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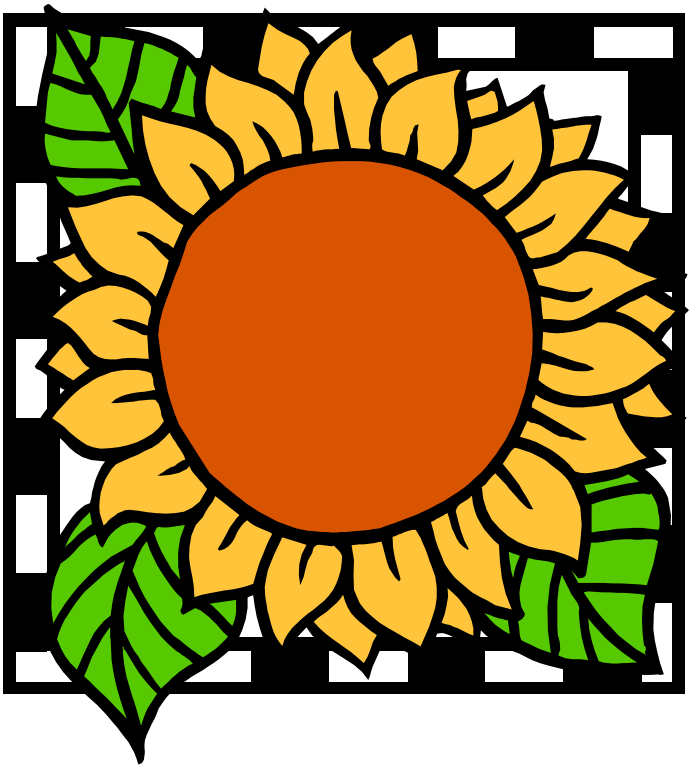

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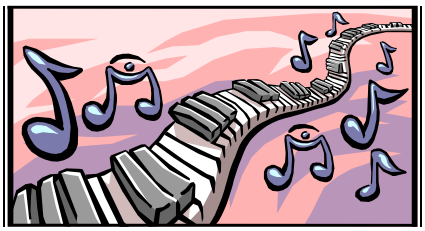
Getting to the Point of Assessment Myths

Source: *Mathematics Assessment: Myths, Models, Good Questions, and Practical Suggestions*, NCTM, 1991. The following excerpt is a direct reprint from the book.

Mathematics instruction and assessment are replete with conventional wisdom. Often, however, this conventional wisdom takes the form of myth — widely held beliefs from an earlier age that are neither supported by current knowledge nor compatible with current conditions. The NCTM has identified some widely held mathematics beliefs and has provided facts to dispel the myths.

Myth: *Learning mathematics means mastering a fixed set of basic skills; therefore mathematics tests should focus on whether students have mastered these basic skills.*

Fact: *Everybody Counts* (Mathematical Sciences Education Board 1989, p. 57) makes the point that "skills are to mathematics what scales are to music or spelling is to writing. The objective of learning is to write, to play music, or to solve problems — not just to master skills."



As our objectives change, so too must our assessment instruments. Mathematics test can no longer remain primarily multiple-choice vehicles used to assess the memorization and regurgitation of rote skills. Instead we must assess authentic student problem solving products.

Myth: *Problems and applications come only after mastery of skills.*

Fact: Teachers realize that it is applications and interesting contexts that motivate and engage students. Good problems and problem situations provide a natural instructional environment for *then* learning skills and concepts. It follows that assessment driven by problems and applications will naturally subsume the more routine skills that currently make up the bulk of mathematics assessments.

Myth: *First we teach, then we test.*

Fact: Increasingly, we find advantages in blurring the lines between instruction and assessment, in drawing assessment information from instructional tasks, and in providing additional instruction in context of assessment activities. For years we have understood that the best test also instructs and the best instructional tasks are rich diagnostic opportunities. It is time to use these understandings in all aspects of instruction and assessment.

Myth: *Students learn only by imitation and memorization.*

Fact: Again from *Everybody Counts*, we know that "students construct meaning as they learn mathematics. They use what they are taught to modify their prior beliefs and behavior, not simply to record and store what they are told. It is students' acts of construction and invention that build their mathematical power and enable them to solve problems they have never seen before" (p.59).

Myth: *There is almost always a single right answer to a mathematics problem.*

Fact: Although this myth has long been an assumption about mathematics, most people who use mathematics understand that there are usually many correct answers to real problems and many approaches to getting these answers. Problems with single correct answers seldom occur outside of school.

