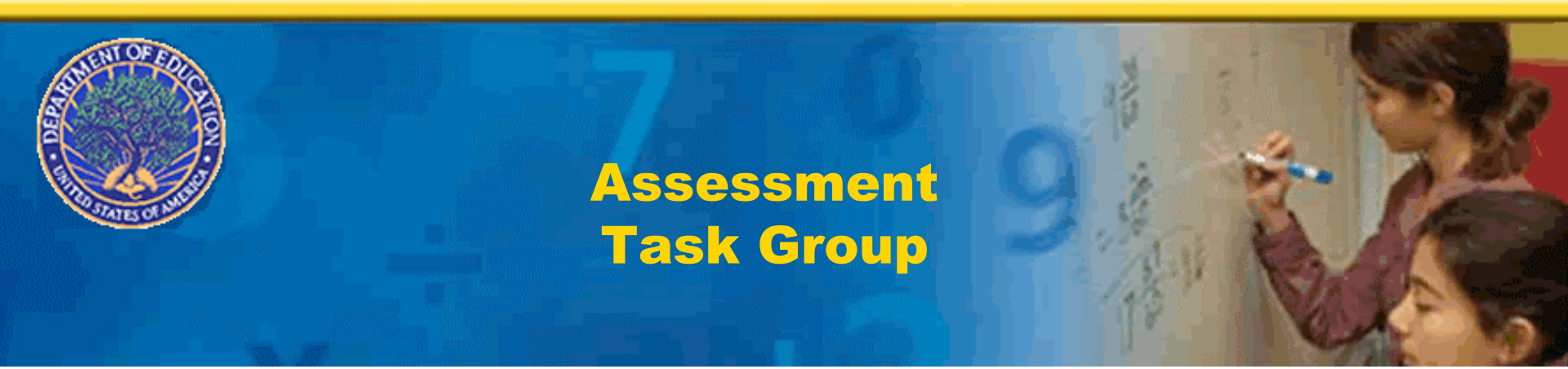
National Mathematics Advisory Panel

Assessment Task Group

St. Louis Meeting

Progress Report

September 7, 2007



Assessment Task Group

TASK GROUP MEMBERS

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Assessment is used to:

- shape the content and format of instruction
- adjusting educational experiences to meet the needs of individual students
- selection
- evaluating student and school performance
  - No Child Left Behind
    - NAEP and State Tests

Given their importance, we need to ensure that the NAEP and state tests:

- Are appropriate.
  - They measure what is intended
  - Are not biased
  - Conclusions drawn from test results are justified
  - Issues of Measurement Quality

- Measure what is deemed important for children to master

Methodology

- Main NAEP Test, 4th and 8th grades
- Representative State tests:
  - California
  - Georgia
  - Indiana
  - Massachusetts
  - Texas
  - Washington

Foundation for Report

- Validity Study of the NAEP Mathematics Assessment: Grades 4 and 8 (NAEP Validity Study Panel, 2007)
- NCES Response to the Validity Study
- Search of the Literature Conducted by Abt Associates

Additional Information Collected

- IDA/STPI collected technical information on each state's web-site, grades 3-8
  - Framework
  - Procedures
  - Released test items
- Could not conduct a survey
- Case study analysis of released items, Grades 4 & 8

Two Main Recommendations

- NAEP and state tests must focus on the mathematics that students should learn (e.g., Conceptual Knowledge and Skills task-group report), with scores on this critical content reported and tracked over time.
- States and NAEP need to develop better quality control and oversight procedures to ensure that test items are of the highest quality, measure what is intended, and non-construct relevant sources of variance in performance is minimized

Principles for the Revision and Reorganization of NAEP

I. Disaggregate Number into two separate areas

A. Number (wholes and integers)

B. Number (Fractions, decimals, percents)

Rationale: CKS foundations, fractions under-represented on current NAEP (less than 20%), produce score to track progress

Principles for the Revision and Reorganization of NAEP

II. Combine Measurement and Geometry

Rationale: Consistent with 12th grade, increase the complexity of measurement items

Principles for the Revision and Reorganization of NAEP

III. Algebra –

A. Patterns – overrepresented and poorly done

B. Is K-4th grade algebra really algebra?

Rationale: CKS algebra topics, criticism of pattern problems as non-mathematical

Quality Control Issues

Contamination from:

- Verbiage—unnecessary, excessive, unfamiliar
- Confusing visual displays

Excessive verbiage can attenuate the performance of some groups and hence requires special attention

--We saw many instances of items with problems of this type

Situated Mathematics Problems (e.g., real world or word problems) should satisfy the following conditions:

- Skill at deciding what mathematical knowledge and skills to draw on
- Language is concrete and serves to clarify mathematical relationships in the problem
- Knowledge that has been taught
- Natural and well-written English prose
- Sufficient numbers and depth to address the entire range of student ability

Scientific and logical evidence & content expertise needs to guide test design

Item content needs to be carefully examined in order to understand performance

We also suggest:

- Detailed item specification
- Better integration between item specification and actual item content
- Fostering research and high-level analysis on the design of mathematics items

Proficiency standards need to be set in a manner that:

- reflects best scientific practice (e.g., modified Angoff)
- International data on student performance

NAEP should conduct a special study of algebra involving students who have completed or are about to complete one or more courses in formal algebra

- Assess the algebra objectives endorsed by the National Math Panel

Forthcoming: calculators, item types