second edition

PERFORMANCE TASKS AND RUBRICS

for Early Elementary Mathematics

Meeting Rigorous Standards and Assessments

CHARLOTTE DANIELSON
AND PIA HANSEN

An **Eye On Education** Book

ROUTLEDGE

3

Making an Evaluation Plan

Designing and implementing performance assessment entails a major investment of time and energy. To ensure that this investment is a wise one and that it yields the desired benefits, it is essential to work from a plan. How to develop such a plan and integrate it into a school or district's curriculum is the subject of this chapter.

A Curriculum Map

A useful approach to developing an assessment plan for mathematics instruction is to begin with a consideration of goals in the mathematics curriculum as a whole. An assessment plan, after all, should have as its goal the assessment of student learning in the curriculum; it makes no sense in isolation from the curriculum. Therefore, a plan for assessment should be created with the end in mind.

Critical Areas of Focus, Domains, and Clusters

A good place to start in thinking about the assessment demands of the Common Core and other rigorous state standards is to consider the domains/strands and major clusters. Critical areas are identified by grade level, to provide a focus, to prioritize what's worth teaching and re-teaching for mastery, and what is supporting the work of the next grade.

These standards have had an enormous influence on the teaching of mathematics, and have caused educators everywhere to think more deeply about what they teach and how to engage their students in both conceptual understanding and procedural fluency with duel intensity.

For example, kindergarten teachers are developing counting and cardinality concepts that are then applied in first and second grades in the Number and Operations in Base Ten domain, when students count multiples of 10, 100, and 5s from any given number to add and subtract. Fraction concepts, parts of a whole, are introduced in the Geometry domain in first grade (halves and fourths) and second grade (halves, thirds, and fourths). Students apply their understanding of equal parts to unit fractions on a number line in grade three and operations with fractions in grades four and five. These content standards define grade-level proficiency and mastery, with a focus on fewer concepts, with a deeper conceptual understanding. Teaching less, at a higher cognitive demand.

The eight Standards for Mathematical Practice describe the characteristics and traits of mathematically proficient students. These practices rest on important processes and proficiencies much like the National Council of Teachers of Mathematics (NCTM) process standards of problem solving, reasoning and proof, communication, representation and connections. They also reflect the proficiency specified in the National Research Council's report *Adding It Up*: adaptive reasoning, strategic competence, conceptual understanding (comprehension of mathematical concepts, operations and relations), procedural fluency (skill in carrying out procedures flexibly, accurately, efficiently, and appropriately), and productive disposition (habitual inclination to see mathematics as sensible, useful, and worthwhile, coupled with a belief in diligence and one's own efficacy).

Publishers, administrators, and teachers that recognize how fundamental the practices are to learning the new content standards, will certainly be interested in creating performance task assessments. Weaving the content standards with the practices has the potential to transform mathematical teaching and learning from what many experienced as students. Math content knowledge, the "what," must be addressed alongside of the "how" to support the belief that all students can—and must—develop proficiency with the mathematical practices.

School mathematics has traditionally been taught as a fixed set of facts and procedures for computing numerical and symbolic expressions to find one correct answer. Current practices are based on the beliefs that students should understand and reason with mathematical concepts, solve problems in diverse contexts, and develop a confidence in their own mathematical ability.

Active environments, where academic concepts are taught in a context of real-life problems, are more beneficial to students.

When educators are planning an intellectually stimulating curriculum for primary students that is rich in content, they look to the National Association for the Education of Young Children (NAEYC). Their recommendations for a high quality mathematics education are similar to the new practice standards:

- enhance children's natural interest in mathematics and their disposition to use it to make sense of their physical and social worlds;
- build on children's varying experiences, including their family, linguistic, and cultural backgrounds; their individual approaches to learning; and their informal knowledge;
- base mathematics curriculum and teaching practices on current knowledge of young children's cognitive, linguistic, physical, and social-emotional development;
- use curriculum and teaching practices that strengthen children's problem solving and reasoning processes as well as representing, communicating, and connecting mathematical ideas;
- ensure that the curriculum is coherent and compatible with known relationships and sequences of important mathematical ideas;
- provide for children's deep and sustained interaction with key mathematical ideas;
- integrate mathematics with other activities and other activities with mathematics;
- provide ample time, materials, and teacher support for children to engage in play, a context in which they explore and manipulate mathematical ideas with keen interest;
- actively introduce mathematical concepts, methods, and language through a range of appropriate experiences and teaching strategies;
- support children's learning by thoughtfully and continually assessing all children's mathematical knowledge, skills, and strategies.

(Source: http://www.naeyc.org/files/naeyc/file/positions/Mathematics_Exec.pdf)

Primary teachers are aware of the stages of concept development with young children—exploration, inquiry, and utilization. Students actively explore all the possibilities in play. Then they are ready to participate in the introduction of numerical skill. The new learning takes on a totally new significance when students apply it to their own personal life. Students relate language to mathematical action and practice, communicating in a precise dialogue.