



The Principals' Partnership

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Research Brief

Mathematics

Question:

What are some norm-referenced high school math tests we could administer to assess the value of our math program?

Summary of Findings: Below are several norm referenced math tests. Each was reviewed in the Mental Measurements Yearbook. This is a print resource and probably available at your local university library. An index of MMY articles on mathematics tests is available at <http://www.unl.edu/buros/>. Each of these tests has a cost associated with it to license the test and each has different requirements for administering and scoring the test. All four tests had acceptable scores for reliability. The validity of each test will depend on how well the content of the test matches the content of your math program. More information is available either from the Mental Measurements Yearbooks or from the test publisher.

STAR Math

Is designed as a computer-adaptive math test and database to place students at the appropriate math level in grades 3-12.

Publisher: Renaissance Learning, Inc.

(Note: this might be the best test for the school, which originally requested this research brief)

This is a computer-based test designed to assess student's mathematical abilities in 15 minutes or less. It is divided into two major parts, each containing 12 multiple-choice type items. The first part of the test includes two strands: Numeration Concepts and Computation Items, whereas the second part consists of six strands: Word Problems, Estimation, Statistics, Charges, and Graphs, Geometry, Measurement, and Algebra. There are two primary purposes: first to provide teachers a quick estimate of students' mathematical achievement, and second to provide a means of assessing growth over periods of time. STAR Math is normed for the U.S. This test has good reliability and validity.

Stanford Diagnostic Mathematics Test

(Brown Level for grades 6.5-8.9 and Blue Level for grades 9.0-13.0)

Is designed to measure competence in the basic concepts and skills that are prerequisite to problem solving in mathematics.

Publisher: Harcourt Brace Educational Measurement

Whereas an achievement test is designed to measure a student's knowledge (for example, in arithmetic), a diagnostic test is designed to learn what difficulties a student may have, for example, in addition and carrying. The purpose of this test is to determine specific areas in which each student is having difficulty. Because the NCTM standards recommend that problem solving be the focus of curriculum, instruction, and assessment, the test emphasizes problem solving and problem solving strategies while maintaining a traditional computation subtest. Reliability and validity in this test are both good.



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Test of Mathematical Abilities

Is designed to be a measure of math ability for use with students in the 8-18 age group.

Publisher: PRO-ED, Inc.

In addition to story problems and computations, it also provides standardized information about attitudes, vocabulary, and general cultural applications of mathematical information to assist administrators not only to identify individuals who are weak in math, but also to understand better the nature of those problems. Both reliability and validity are good with this test.

Online Resources:

Norm-Referenced Achievement Tests

Fairtest: The National Center for Fair & Open Testing

Human beings make tests. They decide what topics to include on the test, what kinds of questions to ask, and what the correct answers are, as well as how to use test scores. Tests can be made to compare students to each other (norm-referenced tests) or to see whether students have mastered a body of knowledge (criterion or standards-referenced tests). This fact sheet explains what NRTs are, their limitations and flaws, and how they affect schools.

<http://www.fairtest.org/facts/nratests.html>

Parents' Guide to Standardized Tests

Whether you're for them or not, odds are your kids will have to take at least one standardized test this year. Our tips and resources will help your kids face the music on test day.

<http://www.familyeducation.com/topic/front/0,1156,1-9028,00.html>

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