

6.NS Estimating Products of Decimals

Alignments to Content Standards: 6.NS.B

Task

Decide which value is closest to the answer for each of the following questions. Explain your reasoning.

a. 8 bottles each contained 1.2 liters of water. About how many liters of water were there all together?

0.1	1	10	100
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b. A school bought 8.5 kilograms of apples. If apples cost \$2.45 per kilogram, about how much did they pay (in dollars)?

0.2	2	20	200
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c. A laptop contains about 0.0006 kilograms of gold. If a manufacturer plans to produce 10,100 of these laptops, about how many kilograms of gold are needed?

0.6	6	60	600
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IM Commentary

The purpose of this task is to help students estimate products of decimal numbers. Estimation is a valuable strategy when deciding where to put the decimal point when multiplying decimals. Although students will learn an algorithmic approach to multiplying decimals in grade 6, making sense of the context is a powerful tool that can support students' developing fluency. In order to promote sense-making, this task might work best before a teacher explains an algorithmic approach, so that students don't just carry out computations and look to see which choice is closest.

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Solution

Answers will vary. Sample responses:

a. There were about 10 liters of water all together. I know this because 8×1 is 8. Since we are multiplying 8 by 1.2, the answer will be greater than 8, but not much greater.

b. They paid about \$20. $8 \times 2 = 16$. The numbers we are multiplying are a little larger than 8 and 2, so I'd expect the product to be a little larger than 16.

c. There would be about 6 kilograms of gold in 10,001 laptops. I know that 10×0.0006 is 0.006, 100×0.0006 is 0.06, $1,000 \times 0.0006$ is 0.6. Therefore $10,000 \times 0.0006$ is 6. 10,001 is very close to 10,000, so the answer is very close to 6. We could also approach this estimation verbally: Since 0.0006 is six ten-thousandths or $6 \div 10,000$, multiplying by 10,000 results in 6.



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