InsightMath California

Extending Division to Decimals

Family Guide | Grade 5 | Unit 9

Your student is exploring how extending place value patterns and fraction understanding can help to divide decimals.

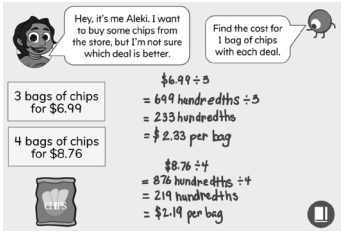
Key Math Ideas

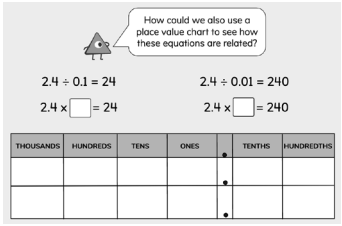
To begin the unit, students connect what they already know about interpreting fractions as division to understand how fractions and decimals relate to each other. They learn that when you divide whole numbers, you can get decimals that either end (such as 0.25) or repeat forever (such as 0.333...). Students then divide decimal numbers by thinking about sharing situations, building on what they know about place value to break decimal numbers into forms that are easier to work with, such as thinking of 0.4 as 40 hundredths. This approach helps students connect decimal division to the whole number division they already understand, making the new concept easier to grasp.

In the second half of the unit, students divide by decimal divisors, starting with divisors of 0.1 and 0.01 and then moving on to more complex decimal divisors such as 0.5 or 0.25. Through this work they notice something surprising—when dividing by these decimals, the answer is actually larger than the starting number (for example, 5 ÷ 0.1 = 50). Just like with their work dividing with fractions, this challenges what they previously understood about division (that dividing makes things smaller).

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

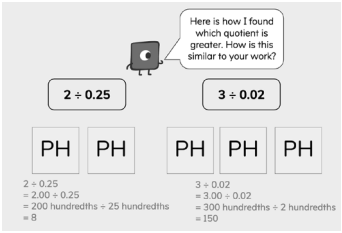
- convert between common fractions and decimals, such as 0.5 = $\frac{1}{2}$, 0.25 = $\frac{1}{4}$, 0.75 = $\frac{3}{4}$, and 0.2 = $\frac{1}{5}$;
- divide whole numbers resulting in a decimal quotient, such as 1 ÷ 5 = 0.2 or 2 ÷ 9 = 0.222 . . . , and describe patterns;
- divide decimals by whole numbers such as 1.4 ÷ 2 by asking "If 1.4 is divided into 2 equal parts, what is the size of each part?"
- divide a decimal by a whole number using area models and place value strategies;
- describe why dividing a decimal by a whole number results in a quotient that is smaller than the dividend.





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

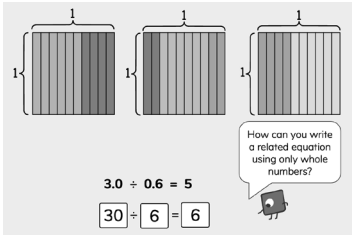
- use words and models to explain why dividing by 0.1 (or 0.01) is equivalent to multiplying by 10 (or 100);
- describe why dividing by a decimal less than one results in a quotient that is greater than the dividend;
- divide by decimals up to the hundredths place using area models and place value strategies;
- solve multistep problems by adding, subtracting multiplying or dividing with decimals up to the hundredths place.



Helpful Hint

Throughout the unit students divide with decimal numbers by:

- using models to divide using related whole number thinking, as shown in the example to the left, dividing 3 ÷ 0.6 = 5 and connecting it to 30 ÷ 6 = 5;
- using place value to rewrite dividends and divisors, then using whole number division connections, such as thinking of 4.5 ÷ 5 as 45 tenths ÷ 5 which results in 9 tenths (0.9).



Tips for Supporting Your Student at Home

Questions to Ask Your Student

→ In the first half of the unit:

- How can you use patterns to describe the relationship between decimals, fractions, and division?
- How can you model division of a decimal by a whole number?
- What strategy can you use to solve division problems with decimal dividends?

→ In the second half of the unit:

- How can we use patterns to understand division of whole numbers or decimals by 1 tenth (0.1) or 1 hundredth (0.01)?
- How can we use place value patterns to divide whole numbers by tenths and hundredths?
- What place value patterns can we see when we compare division and multiplication with decimal numbers?

If...	Try...
your student struggles to divide a decimal number by a whole number . . .	having them use the smallest place value to rewrite the problem and use whole number thinking. For example, if dividing 6.99 ÷ 3, help them to rewrite the problem as 699 hundredths ÷ 3. Being able to use whole number division thinking to help divide whole numbers makes the problems more approachable.

Student Strengths Spotlight

I value mistakes.	It is important for students recognize that mistakes are opportunities to learn, especially when contending with new or challenging content.
I ask my classmates to clarify their reasoning.	Asking for clarification from classmates helps students learn from each other and reflect on their own understanding.
I am precise with the words I use to explain thinking.	Using place value patterns to divide decimals requires precision. Students are careful with the words they use to explain their work to maintain mathematical accuracy.
I notice patterns and try to apply them.	Students notice and apply place value patterns when dividing with decimals, leading to strategies that are easier to understand.

Try This Together!

- **Let's Go Shopping.** Take your student grocery shopping with you. As you find your items on the shelves, have them notice how the price per item is listed on the price tags. After you purchase your groceries, point out any items you may have purchased in packs of more than one, such as a two pack of hand soap or a bag of 10 apples. Next, have your student find the price per item in the package. For example, a two pack of hand soap is $2.50, so each hand soap is $2.50 ÷ 2 = $1.25. Ask them to share their strategies and models with you.
- **Material Requirements.** When doing a project or craft around the house, invite your student to help you determine measurements. For example, when cutting string to make necklaces, if each necklace 0.25 yards of string, and you need to know how many necklaces you can make with 6 yards, you would divide 6 ÷ 0.25 = 24 items. Have your student determine how to solve the problem and share their decimal division thinking.