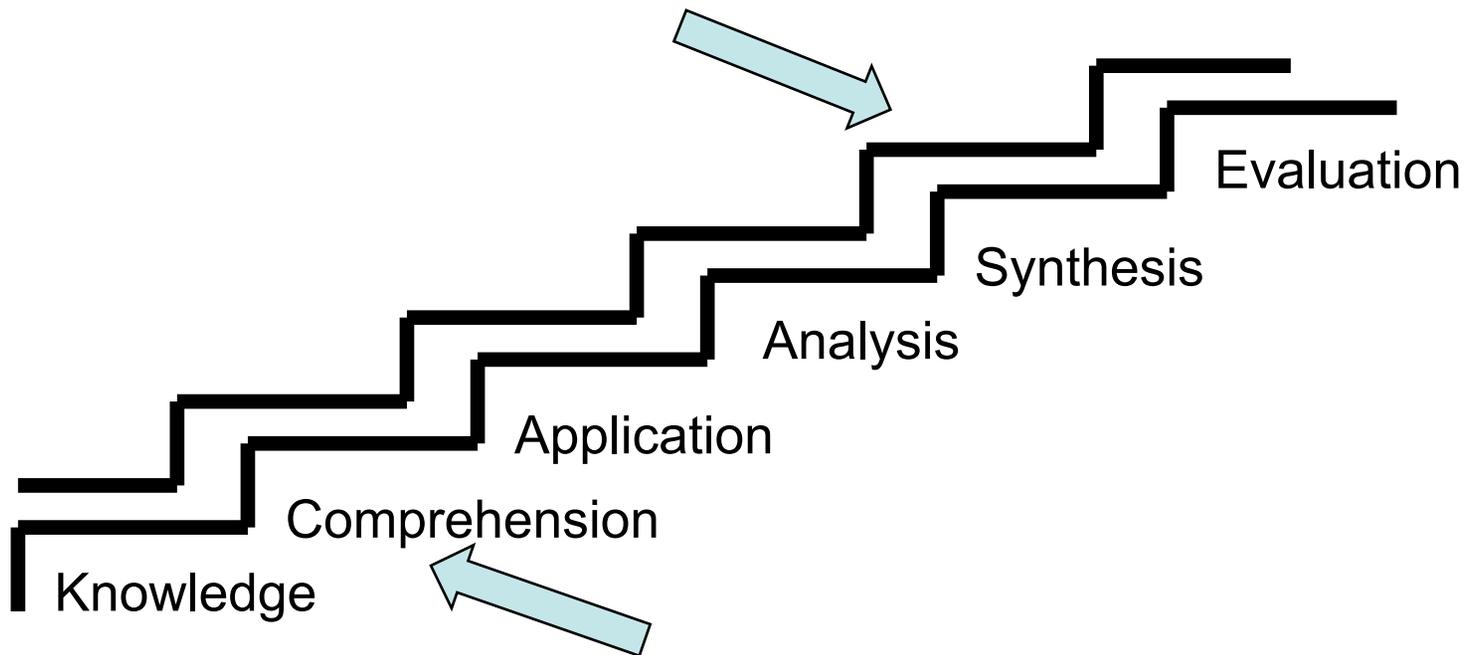
Bloom's Taxonomy

Taxonomy of Educational Objectives (1956)

Writing Goals

- Use verbs that indicate your goals extend beyond recalling, reciting, or explaining what was covered in class
  - Interpret, construct, formulate, solve, analyze, predict
    - "recognizing plate boundaries" vs.
    - "being able to interpret tectonic setting based on information on physiography, seismicity, and volcanic activity"

- Focus on observable/measurable goals
  - What could students do to show they have mastered this goal?

Some Examples of Goals

I want students to be able to:

- use characteristics of rocks and surficial features in an area to analyze the geologic history
- analyze unfamiliar areas and assess geologic hazards (different than recalling those done in class)
- predict the weather given appropriate meteorological data
- design computer models of earth processes

Some Other Examples

Consider A Course That You Will Be Teaching

- ## What are your goals?
  - When students have completed my course, I want them to be able to:

Develop a Course Plan

- Select content that helps you achieve the goals
- Design class activities, assignments, labs, lectures, exams, …
- Provide repeated opportunities for students to practice, with feedback

Cutting Edge Course Design Tutorial –
   also includes descriptions of various teaching strategies and some assignments

What makes an activity or assignment successful?

Designing Activities

1. Students must be engaged to learn - How does the activity motivate them?

2. Students must construct new knowledge incrementally as a result of experience - What experiences will they have in this activity?

3. Students must refine and connect their knowledge to be able to use it further. How will the activity promote reflection on and application of the new knowledge?

Edelson, 2001, Learning for Use

A Framework for the Design of Technology-Supported Inquiry Activities: Journal of Research in Science Teaching, vol 38, no 3, p 355-385

Designing/Reviewing Activities

- To what extent does the activity motivate and engage students actively in their learning?
  - Encourage student interest and attention
  - Build on what students know
  - Motivate students to perform at high level
  - Include opportunities for students to reflect, discuss, and synthesize
  - Provide opportunities for students to confirm their understanding

Context for Today's Sessions

- Active engagement is important for learning
- Students have different learning styles
- Consider your teaching goals in designing courses
- Consider review criteria in designing/selecting activities

Expand your "toolbox" of teaching strategies

Most students
passive

most students
active

Insights from Learning Science (How People Learn – NRC, 1999)

- Learning is additive, it builds on current understanding

- Understanding is actively constructed
    - This requires an engaged learner
    - Different people construct/learn most easily in different ways

- Learning to learn-metacognition is an important aspect of becoming an expert and is context specific