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Assessment as a Trojan Horse for
Educational Improvement & Equity

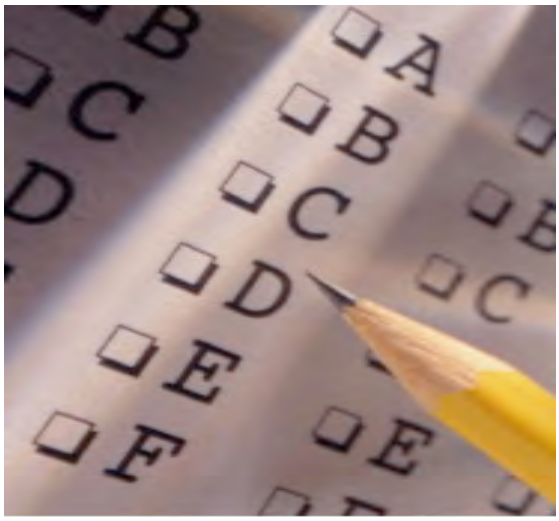
Main Points

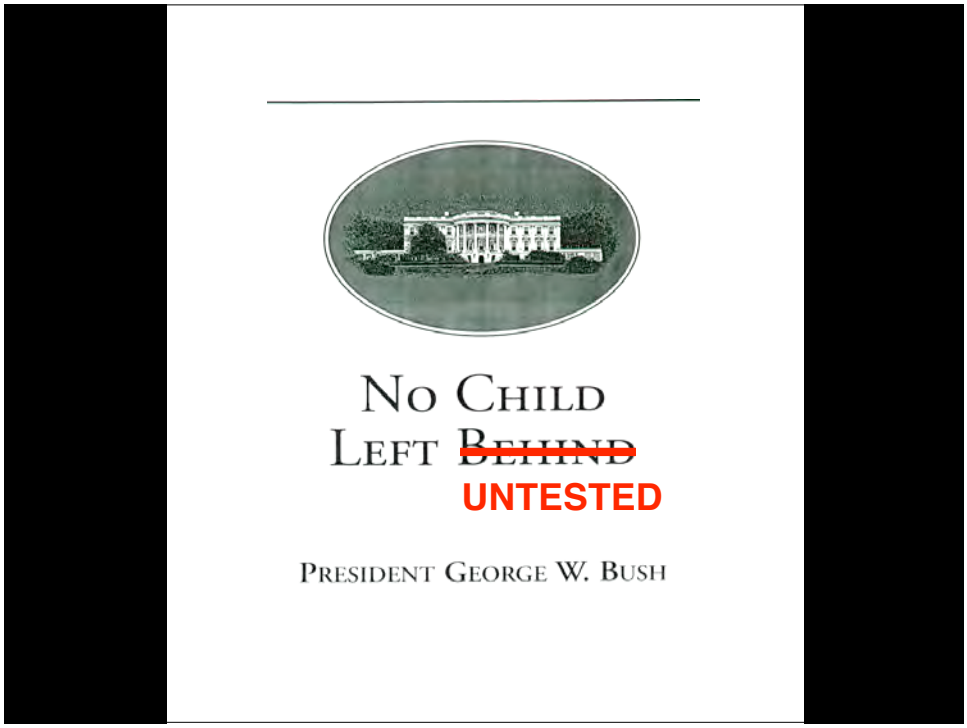
- Assessment can serve both positive and negative functions in educational systems
  - Negative when it becomes the de-facto driver of curriculum and instruction (often the product of large-scale testing & program evaluation efforts)
  - Positive when it breaks down barriers and forces diverse stakeholders to have a deep conversation about what we want students to know and be able to do and the implications for teaching & learning
- In the context of accountability, it is especially important to sort out these issues so that assessment can be a positive *"Trojan Horse"*

