

Just In Time Quick Check
Standard of Learning (SOL) 5.5a

Strand: Computation and Estimation

Standard of Learning (SOL) 5.5a

The student will estimate and determine the product and quotient of two numbers involving decimals.

Grade Level Skills:

- Estimate and determine the product of two numbers in which:
 - the factors do not exceed two digits by two digits (e.g., 2.3×4.5 , 0.08×0.9 , 0.85×2.3 , 1.8×5)
 - the products do not exceed the thousandths place. (Leading zeroes will not be considered when counting digits.)
- Estimate and determine the quotient of two numbers in which
 - quotients do not exceed four digits with or without a decimal point;
 - quotients may include whole numbers, tenths, hundredths, or thousandths;
 - divisors are limited to a single digit whole number or a decimal expressed as tenths; and
 - no more than one additional zero will need to be annexed.
- Use multiple representations to model multiplication and division of decimals and whole numbers.

Just in Time Quick Check

Just in Time Quick Check Teacher Notes

Supporting Resources:

- VDOE Algebra Readiness Formative Assessments
 - [SOL 5.5a](#) (Word) / [PDF](#)
- VDOE Word Wall Cards: Grade 5 ([Word](#)) | ([PDF](#))
 - Decimal Place Value Position
 - Round
 - Multiply
 - Divide

Supporting and Prerequisite SOL: [5.4](#), [4.6a](#), [3.4a](#), [3.4b](#), [3.4d](#)

SOL 5.5a - Just in Time Quick Check

1. Use estimation to determine where the decimal should be placed in the product or quotient below. Explain your thinking.

a. $2.6 \times 5.1 = 1326$

b. $25.01 \div 6.1 = 41$

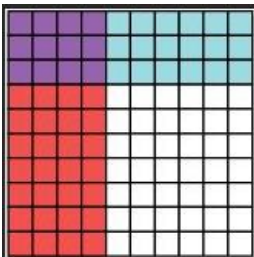
2. Solve.

a. 0.5×8.2

- b. Find the quotient of 16 and 0.2.

3.  represents one whole.

What multiplication equation is modeled below?



4. Use estimation to choose all the following that have a solution greater than one. Explain your thinking.

a. 0.99×5.8	b. $1.6 \div 4$	c. 2×0.25	d. $1.85 \div 0.5$
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Common Errors/Misconceptions and their Possible Indications

1. Use estimation to determine where the decimal should be placed in the product or quotient below. Explain your thinking.

a. $2.6 \times 5.1 = 1326$

b. $25.01 \div 6.1 = 41$

Estimation is a benefit when doing computation because it gives students an idea of whether their answer is reasonable. Some students have the misconception that estimating is simply rounding the final answer. Encouraging estimation prior to completing the computation and having conversations regarding rounding will assist students in not having to rely on procedural thinking, as well. Additionally, applying real life uses for estimation may help students see the value. In question a, students who place the decimal as 132.6 are likely to be looking at the factors and thinking that each of those has one decimal place so the answer should, as well. They are not thinking about the reasonableness of their answer. In question b, students' explanations for the decimal placement will provide insight into whether they are relying on procedural thinking.

2. Solve.

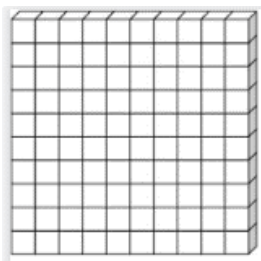
a. 0.5×8.2

b. Find the quotient of 16 and 0.2

For question a, some students will line up the decimals, then multiply the factors and move the decimal point straight down into the product to obtain an answer of 41. Provide students with opportunities to estimate to help them discover that multiplication by a decimal less than one will result in a smaller product. With strong estimation skills, some students may also realize that the question is asking for half of 8.2, which is 4.1. Additionally, using base ten blocks or a number line model can cement this understanding. For example, on a number line, five groups of 0.3 can be modeled to show that the product of five and 0.3 is smaller than five. Compare this model to five groups of one.

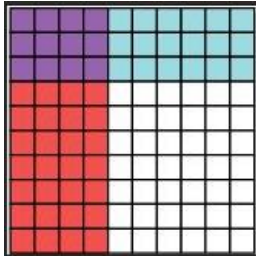
Conversely, for question b, students may have difficulty understanding that when a dividend is divided by a number less than 1, the quotient is bigger than the dividend. Using manipulatives can provide students visualization for this concept. Using base ten blocks, students can break 4 into groups of 0.5 and see that there would be 8 groups.

For both a and b, using manipulatives, real world application and repeated examples showing patterns can help students conceptualize multiplying and dividing decimals.



3.  represents one whole.

What multiplication equation is modeled below?



Students often count the blocks of each of the different colors and try to use those numbers to create an equation. Others may be able to find the two factors, but do not understand where to find the product.

If students have not been exposed to this area model, it would be difficult for them to make sense of it. Teachers are encouraged to utilize the area model when introducing the concept of multiplying a decimal by a decimal. One decimal factor can be found with the light blue squares and the other decimal factor can be found with the red squares. Creating both decimals on hundred grids using transparent sheets may assist students in visualizing the two decimal factors. When students put the transparencies on top of each other, the overlap shows the product.

The area model for multiplying fractions will be used in sixth grade. Helping students see the factors and the product with decimals lays groundwork for sixth grade.

4. Use estimation to choose all the following that have a solution greater than one. Explain your thinking.

a. 0.99×5.8	b. $1.6 \div 4$	c. 2×0.25	d. $1.85 \div 0.5$
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Student choices and their explanations will give the teacher insight to any misconceptions students have about multiplying and dividing by decimals.

Students who choose b may struggle with the idea that a smaller number can be divided by a larger number and think that 4 is being divided by 1.6, which is greater than 1.

Students who do not choose d may not understand that dividing by less than a whole results in a larger quotient. Making the connection that dividing by half is the same as doubling or multiplying by 2 can be difficult for students to understand. Using manipulatives such as base ten blocks and number lines can help clarify these misconceptions.

Students who are struggling with number sense may benefit from small group investigations given different multiplication and division of decimal problems. Ask them to look for patterns and sort into groups of less than one, equal to one and greater than one.