

Physics 4810 / 7810 Introductions . . .

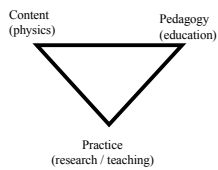
Day 2: Fa2008
 Class Structure
 Fieldsites
 State of Affairs of Physics
 The Introduction to Physics (text)



A quick word on work . . .

- Teaching Statements:
 - GREAT JOB--- focus on confidence, motivation, and play ! [interesting]
- Discussion Forum
 - Not so great a job
 - Is this a CU Learn issue? (Assignments vs. Discussions)

Course Structure



- Tues: readings on Teaching and Learning
 - summary paragraph for each article
 - 3 points / questions
 - Posted on Online discussion (Monday 5p)
 - 1 response (Tues noon)
 - Thurs: Mechanics Content
 - Read chapter (1 paragraph summary)
 - Do 3 HW problems (solve -- then start analysis)
 - Fieldwork:
 - Opportunity to synthesize Tues & Thurs
 - Conduct research / work for
 - Final Project
- GROUP WORK IS ENCOURAGED

Quick Poll on Field Sites

- University
- Phys 1110 Tutorials (Mon 5p pre and Thurs)
 - Phys 2010 (variable; labs)
 - Phys 2170 (modern phys; support lectures, MWF 10a)
 - Phys 3310 EM (Tutorials Fridays from 3-4pm and the help sessions 3:30-5pm Mondays and Tuesdays)
 - Phys3220 QM
- K12
- PISEC (CASA: variable; 3-6p; 1x / week (Mon); San Diego - video (5-7p Wed)
 - K-6: Spangler Elementary (Longmont) Wed 2:45p
 - H.S.: Boulder High, Fairview & Boulder Charter Prep

Group Discussion

- College / University (w/ Noah or Chandra or Stephanie...)
- K12 - formal (w/ Steve)
- K12 informal (w/ Laurel)

Down the Rabbit Hole . . .



What's our goal?

"By the Year 2000, United States students will be first in the world in mathematics and science achievement"

Goals 2000: Educate America Act -

Pub. Law 103-227 (108 Stat. 125)- (1/24/1994 proposed)4/26/96 - originally from the 1989 National Gov's Conference.

How are we doing: TIMSS

AVERAGE ADVANCED MATHEMATICS PERFORMANCE OF ADVANCED MATHEMATICS STUDENTS IN ALL COUNTRIES

NATIONS WITH AVERAGE SCORES SIGNIFICANTLY HIGHER THAN THE U.S.		NATIONS WITH AVERAGE SCORES NOT SIGNIFICANTLY DIFFERENT FROM THE U.S.	
NATION	AVERAGE	NATION	AVERAGE
FRANCE	557	(ITALY)	474
(RUSSIAN FEDERATION)	542	CZECH REPUBLIC	469
SWITZERLAND	533	(GERMANY)	465
(AUSTRALIA)	528	(UNITED STATES)	442
(DENMARK)	522	(AUSTRIA)	436
(CYPRUS)	518		
(LITHUANIA)	516		
GREECE	513		
SWEDEN	512		
CANADA	509		
(SLOVENIA)	475		

NATIONS WITH AVERAGE SCORES SIGNIFICANTLY LOWER THAN THE U.S.	
NATION	AVERAGE
NONE	

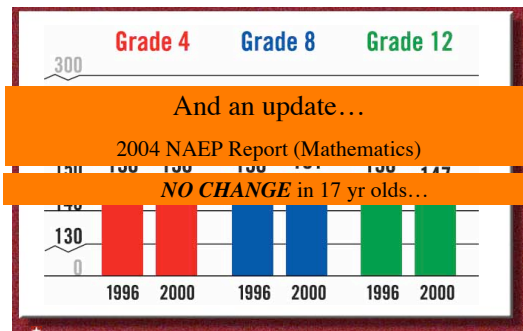
How are we doing NCES/NAEP

Highlights Report Card 2000

NAEP 2000 Science Assessment Results Released

Results for the 2000 National Assessment of Educational Progress (NAEP) science assessment show no significant change in grades 4 and 8, and a decline in performance at grade 12 since 1996.

National Scale Score Results Across Years



How are we doing: Harvard

(University) Students fail to learn basic concepts in (introductory physics) classes.

E.g.

1. Find the current through the 2 ohm resistor and the potential difference between points a and b. ~75%

2. In the circuit shown, explain what will happen to the following variables when the switch is closed. ~40%

- the current through the battery
- the brightness of the bulbs
- the voltage drop across the bulbs
- the total power dissipated

From: Mazur (1997)

Why's this important?

Why physics education?

Why education *in general*?

What IS education, anyway?

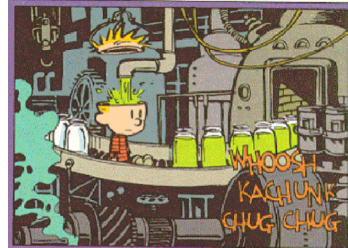
Why's this important?

The [National] Commission [on Mathematics and Science Teaching for the 21st Century] is convinced that the future well-being of our nation and people depends not just on how well we educate our children generally, but on how well we educate them in mathematics and science specifically” –

Before It's Too Late – pg. 4 - Sept 2000

Trad'l Approach Theoretic Background

Individual $\xrightarrow[\text{via transmission}]{\text{Instruction}}$ Content (E/M)



Rising to the Concrete

- Let's take a look at the text
- What are the roles of a textbook? (currently and in ideal)
- Assignment for today:
 - Introduction
 - Chapter 1

Introducing physics

- What is the point of the Intro to Educators?
- What is the point of the intro to students?
- Where to people start?

The intro to students

- What is physics?
- How to learn / use this text.

Chapter 1

- What topics are covered?
- How long should this take?