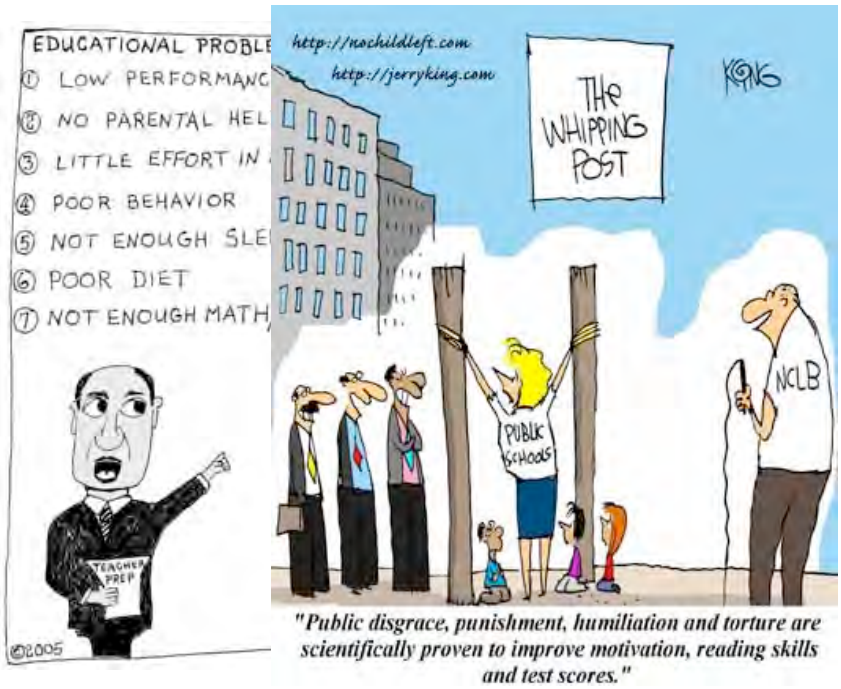
Elements in Making My Case

- When the assessment of "X" substitutes for understanding what "X" is and how it develops
  - Examples from Large-Scale testing programs

An Obsession with Standardized Testing & Test Scores







Perspectives on the Problem

- "Assessing education well may depend on assessing it less." (Stake, 1999)
- You don't fatten a pig by constantly weighing it!
- What we are testing is but a small part of what students are really supposed to know & understand.
- The focus on standardized tests is unduly narrowing the teaching and learning process.
- Current tests are based on outdated theories & technologies.

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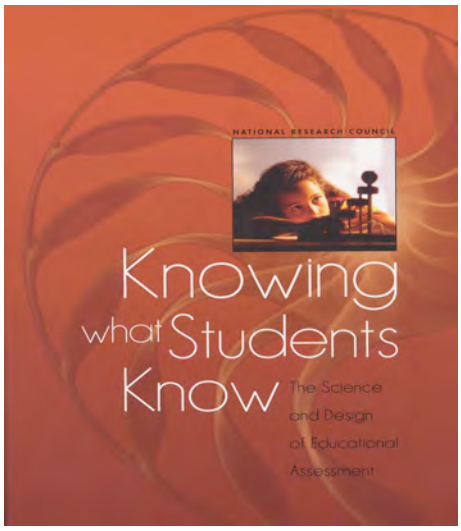
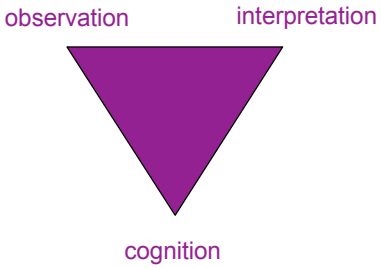
- The conceptual underpinnings of assessment
  - What needs to drive the thinking & design

Contexts and Purposes: Distinctions That Matter

- Contexts:
  - small scale: individual classrooms
  - intermediate scale: schools, departments, colleges
  - large scale: university systems, districts, states, nations
- Purposes:
  - assist learning (formative)
  - appraise individual achievement (summative)
  - evaluate programs (accountability)
- Problem: One size does not fit all
  - Educators at different levels need different information
  - Differing priorities, constraints, & tradeoffs

