InsightMath California

Extending Division to Multidigit Whole Numbers

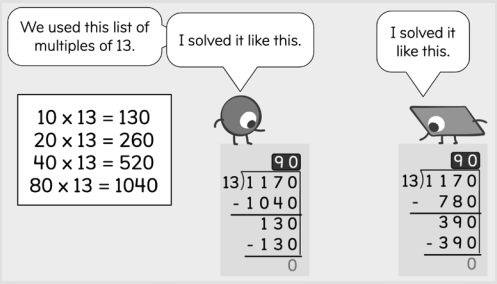
Family Guide | Grade 5 | Unit 3

Your student is exploring how division of multidigit numbers is a repeated process of estimating partial quotients based on multiples of the divisor.

Key Math Ideas

In this unit, students build on what they already know about division to solve problems with larger numbers divided by two-digit numbers and to write remainders as fractions. Students also connect their understanding of fractions to division when they see that dividing a smaller number by a larger number creates a fraction. This leads to writing remainders as fractions, allowing them to interpret remainders in different ways depending on context of the problem.

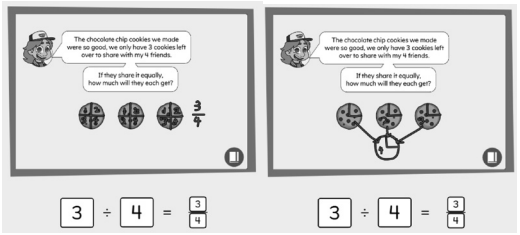
Students expand on their fourth grade work dividing larger numbers to divide by estimating answers using place value and multiples of the dividing number. Students divide using area models and partial quotients, exploring how the same problem can have different pathways to an answer (as shown to the right). Refining these division strategies and using them efficiently serves as a foundation for learning the standard algorithm for division in grade 6.



Two ways to use the partial-quotients algorithm to divide 1,170 (the dividend) by 13 (the divisor) and get the same answer of 90 (the quotient).

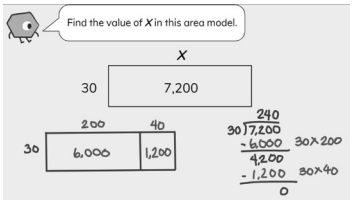
→ In the beginning of the unit, your student will learn to

- solve word problems involving division resulting in fractional quotients that are fractions and/or mixed numbers;
- write remainders as fractions and interpret the quotient in the context of the problem;
- describe and use the inverse relationship between multiplication and division to solve problems and verify solutions.



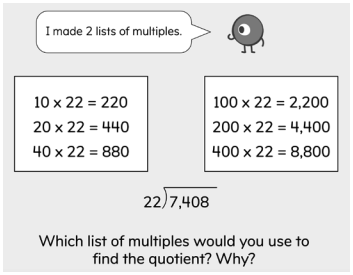
→ In the middle of the unit, your student will learn to

- use the partial-quotients algorithm to record steps involving division by a one-digit divisor or divisor that is a multiple of 10;
- use estimation to determine whether an quotient is reasonable;
- solve division word problems with mixed number quotients and interpret remainders based on the context;
- use place value relationships and multiplication patterns to solve division problems.



→ At the end of the unit, your student will learn to

- use multiples of the rounded divisor to use estimation to find a starting point for solving division problems;
- use multiples of the divisor strategically to help solve division problems using the partial-quotients algorithm;
- use the partial-quotients algorithm to record steps involving division by a two-digit divisor;
- identify when a remainder calls for rounding up, rounding down, or writing the quotient as a mixed number based on the context.



Helpful Hint

In this unit, students work on the real world skill of interpreting the quotient of a division problem. Support students to do this is in the world around them, with smaller or larger numbers. When cutting a string into 5 equal pieces to make bracelets, the length of each can be a fractional amount. When putting an equal amount of candies into goody bags, we typically cannot put a fractional amount of each candy so we may need to round down (how many bags can I make before running out?) or round up (how many candies do I need to buy to have enough?).

Tips for Supporting Your Student at Home

Questions to Ask Your Student

→ In the beginning of the unit:

- What do you notice about the numerator and denominator in quotients?
- What are different ways to think about solving division problems?
- What are different ways we can think about division with remainders??

→ In the middle of the unit:

- What strategies can you use to solve division problems?
- How can multiplication and powers of 10 help you divide?
- How can you round to help solve division problems?
- What strategies can we use to solve word problems??

→ By the end of the unit:

- What strategies can you use to solve division by two-digit numbers?
- How can you use multiples of the divisor to divide?
- How do you know when a problem has a remainder?
- How do visual models help you solve problems??

If...	Try...
your student is struggling with where to start on a division problem . . .	asking what they notice about the divisor, such as "Is it easy to find multiples of the divisor?" or "Would it be helpful to round the divisor and find multiples of the rounded number first?" Support students to recognize a strategy that is most efficient for them.

Student Strengths Spotlight

I take time to understand the problem and look for entry points.	Before starting to solve, students consider efficient ways to divide based on the problem, such as how to use multiples of the divisors or if they should start with estimating.
I justify my thinking.	As students interpret remainders, they justify whether they should round up, round down, or keep the quotient as a mixed number based on the context of the problem.
I explain how my classmates' reasoning compares to my own.	Students make comparisons between their strategies for dividing, recognizing that there are multiple pathways to finding answers.
I choose representations to help me solve problems and to record and share my thinking.	Students choose how to show their thinking when dividing multidigit numbers and have opportunities to explain their work.

Try This Together!

- 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 $17 \div 5 = 3$ with a remainder of 2, we would actually need 4 cars to fit everyone.
- 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 22 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.