

Problem Solving Discourse Rubric

The problem solving rubric is meant to be used during observations of students' group and whole-class discourse and can also apply to students' written work for some categories. It is generalized to cover all mathematical problem solving situations.

	Above Standard	At Standard	Below Standard	Unacceptable
Problem Solving	Student demonstrates evidence of all four problem solving steps outlined in the "At Standard" description.	Student demonstrates evidence of active problem solving by doing two or more of the following: (1) restating and understanding the question, (2) discussion of solution strategies, (3) executed plan, (4) checked solution for rationality.	Though student demonstrates some evidence of problem solving, he/she is overly dependent upon others' work to get started. Student demonstrates evidence of one or none of the list in the "At Standard" level.	Student allows others in the class/group to engage in problem solving and only writes down what others have done.
Reasoning & Proof	Student not only explains his/her own reasoning to others with clarity, completeness, and correctness, but also draws those sorts of explanations out of other students in the group.	Student provides a clear, complete and correct explanation of the mathematical work s/he has finished.	Student provides an explanation of the mathematical work s/he has finished, but the explanation is lacking in clarity, completeness, and/or correctness.	Student does not offer an explanation of the mathematical work s/he had finished.
Representation	Student demonstrates multiple meaningful representations for the same problem.	Student demonstrates written evidence that represents solution strategies in a mathematically meaningful way.	Though student demonstrates written evidence of solution strategies, the representation is not mathematically meaningful.	No attempt is made to represent the solution strategies.
Communication	Student is actively engaged in drawing out others' ideas and building upon them in small groups OR Student is actively engaged in listening to and sharing ideas with others in whole-class discussions.	Student is actively engaged in listening to and sharing ideas with others in small groups OR Student is actively engaged in listening to or sharing ideas with others in whole-class discussions. (Active listening includes questioning and clarifying others' ideas.)	Student either listens actively or contributes to the discussion in small groups, but does not do both. OR Student actively takes notes during whole-class discussions, but does not contribute vocally.	Student demonstrates no evidence of involvement in the group's work OR Student is not engaged in full class discourse (i.e., writing down final answers only, taking pictures of work, or engaged in off-task behavior).
Connections	Student not only connects multiple mathematical ideas together, s/he recognizes and encourages others' efforts to make those connections.	Student connects multiple mathematical ideas. This includes connections in his/her own thinking or connections in the thinking of others.	Student is not able to recognize connections between mathematical ideas in their own thinking or in the thinking of others.	
Productive Disposition	Student not only persists in his/her efforts to understand and solve the problem mathematically, but encourages others to do so as well.	Student persists in his/her efforts to understand and solve the problem mathematically.	Student begins to persist in his/her efforts to understand and solve the problem, but ultimately seeks out answers from others or gives up.	Student is unwilling to engage the mathematics in the problem.

Scoring (one possible scoring scheme)

25 points = All items "At Standard" and at least 2 items "Above Standard."

22 points = All items "At Standard" and 1 item "Above Standard."

20 points = All items "At Standard."

Deduct 2 points for each item "Below Standard."

Deduct 5 points for each item "Unacceptable."