

### The New York State Testing Program Standard Performance Index (SPI) for Grade 4 Mathematics, 2003

The New York State Testing Program Standard Performance Index (SPI) represents the number of items a student, based on his/her performance on the test, would be expected to answer correctly if there were 100 items measuring each of the New York State Mathematics (MA) Key Ideas. The SPI may be used as a diagnostic tool that provides a profile of a student's relative strengths and weaknesses in relation to each of the seven MA Key Ideas. It is important to remember that the calculation of the SPIs depends on student responses to the items measuring a key idea and how difficult those items are. This item difficulty information is obtained through the analysis of field test scores.

A student may have a seemingly high SPI on Key Idea 2 (for example, 92 out of a possible 100) and a seemingly low SPI on Key Idea 1 (for example, 59 out of a possible 100). This type of result does not necessarily mean that he or she is strong on Key Idea 2 and weak on Key Idea 1. It could mean that the items on Key Idea 2 are relatively easy and the items on Key Idea 1 are more difficult. Since the difficulty of the items within each Key Idea may vary, a point of reference (expected SPIs) for each Key Idea is needed for teachers and students to better understand SPI scores.

For comparisons, a table of *expected SPIs* that identify the value differentiating performance levels for each of the seven MA Key Ideas is presented. The table entries show the SPI scores expected for students at the decision points separating performance level 1 from performance level 2, performance level 2 from performance level 3, and performance level 3 from performance level 4. The expected SPIs can be used as reference points against which each student's scores may be compared. For example, think of a grade 4 student whose SPI on Key Idea 1 is 59. The expected SPI for the decision point separating performance level 2 from performance level 3 is 47. That is to say, a student *just at* the level 3 cut score is expected to get an SPI of 47 on Key Idea 1. Although the student who obtained the SPI of 59 seems to be scoring low against the possible 100 points, he or she is still higher than what is expected for a student just at performance level 3 for Key Idea 1. **A table of *expected SPIs* for students who took the Braille form of the grade 4 MA test is also presented. These expected SPIs differ only in Key Idea 4 due to an item deletion. It was decided that the item was not appropriate for the Braille form.**

Expected SPIs change from year to year depending on the difficulty of each year's test items. Therefore, it is not possible to compare SPIs from year to year without reference to a particular year's expected SPIs. Expected SPIs are published in the technical reports (<http://www.emsc.nysed.gov/ciai/testing/pubs.html>) and are also available on the OSA website (<http://www.emsc.nysed.gov/ciai/assess.html>) beginning in 2003.

Expected SPIs at the Cut Points for each MA Key Idea and Performance Level

Key Ideas		Grade 4 MA		
		Level 2	Level 3	Level 4
01	Mathematical Reasoning	25	47	82
02	Number & Numeration	46	73	93
03	Operations	30	59	88
04	Model/Mult. Representation*	42	68	87
05	Measurement	28	44	66
06	Uncertainty	25	47	81
07	Patterns/ Functions	23	46	80

\*Key Idea 04, Model/Mult. Representation, has relatively few items. Therefore, the associated SPIs and expected SPIs for this Key Idea are less reliable and need to be interpreted with caution.

Key Ideas		Grade 4 MA Braille		
		Level 2	Level 3	Level 4
01	Mathematical Reasoning	25	47	82
02	Number & Numeration	46	73	93
03	Operations	30	59	88
04	Model/Mult. Representation*	50	79	95
05	Measurement	28	44	66
06	Uncertainty	25	47	81
07	Patterns/ Functions	23	46	80

\*Key Idea 04, Model/Mult. Representation, has relatively few items. Therefore, the associated SPIs and expected SPIs for this Key Idea are less reliable and need to be interpreted with caution.