

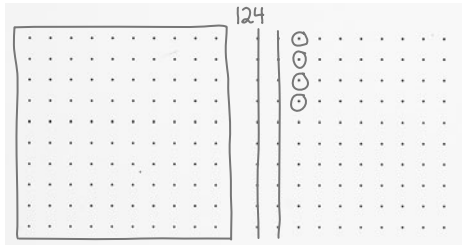
# Teaching Unit 3 (Continued)

## Math Background

### Ones, Tens, and Hundreds

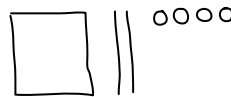
**Place Value Drawings** Children represent numbers to 200 with a drawing of Quick Hundreds (boxes) for hundreds, Quick Tens (sticks) for tens, and circles for ones. Children use the dot array on their MathBoards to start, then graduate to freehand drawings where they use boxes, tens, and ones to represent numbers. These drawings of quantities help children build meanings for ones, tens, and hundreds and facilitate multi-digit addition and subtraction.

Drawing of 124



1 Quick Hundred 2 Quick Tens 4 ones

Freehand Drawing of 124

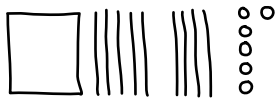


**Represent Numbers in Various Ways** Children explore various methods of representing numbers to 200, and find the meaning of different place value positions.

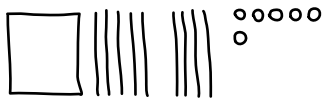
196

#### Drawings

Children draw Quick Hundreds, Quick Tens, and circles to represent numbers.



or



Notice the importance of using 5-groups in the tens and the ones to see each number and to be accurate.

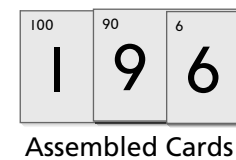
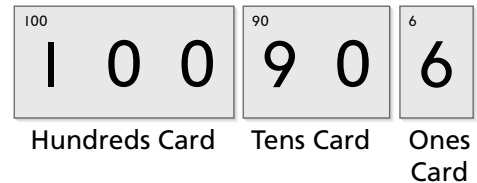
#### Expanded Form

Children write the value of the digit in each place of a number in equation form.

$$196 = 100 + 90 + 6$$

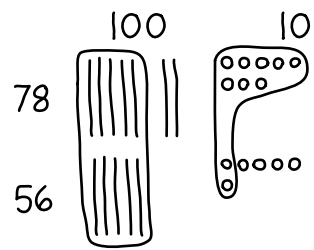
#### Secret Code Cards

Children use the cards to show the hundreds, tens, and ones of a number. Secret Code Cards have a small number with the card's value on the top left, visible when cards are assembled.



### Relating Math Drawings and Numerical Methods

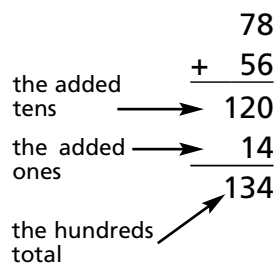
The purpose of Proof Drawings is to make numerical methods meaningful. Therefore, each step in a drawing must be related to a step in the numerical method. Steps in this Proof Drawing can relate to each numerical method below and to others that students invent.



**Research-Based Accessible Algorithms for 2-Digit Addition** Students are introduced to two methods that are mathematically general, show important mathematical features, and were found to be easily understood and used by students. These methods also relate easily to the common New Groups Above method, which is also discussed.

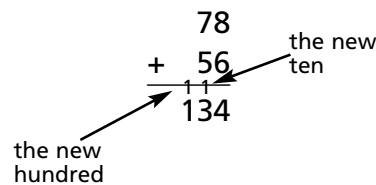
#### Show All Totals Method

Children add the tens, then add the ones, and then find the hundreds total.



#### New Groups Below Method

Children write the new ten on the line below the addition example, rather than above.



#### New Groups Above Method

This is the common U.S. algorithm.

$$\begin{array}{r} 11 \\ 78 \\ + 56 \\ \hline 134 \end{array}$$

New Groups Below makes the addition easier than New Groups Above because you add the 2 numbers you see and increase by 1, rather than increasing the top number by 1 and then adding the unseen result to the bottom number. Also, with New Groups Below, you can see the 14 ones and the 13 tens more easily.