Chapter 10
Placing Students on the Mathematics Scales

Near the end of the year, based on evidence in a student's Learning Record (student work and teacher/student commentaries), the teacher identifies the levels on the Mathematical Understanding Scale and the Mathematical Disposition Scale that best describes a student's achievement. This is done during the third and/or fourth quarter. If you are participating in the Learning Record Moderations, the three records that will be sent to the moderations need to be completed and students placed on the scales near the end of the third quarter. A final placement for all records, including the moderated ones, is done at the end of the year.

Determining the appropriate level placement of a student requires thoughtful analysis of the evidence in the portfolio. The assumption is that the student and the teacher are familiar with the scale descriptors and have selected work that shows the student's progress over the year and the student's deepening understanding of mathematics. The teacher and students need to consider how the contents of the portfolio provide evidence for placement at a particular level on the scale(s). Particularly for records that will be going through moderation, the teacher needs to consider how the portfolio will be viewed and evaluated by reviewers who do not know the student.

Holistic Judgment

Placement on the mathematics scales is made using a holistic judgment—an overall appraisal is made across all mathematical areas rather than separate appraisal for each area or concept. The description of each level is not intended to be a check-list with the requirement that the student must have mastered each

criterion mentioned. (Also, it is not feasible in a student's Learning Record to show evidence of understanding all the concepts identified in the scales.) To make the judgment, a teacher needs to:

- Carefully review the level descriptors of the two or three levels at which the student may be performing.
- Carefully review all the evidence in the student's Learning Record, including the Observation Notes, the Analysis of Mathematics Work, the student work related to both sections, and the section, Summarizing Student's Mathematics Learning.
- Identify which level on the scale is the best overall match to indicate the student's level of understanding and/or disposition. (See also additional comments below.)

Placing Students on the Mathematical Understanding Scale

The mathematics component of the Learning Record is based on the assumption that mathematical understanding is critical. In order to become mathematically powerful, students need to understand and make sense of the mathematics they are learning. Therefore a LR needs to show evidence of the particular student's understanding. Showing only that a student knows how to perform computational procedures is not sufficient. Students must know when and how to use mathematics, and they must think critically when solving problems.

The important understandings for each level of the scale are described in four areas of mathematics: (1) numbers sense; (2) patterns, functions, and algebra; (3) geometry and measurement; and (4) data analysis, statistics, and probability. It is assumed that the emphasis and balance across mathematical areas may be different in various grades and classrooms. For example, the area of Number Sense may receive more emphasis in primary grades, and a high school may teach courses that emphasize algebra one year and geometry the next. However, It is also assumed that, especially for teachers who have used the LR for a few years, that each student's LR will include some evidence from each of

these areas. Nevertheless, it would be virtually impossible to include work that provides evidence for all the mathematical understandings listed in a descriptor. Therefore, when making a judgment placing a student at a particular level, that judgment needs to be based on the work and commentary that is included in the portfolio—what level is the best overall match for the evidence?

Placing Students on the Mathematical Disposition Scale

The Mathematical Disposition Scale was developed based on the assumption that students' dispositions toward mathematics must be reflected. The scale incorporates the Learning Record's Five Dimensions of Learning: Confidence and Independence, Experience, Skills and Strategies, Knowledge and Understanding, and Ability to Reflect. (See Chapter 1, pp. 4-5.)

To some degree, placement of students on this scale is related to a student's age and maturity. For example, the Disposition Scale is not used at grades K-2 since most of these students are only beginning to develop the ability to be self-reflective. For older students, two students who are working at the same level on the Mathematical Understanding Scale, may be at quite different levels on the Disposition Scale. For example, a high-achieving fifth grade student and a low-achieving eighth grade student may both be at level 7 on the Understanding Scale. However, it is highly probable that they differ significantly in their mathematical disposition. The fifth grader may be confident and work independently, while the eighth grader, who is working below grade level expectations, may lack confidence and must be urged to complete his or her work.