

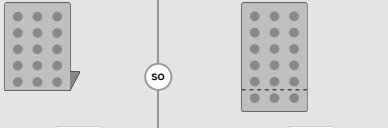
Core Focus

- Multiplication: Sixes and last facts
- Multiplication: Solving word problems
- Addition: Standard algorithm and compensation strategy
- Addition: Solving word problems

Multiplication

- By this stage, students should be able to recall many multiplication facts automatically. If not, these facts can often be figured out from known facts using number sense and reasoning practiced within the strategies.
- In this module, students work with the multiplication facts involving 6, which uses the **build-up strategy** with the more familiar $\times 5$ facts. E.g. they can figure out $6 \times 7 = ?$ by *thinking* 5×7 is 35, so 6×7 is $35 + 7$, which is 42.
- In this example of an array, there are 5 rows with 3 columns in each row, which equals 15. When one row is uncovered or unfolded (as shown) it creates 6 rows of 3. The unfolded array shows $15 + 3 = 18$, so $6 \times 3 = 18$. Making these connections builds students' number sense and reasoning.

Step Up I. Look at these arrays. Complete the sentences.



5 rows of 3 =

so


6 rows of 3 =

- Another way to think about $\times 6$ facts is to break an **array** apart into a familiar $\times 5$ array and a $\times 1$ array, multiply the parts, and then add them together.

7.2 Multiplication: Reinforcing the sixes facts

Step In What multiplication fact does this whole array show?

How could you figure out the total number of dots?
Complete these facts to help you.



$5 \times 3 = \text{$

$1 \times 3 = \text{$

There are 18 dots in total because $15 + 3$ is 18.

In this lesson, students reinforce the $\times 6$ multiplication facts by continuing to build on the $\times 5$ multiplication facts.

- The last facts learned involve 3 and 7: 3×3 , 7×7 , 3×7 , and 7×3 . To figure out facts involving 3, students might think about the twos facts, then build up. E.g. to figure out $3 \times 7 = ?$, *think* $2 \times 7 = 14$, plus one more $7 = 21$.

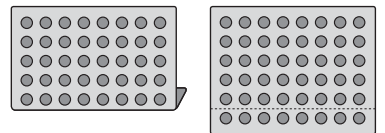
Ideas for Home

- Encourage your child to explain how knowing the $\times 5$ facts makes the $\times 6$ facts easier to solve. E.g. "I know that 5×7 is 35, and $35 + 7$ is 42, so 6×7 is 42."
- Create arrays with pennies to illustrate $5 \times \underline{\quad}$, then add one row to illustrate $6 \times \underline{\quad}$.

Glossary

- ▶ This **array** models the **build-up strategy** for $\times 6$ facts:

E.g. $5 \times 8 + 8 = 48$



On the left, 5 rows of 8 are 40. When one row is unfolded, the array shows that 6 rows of 8 are 48.

Helpful videos

View these short one-minute videos to see these ideas in action.

www.bit.ly/OI_6

www.bit.ly/OI_8

Addition

- Previously learned **estimation** skills and number patterns associated with addition help students solve word problems based on real-life situations.

7.6 Addition: Making estimates

Step In Imagine you had two \$50 bills in your wallet.

Could you buy both of these games? How do you know?
How could you estimate the total cost of the two games?

Monique adds the digits in the tens place first. If the total is close to \$100 she adds the digits in the ones place.
Why does she add the digits in the tens place first?

Carter rounded one of the prices to a nearby ten, then added the second price.

In this lesson, students explore efficient strategies to estimate how much an item will cost.

- Experience with composing and decomposing numbers has prepared students to learn the standard algorithm, the paper-and-pencil procedure most adults learned to add multi-digit numbers. What was once called carrying is now **regrouping**.

What number does each picture represent?

Imagine you added the blocks together.
What would be the total?
What is another way to show the same value?

You could regroup 10 ones blocks as 1 tens block.

- Students connect place-value strategies with the standard algorithm.
- Students find answers by working with convenient estimates, such as multiples of ten, and calculate exact answers using strategies such as **compensation**.

7.11 Addition: Introducing the compensation strategy

Step In How could you calculate the exact cost of these two items?

Dwane showed each number with base-10 blocks. He then moved the blocks between each group to make it easier to add.

How did the numbers change? Did it affect the total? How do you know?

Dwane then showed his strategy on this number line.

Gloria used a different strategy. She rounded 48 to a nearby ten.

The amount that she added to round (2) is then subtracted afterward to calculate the exact cost.

In this lesson, students use compensation to make quantities easier to compute mentally.

Ideas for Home

- Ask your child to add two- and three-digit quantities by first estimating the total, adding mentally, then using the standard algorithm.
- Talk about which methods are appropriate for different situations. When shopping, estimation and mental calculation are usually sufficient. Explain why the accuracy of the standard algorithm is better when paying bills.

Glossary

- Estimation** is a rough calculation of a quantity when the exact amount is not needed. E.g. $46 + 32$ is about 80.
- Regrouping** is when numbers are regrouped into new place values to combine the quantities.
- The **compensation** strategy involves rounding one number to a nearby multiple of 10, then adding the other number. The total is then adjusted to compensate for the rounding. For example, see $46 + 32$ and think $50 + 32 - 4$ or $30 + 46 + 2$.