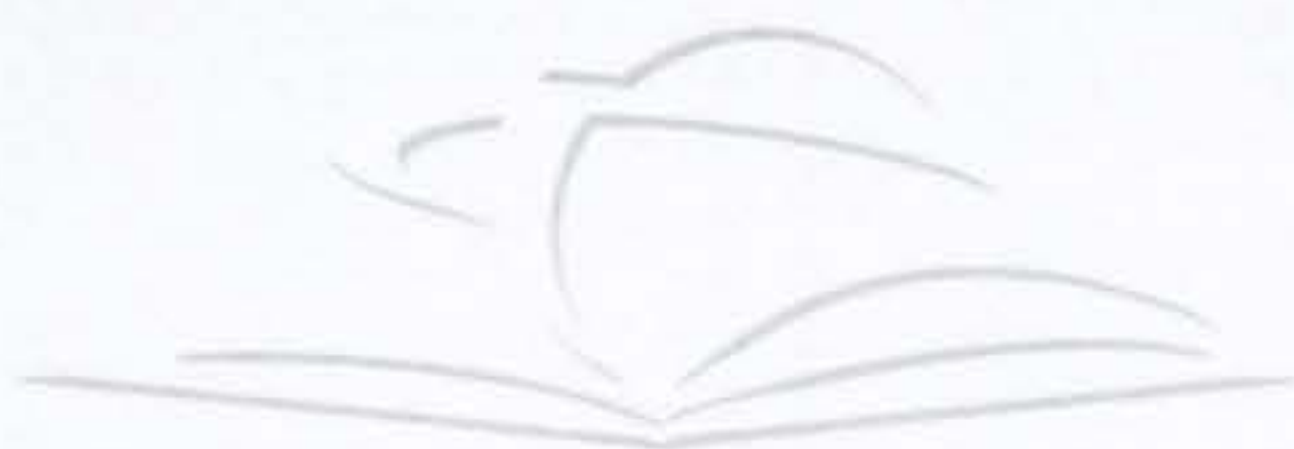


# It Takes...



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*Comprehensive*  
MATHEMATICS  
P L A N

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## INTRODUCTION

Teachers assess students for two reasons: (1) to gather evidence of student achievement to inform instructional decisions and (2) to motivate learning. Assessment helps answer the following questions: *“How can I communicate my expectations about my students’ mathematical understanding and the quality of their work? What do I think my students understand and what do they think they understand? Does the task or activity I am using provide my students the opportunity to demonstrate what they know? Is the activity I am using addressing the mathematics I think it addresses? What activity should I use next?”* and *“How can I communicate to my students and their parents what I think they understand?”* With the challenges faced by teachers in today’s classrooms, assessment supports the mathematical development of our students and provides the teacher with data about their students’ mathematical learning, communicates information and expectations to students, parents, other teachers, and guides, improves, and provides further opportunities for instruction.

### TOOLS FOR ASSESSMENT

The following assessment tools will assist teachers in assessing students’ mathematical power.

#### Authentic Assessment

Authentic assessment is any type of assessment that requires students to demonstrate skills and competencies that realistically represent problems and situations likely to be encountered in daily life. Students are required to produce ideas, to integrate knowledge, and to complete tasks that have real-world applications. Such approaches require the person making the assessment to use human judgment in the application of criterion-referenced standards.

Authentic assessment not only measures what a student knows but also what a student can do in a real world context. In other words, students learn how to apply their skills to authentic tasks and projects. Authentic assessment does not encourage rote learning and passive test-taking. Instead, it focuses on students’ analytical skills; ability to integrate what they learn; creativity; ability to work collaboratively; and written and oral expression skills. It values the learning process as much as the finished product. Authentic assessment is a contrast to traditional educational testing and evaluation, which focuses on reproducing information such as memorized definitions, terms, or formulas. There are five major types of *performance samples*—learning activities that encourage students to use higher-order thinking skills. These are: performance assessment, portfolios, self-assessment, short investigations and open-response questions.

## Performance Assessment

A performance-based assessment system is an integrated approach to education that underpins the culture of a school. Performance-based assessment incorporates curriculum, instruction, high standards, a variety of student work over a period of time, continuous assessment and professional development. It focuses on the ability of teachers (a) to present new ideas so they connect to what students already know, (b) to provide tasks that actively engage students in critical thinking and solving problems, (c) to plan instruction based on knowledge of how students differ in their approaches to learning, and (d) to create a learning environment in which learning by all students is valued.

Tasks used in performance-based assessment include essays, oral presentations, open-ended problems, hands-on problems, real-world simulations and other authentic tasks. Such tasks are concerned with problem solving and understanding. Just like standardized achievement tests, some performance-based assessments also have norms, but the approach and philosophy are much different than traditional standardized tests. The underlying concept is that the student should produce evidence of accomplishment of curriculum goals which can be maintained for later use as a collection of evidence to demonstrate achievement, and perhaps also the teacher's efforts to educate the child.

Performance-based assessment is sometimes characterized as assessing real life, with students assuming responsibility for self-evaluation. Testing is "done" to a student, while performance assessment is done by the student as a form of self-reflection and self-assessment. The overriding philosophy of performance-based assessment is that teachers will have access to information that can provide ways to improve achievement, demonstrate exactly what a student does or does not understand, relate learning experiences to instruction, and combine assessment with teaching.

Performance assessments test students' ability to use skills in a variety of authentic contexts. They frequently require students to work collaboratively and to apply skills and concepts to solve complex problems. Short- and long-term tasks include such activities as:

- conducting a week-long science experiment and analyzing the results
- utilizing math skills to develop a cost estimate for groceries needed to feed a family of four for one week
- working with a team to prepare a position in a classroom debate
- writing, revising, and presenting a report to the class

## Portfolios

A portfolio is a collection of student work done over a substantial period of time. This long-term perspective accounts for student improvement and teaches

students the value of self-assessment, editing, and revision. A student portfolio includes but is not limited to:

- student self-reflection and analysis of work completed
- journal entries and reflective writing
- group reports
- peer reviews
- artwork, diagrams, charts, and graphs
- student notes and outlines
- rough drafts and polished writing

### **Self-Assessment**

Self-assessment requires students to evaluate their own participation, process, and products. Evaluative questions are the basic tools of self-assessment. Students give written or oral responses to questions such as:

- What was the most difficult part of this project for you
- What do you think you should do next?
- If you could do this task again, what would you do differently?
- What did you learn from this project?

### **Mathematical Investigations**

Investigations ask students to experiment, hypothesize, measure, analyze, test, talk, write, explain, and justify their ideas. Investigations engage students in real mathematics.

### **Open-Response Questions**

Open-response questions, like short investigations, present students with a stimulus and ask them to respond. Response includes:

- a brief written or oral answer
- a mathematical solution
- a drawing
- a diagram, chart, or graph

Many teachers find that authentic assessment is most successful when students know what teachers expect. For this reason, teachers should always clearly define standards and expectations. Educators often use rubrics, or established sets of criteria, to assess students' work.