4 Module 8

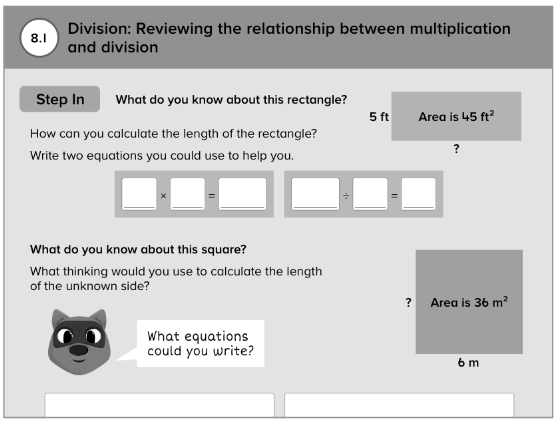
ORIGO STEPPING STONES 2.0

Core Focus

- Division: Partial-quotients strategy (two-, three-, and four-digit dividends)
- Common fractions: Multiplicative nature (area and number line models)
- Common fractions: Multiplying mixed numbers

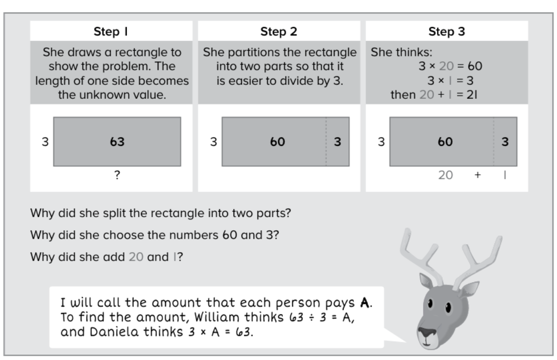
Division

- The **array** model helps students review the concept of division. Students are given the total in the array, but can only see the number of rows, or the number in one row. This demonstrates the idea of a missing factor, and shows that most arrays have two related multiplication equations, and two related division equations.



In this lesson, students calculate the length of the unknown side.

- Students extend their skill with division by building on what they know about the relationship between multiplication and division. Just like multiplication, division can be represented using a rectangular area model.
- In the problem below, students use what they know about the area model formula (L × W = A) to split the total area (63) into parts that can easily be divided (60 + 3) by the known W dimension (3) to find the missing L dimension (21).



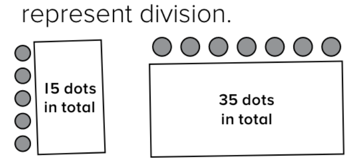
In this lesson, area models are used to split two-digit dividends into parts that are easily divisible by one-digit divisors.

Ideas for Home

- Take turns practicing mental division problems while traveling or walking. Use multiples of the divisor to come up with problems like 336 ÷ 3. This problem can be mentally decomposed to become 300 ÷ 3 and 36 ÷ 3, which equals 100 + 12, which equals 112. Try 245 ÷ 5, 648 ÷ 6, 819 ÷ 9, 444 ÷ 4, 396 ÷ 3, etc...

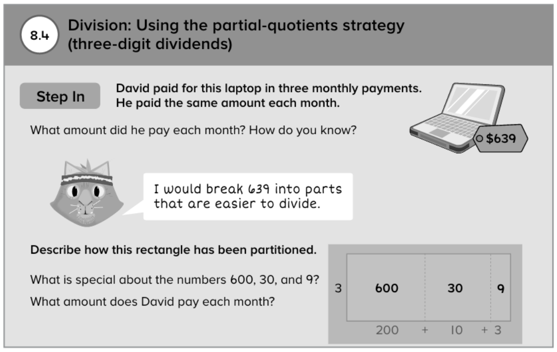
Glossary

- A partially covered **array** show the total and either the number of groups or the number in each group to represent division.



- The **dividend** is the number that is split into smaller equal parts when division is performed.
- The **divisor** is the number that indicates how many parts the dividend is to be split into, or the number in each part.
- The **quotient** is the missing information in a division problem (the answer).

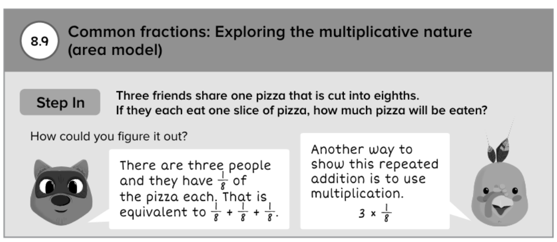
- All the lessons build on this of idea of partitioning to make division easier, even when the numbers in a division problem are three or four digits. The key is to choose convenient ways to do the partitioning, so the division becomes easy to perform.



In this lesson, area models are used to break three-digit dividends into parts that are easily divisible by one-digit divisors.

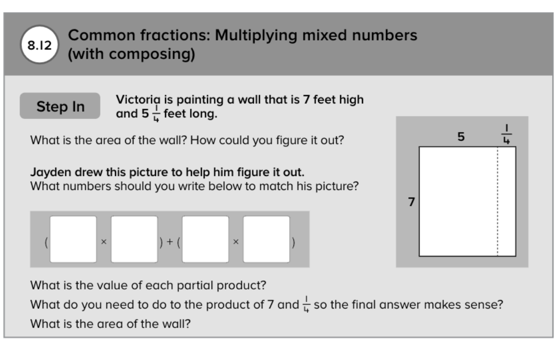
Common fractions

- Students explore how to multiply when the number of groups is a whole amount and the number in each group is a fractional amount. They consider what happens to the numerators and denominators of **fractions** when multiplying. An area model is used to represent the situations.



In this lesson, students multiply fractions.

- Students also use area models to reinforce multiplying whole numbers by **mixed numbers** in parts.



In this lesson, students multiply fractions with mixed numbers.

Ideas for Home

- Find recipes that have fractions in the ingredients list. Discuss how you could figure out the amount needed if you need to make multiple batches.

Glossary

- **Fractions** describe equal parts of a whole. In this example of a common fraction, 2 is the **numerator** and 3 is the **denominator**.

- A **mixed number** is a whole number and a common fraction added together and written as a single number without the addition symbol.