



**TEACHERS
DEVELOPMENT GROUP**

Student Mathematical Discourse

About Mathematical Discourse

The Student Discourse Observation Tool provides a structure for documenting and characterizing students' discourse about mathematical concepts and procedures. While the teacher may initiate the discourse and may be involved in the interaction, only the *students' mathematical thinking* is documented. The following chart provides examples of typical classroom activities that are and are not considered mathematical discourse in applications of this tool.

What Is and Is Not Student Mathematical Discourse¹

IS Considered Discourse

- A student asks, "I don't understand how you got that answer. Could you explain it again?"
- A student explains, "I first added 20 and 40 to get 60. Then I subtracted 2 and added 3 to get 61."
- A student explains, "I saw that $18 + 43$ was the same as $(20 + 40) - 2 + 3$."
- Students write in their journals about their thinking to solve a problem.
- A student states, "I think I see a pattern. Each one goes up by 3 more than the one before it."
- Two students discuss whether a procedure suggested by a student will work in all similar situations.
- A student challenges an algorithm posed by a student by saying, "Yes, but how does it work with 37×98 ?"
- A student answers a question in response to the teacher.
- The teacher provides an explanation of a

IS NOT Considered Discourse

- mathematical procedure to the class.
- The teacher provides further explanation in response to a student's question.
- Two students discuss the scores of last week's football game.
- The teacher provides instructions to the class about an activity they are about to engage in.
- A student asks a question about nonmathematical procedures related to an assignment such as when the assignment is due, whether students need to show their work, and the like.
- Students practice applying a procedure to solve problems of a specific type (seat work).
- The teacher provides a counter example to a method posed by a student.

Tools for Mathematical Discourse¹

| | |
|--------------------------|--|
| Verbal | A student communicates mathematical ideas or procedures verbally (orally). |
| Gesturing/Acting | A student makes gestures or other body movements to communicate mathematical ideas or procedures. |
| Written | A student writes a narrative of mathematical ideas or procedures. |
| Graphs, Charts, Sketches | A student uses tables, graphs, charts, sketches, or other visual aids to depict mathematical ideas or procedures. |
| Manipulative | A student uses physical objects to model mathematical ideas or procedures. |
| Invented Notation | A student uses informal, nonmathematical notation to communicate mathematical ideas or procedures. |
| Formal Notation | A student uses standard (formal) mathematical notation to communicate mathematical ideas or procedures. |
| Computers/Calculators | A student uses computers, calculators, the Internet, or other forms of technology to communicate mathematical ideas or procedures. |
| Other | A student uses tools other than those described above. |

¹ RMC Research Corporation, Portland, Oregon, 2005.

