

The Practical Solution Part II: Linking

Link between the unknown and the known or among elements of a concept or process by linking them to the students'

- knowledge from life experiences
- knowledge from previous learning
reference previous lectures, other courses, etc.
- intuitions, conceptions, senses, aptitudes (multiple representations)
oral or audio representations: verbal, sounds
visual representations: graph, picture, diagram, physical model, table,
symbolic, demonstration, formal writing, mathematical development,
hand/body intuitive description
it is important to link the representations to each other and the concept

Make links to the students by

- consistent checking for students understanding, monitoring students' egos, keeping record of students' difficulties
- reviewing, repeating, elaborating, illustrating, applying
- soliciting participation
- allowing for student questions

Practice: Prepare a five minute presentation on one of the following topics using some of the techniques discussed in this workshop.

- Why is the sky blue?
- How does soap work?
- Why is the center of the earth hot?
- Why can you hear the ocean in a seashell?
- What is smog?
- How does a virus infect a cell?
- What limits the rate at which cell division takes place?
- What powers the sun?
- Why do metallic things spark in the microwave?
- Billiards: if the cue ball strikes a stationary object ball, the two move off at right angles to each other. Why is this?
- Choose your own.

Resources:

Hativa, N. *Clarity of Explanations in Natural Sciences and Engineering Courses*. Center for Teaching and Learning at Stanford University, 1995, Videotapes.

Perelman, Ya. *Physics for Entertainment* (2 vols.). trans. Arthur Shkarvosky. Mir Publishers, 1975. Parlor tricks and uncluttered two to three page explanations.

Adair, Robert Kemp. *The Physics of Baseball*, 2nd ed. Harper Collins, 1994. Interesting source for mechanics examples.

Physics Demonstration Experiments (2 vols.). ed. Harry Meiners. Ronald Press, New York, 1970. Lecture-scale demonstrations mostly, but good for consulting.

Chemical Demonstrations: A Handbook for Teachers of Chemistry (4 Vols). ed. Bassam Z. Shkhashiri. University of Wisconsin Press, Madison, WI, 1985.

Faculty, lab staff, lecturers, technicians, and experienced TAs in your department.