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ABSTRACT

Project Basic is a program developed by the Maryland State Department of Education to assure that students attain basic skills in a variety of areas. Two levels of tests are given in grade 7 to monitor progress, and in grades 9 to 12 to determine whether each student has met the state minimum competency level. Students must pass the higher level of the Maryland Functional Reading Test to be eligible to graduate from high school. There are retest requirements until the test is passed. Graduation requirements apply to handicapped students (mainstreamed or in regular classes) on a different schedule. Test security requires several test forms, therefore test scores have been put on a scale that can correct for differences in difficulty. Scale scores transformed to performance-related scores, and estimated percent-correct scores are used to adjust to the different forms. Scores reported for the total test determine graduation eligibility, and scores for each domain determine areas needing further instruction. The results are reported to students, parents and school staff with pass/fail and performance indications. (CM)

MONTGOMERY COUNTY
PUBLIC SCHOOLS
ROCKVILLE, MARYLAND

Project Basic Test Interpretation

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Superintendent of Schools

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PROJECT BASIC TEST INTERPRETATION

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PROJECT BASIC TEST INTERPRETATION

Purpose of Project Basic

Project Basic is a program developed by the Maryland State Department of Education (MSDE) to assure that students attain basic skills in a variety of areas. The program includes tests to determine whether students have reached a minimum competency level set by the state. There are two levels of tests. The first tests are given in Grade 7 to determine whether students are progressing satisfactorily or whether they need special instruction. Higher level tests are given in Grades 9 to 12 to determine whether each student has reached the state minimum competency level.

Students must pass the higher level of the Maryland Functional Reading Test, a part of Project Basic, to be eligible to graduate from high school. Those who fail the test retake it after appropriate instruction until they pass. Similar requirements will be implemented in the other Project Basic competency areas after the tests have been validated. These graduation requirements apply to handicapped students on a different schedule. Handicapped students who receive special services but who are enrolled in regular classes for at least half of the day (Levels 1, 2, or 3) will have to pass the reading test starting with the Class of 1986. They will have to pass the other tests on the same schedule as nonhandicapped students. Handicapped students in special classes or schools (Levels 4 or 5) will not have to pass the tests until at least the Class of 1989. Where necessary, handicapped students will be tested under special conditions that give them a reasonable chance to demonstrate what they know (e.g., Braille copies of the test for blind students).

Project Basic Test Scoring Procedures

Until the fall of 1982, scores on the Maryland Functional Reading Test (MFRT) were reported as the percent of questions answered correctly, like on many of the classroom tests students take in school. This scoring method was adequate when only one form of the test was being used at each level. However, test security requires several test forms. It is almost impossible to develop several forms at exactly the same level of difficulty. To use forms at different levels of difficulty would be unfair, and possibly illegal, because students must pass the tests to graduate. Thus, it is necessary to use a scoring system other than "percent correct" when several forms of a test are used.

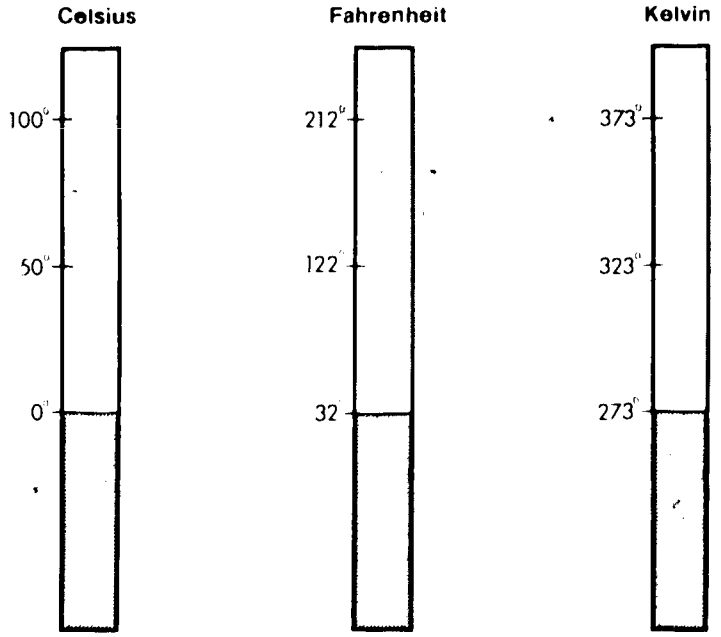
As a result of the virtual impossibility of producing several test forms of equal difficulty, the test scores have been put on a scale that can correct for differences in difficulty. The statistical procedure used by MSDE to do this, the Rasch Model, aims at assigning students the same scale score for the same level of knowledge, no matter which form of the test is used. In the case of the reading test this correction for differences in difficulty includes the forms of the test used before Fall, 1982.

An example from another type of measurement may help to illustrate what this scaling accomplishes. There are several different methods for indicating temperature. We may use Celsius, Fahrenheit, or even the Kelvin scale. Each of these will provide a different number to describe the same temperature just as different test forms will probably provide different percents correct to

describe the same amount of knowledge. If the temperature is at the freezing point, these different methods will report the temperature as 0^{o}, 32^{o} and 273^{o}, respectively (see Figure 1). If we do not know which method is being used, we do not know how cold it is. Likewise, in testing, if we do not know how difficult a test form is, we do not know how much knowledge a student has. Thus, in measuring both temperature and knowledge, the measurement must be put on a common scale before it can be interpreted.

Figure 1

Thermometers Showing Different Temperature Scales



The use of scale scores to equate performance on different forms of a test is not new, nor unique to Project Basic. Similar procedures have been used for many years on many tests, including the Scholastic Aptitude Test (SAT) taken by college-bound high school students.

