3 **Module 4**

Core Focus

- Division: Introducing the symbol and connecting multiplication and division, and the tens, fives, twos, and fours facts
- Common fractions: Reviewing unit fractions, symbols, and relating models

Division

- Multiplication and division receive significant attention in third grade. It is very important for students to understand how these operations are closely related.

- *Fair shares* are a familiar concept well before working with division symbols. For example, *20 marbles shared fairly among 4 children* means each child gets the same number (5). The division equation $20 \div 4 = 5$ represents the *fair share.* The related multiplication equation is $4 \times 5 = 20$.

In this lesson, students connect multiplication and division.

- Because multiplication and division are so closely related, students use **arrays** to visualize multiplication facts when they think about division. This strategy is emphasized for tens and fives facts.

In this lesson, students work with twos and fours division facts by using halving and related multiplication strategies.

- In Module 3, students focused on doubling for twos multiplication facts and doubling doubling for fours multiplication facts. Now students think about the twos and fours division facts as halving and halving-halving.

Ideas for Home

- Practice division facts. E.g. "What is $28 \div 4$?" Instead of stopping at 7, ask your child to explain the halving strategy: "I know half of 28 is 14 and half of 14 is 7, so $28 \div 4 = 7$."

- Practice the twos and fours doubling facts. E.g. "What is 4×7?" Instead of stopping at 28, ask your child to explain the doubling strategy: "I know that double 7 is 14 and double 14 is 28, so 4×7 is 28."

Glossary

▸ Partially covered **arrays** show the total and either the number of groups or the number in each group to represent division using images already familiar to students from their study of multiplication.

1

3 **Module 4**

ORIGO
STEPPING STONES 2.0
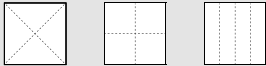
Fractions

- Fractions are often challenging for students, but they are very important in daily life and they provide essential understanding for later work with decimals, algebra, and other advanced mathematics.

- In Grades 1 and 2, students explored their understanding of one-half, one-third, and one-fourth in sets of objects and in geometric shapes. This section of the module begins by reviewing fractions using the **area model**.

4.8 **Common fractions: Reviewing unit fractions**

Step In These are three different ways to fold a square into 4 parts of equal size. What do you notice?

Color one part of each large square. What fraction of each square did you color?

All the large squares are the same size and shape but they are split up in different ways.

How could you check that the shaded fraction of each square covers the same amount of paper?
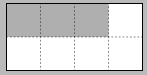
Each large square is called **one whole**.

In this lesson, students review unit fractions.

- As in Grades 1 and 2, the area model continues to represent fractions by showing the relationship between the shaded area and the total area.

- In Grade 3, fraction models extend to **number lines** and are described using numeric symbols. Number lines show the relative position of fractions.

4.9 **Common fractions: Writing with symbols**

Step In Layla is covering a rectangle with orange pattern blocks.

What fraction of the rectangle has she covered so far?

Write a numeral to show the number of parts that are covered and a numeral to show the number of equal parts in the whole.

parts covered
equal parts

The numeral on the top is called the **numerator**.

The numeral on the bottom is called the **denominator**.

Together the two numerals make a **common fraction**.

In this picture, the numerator tells how many blocks have been used. The denominator tells how many blocks will cover the rectangle. Together they show that $\frac{3}{8}$ of the rectangle is covered.

In this lesson, students write common fractions using numbers. Three shaded parts out of eight equal parts is written $\frac{3}{8}$.

Ideas for Home

- Notice fractions in kitchen measures, e.g. compare $\frac{1}{2}$ cup of flour to a whole cup, $\frac{1}{4}$ tablespoon to 1 tablespoon, etc.

- Look at an analog clock together and notice the half (30 minutes), quarter (15 minutes), and third (20 minutes) on the clock face.

Glossary

▸ The **area model** of fractions shows fractions as parts of a two-dimensional area or three-dimensional object.

▸ The **number line model** is a more sophisticated length model. Number lines specifically require that students interpret fractions as numbers.