Assessment as a Process of Reasoning from Evidence

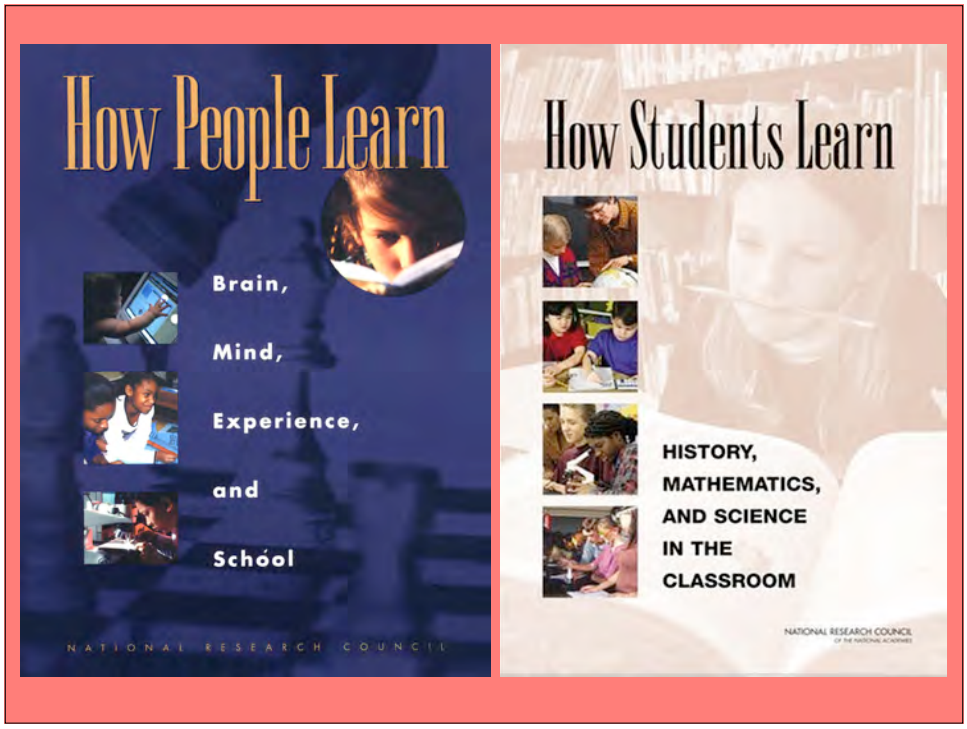




Must be coordinated!

Scientific Foundations of Educational Assessment

- Advances in the Sciences of Thinking and Learning -- the cognition vertex
  - informs us about what observations are important and sensible to make
- Contributions of Measurement and Statistical Modeling -- the interpretation vertex
  - Informs us about how to make sense of the observations we have made



Why Models of Development of Knowledge & Skill are Critical

- Tell us what are the important aspects of knowledge & skill that we should be assessing.
  - much more precise and interpretable than "standards"
- Give us strong clues as to how such knowledge can be assessed
  - target "learning performances" and useful forms of evidence
- Can lead to assessments that yield more instructionally useful information
  - diagnostic & prescriptive
- Can guide the development of systems of assessments
  - work across contexts, levels, & time

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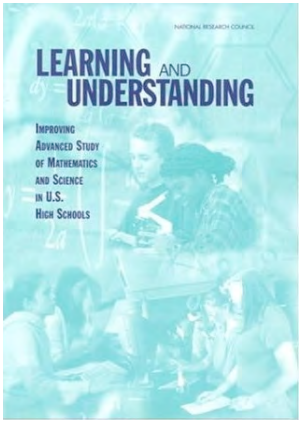
- The challenge of going from rhetoric to reality
  - Redesign of a major high-stakes program

CollegeBoard Advanced Placement Program

- Since 1955, the AP Program has enabled millions of students to earn college credit or placement while still in high school.
- The AP Program offers 37 courses and exams.
- More than 17,000 schools worldwide participate in the AP Program.
- Twenty-five percent of U.S. public high school students in the class of 2008 took an AP Exam at some point in high school.
- In 2008, nearly 1.6 million students worldwide took more than 2.7 million AP Exams.
- More than 90% of the nation's 4-year colleges and universities, and institutions in 45 countries, have an AP policy that grants incoming students credit, placement or both for qualifying AP Exam grades.
- In 2008, more than 3,600 colleges and universities accepted qualifying AP Exam grades for credit and/or placement.

