

Core Focus

- Number: Reading and writing six-digit numbers and working with place value
- Multiplication: Extending the twos, fours, eights, and tens facts and exploring patterns

Number

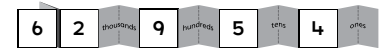
- Number sense strategies from previous grades now extend to six-digit numbers. Students learn to read, write, draw, compare, and order these numbers using familiar and new models.
- Six-digit numbers are read in groups of three digits (starting from the left). Use of the **numeral expander** in all these lessons help students make sense of reading and ordering these numbers. The **abacus** also helps students visualize place value.

Ideas for Home

- Find six-digit numbers like city populations, or make up your own, and ask your child to read them out loud.
- Compare six-digit numbers and ask your child to explain why one number is greater or less than another.

Glossary

- ▶ **Numeral expanders** show how the position of each digit in a number represents a designated place value.
- ▶ An **abacus** is a calculation tool that excels at demonstrating place value. For example, this model shows how 3 *ten-thousands* is the same as $3 \times 10,000$, and so on.



1.4 Number: Reading and writing six-digit numbers (with teens and zeros)

Step In Write digits on the expander to match the number shown on the abacus.

How could the expander help you figure out how to say the number name?

In this lesson, students use a numeral expander to read and write six-digit numbers. An abacus is used to represent these numbers.

1.7 Number: Working with place value

Step In What number is shown on this abacus?

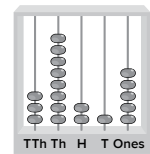
How does the value change if the bead is moved to a rod on either side?

The value is 10 times **greater** if moved one rod to the **left**. I divide the value by 10 if the bead is moved one rod to the **right**.

What does this chart show?

1,000 is 10 times greater than 100, or 100 times greater than 10. What else do you notice?

In this lesson, students consider the role of place value to write six-digit numbers. They use an abacus model and place-value chart to assist in creating new numbers.



Helpful videos

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

www.bit.ly/O1_9
www.bit.ly/O1_33


Multiplication

- Students extend multiplication strategies that were explained in earlier grade levels to multiply one- and two-digit numbers, including the **double-double strategy** and the **double-double-double strategy**.

1.10 Multiplication: Extending the fours and eights facts

Step In How many stickers are on this sheet?

How would you calculate the number of stickers on four of these sheets?



I can extend the double-double strategy. Double 24 is **48**. Double **48** is 96.

In this lesson, students extend strategies to multiply one- and two-digit numbers.

- Students explore patterns involving place value in multiplication. The numeral expander provides a place-value model that discourages inaccurate explanations like *I add zeros when I multiply by multiples of 10*.

1.12 Multiplication: Exploring patterns

Step In What is the same about these quantities? What is different?

3×4 ones =

3×4 tens =

3×4 hundreds =

3×4 thousands =

What is another way to say the last three products?

What are the different ways you could say the products of these?

4×6 tens = 4×6 hundreds =

4×6 thousands =

The numeral expander shows that 3×4 tens equal 12 tens, which is the same as 120, etc. Accurate place-value language supports deep understanding of multiplying and dividing by magnitudes of ten.

Ideas for Home

- Practice the doubles strategy with household items. Four pairs of shoes is double double one pair of shoes. Double double 6 would describe the total number of eggs in two full cartons.

Glossary

- The **doubles strategy** is a method of mental multiplication. If a number is multiplied by a power of two, the calculation can be performed by repeatedly doubling the numbers. For example, $4 \times 8 = 32$ is the same as $4 \times 2 \times 2 \times 2$, or *double double double 4*.