SIMPLE ADDING

To add, for example, 4 apples and 3 apples: First enter 4 (Fig. 1). Next, place a finger after the 4 and enter 3 more (Fig. 2). Remove the finger and add the quantities by pushing them together (Fig. 3). The sum of 7 is immediately obvious without any counting. The finger as separator is needed only for the first few additions.

4

Fig. 1: entering the 4.

4 + 3

Fig. 2: entering the 3.

4 + 3 = 7

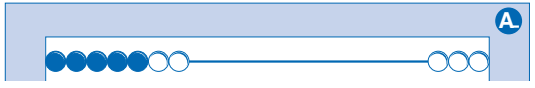


Fig. 3: adding them together.

Note that the problem is written horizontally, in the equation form.

ADDITION STRATEGIES

An addition strategy is an efficient technique for recalling an addition fact. Counting is slow and often inaccurate. Rote memory is high maintenance, requiring frequent review. It also hampers integrating new concepts and applying knowledge.

A visual strategy for 4 + 3 is to take one from the 3 and give it to the 4, making 5 and 2, which the child learned previously with fingers (Fig. 4). Later, ask the child to do this mentally.

4 + 3 = 7

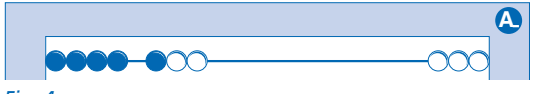


Fig. 4

10 Strategy

To add 9 + 6, enter 9 and 6 on the first two wires. Next, move a bead from the 6 to the 9 to change the 9 into 10 (9 + 6 = 10 + 5 = 15). After the child works on the abacus, ask him to practice this strategy mentally (Fig. 5). This strategy is also effective for adding 8.

9 + 6 = 15

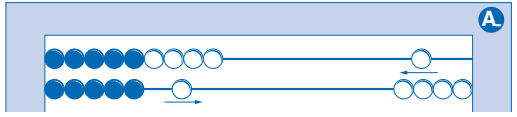


Fig. 5

Two-fives strategy

To add 6 + 7, enter 6 and 7 on two wires. The two 5s make 10, while the remaining 1 and 2 make 3, giving the sum of 13. This strategy works for facts where both addends are 5 or more (Fig. 6).

6 + 7 = 13

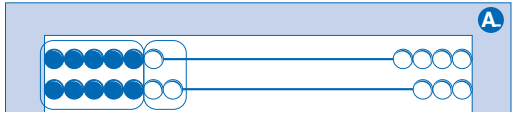


Fig. 6

U.S. MONEY

It is very easy to represent money on the abacus; there are 100 beads to represent a dollar. A single bead is a penny, a group of five is a nickel, a whole row is a dime, and each of the four groups shown at the right is a quarter (Fig. 7).

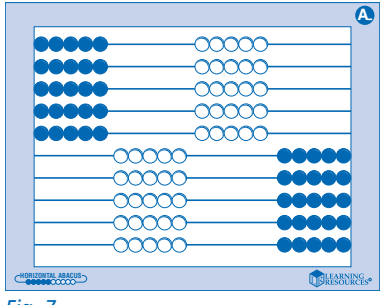


Fig. 7

MULTIPLICATION

To demonstrate multiplication, ask the child to enter 6 four times. Explain that the abacus shows 6 taken four times, which we write as 6 x 4. Let the child find the product, 24 (Fig. 8).

6 x 4 = 24
(6 taken 4 times)

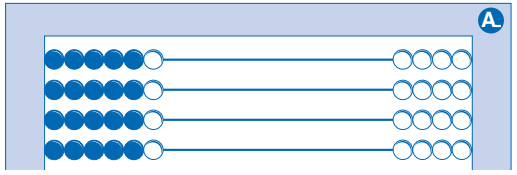


Fig. 8

The purpose of this exercise is to help the child understand multiplication, not memorize the facts.

BEAD TRADING

To understand the pattern of trading—that 10 ones is 1 ten, 10 tens is 1 hundred, and 10 hundreds is 1 thousand—children must work with numbers beyond 99.

On the reverse side of the abacus is a label indicating 1000, 100, 10, and 1. This more abstract though traditional use of the abacus stresses "trading," or carrying. Note that two wires are used for each denomination. Keeping the two columns as even as possible makes trading easier.

