

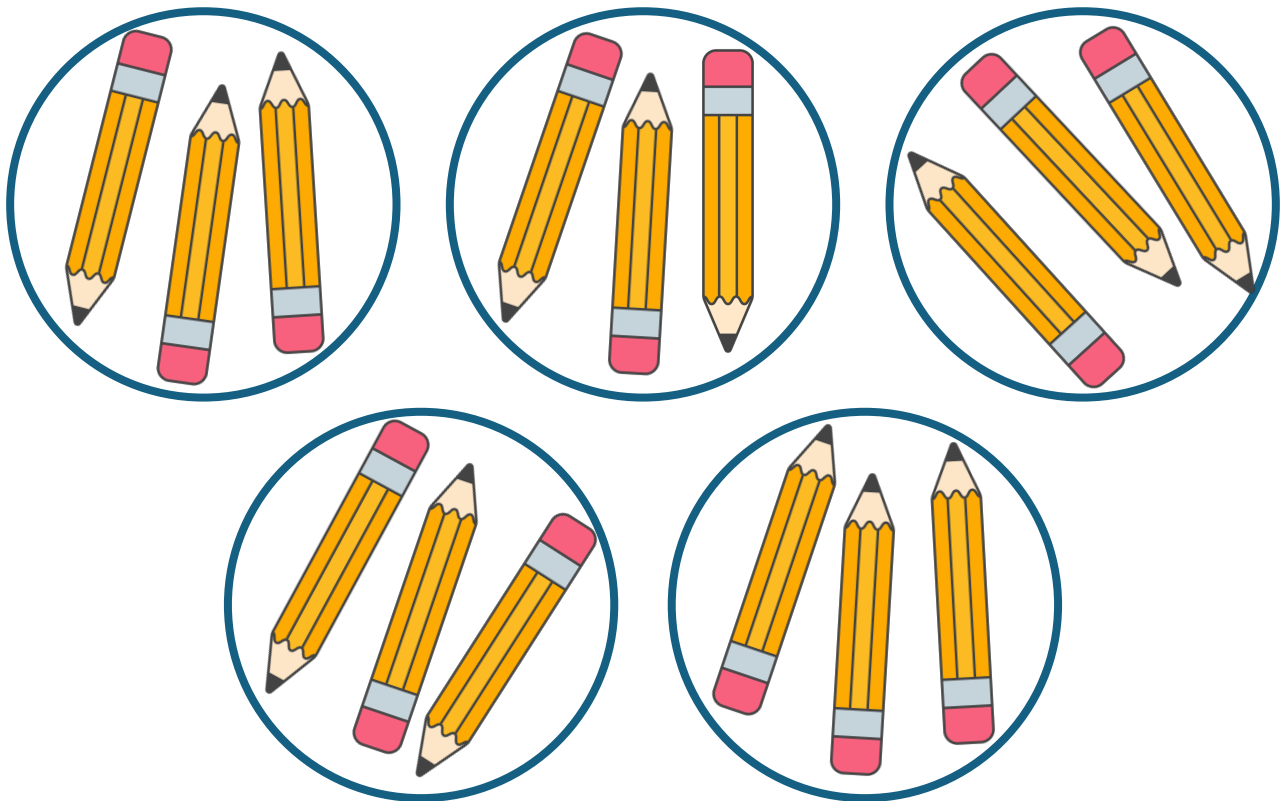
Multiplication Strategies

EQUAL GROUPS

The equal groups strategy helps you understand multiplication by grouping objects into sets that have the same number of items. To find the total, you just multiply the number of groups by how many are in each group.

