SUM IT UP

Dear parent or guardian: This is a summary of the key ideas your child is learning in mathematics. You can use this summary as background as you support your child's work.

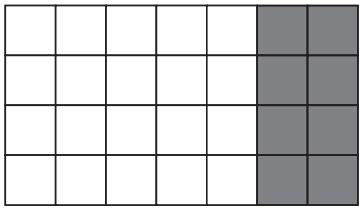
2 Multiplying Two-Digit Numbers

Strategies for Multiplying

There is a variety of ways to multiply small numbers.

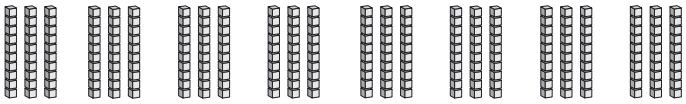
- One way is to break up one of the numbers into parts, then multiply the parts and add.
  For example, to multiply 4 × 7, you can think of 7 as 5 + 2.
  4 groups of 7 is 4 groups of 5 and 4 groups of 2.
  That's 4 × 5 + 4 × 2.

$$\begin{aligned} 4 \times 7 &= 4 \times 5 + 4 \times 2 \\ &= 20 + 8 \\ &= 28 \end{aligned}$$



- You can also break up two-digit numbers to multiply.

  For example, to multiply 8 × 34, you can think of 34 as 30 + 4.
  8 × 34 = 8 × 30 + 8 × 4
  That's 240 + 32 = 272.



8 groups of 30

8 groups of 4

Strategies for Multiplying (continued)

This way of multiplying by using place-value parts represents a conventional, or standard, algorithm for multiplying. It can be recorded in several ways:

$$\begin{array}{r} 34 \\ \times\ 8 \\ \hline 240 \\ +\ 32 \\ \hline 272 \end{array}$$

This starts with $8 \times 30 = 240$.

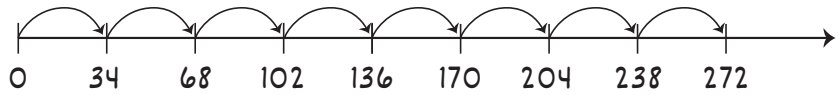
$$\begin{array}{r} 34 \\ \times\ 8 \\ \hline 32 \\ +\ 240 \\ \hline 272 \end{array}$$

This starts with $8 \times 4 = 32$.

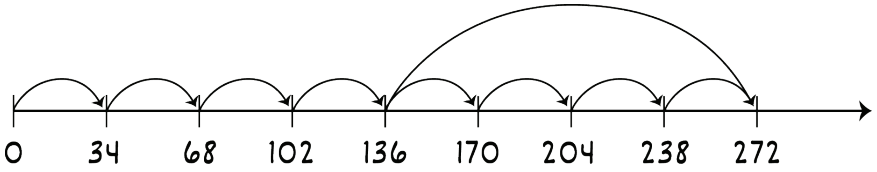
$$\begin{array}{r} {\scriptstyle 3\ \ } \\ 34 \\ \times\ 8 \\ \hline 272 \end{array}$$

This starts with $8 \times 4 = 32$, but the 2 is recorded in the ones place in the product and the 3 tens is recorded above. Then 8 sets of 3 tens is calculated as 24 tens and the extra 3 tens makes 27 tens.

- You can also calculate 8×34 using a number line to model 8 jumps of 34.



You might have noticed that when 4 jumps took you to 136, you could have added 136 to 136 to figure out where 8 jumps would take you.



- Another way to calculate 8×34 is to think of 34 as $40 - 6$.

$8 \times 34 = 8 \times 40 - 8 \times 6$
$= 320 - 48$
$= 272$

- Another way to calculate 8×34 is to think of 34 as $25 + 9$.

$8 \times 34 = 8 \times 25 + 8 \times 9$
8×25 is 2 sets of 4×25, which is 100, so this is $200 + 72 = 272$.

Estimating Helps

To see if the product you calculated is reasonable, you can estimate.
8 × 34 is about 10 × 30, or 300, so 272 is reasonable.

When to Multiply

Remember that you multiply when you are figuring out the total when there are many equal groups or when you are making a comparison involving multiplication (e.g., one amount is 8 times another).

- For example, in this situation, you can use multiplication to solve a problem involving equal groups:

  There are 8 rows in a conference hall,
  and there are 34 seats in each row.
  How many seats are there altogether?
  8 × 34 = 272 seats

- In this situation, you can solve a problem that involves a comparison between two amounts:

  A classroom seats 34 people and
  a study hall seats 8 times as many.
  How many people does a study hall seat?
  8 times as many as 34 is 8 × 34 = 272 people.

Notes

It is important to be aware that a conventional, or standard, algorithm for multiplying is not necessarily ideal in every situation. Many students do better with some of their own strategies or their own ways of recording.

Also, it is important for students to be exposed to a variety of strategies, but they don't have to use every one.

Definitions

product: the result of multiplying; for example, in 7 × 38 = 266, 266 is the product