InsightMath California

Extending Multiplication to Decimals

Family Guide | Grade 5 | Unit 8

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

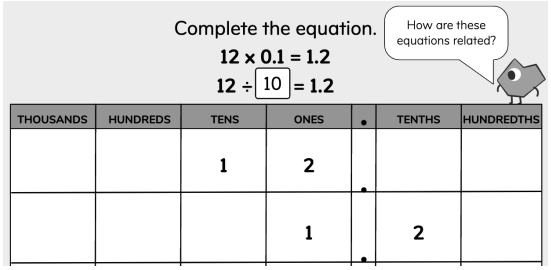
Key Math Ideas

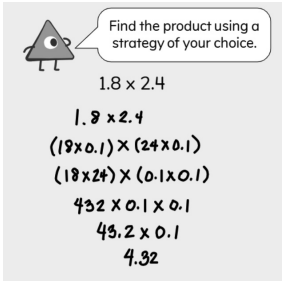
Students build their understanding of decimal multiplication by connecting it to what they already know about place value and powers of ten. Thinking of decimals as whole numbers multiplied by place value factors, such as 0.3 = 3 × 0.1 helps bridge their knowledge of whole number multiplication with new decimal concepts and allows them to use this as a strategy for multiplying decimals.

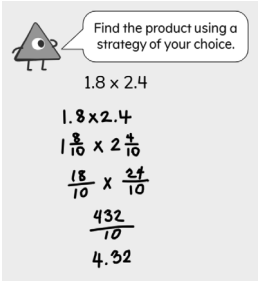
Later in the unit, students multiply two decimal numbers together using what they have already explored. They discover important patterns in how decimal places work when multiplying. For example, when you multiply tenths by tenths, you get hundredths (0.1 × 0.1 = 0.01) and when you multiply tenths by hundredths, you get thousandths (0.1 × 0.01 = 0.001). As students understand these patterns better, they develop more efficient methods of solving while retaining their conceptual understanding.

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

- use words and models to explain why multiplying by 0.1 (or 0.01) is equivalent to dividing by 10 (or 100);
- use place value understanding to rewrite a decimal as a product of a whole number factor and a decimal place value factor, such as rewriting 0.2 as 2 × 0.1;
- use area models and place value patterns to multiply whole numbers by decimals between 0 and 1 (with digits in the tenths and/or hundredths places only);
- determine, without solving, if a product will be greater than or less than a factor based on whether the other factor is greater than or less than 1, such as when given 4 × 0.7, knowing that the product will be less than 4 because 0.7 is less than 1.







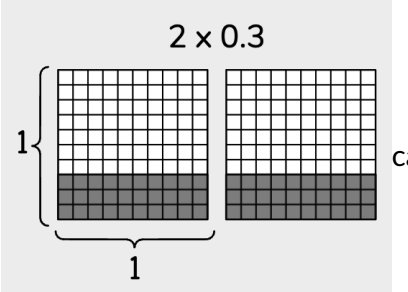
→ In the second half of the unit, your student will learn to

- use area models and place value patterns to multiply decimals up to the hundredths place;
- compare the size of the product to the size of the factors, without solving;
- estimate to determine if an answer is reasonable when multiplying decimals.

Helpful Hint

Throughout the, unit students multiply decimal numbers by:

- making visual models, as shown in the example to the left multiplying 2 × 0.3 as 2 groups of 3 tenths;
- expressing the factors as a product of 2 or more factors, such as rewriting 0.4 × 0.06 as (4 × 0.1) × (6 × 0.01) so they multiplying 4 × 6 = 24, then 24 × 0.1 × 0.01 = 0.024;
- rewriting the decimal as a fraction, such as thinking of 0.4 × 0.06 as $\frac{4}{10} \times \frac{6}{100} = \frac{24}{1000} = 0.024$.



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Tips for Supporting Your Student at Home

Questions to Ask Your Student

→ Throughout the unit:

- How can you estimate to help you multiply?
- How can you use place value patterns to help you multiply the whole number and decimal?
- How can you compare decimal multiplication problems without solving?

→ By the second half of the unit:

- How can factoring help you multiply decimals?
- What strategies can you use to multiply the decimal numbers?
- How can you compare decimal multiplication problems without solving?

If...	Try...
your student struggles to know where to start with a decimal multiplication problem . . .	asking them what they know about the factors in the problem and if they can use place value and whole number multiplication to help them solve.

Student Strengths Spotlight

I take time to understand the problem and look for entry points.	Making sense of the problem before beginning to solve helps students consider what strategy is most efficient.
I explain how my classmates' reasoning compares to my own.	Sharing strategies allows students to reflect on their own understanding and expand by learning from their classmates.
I determine what tools and strategies might help me solve this problem.	Using place value charts and area models while developing their strategies for multiplying with decimals.
I choose representations to help me solve problems and to record and share my thinking.	Students choose strategies and record their work. This allows them to compare strategies for efficiency and reflect on their understanding.

Try This Together!

- **Grocery Decimals.** While grocery shopping or making a list of grocery items, have your student help determine costs where multiplying decimals is necessary. For example, if tomatoes cost $0.83 each and you buy 5 of them, what will the total cost of tomatoes be? Or, if apples are $1.29 for one pound, what will be the cost of 1.5 pounds of apples?
- **Would You Rather?** Pose some "Would You Rather?" questions to your student using decimal multiplication problems. For example, ask them "Would you rather have 2×0.4 dollars or 2×1.5 dollars?" Have your student estimate the answer first, recognizing that multiplying 2 by a decimal less than 1 will result in a product less than multiplying 2 by a decimal greater than 1. Have your student then find the actual products and explain their strategy.