Example:

If you have 5 groups of 3 pencils, you can find the total number of pencils by multiplying $5 \times 3 = 15$.



$$5 \times 3 = 15$$

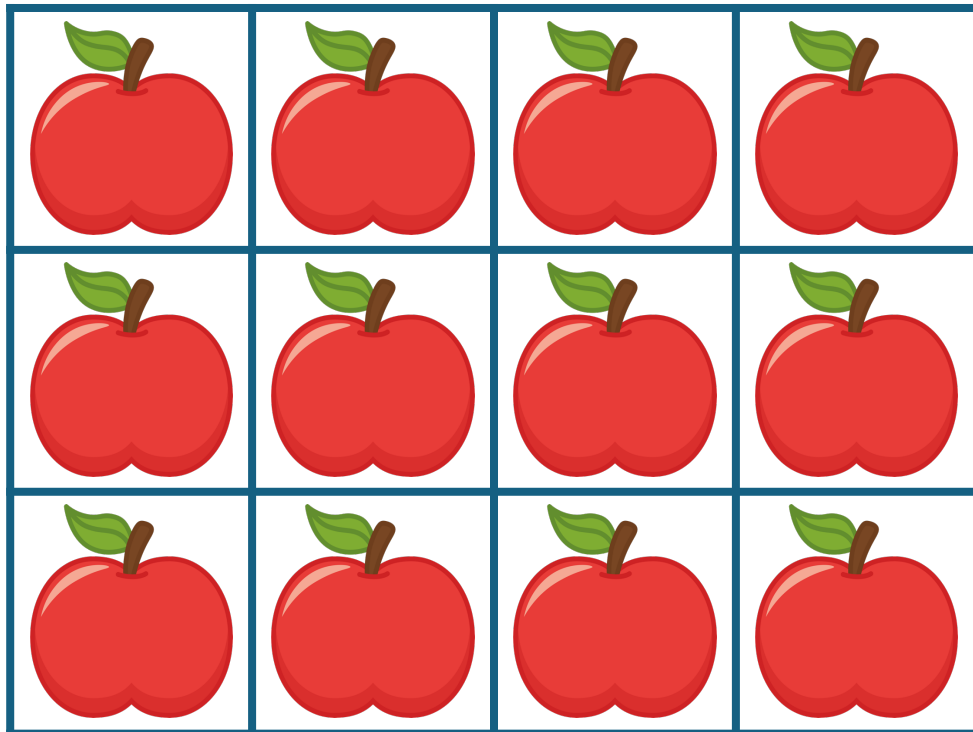
Multiplication Strategies

ARRAY

An array is a way to show multiplication by organizing objects into rows and columns. Each row has the same number of objects, and each column has the same number too. To find the answer, you can count how many objects there are in total.

Example:

If you have 3 rows of 4 apples, you can find how many apples there are by multiplying $3 \times 4 = 12$.



$$3 \times 4 = 12$$

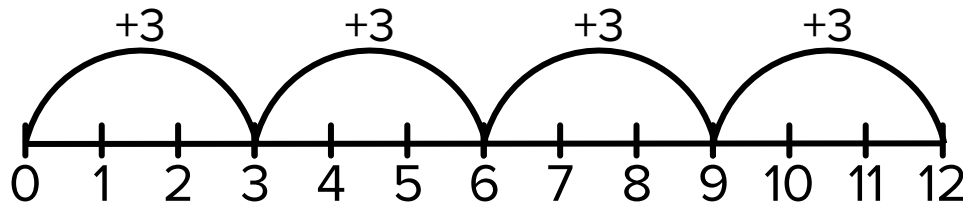
Multiplication Strategies

NUMBER LINE

The number line strategy helps you solve multiplication problems by making equal jumps on a number line. Each jump represents one group, and you keep jumping until you reach the total.

Example:

For 4×3 , start at 0 and make 4 jumps of 3 on the number line. You'll land on 12, so $4 \times 3 = 12$.



$$4 \times 3 = 12$$

Multiplication Strategies

REPEATED ADDITION

Repeated addition means adding the same number over and over to find the answer to a multiplication problem. You can think of multiplication as adding a number multiple times.

