FOIL Method:

A. The FOIL method stands for – **F**irst, **O**utside, **I**nside, **L**ast. This method can be used to multiply any 2-digit numbers together. However, there are many cases where other strategies should be used since the FOIL method is somewhat time -consuming.

B. The FOIL method comes from algebra:

$$(10a + b)(10c + d) = 100ac + 10(bc + ad) + bd$$

C. Using numbers instead of variables we can get the following steps:

1. Multiply the ones digits together (or the last digits). 'L'

2. Multiply the inside numbers and the outside numbers and add them together. 'O' + 'I'.

3. Multiply the tens digits together (or the first digits). 'F'

4. Putting these steps together we get an answer in the form: 'F' ('O'+'I') 'L' or FOIL.

5. Keep track of any numbers you need to carry to add to any of these steps.

Ex [1] 12 x 34 =_____.

1 2 x 3 4 =

a) 2 x 4 = 8. Write down 8.

1 2 x 3 4 =

b) 2 x 3 + 1 x 4 = 6 + 4 = 10. Write down 0 and carry *1.

1 2 x 3 4 =

c) 1 x 3 = 3 + *1 = 4. Write down 4.

d) The answer is 408.

Ex [2] 45 x 24 =_____.

a) 5 x 4 = 20. Write 0, carry *2.

b) 5 x 2 + 4 x 4 = 10 + 16 = 26 + *2 = 28. Write 8, carry *2.

c) 4 x 2 = 8 + *2 = 10. Write 10.

d) The answer is 1080.

D. Sometimes the FOIL method can be adapted to multiply 3 digit numbers as well.

Ex [1] 114 x 42 =_____.

   a) To multiply by 114 using the FOIL method, think of 'F' as being 11 in this
       case.

   b) 4 x 2 = 8. Write 8.

   c) 4 x 4 + 11 x 2 = 16 + 22 = 38. Write 8, carry *3.

   d) 11 x 4 = 44 + *3 = 47. Write 47.

   e) The answer is 4788.