

Core Focus

- Number: Comparing, ordering, and rounding six-digit numbers
- Multiplication: Multiples, factors, prime and composite numbers
- Area and Perimeter: Calculating for rectangles and word problems

Number

- Students use skills developed in earlier grades to compare and order six-digit numbers.
- By placing numbers on a **number line**, students can visualize their positions relative to each other, and relative to benchmark numbers like tens, hundreds, and thousands. This visualization helps students understand the concept of rounding, instead of relying on rounding rules.

3.3 Number: Rounding six-digit numbers

Step In This table shows the annual home game attendance totals for some NFL teams.

Team	Total
Dallas	704,345
NY Giants	641,184
Green Bay	623,577
Washington	617,767
NY Jets	615,656

Which team had the greatest total attendance?

Which teams had a total of more than 630,000 spectators?

Which teams had about 620,000 spectators?

How can you figure this out? Which digits will you look at to help you decide?

Draw an arrow on this number line to show the total attendance at the NY Giants' home games.

If you had to round this number to the nearest **hundred thousand**, what number would you write?

How would you round the same number to the nearest **ten thousand**?

In this lesson, students use a number line to round six-digit numbers.

Multiplication

- **Doubling and halving** is a strategy to simplify multiplication. Students double one factor while halving the other.
- Students also practice finding factors to extend the doubling and halving strategy in other ways.

3.7 Multiplication: Finding pairs of factors

Step In What do you notice about the orange arrays?

Complete this table to describe each array.

20
is the same value as
___ × ___
___ × ___
___ × ___

What do you notice about the factors?

You can double one factor and halve the other to help find different pairs of factors.

How could you figure out all the factors of 18?

In this lesson students find pairs of factors.

Ideas for Home

- Look up city populations or areas and find some that are six digits long. Ask your child which numbers are greater or less. For further practice, create a number line and place the populations or areas on it for comparison.

Glossary

- ▶ When compared on a **number line**, greater numbers are farther from 0 on the number line, and lesser numbers are closer to zero.

Students can also see where numbers sit relative to rounding benchmarks like the nearest ten, hundred, thousand, or more.

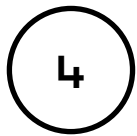
- ▶ **Doubling and halving** is a mental strategy that helps simplify complex multiplication. For example, if a student sees 12×15 , they can double the 15 and halve the 12 to get 6×30 , which is a more straightforward multiplication problem. For factors that do not easily fit the doubling and halving strategy, students can break down the greater factor into lesser factors, then add the resulting products.

Helpful videos

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

www.bit.ly/O1_24

www.bit.ly/O1_28



Module 3

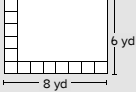
Area and Perimeter

- Students extend what they learned about **area and perimeter** in Grade 3 to investigate and then develop rules for finding the area and perimeter of rectangles. By applying the concept of arrays, students see that rectangles can be viewed as rows and columns of squares. This helps illustrate the meaning behind the familiar formula for the area of a rectangle: $A = L \times W$.

3.9 Area: Developing a rule to calculate the area of rectangles

Step In Each small square in this large rectangle measures 1 yard by 1 yard.

What are the dimensions of the large rectangle?



The width is 6 yards.
The length is 8 yards.

A short way to write square units is to use a small 2. For example, 370 square yards can be written as 370 yd^2 .

How could you use the dimensions to calculate the area of the rectangle?


In this lesson, students calculate the area and develop rules to be used for finding the area of any rectangle.

- By finding the perimeter of rectangles, students derive a formula from their observations. Because a rectangle has two identical lengths and two identical widths, they arrive at the following formula: $P = (2 \times L) + (2 \times W)$, or $P = 2 \times (L + W)$.

3.10 Perimeter: Developing a rule to calculate the perimeter of rectangles

Step In What are the dimensions of this mirror frame?

What do you call the distance around a rectangle?
How could you calculate the perimeter of this mirror frame?



$12 + 12 + 6 + 6 = 36$ inches

What is another way you could calculate the perimeter?

You could multiply the length and width by 2. Then add them together. That is $2 \times 12 + 2 \times 6$.

In this lesson, students measure perimeter and develop rules to be used for finding the perimeter of any rectangle.

Ideas for Home

- Using a measuring device, work together to find the area and perimeter of smaller rectangular shapes and spaces in your home: e.g. a cupboard, a table top, a book, picture frames, or rugs. Use the $L \times W$ formula to find the area. Use the $(2 \times L) + (2 \times W)$ formula to find perimeter.

Glossary

- Area and perimeter** are two concepts that students may confuse for one another. One way to remember that *perimeter* is the linear distance around the edge of a rectangle, and not the flat space that it covers, is to think of the word *rim* that appears in the middle of the word. Another approach is to remember that *area* and *array* look and sound similar to each other.