Addition and Subtraction Generalizations

A. Generalizations K-5 Students Make about the Operation of Addition

1. You can add numbers in any order.
2. You can break numbers into parts to add them.
3. If one number is larger than another, and the same number is added to each, the first total will be larger than the second.
4. If you add 1 (or any amount) to one of the numbers in an addition problem, the sum increases by 1 (or that amount).
5. If you subtract 1 (or any amount) from one of the numbers in an addition problem, the sum decreases by 1 (or that amount).
6. If you add 1 (or any amount) to one of the numbers in an addition problem, and subtract it from the other, the sum remains the same.
7. Adding 0 to a number does not change the number.

B. Generalizations K-5 Students Make about the Operation of Subtraction

1. Order matters in subtraction.
2. You can break a number into parts to subtract it.
3. If you add the same amount to both numbers in a subtraction problem, the difference remains the same.
4. If you subtract the same amount from both numbers in a subtraction problem, the difference remains the same.
5. The more you subtract, the smaller the result. The less you subtract, the larger the result.
6. If you subtract 1 more, you get 1 less.
7. Subtracting 0 from a number does not change the number.
8. If you subtract an amount from itself, the result is 0.

C. Generalizations about the Relationship between Addition and Subtraction

1. Subtraction and addition are inversely related. Students sometimes say subtraction "undoes" addition.
   a. If you add and then subtract the same amount to/from a number, the original number is the result.
   b. You can treat any subtraction problem as a missing addend problem.
   c. You can treat any missing addend problem as a subtraction problem.

These statements are based on a set of ideas presented in Schifter, D., Monk, G.S., Russell, S.J., & Bastable, V. (April 2007). Early Algebra: What Does Understanding the Laws of Arithmetic Mean in Elementary Grades? in J. Kaput, M. Blanton, & D. Carraher (Eds.) Algebra in the Early Grades. Mahwah, NJ: Lawrence Erlbaum Associates