HANDS-ON MANIPULATIVE
PROBLEMS FOR DIVISION

Instructions: In a group of two or more, go through each of the problems below and have a discussion about the questions being asked. As time permits, make up your own division problems using the block, flats, longs and units provided.

1. Pick up 1 flat, 7 longs and 6 units. Try to make groups of size 8 of equal pieces. In other words, trade in the flat for 10 longs and make groups of longs of size 8, use your extra longs and trade them in for units, and then make groups of size 8 with the units. Keep track of the groups you have created of size 8. Did you have any units left over? How does this exercise correspond to a division problem? How is the quotient of the division problem revealed in this exercise? Calculate the quotient of the division problem directly (with paper and pencil) to help or check your answer to this last question. If the answer to any of the questions is not clear, move on to the next problem and come back to this one.

2. Pick up 1 block, 8 flats, 6 longs and 9 units. Repeat the previous problem but this time use groups of size 7 (and start by trading the block for 10 flats).

3. In this exercise, make groups of size 4 and begin with 5 flats, 2 longs and 3 units. What happens that is different in this exercise? What does this difference have to do with the corresponding division problem?

4. Pick up 5 flats, 2 longs and 3 units as in the previous problem. Next, take a pencil and a piece of paper and begin doing the division problem $523 \div 4$ using the standard approach. At each step (that is, each time you write down a number and progress in the division problem), figure out what you did in the third exercise above, creating groups of 4, that mirrors what you are doing with pencil and paper. For example, you should start by putting a "1" above the 5 in the standard division with pencil and paper. This corresponds in the third exercise to creating "1" group of 4 flats from the 5 flats. Continue through the division like this, determining how the numbers with the pencil and paper that you are writing down correspond to the process you went through in the third exercise.

One might envision working with blocks, flats, longs and units similar to the above prior to teaching a child our standard division algorithm. Although the last exercise above requires knowledge of standard division, it would make for a nice exercise after children have learned standard division; in other words, one can introduce division through the blocks, flats, longs and units pieces as in the first three exercises, then introduce the standard division algorithm (and/or repeated subtraction), and then go back to the pieces and do a problem similar to the last one above.