Smarter Balanced Assessment Consortium (SBAC)

Mathematic Content Leads

April 12, 2012
Goals

- Understand the implications of SBAC assessments for mathematics education in Iowa.
- Q & A
Balanced Assessment System

Summative

Formative

Interim
Balanced Assessment System

Selected Response

Constructed Response

Performance Tasks
State Implementation Timeline

- 2011-2012 School Year—Technology readiness tool available
- Winter/Spring 2013—Pilot testing of summative and interim assessments
- Spring 2014—Field testing of summative and interim assessments
- 2014-15 School Year—Implementation of assessment system and launch of digital library
Key Dates for Teachers/Content Leaders

- Spring/Summer 2012—help write *Pilot items* and tasks, review for alignment with CCSS, and check for bias/sensitivity

- Summer/Fall 2013—Teams of math educators valuate formative assessment practices and instructional resources; professional development cadres meet

- Winter/Spring 2013—*Pilot Testing of items/tasks in a sample of schools*

- Fall 2012–Fall 2013—teams write *Field Test* items and tasks review for alignment with CCSS, and check for bias/sensitivity

- Spring 2014—Broad participation in *Field Testing of summative and interim assessments*

- 2014-15 School Year—Implementation of assessment system and launch of digital library
Summative Assessments

For reporting and program evaluation
Summative

- Computer adaptive
- Spring administration
  - 12 week window
- Online (paper & pencil available for 3 years)
- All 4 levels DOK will be assessed
- All levels of Bloom’s will be assessed
- Standards-based
Summative

- Multiple Formats
  - Selected response
  - Short constructed response
  - Extended response
  - Performance tasks

- Multiple Types
  - Traditional
  - Technology enhanced (e.g. drag and drop, building models, etc.)
  - Performance task w/collaboration + independent
  - Independent performance task
Mathematics Reporting Based on 4 Claims

1. Concepts and Procedures
2. Problem Solving
3. Communicating Reasoning
4. Modeling and Data Analysis
Math Claim 1: Concepts and Procedures

Students can explain and apply mathematical concepts and interpret and carry out mathematical procedures with precision and fluency.
Assessing Claim 1

Assessment items will focus on procedural skills and the conceptual understanding on which developing skills depend

- Using appropriate tools strategically.
- Attending to precision.
- Looking for and making use of structure.
- Looking for and expressing regularity in repeated reasoning.
Math #1 Assessing: Using appropriate tools strategically

- Use technological tools to explore and deepen their understanding of concepts.

- Students will use manipulatives to solve problems – hands-on and virtual
#1 Assessing: Attending to precision.

- State the meaning of the symbols they choose, including using the equal sign consistently and appropriately.
- Specify units of measure and label axes to clarify the correspondence with quantities in a problem.
- Calculate accurately and efficiently, and express numerical answers with a degree of precision appropriate for the problem context.
  - In the elementary grades, students give carefully formulated explanations to each other.
#1 Assessing: Look for and make use of structure.

- Look closely to discern a pattern or structure.
  - Young students might notice that three and seven more is the same amount as seven and three more, or they may sort a collection of shapes according to how many sides the shapes have.
  - Later, students will see $7 \times 8$ equals the well remembered $7 \times 5 + 7 \times 3$, in preparation for the distributive property.
- See complicated things, such as some algebraic expressions, as single objects or composed of several objects.
#1 Assessing: Look for and express regularity in repeated reasoning.

- Notice if calculations are repeated.
- Look for both general methods and shortcuts.
- Upper elementary students might notice when dividing 25 by 11 that they are repeating the same calculations over and over again and conclude they have a repeating decimal.
- Maintain oversight of the process of solving a problem while attending to the details.
- Continually evaluate the reasonableness of intermediate results.
Claim #2: Problem Solving

Students can solve a range of complex well-posed problems in pure and applied mathematics, making productive use of knowledge and problem solving strategies.
Assessing Claim 2

- Assessment items and tasks focused on Claim 2 include well-posed problems in pure mathematics and problems set in context.
- Claim 2 will be assessed using a combination of SR items, CR items/tasks, and ER items/tasks that focus on making sense of problems and using perseverance in solving them.
Claim #3: Communicating Reasoning

Students can clearly and precisely construct viable arguments to support their own reasoning and to critique the reasoning of others.
Assessing Claim 3

- Claim 3 refers to a recurring theme in the CCSSM content and practice standards—the ability to construct and present a clear, logical, convincing argument.
  - For older students, this may take the form of a rigorous, deductive proof based on clearly stated axioms.
  - For younger students, this will involve more informal justifications.