For example, in adding 8 + 6 = 14, we cannot have more than 9 ones. To trade, move down ten 1-beads (five from each wire) and move up one 10-bead. Use your right hand for the ones and your left hand for the ten. Ask the child to read the sum before and after trading, shown below (Fig. 9 and 10).

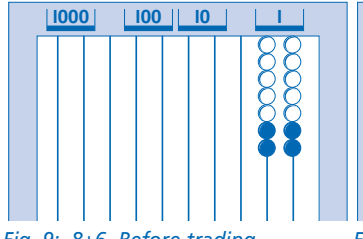


Fig. 9: 8+6 Before trading

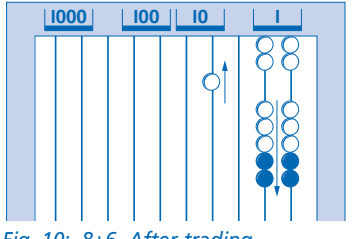
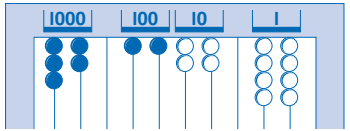


Fig. 10: 8+6 After trading

ADDING FOUR-DIGIT NUMBERS

Example: 5248 + 1937. First, enter from left to right the number 5248 (Fig. 11).



5248
+ 1937

Fig. 11

Start the addition of the second number by adding the 7 ones, which gives 15 ones (Fig. 12). Trade as shown below (Fig. 13). It is very important to record the results of each step; write 5 ones and an extra ten.

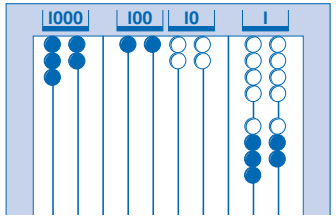


Fig. 12

5248
+ 1937

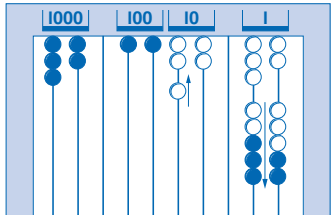
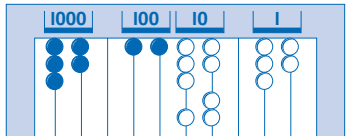


Fig. 13

1
5248
+ 1937
5

Next, add the 3 tens and record that result, 8 tens, as shown (Fig. 14).



1
5248
+ 1937
85

Fig. 14

Then, add the 9 hundreds; another trade is necessary. Again, record the results, the 1 hundred and the extra 1 thousand (Fig. 15 and 16).

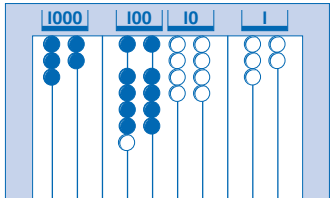


Fig. 15

1
5248
+ 1937
85

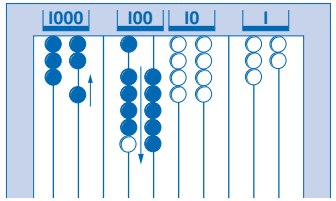


Fig. 16

1 1
5248
+ 1937
185

Finally, add the thousands; no trade is necessary. The solution is 7185 (Fig. 17). After 6–10 problems adding four-digit numbers, most children can do these additions on paper without further instruction.

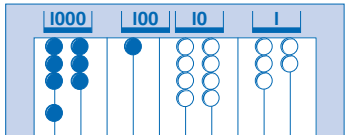


Fig. 17

1 1
5248
+ 1937
7185

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Cotter, Joan A. Activities for the AL Abacus: A Hands-on Approach to Arithmetic. 2nd Ed. Hutchinson, MN: Activities for Learning, 2000.

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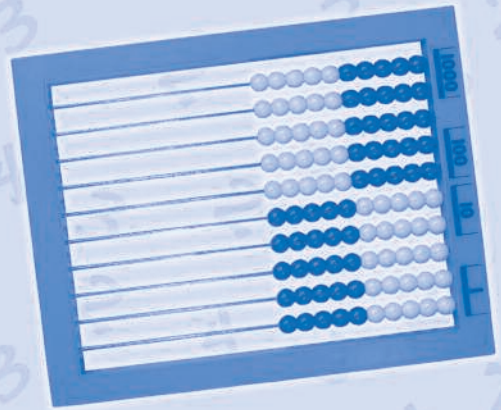

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