Adding and Subtracting Mentally
Check Your Understanding

One indicator of how well a student understands adding and subtracting mentally is to compare a student's work and explanation for a problem with how other students have responded to the same problem. Students, teachers, and parents can use the following problem and sample responses to evaluate understanding.

Directions for the Student:

1) Solve the following problem and explain your work and answer.
2) Compare your work to the sample responses in order to determine if your work indicates deep, partial, or beginning understanding.

Problem:

Twenty-eight second graders and twenty-five third graders were in a school program. How many second and third graders were in the program?

Level of Understanding	Sample Student Response	Comments
Deep Understanding	**Student 1:** "I thought 25 + 25 is 50. Since 28 is just 3 more than 25, it's 3 more than 50, or 53."	This student is using known facts, namely 25 + 25. Anytime you can use a known fact and relate that answer to the new problem, it makes the new problem easy to answer mentally.
	Student 2: "Twenty-eight and 20 is 48. Then just add 5 more. Two more is 50 and 3 more is 53."	By adding tens first, this student is able to get close to the answer. Then adding 2 to make 50 and then adding the rest eliminates the need to rename. Without having to rename, the problem becomes easy to answer mentally.

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Partial Understanding	**Student 3:** "Twenty and 20 is 40. Then 5 + 8 is 14, so it's 54."	This student had a good way to solve the problem mentally, but made an error in adding 5 + 8.
	Student 4: "Eight and 5 is 13. Carry the one. Then 1 + 2 + 2 is 5. So it's 53."	This student is using the standard algorithm, but doing it mentally. In general, that is an inefficient way to add mentally. Without further questioning, it is impossible to tell if the student really understands or is just using a memorized procedure.

Level of Understanding	Sample Student Response	Comments
Beginning Understanding	**Student 5:** "I need a pencil and paper to do that."	This student is not trying to make sense of adding without using a memorized paper-and-pencil procedure. Most students who give a response like this do not understand how to beak numbers apart to help make sense of adding and subtracting.
	Student 6: "Eight and 5 is 13. Two and 2 is 4. So it's 413."	This student added the numbers in the ones column. Then the student added the numbers in the tens column and placed that answer (4) to the left of 13. This response indicates that the student does not understand place value.