

ASCD 2010 Annual Conference

**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

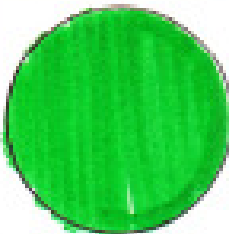
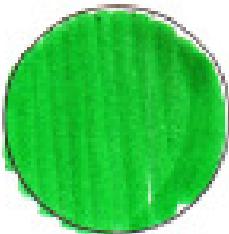

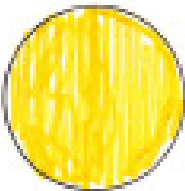


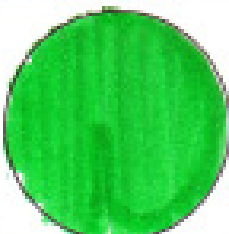
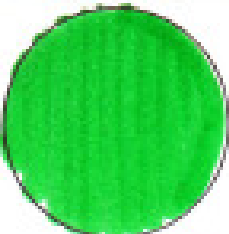

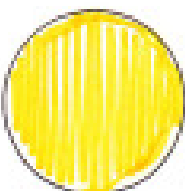


- Development and testing of assessments and instructional tools in math and literacy
- Research and field testing to ensure the assessments and tools are effective, aligned with standards, and internationally benchmarked
- Work with partners to make them universally available to teachers, districts, and states

Math Solutions Gates Grant

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

	Add/ Sub/ PV	Mult/ Div	Frac/ Dec
Conceptual Understanding			
Number Sense			
Computation			
Problem Solving			

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Links to References

- Snapshots of Students' Misunderstandings, Marilyn Burns
- http://www.mathsolutions.com/documents/0210_Ed_Leadership.pdf
- Looking at How Students Reason, Marilyn Burns
- http://www.mathsolutions.com/documents/2005_How_Students_Reason.pdf
- Mental Math, Marilyn Burns
- http://www.mathsolutions.com/documents/2007_Instr_MentalMath.pdf
- Common Core Standards
<http://www.corestandards.org>
- Formative Assessment: A Process for Improving Teaching and Learning, NYSED
<http://scdn.wsbores.org/documents/FormativeAssessmentWhitePaperforNov13.pdf>