InsightMath California

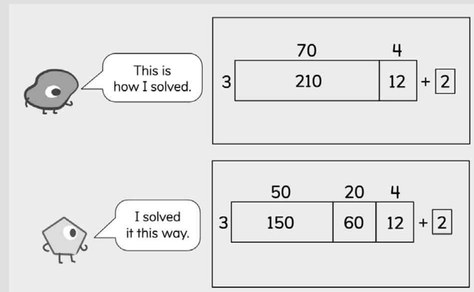
Building Division Strategies

Family Guide | Grade 4 | Unit 5

Your student is exploring how multiplication and division models and strategies can be extended and applied to division problems involving multidigit numbers and remainders.

Key Math Ideas

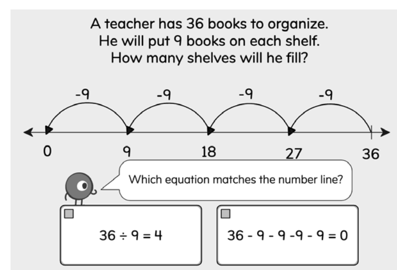
In this unit, students build on what they already know about multiplication and division from previous units and grades. They will expand their understanding of division by exploring different ways of thinking about division and learning more efficient methods for dividing larger numbers. Students will strengthen their understanding of how multiplication and division are connected as they discover factor pairs, learn rules for divisibility, and figure out what remainders mean in real-world situations. Students divide using area models and partial quotients, exploring how the same problem can have different pathways to an answer (as shown to the right). Expanding their division strategies serves as a foundation for dividing with larger numbers efficiently in grade 5 and learning the standard algorithm for division in grade 6.



Two ways to solve 224 ÷ 3 using area models to divide 224 (the dividend) by 3 (the divisor) and get the same answer of 74 R2 (the quotient, which includes a remainder).

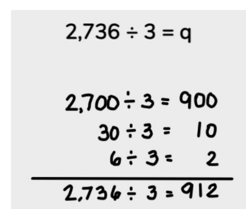
→ In the first half of the unit, your student will learn to

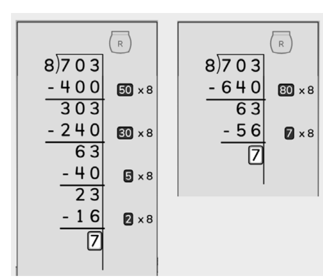
- show how the same division expression can represent either an unknown number of groups or an unknown amount in each group, such as how 21 ÷ 3 might represent 21 treats divided into 3 bags and an unknown number of treats in each bag, or it might represent 21 total treats with 3 treats in each bag and an unknown number of bags;
- understand division as repeated subtraction;
- represent and solve division problems with bar models and number lines;
- explain why the remainder should be less than the divisor.



→ In the second half of the unit, your student will learn to

- solve division problems using place value patterns and known division facts, such solving 2,100 ÷ 3 by knowing the quotient will be 100 times as much as 21 ÷ 3 because 2,100 is 100 times greater than 21;
- solve division problems by strategically breaking up the dividend when there are obvious multiples in the digits, as shown in the example to the right that 2700, 30, and 6 are all multiples of 3;
- use known division or multiplication facts to help solve division problems, such as when solving 167 ÷ 3 students recognize how 3 × 50 is 150, which leaves 17 remaining, and 3 × 5 is 15 which leaves 2 remaining;
- use area models and equations to solve division equations.





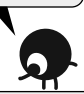
Two strategies for recording partial quotients to divide.

Helpful Hint

There are many different ways to model and solve division problems. Encourage your student to share what they notice about the numbers in the problem before solving to help them choose an efficient division strategy.

Tips for Supporting Your Student at Home

Questions to Ask Your Student



- How is division related to subtraction?
- How can you divide by making equal groups?
- What multiplication or division facts do you know that can help you solve this problem?
- How can thinking of multiples help you to divide?
- How can you break apart this number to help you divide?
- How can you use an area model to help you divide?
- How can you record division steps?
- Do you think there will be a remainder? Why or why not?
- What does the remainder represent in the problem? How can it help you answer the question??

If...	Try...
your student ignores the zeros when dividing, such as thinking 9003 ÷ 3 = 31 because they thought of it as 93 ÷ 3 . . .	asking them to write equations for each partial quotient, supporting them to break apart the dividend (9003 as 9000 and 3) before dividing. Ask, “What numbers did you divide first? What equation represents that?” Also ask about the place value of the digits they divided. “What is the value of the 9? Does the equation you wrote show that?”

Student Strengths Spotlight

I do not give up, even when a problem is challenging.	Dividing larger numbers and learning new strategies can be challenging. However, when students persevere, they grow not only their skills but also their confidence.
I determine what tools and strategies might help me solve this problem.	Students choose to use their preferred strategies and methods to solve the problems.
I choose representations to help me solve problems and show my thinking.	Students choose how to show their thinking when dividing multi-digit numbers and have opportunities to explain their work.

Try This Together!

- **Share What You Know.** Give your student a number, set a timer for about five minutes, and ask them to make a list of everything they know about that number. Try starting with a two-digit number before moving on to larger numbers. Things to consider:
  - Is it even or odd? How do you know?
  - Is it prime or composite? How do you know?
  - What factors does it have? What numbers is it divisible by? What numbers is it a multiple of?
  - What multiplication or division equations can you write with that number?
- Challenge them to write even more facts in the second round. Alternatively, you can each write your own list and see who has the most unique answers when the timer beeps.
- **Division in our Lives!** Look for opportunities for your students to recognize division situations in the real world and solve. For example, if a box of crackers has 435 crackers and they want to make 9 snack packs with the same number of crackers in each, how many crackers will be in each bag? If there is a remainder, ask students what they would do with it.
- **Remainders Around Us.** Look for situations where remainders show up in your family’s life such as putting the same number of items into treat bags or sharing food equally. Ask your students how they would use the remainder to inform their decision making. For example, if the soccer team is carpooling to a game and each car can fit 5 people, how many cars do we need to transport 17 people? We want students to recognize that since 17 ÷ 5 = 3 with a remainder of 2, we would actually need 4 cars to fit everyone.