Example:

For 4×3 , you can add 3 four times: $3 + 3 + 3 + 3 = 12$.

$$3 + 3 + 3 + 3 = 12$$

$$4 \times 3 = 12$$

Multiplication strategies

PARTITIONING

Partitioning is a way to break numbers into smaller, easier parts to multiply. You split the numbers into tens and ones, multiply each part separately, and then add everything together to get the final answer.

Example:

$$23 \times 4 = \underline{\quad}$$

Break 23 into 20 and 3

$$20 \times 4 = 80$$

$$3 \times 4 = 12$$

$$80 + 12 = 92$$

Multiplication Strategies

COLUMN METHOD

The column method is a way to multiply numbers by stacking them on top of each other in columns. You multiply each digit starting from the right, carrying over any extra tens as you go, and then add the results together.

STEP 1

Multiply the ones column

$$\begin{array}{r} 45 \\ \times 3 \\ \hline \end{array}$$

$3 \times 5 = 15$

STEP 2

Regroup (if needed)

$$\begin{array}{r} 145 \\ \times 3 \\ \hline 5 \end{array}$$

Write the 5 in the ones column and put the 1 in the tens column.

STEP 3

Multiply the tens column

$$\begin{array}{r} 145 \\ \times 3 \\ \hline 5 \end{array}$$

$3 \times 4 = 12$

STEP 4

Regroup (if needed)

$$\begin{array}{r} 145 \\ \times 3 \\ \hline 135 \end{array}$$

$12 + 1 = 13$
Write 13 in the tens and hundreds column

Multiplication Strategies

GRID METHOD

The grid method is a way to multiply large numbers by breaking them into parts and organizing the multiplication in a table. You multiply each part separately and then add the results to get the total.

Example: 14×26

STEP 1

Draw a grid to organize your multiplication. Write the split numbers across the top and along the left side of the grid.

| | | |
|----|----|---|
| | 10 | 4 |
| 20 | | |
| 6 | | |

STEP 2

Multiply each part of the numbers and fill in the boxes with the products.

| | | |
|----|-----|----|
| | 10 | 4 |
| 20 | 200 | 80 |
| 6 | 60 | 24 |

STEP 3

Add all the products together to find the final answer.

$$\begin{array}{r} 200 \\ 80 \\ 60 \\ + 24 \\ \hline 364 \end{array}$$

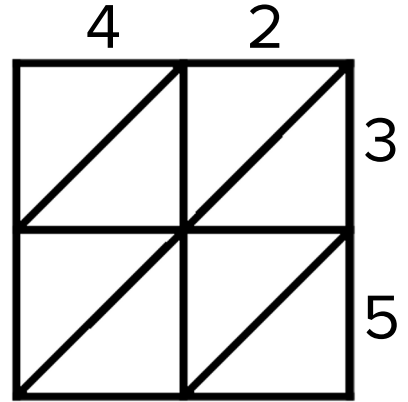
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LATTICE

The lattice method is a way to multiply large numbers by breaking them into smaller parts using a grid. Each part of the multiplication is placed in a box, and then you add the numbers diagonally to find the answer.

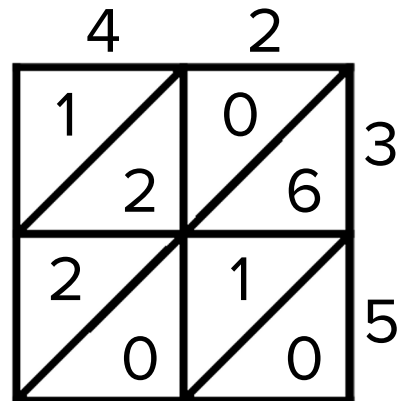
STEP 1

Draw a grid that matches the digits of the numbers you're multiplying. Each digit gets its own row or column. Write the digits of one number along the top and the digits of the other number along the side.



STEP 2

Multiply the numbers at the top and side of each box, then write the answer in the box. Write the tens digit on one side of the diagonal and the ones digit on the other.



STEP 3

Add the numbers diagonally, starting from the bottom right corner of the grid. Carry over any tens to the next diagonal if needed, just like you do in regular addition.

