Lesson 4-7

Friday, October 11, 2019 2:01 PM

Name MB 201

Lesson 4-7
Use Properties to Multiply Decimals

I can ...
use properties to multiply decimals.

Content Standard 5.NBT.B.7
Mathematical Practices MP.1, MP.2, MP.6, MP.7

Solve & Share

The weight of small bag of raisins is 0.3 times the weight of a large bag. The large bag weighs 0.8 pound. What is the weight of the small bag? *Solve this problem any way you choose.*

$0.8 \times 0.3 = 0.24$
1dp + 1dp = 2dp

0.24 pounds

$0.8 \times 0.3 = x$
$\frac{8}{10} \times \frac{3}{10}$
$\left(8 \times \frac{1}{10}\right) \times \left(3 \times \frac{1}{10}\right)$
$(8 \times 3) \times \left(\frac{1}{10} \times \frac{1}{10}\right)$
$24 \times \frac{1}{100} = \frac{24}{100} = 0.24$

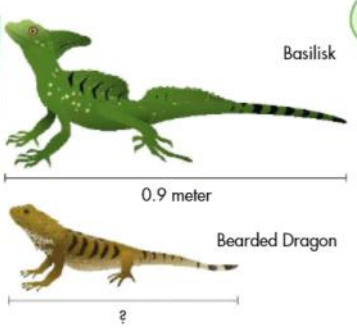
Look Back! MP.7 Look for Relationships How is solving this problem like finding the product of 3 and 8? How is it different?

Both problems have the same digits in the product. For decimals, each decimal is less than 1 so the product is less than 1 and the decimal is in a different place. $8 \times 3 = 24$. $0.8 \times 0.3 = 0.24$

Digital Resources at PearsonRealize.com Topic 4 | Lesson 4-7 201

How Can You Use Properties to Multiply Decimals?

The length of a Bearded Dragon Lizard is 0.6 times the length of a basilisk lizard. What is the length of the Bearded Dragon?



Step 1

Use fractions to rewrite the multiplication expression.

$0.6 \times 0.9 =$

$\frac{6}{10} \times \frac{9}{10} =$

$\left(6 \times \frac{1}{10}\right) \times \left(9 \times \frac{1}{10}\right)$

Step 2

Use the Associative and Commutative Properties to rearrange the factors.

$\left(6 \times \frac{1}{10}\right) \times \left(9 \times \frac{1}{10}\right) =$

$(6 \times 9) \times \left(\frac{1}{10} \times \frac{1}{10}\right)$

Step 3

Multiply the whole numbers. Multiply the fractions. Write the product as a decimal.

$(6 \times 9) \times \left(\frac{1}{10} \times \frac{1}{10}\right) =$

$54 \times \frac{1}{100} =$

$\frac{54}{100} = 0.54$

The bearded dragon is 0.54 meter long.

Convince Me! MP.7 Use Structure Tyler explained how he multiplies 0.7×0.2. "I multiply $7 \times 2 = 14$. I know that a tenth times a tenth is a hundredth, so I use hundredths to write the product. The product is 0.14." Use properties to show that Tyler is correct.

$0.7 \times 0.2 = x$

$\frac{7}{10} \times \frac{2}{10}$

$\left(7 \times \frac{1}{10}\right) \times \left(2 \times \frac{1}{10}\right)$

$(7 \times 2) \times \left(\frac{1}{10} \times \frac{1}{10}\right)$

$14 \times \frac{1}{100} = \frac{14}{100} = 0.14$

Name _____

Another Example

A slice of bread has 1.25 grams of fat. How many grams of fat are in 1.5 slices?

$$1.25 \times 1.5 = \frac{125}{100} \times \frac{15}{10}$$
$$= \left(125 \times \frac{1}{100}\right) \times \left(15 \times \frac{1}{10}\right)$$
$$= (125 \times 15) \times \left(\frac{1}{100} \times \frac{1}{10}\right)$$
$$= 1{,}875 \times \frac{1}{1{,}000}$$
$$= \frac{1875}{1{,}000} = 1.875$$

There are 1.875 grams of fat in 1.5 slices of bread.

Guided Practice

Do You Understand?

1. Mason is multiplying $(3 \times 5) \times \left(\frac{1}{10} \times \frac{1}{10}\right)$. What decimal multiplication problem is he solving?

$(3 \times \frac{1}{10}) \times (5 \times \frac{1}{10}) = \frac{3}{10} \times \frac{5}{10} = 0.3 \times 0.5$

2. Complete Mason's work to find the product. Write it as a decimal.

$15 \times \frac{1}{100} = \frac{15}{100} = 0.15$

Do You Know How?