Why an AP Science Redesign?

- **A 2002 NRC Report identified ways to improve advanced study of math and science in the U.S. The Report's recommendations are applicable to all AP course subjects:**
  - Emphasize deep understanding rather than comprehensive coverage -- avoid "mile wide & inch deep" syndrome
  - Reflect current understanding of how students learn in a discipline
  - Reflect current research directions within the disciplines
  - Emphasize the development of inquiry and reasoning skills



NSF CollegeBoard

AP Redesign Goals

Produce a more inclusive and more engaging program of study for each AP discipline by identifying:

- The concepts to be studied in depth and measured on the exams
- The essential reasoning and inquiry skills that are to be supported with instruction and measured on the exams
- Cutting-edge areas of research that can capture essential concepts within the discipline and engage diverse student populations
- Instructional practices that are successful for developing conceptual understanding
- The minimum resources required to support these practices

To Create an AP Program that:

- Engages diverse student populations in college-level knowledge, skills and abilities within a discipline
- Supports teachers with professional development opportunities and tools
- Supports the awarding of college credit/placement for qualifying student exam performance

Conceptual Approach Builds Upon Work of Others:

Understanding by Design, G. Wiggins & J. McTighe (1998, 2006).

How People Learn: Brain, Mind, Experience & School. J. Bransford, A. Brown, & R. Cocking, S. Donovan, & J. Pellegrino (2000).

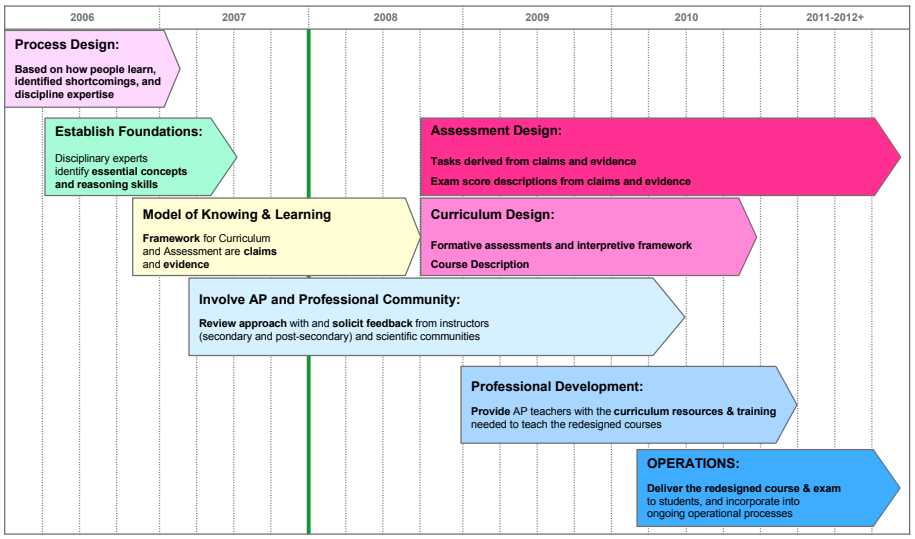
Knowing What Students Know: The Science and Design of Educational Assessment, J. Pellegrino, N. Chudowsky, & R. Glaser (2001).

Evidence-Centered Assessment Design: Layers, Structures, and Terminology, R.J. Mislevy & M.M. Riconscente (2005).

