

### Multi-digit Multiplication

Our next unit in math focuses on multiplying ones, tens, and hundreds. In this unit, students will learn to multiply tens and hundreds by a 1-digit number, write and solve problems vertically, and multiply 2-digit and 3 digit numbers by a 1-digit number. To develop a deeper understanding of multi-digit multiplication, the students will progress through a variety of models. The models include using the place value board with disks, the area model, the left to right method, and the traditional algorithm. These models will move students from solving problems at the concrete stage to the abstract stage. Additionally, these models will be used in later grades for multi-digit multiplication.

The first model students will learn uses the place value board and disks. Using this concrete model, students learn to multiply tens and hundreds by a 1-digit number. The goal is for students to be able to mentally solve these types of equations. Examples of equations multiplying tens and hundreds by a 1-digit number include  $30 \times 4$ ,  $20 \times 5$ ,  $6 \times 300$ , and  $400 \times 5$ . Students will also use this concrete model with multiplying 2-digit and 3-digit numbers by a 1-digit number. Examples include  $3 \times 42$ ,  $5 \times 26$ , and  $4 \times 321$ .

#### Examples of multiplication using the place value board and disks:

1. Divide the place value board into the number of rows by looking at the first factor to be multiplied. (If the first factor is large, use the commutative property to switch the order of the factors. The product will be the same.)
2. The second factor tells what disks to put into each of the rows.

Ex)  $3 \times 13 = \underline{39}$

Tens	Ones	Language used:
⑩	①①①	I have one group of 13.
⑩	①①①	I have two groups of 13.
⑩	①①①	I have three groups of 13.
3	9	

$4 \times 24 = \underline{96}$

Tens	Ones	
⑩ ⑩ ⑩ ⑩	①①①①	
⑩ ⑩	<del>①①</del> <del>①①</del>	Rename 10 ones disks as a tens disk. ⑩
⑩ ⑩	<del>①①①①</del>	
⑩ ⑩	<del>①①①①</del>	
⑩ ⑩	<del>①①①①</del>	
9	6	

$2 \times 417 = \underline{834}$

Hundreds	Tens	Ones	
①①①①	⑩ ⑩	①①①①	Rename 10 ones as a ⑩.
①①①①	⑩	<del>①①</del> <del>①①</del> <del>①①</del>	
8	3	4	

\* Be sure to check to see that no column has 10 or more in it before you total the column (begin with the ones). If it does, be sure to rename/regroup first.