Format of Project Basic Test Scores

Two kinds of scores are used to report results for Project Basic tests - scale scores and estimated percent correct scores. The scale score is supposed to adjust students' scores on different forms of a test so that they will have an equal chance of passing no matter which form is taken. As a result the same passing score can be used for all forms of all tests, no matter what each

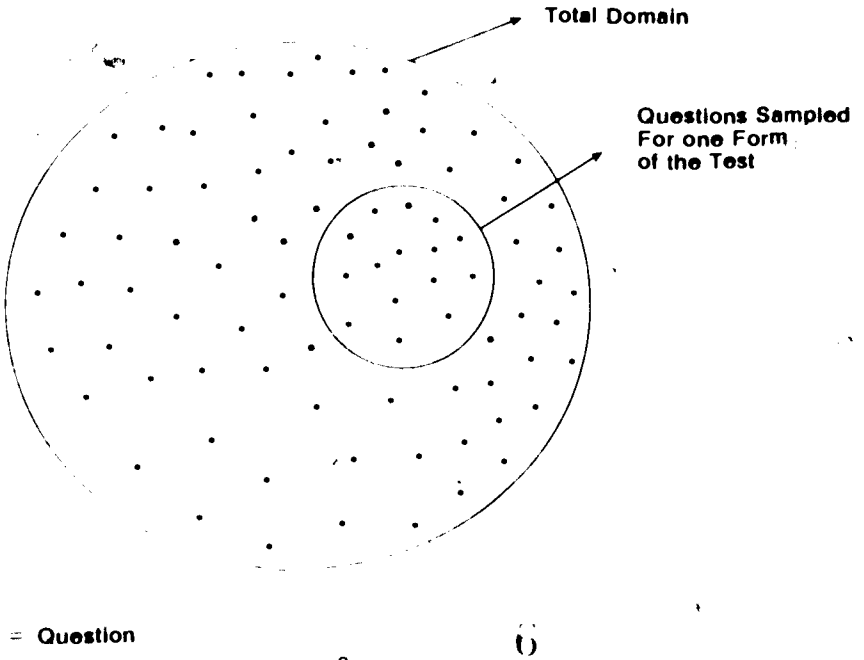
measures or how difficult it is. The passing score has been set at 340 by the state education department, with scale scores ranging from about 100 to about 475.

While the scale score provides a way of equating scores on different test forms, it does not permit an interpretation of what the score means beyond telling whether a student passed the test. Therefore, the scale score will be transformed to a more performance-related score, the estimated percent correct. This latter score estimates the percent of questions a student would have answered correctly if he or she had been asked all questions available for making up the different versions of the test. In the case of Project Basic tests there are usually about 100 questions for each section of a test. The one exception to this is the higher level of the Maryland Functional Writing Test which requires the writing of paragraphs rather than the answering of multiple choice questions. For this test there are only a few questions for each section.

Each section is aimed at determining whether a student has mastered a particular set of skills, such as Following Written Instructions. The technical name for each of these sections is "domain." When the state creates a new test form it uses a sample from the 100 questions in a domain. This sampling is shown graphically in Figure 2. The dots in the large circle represent all of the available questions. Those in the small circle represent the questions included in the sample for one form of the test. To ask all of the questions would make the test too long and would not greatly improve the accuracy of the score. The estimated percent correct is an approximation of the percent of questions that would have been answered correctly if all 100 had been asked. The scoring procedure adjusts the scores so that this estimate will be the same for whichever form (i.e., sample of questions) the student takes.

Figure 2

Illustration of Question Sampling



Uses of Project Basic Test Scores

Scores are reported for the total test and for each domain. The scores are used to make two types of decisions. One of these is whether the student passed the higher (graduation) level test. This is based on the total test score. As indicated previously, any scale score of 340 or higher for the total test is passing. This is true no matter what the student achieved on each domain. No passing score has been established by the state department of education for the lower level tests. The major reason for testing at this level is to see whether the student has any weak areas in which he/she needs special instruction.

Determination of weak areas is the other decision made from these scores. This decision is made on both test levels and is based on how far a student's scale score in each domain is from 340, the passing score on the total test. Scores close to 340 indicate that the student may need a little help in that domain. Scores well below 340 indicate that the student definitely needs some additional instruction. The level of performance in each domain is indicated on test reports for 7th grade students and for those in Grades 9 to 12 who fail the test.

The results are reported to students, parents and staff with the pass/fail and performance indications discussed above. A sample of part of the score report for parents is shown in Figure 3. The total test score is reported as a scale score so that the same score, 340, can be used for passing on all tests. The student whose scores are reported in Figure 3 did not pass the test. The domain scores, reported as estimated percent correct, and the comments provide a description of the student's performance.

Figure 3

SAMPLE PROJECT BASIC SCORE REPORT

TEST SECTION	SCORE	COMMENT
COUNTING	98	GOOD PERFORMANCE
ADDITION	90	GOOD PERFORMANCE
SUBTRACTION	77	FAIR, MAY NEED INSTRUCTION
MULTIPLICATION	75	GOOD PERFORMANCE
DIVISION	43	NEEDS INSTRUCTION
TOTAL TEST	317	FAILED TEST, STUDENT WILL BE RETESTED AFTER INSTRUCTION.

The comments are needed for interpretation because the same estimated percent correct may indicate different levels of achievement in different domains. In the example, the score of 75 in multiplication indicates good performance while a 77 in subtraction means the student may need instruction. This happens because the questions in each domain are not equal in difficulty. That is, it may be just as hard to get 70 percent correct in multiplication as it is to get 85 percent correct in subtraction. How this might happen can be seen if one pretends the two domains represent two different distances for shooting a basketball. A person will be expected to make more shots from 15 feet than from 40 feet. Thus, 20 percent accuracy from the longer distance may be equivalent in skill to 50 percent accuracy from 15 feet.

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