Collaboration with Jeanne Pemberton, Mark Reckase, Meryl Bertenthal, John Eggebrecht, Kristen Huff, Cindy Hamen, Marcia Wilbur et al.

Supported by NSF and the College Board

Components & Timeline



AP Redesign Implications

For AP science teachers and students:

- AP instructors and students will have a well-defined set of learning objectives that support teaching for deeper understanding.
- The AP Exams will be congruent with these learning objectives.
- AP instructors will have tools and professional development opportunities that support teaching, learning and success on the AP Exam
- The post-secondary community and professional societies will have a better understanding of, and confidence in, the value of AP courses.

For science education generally:

- The emphasis on reasoning and inquiry, enforced by the exams, can influence school science in lower grades and in the universities.
- The development of a high-stakes exam based on evidence-centered design principles can influence state and national assessment designs.
- The redesigned courses will increase interest and success within a new population of students who can then contribute to both science education and the practice of science.

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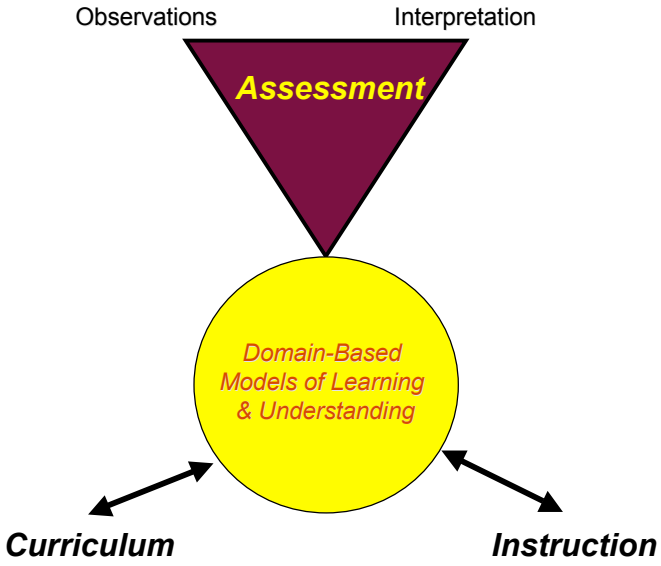
  - Redesign of a major high-stakes program
- Applying these ideas to developing state plans for assessment & accountabilty
  - Building coherent systems of assessment