Myth: *Objective, multiple-choice tests are the only valid and reliable indicators of quality mathematical performance.*

Fact: *Everybody Counts* addresses this myth succinctly:

> Experience in evaluating student writing shows that readers judging whole essays produce results more aligned to the goal of high-quality writing than do objective exams of grammar and vocabulary. Similar experiences show that one can reliably judge scientific understanding by observing student teams in a laboratory. Effective means of assessing operational knowledge of mathematics must be similarly broad, reflecting the full environment in which employees and citizens will need to use their mathematical power (p.69).

Traditional multiple-choice questions may have a place in mathematics assessment, but they are inadequate for assessing many of our new goals. Limiting assessment to this form is comparable to a doctor's use of only a stethoscope to diagnose a serious heart problem.

Myth: *The purpose of assessment is to determine which students "have it" and which do not, and then try to assign grades and placements accordingly.*

Fact: In a world where we truly believe that ALL students can be successful and where ALL students can and must learn mathematics, traditional assessment practices that sort, rank, and stigmatize have less and less value. Today's needs demand multiple methods of assessment, integrally connected to instruction, that diagnose, inform, and empower both teachers and learners.

Myth: *objective multiple-choice tests are the best way to measure the most important ideas in mathematics.*

Fact: Some elements of mathematics learning can only be measured in ways other than multiple-choice tests. We need to know whether students can represent, summarize, and interpret data, whether they understand the measurement of three-dimensional objects, whether they can effectively interpret the answers shown on a calculator, whether they can communicate their mathematical ideas, whether they can communicate their mathematical ideas, whether they will persist in working on a problem, and whether they will go beyond the immediate problem to the exciting and powerful world of "What if…?"

Myth: *Class grade assignments should be based on a bell-shaped curve.*

Fact: The application of this statistical idea to students' achievement in a course is both illogical and statistically invalid. A class of student makes up a very small sample of the population and is seldom representative of a random distribution. Too, the aim of effective instruction is to modify that distribution and enable clustering student ratings at the top of the scale rather than at the middle.

Myth: *In the classroom, only the teacher can adequately evaluate a student's progress.*

Fact: The most effective assessment of all is that of one's own learning. One of the most valuable lifelong skills students can acquire is the ability to look back and reflect on what they have done and what they still need to do. Students who develop a habit of self-assessment will also develop their potential for continued learning.

Myth: *Alternative forms of assessment are less objective than traditional forms of testing and simply the latest fad in ducking educational accountability.*

Fact: Many states and countries are moving toward or are already effectively using alternative assessments that allow educational decisions to be based on a more complete set of facts than has ever before been available. The meaning of accountability is being expanded to include students; ability to formulate problems, to pose and test hypotheses, to solve problems that require time and thought, and to be persistent, flexible, and confident. ♣

It is a major purpose to convince the reader of the bankruptcy of these myths, to show the richness of information available about student learning, and by argument and example, to promote alternative forms of assessment as key elements in reform movement.

Increasingly, research and the wisdom of practice are suggesting much closer examination of these beliefs, finding sound reasons to question conventional wisdom. Changes in curriculum and instruction must be accompanied by equally substantive changes in assessment policies, procedures and instruments.

Criteria for Performance Tasks

Here is a list developed by Steve Leinwand and Grant Wiggins, of important characteristics to look for in performance tasks.

ESSENTIAL	↳ The task fits into the core curriculum. ↳ It represents a "big idea."	Vs.	TANGENTIAL
AUTHENTIC	↳ The task uses processes appropriate to the discipline. ↳ Students value the outcome of the task.	Vs.	CONTRIVED
RICH	↳ The task leads to other problems. ↳ It raises other questions. ↳ It has many possibilities.	Vs.	SUPERFICIAL
ENGAGING	↳ The task is thought provoking. ↳ It fosters persistence.	Vs.	UNINTERESTING
ACTIVE	↳ The student is the worker and decision maker. ↳ Students interact with other students. ↳ Students are constructing meaning and deepening understanding.	Vs.	PASSIVE
FEASIBLE	↳ The task can be done within school and homework time. ↳ It is developmentally appropriate for students. ↳ It is safe.	Vs.	INFEASIBLE
EQUITABLE	↳ The task develops thinking in a variety of styles. ↳ It contributes to positive attitudes.	Vs.	INEQUITABLE
OPEN	↳ The task has more than one right answer. ↳ It has multiple avenues of approach, making it accessible to all students.	Vs.	CLOSED