

“What we assess  
and how we assess  
it communicates  
what we value.”

# MATH AND SCIENCE

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## ASSESSING STUDENT PERFORMANCE

Assessment is not synonymous with evaluation and testing.

*Assessment* is the process of gathering information. Once the information has been collected, evaluation can begin. *Evaluation* is the process of interpreting and integrated diverse pieces of data into a summary judgment. *Tests* are measuring devices used to document student learning on narrowly defined questions and tasks. Educators have a tendency to reduce assessment to testing, often using data from a single test to indicate a student’s capabilities. In reality, tests are just one of many tools available to the assessment process.

Assessment should be a feedback mechanism; it should show students what teachers expect. For example, if the process or strategies students use to arrive at a solution are as important as the solution itself, the teacher should select an assessment method that captures this information. If knowledge of certain facts or procedures is all that is required, a multiple-choice or short-answer test will suffice. Assessment should reflect both instructional goals and strategies.

Recent techniques—known as “alternative,” “authentic,” “active,” and “performance” assessments—reflect new understandings of how students learn. Beyond mastering recollection of facts, these techniques focus on how students integrate and generalize knowledge and procedures. In fact, these techniques go beyond testing and help students gain a deeper understanding of the topic.

### Issues

- As schools increasingly stress higher-order thinking skills and as the school-age population becomes more culturally and linguistically diverse, assessment tools must expand beyond multiple-choice or short-answer tests to measure the full scope of students’ performance and progress accurately.<sup>1</sup>
- Once-per-year standardized tests, including Ohio’s Proficiency Tests, serve valuable purposes. They are rich in data and can outline the general trends in the educational productivity of a state, district, or school. Statements that such tests have no validity or utility demonstrate, at best, serious errors of judgment.<sup>2</sup> Yet, these tests are of limited use to individual teachers, who must make decisions about children and instruction every day of the school year.
- Determining end-of-year or end-of-semester grades is perhaps the most common use of the assessment information teachers collect. Teachers consider many factors when they determine student grades. While some rely only on the absolute level of student achievement, others consider additional factors such as the amount of effort or degree of improvement shown by their students. Most, however, use a mixture of these factors, assigning a higher level of importance to some than to others.<sup>3</sup>
- Research has found that many teachers misuse or ineffectively use traditional forms of assessment, including both commercial tests and teacher-developed instruments.<sup>4</sup>

- The knowledge and abilities of students from different cultural or linguistic backgrounds are not well measured by multiple-choice or short-answer tests or quizzes in English. Alternative forms of assessment, when implemented properly, can give teachers more useful information about what these children know and can do and what kinds of instruction will help them the most.<sup>5</sup>
- Use of homework as an assessment tool varies among teachers of different grades and subjects: 37 percent of primary-grade teachers in the U.S. report that they often collect, correct, and discuss homework, compared to 58 percent of intermediate-grade teachers, 53 percent of middle school teachers, and 50 percent of high school teachers.<sup>6</sup> Yet, 51 percent of mathematics teachers report that they often record only whether students complete a homework assignments.
- Portfolios are a popular assessment method: 49 percent of U.S. teachers say they play an important role in assessing student performance.<sup>7</sup> A portfolio is a collection of a student's work chosen to represent the student's progress in acquiring skills or conceptual understanding. Portfolios can be more or less formal, depending on the criteria involved in selecting and assessing the quality of the work. Portfolio assessment can include teacher-student conferences about selection and assessment of the work. Although they are not without controversy,<sup>8</sup> portfolios allow teachers to evaluate higher-order, complex skills while providing opportunities for student goal setting and self-evaluation.<sup>9</sup>

## Routes and Destinations

When developing assessment tasks, first identify the “big idea” of a unit. What is worth knowing? Next, establish the criteria for judging student learning. Checklists are a useful way of displaying criteria and of clearly identifying the characteristics of a good product. Finally, give students access to the checklist as they prepare for and complete the assessment. The checklist not only will help students understand what is expected of them, it also will help them judge the quality of their work and allow them to discuss their progress with others.

### Good assessment methods:

- Focus on what students know and can do rather than what they do not know.
- Match the curriculum in both *what* is taught and *how* it is taught.
- Are unbiased and fair for all students.
- Allow students to learn at various paces and honor various styles of learning and performance.
- Use questions that require thoughtful responses.
- Compare performance over time to help recognize patterns of success and difficulty.

Nearly any significant learning activity can provide an opportunity for informal assessment and can be modified to become a performance assessment task. Expanding the scope of assessment provides a broader view of student capabilities and knowledge. Teachers are better prepared to describe and comment on each student's learning to parents, administrators, and the students themselves. In addition, continual assessment of student understanding can guide both long- and short-range instructional decisions to:

- Ensure that every student is learning sound and significant mathematics.
- Support the development of a positive disposition toward mathematics.
- Challenge and extend student's ideas.
- Identify student needs in order to adapt or change activities.

Don't get discouraged if change doesn't occur over night. Making changes in classroom assessment practice is often time-consuming and sometimes frustrating. Teachers should keep in mind the following:<sup>10</sup>

- Don't try to do it all at once; start small but start somewhere.
- Don't try to do it all alone; find someone to work with, preferably at the same grade level or within the same discipline.

There is a dynamic interplay between instruction and assessment. Ideally, the lines between instruction and assessment become blurred when tests are part of instruction and instructional tasks are rich diagnostic opportunities.

Adapted from *Minnesota K-12 Mathematics Framework*, SciMath<sup>MN</sup>, 1998.

## Endnotes

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