Strengthening Connections Among Curriculum-Instruction-Assessment

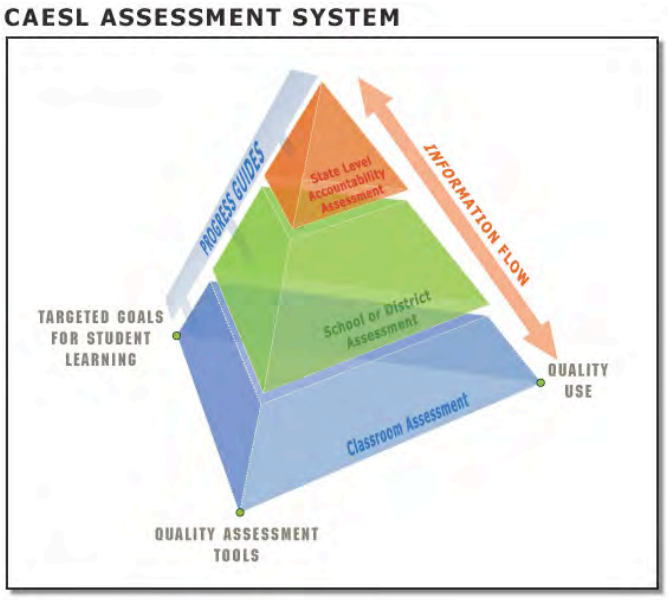


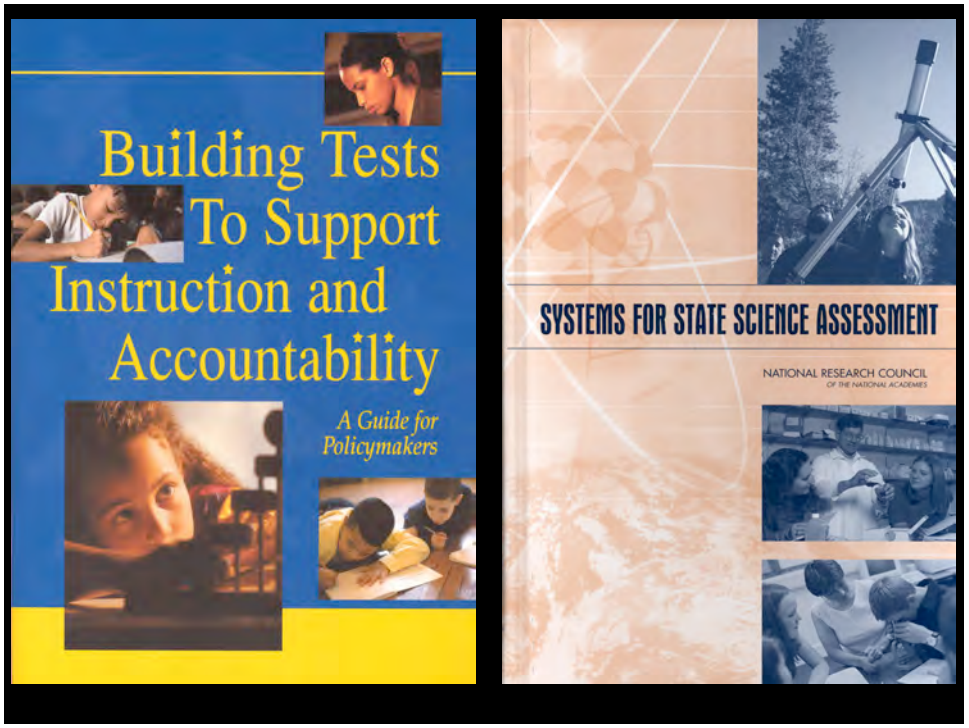
An Integrated Multilevel System

Coordinated across system levels

Unified by common learning goals

Synchronized by unifying progress variables





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- Some Final Thoughts

We need to invest in building better assessments!

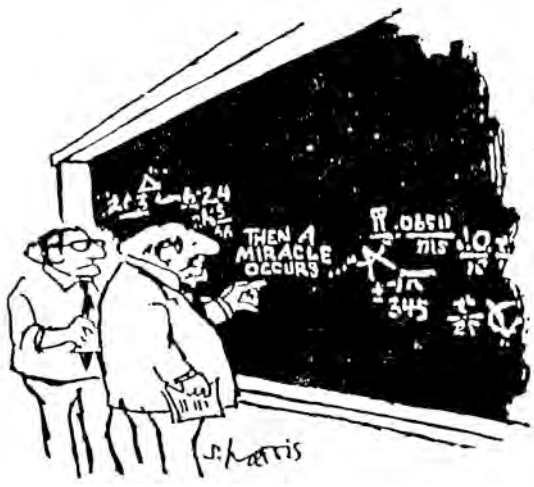
We need to learn how to help teachers use them to improve student learning!

What Will Be Needed to *Leave No Student or Teacher Behind*

- Instructional & assessment materials that incorporate knowledge about domain specific learning trajectories in areas of math, science, literacy, social science etc.
  - Not using what we currently know; need to know more
- Better balance and coordination between large-scale & classroom/instructional assessment practices
- Teacher education -- pre-service & prof development
  - Greater focus on the specifics of quality instructional and assessment practices and how they work
- Technology-based learning environments & tools
  - Enable enhanced instructional & assessment practices
- Educating policymakers -- the need to focus on instruction and understand the limits and uses of tests

Assessment & Accountability Program Design: Making Success More Than A Miracle!

"I think you should be more explicit here in Step Two."




Thank You!