Using Results from Individual Math Assessments in Professional Development

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March 6, 2010
4:00 p.m. - 5:00 p.m.
Summative Assessment

Too little . . .
Too late
Formative Assessment

Assessment *for* learning . . . rather than assessment *of* learning.
Formative Assessment

Definition from The Council of Chief State School Officers (CCSSO)

Formative assessment is a process used by teachers and students 

during instruction that provides feedback to adjust ongoing teaching and learning 
to improve students’ achievement of intended instructional outcomes.
Diagnostic Assessment

• To determine prior knowledge and misconceptions before instruction

• To identify students in need of intervention and determine their specific needs
Individual Mathematics Assessments (IMA)

- Conceptual Understanding
- Number Sense
- Computation
- Problem Solving
Overview of IMA

• Formative/Diagnostic Assessment
  – Conceptual understanding
  – Number sense
  – Computation
  – Problem solving

• 15-minute interview

• Web based for recording responses and generating reports

• Informs classroom instruction for differentiation

• Identifies students who need intervention
Fractions Interview
Assessment Questions

Imagine sitting face to face with a student who is in sixth grade. You’re interested in learning about his or her understanding and skills with fractions.

Think of 3–5 questions you might ask.
Fractions Assessment

• Conceptual Understanding
  Meanings of fractions
  Meanings of mixed numbers
  Equivalence
  Locating fractions on a number line

• Number Sense
  Comparing
  Ordering
  Estimating

• Computation
  Addition/Subtraction/Multiplication/Division
  Note for Division: only whole number divided by fraction and fraction divided by whole number

• Problem Solving
  Determining fractional parts of sets
  Solving problems in contexts
Common Core Math Standards

Fewer,
clearer,
higher. . .
What is a “standard”? 

A standard is a criterion by which to judge or decide.
Three Kinds of Standards in the Common Core

- Standards for Mathematical Practice (Is the student practicing math as a discipline?)

- Standards for Mathematical Understanding (Does the students understand math concepts?)

- Standards for Mathematical Skill (Does the students have strategic competence and procedural fluency?)
Standards for Mathematical Practice

Proficient students of all ages expect mathematics to make sense. They take an active stance in solving mathematical problems. When faced with a non-routine problem, they have the courage to plunge in and try something, and they have the procedural and conceptual tools to carry through. They are experimenters and inventors, and can adapt known strategies to new problems. They think strategically.
Standards for Mathematical Practice

1. Attend to precision.

2. Construct viable arguments and critique the reasoning of others.

3. Make sense of problems and persevere in solving them.

4. Look for and make use of structure.

5. Look for and express regularity in repeated reasoning.

6. Reason abstractly and quantitatively.

7. Model with mathematics.

8. Use appropriate tools strategically.
Standards for Mathematical Practice

Students who engage in these practices individually and with their classmates discover ideas and gain insights that spur them to pursue mathematics beyond the classroom walls. They learn that effort counts in mathematical achievement. The practices . . . are those that expert mathematical thinkers encourage in apprentices. Encouraging these practices in students of all ages should be as much a goal of the mathematics curriculum as is teaching specific content topics and procedures.
Race to the Top

Common assessments based on common standards

- Assessments should aid instructional practices
- More involvement of teachers in development, use, and possibly scoring
- Involve state consortia
Gates Foundation Grants

• Development and testing of assessments and instructional tools in math and literacy

• Research and field testing to ensure the assessments and tools are effective, aligned with standards, and internationally benchmarked

• Work with partners to make them universally available to teachers, districts, and states
Middle School Math Reasoning Inventory (MSMRI)

Web-based formative/diagnostic assessment to provide teachers information and insights into the numerical understanding and skills of their incoming middle school students
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Links to References

• Snapshots of Students’ Misunderstandings, Marilyn Burns

• Looking at How Students Reason, Marilyn Burns

• Mental Math, Marilyn Burns

• Common Core Standards
  • http://www.corestandards.org

• Formative Assessment: A Process for Improving Teaching and Learning, NYSED