

Physics 180/ TEP 105 Reading List: (Actual)

Week 1: Introduction -- Problems & Queries:

NY Times "Push To Reorder Science Puts Physics First" NYT 1/28/99.

Third International Mathematics and Science Study (TIMSS) Summary

McDermott, "How We Teach and How Students Learn - A mismatch?," AJP 61(4), (1993), p295,

Week 2: Introduction / Survey of Physics Ed Reviews (some subset of)

Arons, A.B., "Cultivating the capacity for formal reasoning: Objectives and procedures in an introductory physical science course," AJP 44(9), (1976), 834.

Mestre, Jose, "Learning and instruction in pre-college physical science", Phys. Today 44:9 (1991) 56-62.

Van Heuvelen, A., "Learning to think like a physicist: A review of research-based instructional strategies", Am. J. Phys. 59 (1991) 891-897.

Reif, F., "Scientific approaches to science education", Phys. Today 39:11 (1986)

Week 3: PreCollege Circuits E/M:

Gentner & Gentner, "Flowing Waters for Teeming Crowds: Mental Models of Electricity," in Gentner and Stevens, Mental Models, Lawrence Earlbaum Associates, Publishers (1983), 99.

Driver, Guesne, and Tiberghien, "Children's Ideas and the Learning of Science," in Children's Ideas in Science, Open University Press, (1985) pg 1.

Shipstone, "Electricity in Simple Circuits," in Children's Ideas in Science, Open University Press, (1985) pg 33.

Driver Squires Rushworth and Wood-Robinson, Making Sense of Secondary Science: Research into children's ideas, Chapter 15: Electricity, Routledge Press (1994), 117.

Summers, Kruger, and Mant, Teaching Electricity Effectively: a research-based guide for primary science, Association for Science Education United Kingdom, 1997.

Week 4: Pre-Service / In Service Teachers in E/M:

McDermott, and Shaffer, "Research as a guide for curriculum development: an example from introductory electricity Parts I&II" AJP 60(11), (1992), 994-1013

(Grob, Polak, and Rhoneck, "Computerized Analysis of Student's Ability to Process information in the Area of Basic Electricity," in Goldberg et al, Research in Physics Learning: Theoretical Issues and Empirical Studies.)

Week 5: College Physics:

Monica G. M., Ferguson-Hessler, and Ton de Jong, "On the quality of knowledge in the field of electricity and magnetism" Am. J. Phys. 55, (1987) 492-497.

Rainson, S., G. Tranströmer, and L. Viennot, "Students' understanding of superposition of electric fields", Am. J. Phys. 62 (1994) 1026-1032.

Törnkvist, S., K.-A. Pettersson, G. Tranströmer, "Confusion by representation: On student's comprehension of the electric field concept", Am J. Phys. 61 (1993) 335-338.

Week 6: Theories of Learning / Cognitive Science:

Redish, "Implications of Cognitive Studies for Teaching Physics," AJP 62(6), (1994), 796
Posner, G.J., Strike, Hewson and Gertzog, "Accommodation of a Scientific Conception: Toward a Theory of Conceptual Change," Science Education 66(2), 211-227 (1982).

Week 7: Continued: Construct-isms

DiSessa, A.A., "Knowledge in Pieces," in Forman and Puffall Constructivism in the Computer Age, Hillsdale NJ: Lawrence Erlbaum (1988).
Papert, S., "Situating Constructionism," in Harel and Papert, Constructionism, Ablex, (1991), 1

Week 8: Continued

Bruer, J.T., "Science inside the Black Box" in J.T. Bruer Schools for Thought, Bradford Books
Brow, Collins, Duguid, "Situated Cognition and the Culture of Learning," Educational Researcher, Jan - Feb 1989, 32-42.

Week 9: Context and Culture

Dewey, J., Experience and Education, Ch's 1, 2 & 7 Science Chapter

Week 10: Physics and Gender

Schiebinger, Londa, Has Feminism Changed Science, Harvard University Press, 1999.
Introduction and Chapter 9: Physics and Math