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## Language With Addition and Subtraction

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### Introduction

Language is an important part of the mathematical process. It can be defined as “a system of phonology, grammar, and vocabulary that people in a group use to communicate with one another” (Ruddell, 2002, p. 337). Each person in the classroom must understand and be able to interpret language as they acquire literate behaviors and the academic knowledge for studying school subjects (Combs, 2006).

Assistance must be provided for students as they use their knowledge of oral language as a foundation for experiences with written language. In addition, a learning environment must be provided that entices students to want to learn about written language to expand their ability to communicate with others (Combs, 2006).

In the document prepared by the National Council of Teachers of Mathematics, *Principles and Standards for School Mathematics* (NCTM, 2000), exploring thinking strategies for addition and subtraction will help students see the meaning of the operations. Such explorations will help teachers learn what students are thinking (p. 34).

According to the *Alabama Course of Study: Mathematics*, (Alabama Department of Education, 2003), throughout the Number and Operations strand, there is not only an emphasis on counting

and arithmetic, but also an emphasis on number concepts, number systems, and the meanings of operations (p. 3). In addition, students will demonstrate conceptual understanding of addition and subtraction by joining, separating, and comparing sets of objects as well as applying signs (p.14).

### Activities

When beginning to add numbers, there are several words and/or phrases that can be used to mean addition. The following list shows some English words that are commonly used when referring to addition:

- a. add — *Add* two and three.
- b. plus — Two *plus* three is how much?
- c. sum — Find the *sum* of two and three.
- d. together — *Together*, they had how much (many)?
- e. altogether — How much *altogether*?
- f. combined — What is their *combined* worth?
- g. total — *Total* two and three. (Here, the word *total* is used as a verb.)

Because so many phrases are used to specify when values should be added, it is not very helpful to rely only on key words to help identify the appropriate operation. The issue is further complicated when more than one operation is called for in the problem description.

Without actually computing an answer, students can practice identifying the operation needed to solve the problem. Once students can successfully identify when to invoke each operation, two-step problems can be gradually introduced. For example, the problem below can be easily worked out correctly.

$$\begin{array}{r} 64 \\ +38 \\ \hline 102 \end{array}$$

Students frequently confuse the minuend and subtrahend when interpreting the word *from* in subtraction problems. English is read from left to right. English descriptions of situations calling for addition generally read from left to right (i.e., “How much is two plus three?”). Subtraction, however, can require left-to-right (“three take away two”) “re-processing.”

- a. from — How much is two *from* three?
- b. take away — *Take away* three from five.
- c. remain — If you have five carrots, how many *remain* if a cow eats two?

- d. subtract — *Subtract* two from six.
- e. reduce — *Reduce* the number six by two.
- f. left — If there are five fish, and two die, how many are *left*?
- g. How many — If there are twenty in your class and nine are boys, *how many* are girls?

Initially, students may simply write the problem “three from five” backwards (i.e.,  $3 - 7 = ?$ ) yet calculate the correct result. Later, however, this inaccurate procedure will cause problems when students are learning to do multi-digit subtraction exercises that require regrouping. For example, the error found in the following worked exercise is quite common.

$$\begin{array}{r} 43 \\ -17 \\ \hline 34 \end{array}$$

When confronted with a regrouping situation, this student took the path of least resistance and simply computed the difference between the digits in each column without regard to order. Analyzing error patterns can be a useful aid when trying to determine what students are thinking when they carry out a procedure incorrectly.

Consistent use of left-to-right constructions such as “five subtract three” or “five take away three” minimizes initial confusion. When the teacher introduces the use of the term *from*, careful monitoring of value order must be maintained.

### Conclusion

When trying to develop language experiences in mathematics, be patient and consistent with the student. As each opportunity comes along, try the following:

1. Practice over and over again with simple phrases such as “add two plus three.”
2. Try a variety of phrases such as “find the sum of two and three” and “total two and three.”
3. Begin two-step problems such as  $64 + 38 = \underline{\hspace{2cm}}$ .
4. Practice over and over again with phrases such as “take away three from five.”
5. Try a variety of phrases such as “How much is three from five?” or “If you have five carrots, how many remain if a cow eats two?”
6. Begin two-step problems such as  $43 - 17 = \underline{\hspace{2cm}}$ .

**References**

- (1) Alabama State Department of Education (2003). *Alabama Course of Study: Mathematics*, Montgomery, AL.
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- (4) Ruddell, R. B. (2002), *Teaching Children to Read and Write: Becoming an Effective Literacy Teacher*, 3rd edition. Boston, MA: Allyn & Bacon.

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