- Assessment tasks that address this claim will typically present a claim and ask students to provide, for example, a justification or counterexample.
Claim #4: **Modeling and Data Analysis**

Students can analyze complex, real-world scenarios and can construct and use mathematical models to interpret and solve problems.
Assessing Claim 4

- Tasks designed primarily to assess Claim 4 will involve *formulating* a problem that is tractable using mathematics; that is, formulating a model.
Assessing Claim 4

- Claim 4 tasks will often involve more than one content domain and will draw upon knowledge and skills articulated in the progression of standards up to that grade, with strong emphasis on the major work of previous grades.

- Claim 4 will be assessed both by performance tasks (each lasting up to 120 minutes) and by a collection of 3 to 5 extended-response items/tasks which focus on modeling and data analysis. ER tasks should be designed so that a successful student will complete them in 10-20 minutes.
Interim Assessments

Online assessments to monitor progress
Interim Assessments

- Computer adaptive
- Administration 2 times/year
- Online (paper & pencil available for 3 years)
- All 4 levels DOK will be assessed
- Items will include all levels of Bloom’s
- Schools can choose which standards to assess
- Highly predictive of success on summative assessment
- Optional for LEAs (?)
Formative Assessment
Digital Library

Smarter Balanced Assessment Consortium
Formative Practices

- Digital Library of resources for PD and instructional materials searchable by:
  - Formative assessment: Five Key Strategies
  - Grade level
  - Smarter Balanced claims
  - Smarter Balanced assessment targets
  - Common Core State Standards
  - Content area
  - Mathematical practices
  - Format (video, document, PowerPoint)
Five Key Strategies:

- Clarifying, sharing, and understanding the learning intentions and criteria for success
- Engineering effective classroom discussions, activities, and learning tasks that elicit evidence
- Providing feedback that moves learning forward
- Activating learners as instructional resources for themselves and others
- Activating learners as the owners of their own learning (Wiliam, Dylan. Embedded Formative Assessment, 2011, p. 46)
Digital Library: Professional Development

Assessment Literacy

- Understanding of Evidence-Centered Design and the importance of evidence collection in support of the Smarter Balanced claims and assessment targets
- Understanding of Smarter Balanced Content Specifications aligned with college and career readiness, their roles, and purposes in a balanced assessment system
- Understanding of CCSS Learning Progressions (e.g., using Vygotsky’s Zone of Proximal Development to target instruction)
- Understanding of how the results from the reporting system for Smarter Balanced will help teachers plan for instruction that helps students identify and attain learning goals
Digital Library: Professional Development

- Facilitation and training tools for school-level professional learning teams to build LEA capacity for teachers and instructional leaders to implement formative assessment practices in daily instruction

- Training on the use of the Digital Library

- Training for Teachers, Administrators, Students, and Parents on How to Use Interim and Summative Assessment Reports and Search Resources on the Digital Library To Improve Teaching and Learning
Digital Library: Professional Learning

- **Interim**—Importance of interim assessment in monitoring student learning
  - Purposes of the interim assessment
  - Role of interim assessment item banks (description of quality interim assessment and how to use the interim results in the classroom to target instruction)
  - Effectively using the Smarter Balanced item bank for interim assessments
  - Expanded definitions of terms related to interim assessment

- **Summative**—Description and purposes of Smarter Balanced Summative Assessment
  - Purposes of the summative assessment
  - Selected response (definition and examples)
  - Short and long constructed response (definition and examples)
  - Performance tasks (definition and examples)
  - Technology-enhanced items (definition and examples)
  - Expanded definitions of terms related to summative assessment (e.g., artificial intelligence, CAT, technology-enhanced, content specifications, Evidence-Centered Design.)
Digital Library: Resources

- 52 Smarter Balanced Exemplar Instructional Modules with video clips, lesson plans, curriculum resources, tasks, scoring rubrics, and student products with student feedback and teacher reflection to demonstrate how to use the Formative Assessment Five Key Strategies to teach specific grade level claims and assessment targets in Grades K-12
  - 2 each per content and grade level
Additional Resources

- Instructional tools and resources for teachers (e.g., video demonstrations, templates, strategies and techniques, specific links to Common Core State Standards and examples)
- Teacher template to allow teachers to track their own and student learning through Formative Assessment Practices and Strategies.
- Assessment Glossary for Classroom Teachers
- review of curriculum materials voluntarily submitted by publishers for analysis of the alignment of the curriculum materials to the Smarter Balanced Content Specifications.
Questions & Answers
SmarterBalanced.org
State Contacts

- Colleen Anderson colleen.anderson@iowa.gov
- Tom Deeter tom.deeter@iowa.gov
- Judith Spitzli judith.spitzli@iowa.gov