(5) Module 6

Core Focus

- Fractions: Adding common fractions and mixed numbers
- Division: Three- and four-digit dividends with one- and two-digit divisors

Fractions

- Students gain a better understanding of fraction addition by visualizing it using area models and length models.

- These models help students identify which fractions should be rewritten to make the denominators the same, making the fractions easy to add.

6.3 Common fractions: Adding (related denominators)

Step In These pizzas were left over after a party.

Very Veggie   Mostly Meat   Super Supreme

Choose two types of pizza to take home. What are the possible combinations you could choose?
How much pizza is there in each of these combinations?

$\frac{1}{3} + \frac{1}{6} =$ $\frac{5}{12} + \frac{1}{6} =$ $\frac{1}{3} + \frac{5}{12} =$

In this lesson, students use area models to help add fractions with different but related denominators.

- When adding fractions that have different, unrelated denominators, such as $\frac{1}{3} + \frac{1}{4}$, students think of multiples for each denominator to figure out a common denominator. In this case, each fraction could be rewritten with twelfths as the common denominator ($\frac{4}{12} + \frac{3}{12} = \frac{7}{12}$).

6.5 Common fractions: Adding mixed numbers (related denominators)

Step In Owen bought these two strips of wood for a picture frame.

$5\frac{1}{4}$ feet

$7\frac{1}{2}$ feet

How would you calculate the total length?
Look at these students' methods.

Fiona thought it would be easier to add the lengths using improper fractions. This is what she wrote.	Allan added the whole numbers and then the fractions.
$\frac{15}{2} + \frac{21}{4} =$	$2 + 5 + \frac{1}{2} + \frac{1}{4} =$

The denominators have to be the same, so they will need to change one of them.

Before they add, what will they need to do with the fractions?
How do you think they will figure out the total?

In this lesson, students describe strategies for adding mixed numbers with related denominators.

Ideas for Home

- Finding common denominators is a key skill when working with fractions. Say two numbers less than 12 (like 3 and 5) and ask your child to find a common multiple. For exmple, the multiples of 3 are 3, 6, 9, 12, 15, and the multiples for 5 are 5, 10, 15. A common multiple for 3 and 5 is 15.

- Help your child develop flexibility in thinking about fractions by talking about equivalent fractions in everyday activities. If a pizza is cut into eight equal slices and your child eats two slices, ask them to describe how much they ate ($\frac{2}{8}$ or $\frac{1}{4}$ of the pizza).

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- Students think about strategies for adding fractions that are greater than one, like $\frac{12}{5}$ (also written as $2\frac{2}{5}$).

- Students choose whether to add the whole numbers and fractions separately, or to change the mixed numbers to improper fractions before adding.

- Depending on which strategy students use to add mixed numbers, the answer will be a mixed number or an improper fraction. Students see that both methods result in equivalent answers.

Division

- When students make the transition from mentally dividing to using the standard division algorithm, it is important to continue using terms like *divide by*.

- In the following problem, students use what they know about the sharing strategy and the area model formula to solve a division problem. The key is to choose convenient ways to do the splitting, so the division becomes easy to perform.

6.8 | **Division: Reviewing strategies**

Step In | Cary bought a cell phone for $369. He paid for it in three equal monthly payments.

Do you think his monthly payment is more or less than $100? How did you decide?

How would you calculate the exact amount?

Carmen follows these steps to calculate the exact amount.

Step 1	Step 2	Step 3
She drew a rectangle to show the problem. The length of one side becomes the unknown value.	She split the rectangle into parts so that it was easier to divide by 3.	She thought: $3 \times 100 = 300$ $3 \times 20 = 60$ $3 \times 3 = 9$
3 369	3 300 60 9 P	3 300 60 9 100 + 20 + 3

In this lesson, students can split blocks into three equal groups or use the area model to split three-digit dividends into parts that are easily divisible by one-digit divisors.

- Students review the steps to divide three-digit or four-digit numbers by a one-digit number. They then progress to dividing three- or four-digit numbers by any two-digit divisor.

Ideas for Home

- Practice mental division problems at the grocery store. For example, for a six-pack of juice drinks that cost $3.36, ask your child how much one drink would cost. Your child should think about each dollar as being 100 cents and respond, "Three hundred cents divided by six is 50 cents. Thirty-six cents divided by six is six cents. So one drink costs 56 cents."

- Create pairs of cards that have a division expression on one card and the matching quotient, or answer, on the other card. Use these cards to play games like Memory.