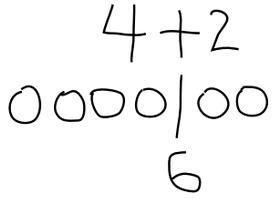
Math Background

Understanding Addition and Subtraction

In Unit 1, children were introduced to the terms *partner* and *total*. In Unit 2, they encounter situations in which either the total or one of the partners is unknown. The first step in solving one of these problems is recognizing which type of unknown must be found.

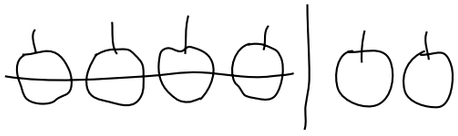
Representing Addition Situations Children begin by literally drawing the objects in the story problem. If they are adding 4 apples and 2 apples, their drawings may look like this.

Children progress rapidly to circle drawings, which simplifies the process by representing the objects with circles rather than realistic drawings. At this point, children are encouraged to label the parts, the total, and the operation.

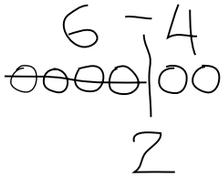


These simplified circle drawings resemble the break-apart drawings already familiar to children. Using this strategy gives children confidence and also facilitates communication.

Representing Subtraction Situations Subtraction problems begin in a way similar to addition. For subtraction, however, the objects being subtracted are crossed off after being separated with a break-apart line. If children are subtracting 4 apples from 6 apples, their pictures would look something like this:



As with addition, children progress to circle drawings and label the various parts. In subtraction problems, the unknown will always be the part that remains.



Explaining Solution Methods Children use their drawings to explain their solution methods. At this stage, the explanation is usually a description of the drawings and does not reveal much about the thinking process. These explanations do give children valuable experience with early math communication. By asking pertinent questions, you can help children progress to explanations that show their thinking.

> *There are 6 baby pigs in the mud, so I drew 6 circles. Then 4 of them went into the barn, so I crossed out 4 circles. There are 2 circles left. That means that there are 2 baby pigs left in the mud.*

To keep their thinking grounded in the actual problem, children should be encouraged to give a labeled answer rather than just a number: *2 pigs* rather than *2*.