Developing Tools and Routines for Formative Assessment in Additive Reasoning

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Ongoing Assessment Project (OGAP)

“Objectives

This is an early stage design and development project focusing on designing and piloting research-based formative assessment tools and routines for the early elementary grades.

In collaboration with the Ongoing Assessment Project (OGAP), we are translating findings from research on student learning of number and operations into tools, resources, and routines for teachers to regularly elicit and analyze student understanding and develop targeted instructional responses.

The project includes multiple iterations of design, field testing, data collection, and revision to improve the implementation of these resources in school settings.

Timeline

Year 1 (2016-17) Materials development and piloting

• Large-scale field testing
• Teachers, math leaders, and trainers
• Data collection on implementation in Philadelphia
• Interviews, observations, surveys
• Measure of teacher knowledge (TAK)

Year 2 (2017-18) Ongoing迭代

• Data analysis and refinement

Year 3 (2018-19) Resources in school settings.

Task Considerations

1 Item Bank

• Online resource of 327 formative assessment items

• Pivoted in over 30 grades K–3 classrooms

• Searchable by content, problem structure, magnitude of numbers, models, or size of groups

2 Additive Reasoning Framework

Additive Level

Flexibility, efficiency, fluency

Built on conceptual understanding

Transitional Level

Provide an instructional link between counting and additive strategies—inheritance to IDENTITY and ACCESS

Not strictly linear

Strategies move up and down the progression depending on problem context and difficulty

Learning Progressions integrating evidence and missing information

Sorting Student Work by strategy levels

Instructional Guidance to support movement up the progression

Underlying Issues/Errors For attending to secondary information

3 Professional Development

12 modular professional development sessions that comprise a 6-4-6 learning cycle.

• Foundational concepts: Number Sense, Counting, Subitizing, Number Composition, Number Lines, Equivalency and Properties

• Operative and fluency: Addition, Subtraction, Basic Fact Fluency

• Supporting content and instructional strategies (CCLS/CCSS expectations for Addition and Subtraction, Problem Solving and Exploring the Item Bank)

• Sorting student work and case studies of OGAP implementation

4 Additional Resources

• Pre-assessments

• Evidence collection sheets

• Observation checklists for kindergarten

• Counting Collections resources

• Developing fluency with number lines guide

• “Teacher Tips” bimonthly email

5 What Are We Learning?

• K-2 teachers have not had many opportunities to learn about how young children learn mathematics or delve deeply into the content they are teaching

• Professional development on early math learning and on visual models helps teachers to understand the role of visual models in teaching

• Take-up of the OGAP formative assessment tools and rubrics varies—this influences across teachers’ beliefs about students, their view of learning and school-level instructional factors

• Visual models play a key role in bridging students understanding of number combinations to more sophisticated additive and subtraction strategies

6 Next Steps

• Revision of Number Progression

• Analysis of teacher interviews and teacher learning data (TAK)

• Case studies of implementation

For more project information, visit: ogapmath.com

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