

## The “learning progression” for fluency with multiplication of multi-digit numbers:

To get to the point of being able to fluently multiply any two whole numbers, students should ...

1. know that the concept of multiplication is repeated adding or skip counting – finding the total number of objects in a set of equal size groups (N.ME.02.04 and N.MR.02.13)
2. be able to represent situations involving groups of equal size with objects, words and symbols. (N.MR.02.16)
3. know multiplication combinations fluently (which may mean some flexible use of derived strategies).
4. know how to multiply by 10 and 100. (N.FL.03.13)
5. use number sense to estimate the result of multiplying.
6. use area and array models to represent multiplication (N.MR.02.14) and to simplify calculations.
7. understand how the distributive property works and use it to simplify calculations. (N.ME.04.09 Multiply two-digit numbers by 2, 3, 4, and 5, using the distributive property...)
8. use alternative algorithms like the partial product method (based on the distributive property) and the lattice method.

And identify typical errors that occur when using the standard algorithm. (N.FL.05.04)

$$\begin{array}{r} 54 \\ \times 76 \\ \hline 4104 \end{array}$$

FLUENCY!