In **3–6**, use properties to find each product. Write the product as a decimal.

3. 3.9×0.7
4. 0.26×2.8
5. 2.6×1.4
6. 4.5×0.08

$3 \times 1 = 3$

$\frac{26}{10} \times \frac{14}{10}$

$(26 \times \frac{1}{10}) \times (14 \times \frac{1}{10})$

$(26 \times 14) \times (\frac{1}{10} \times \frac{1}{10})$

$364 \times \frac{1}{100} = \frac{364}{100} = 3.64$

$3\frac{64}{100} = 3.64$

$\frac{45}{10} \times \frac{8}{100}$

$(45 \times \frac{1}{10}) \times (8 \times \frac{1}{100})$

$(45 \times 8) \times (\frac{1}{10} \times \frac{1}{100})$

$360 \times \frac{1}{1{,}000} = \frac{360}{1{,}000} = 0.360 = 0.36$

Complete # 9, 14, 20, 21

Independent Practice

In **7–15**, write each product as a decimal.

7. 0.6×0.2
8. 0.33×0.8
9. 1.7×0.22
10. 1.8×0.9
11. 0.03×1.6
12. 4.2×4.2
13. 11.1×0.8
14. 1.16×0.4
15. 1.6×0.01

$\frac{17}{10} \times \frac{22}{100}$

$(17 \times \frac{1}{10}) \times (22 \times \frac{1}{100})$

$(17 \times 22) \times (\frac{1}{10} \times \frac{1}{100})$

$374 \times \frac{1}{1{,}000} = \frac{374}{1{,}000} = 0.374$

$\frac{116}{100} \times \frac{4}{10}$

$(116 \times \frac{1}{100}) \times (4 \times \frac{1}{10})$

$(116 \times 4) \times (\frac{1}{100} \times \frac{1}{10})$

$464 \times \frac{1}{1{,}000} = \frac{464}{1000} = 0.464$

*For another example, see Set D on page 228

Math Practices and Problem Solving

16. **MP.7 Use Structure** The total rainfall in March was 3.6 inches. In April, the total rainfall was 1.4 times as much. What was the total rainfall in April?

17. A newly hatched alligator is 0.5 foot long. An adult alligator is 16.4 times as long. How many feet longer is the adult alligator than the newborn alligator?

18. **MP.1 Make Sense and Persevere** The Nature Club held a grasshopper jumping contest. The distance Bugmaster jumped is 1.2 times the distance Green Lightning jumped. The distance Top Hopper jumped is 1.5 times the distance Bugmaster jumped. Complete the table to show the distances Bugmaster and Top Hopper jumped.

Grasshopper	Distance
Green Lightning	1.4 feet
Bugmaster	
Top Hopper	

19. Amanda bought a 6-cup bag of shredded cheese for $6.89. She used 2.25 cups to make lasagna and 1.25 cups to make pizza. How much cheese is left?

20. **Higher Order Thinking** Jodi drew the Eiffel Tower 6.5 inches tall. She thought it was too tall, so she multiplied its height by 0.8. The second drawing was too short, so she multiplied its height by 1.2. Predict whether her last drawing was shorter, the same as, or taller than her first drawing. Check your prediction by finding the height of the last drawing.

Prediction: 6.5 x 0.8 x 1.2 = x
Shorter. 6.24 in is less than 6.5 in.

6.5 ·1dp
x0.8 +1dp
5.20 2dp

5.2 1dp
x1.2 ·1dp
104 2dp
+520
6.24

Common Core Assessment

21. Which expression is equivalent to 0.4×0.3?

Ⓐ $\left(4 \times \frac{1}{100}\right) \times \left(3 \times \frac{1}{100}\right)$
Ⓑ $(4 \times 10) \times (3 \times 10)$
Ⓒ $\left(4 \times \frac{1}{10}\right) \times \left(3 \times \frac{1}{10}\right)$
Ⓓ $\left(4 \times \frac{1}{10}\right) \times \left(3 \times \frac{1}{100}\right)$

22. Which expression is equivalent to 0.71×2.8?

Ⓐ $(71 \times 28) \times \left(\frac{1}{100} \times \frac{1}{10}\right)$
Ⓑ $(71 \times 28) \times \left(\frac{1}{10} \times \frac{1}{10}\right)$
Ⓒ $(0.71 \times 2.8) \times \left(\frac{1}{100} \times \frac{1}{10}\right)$
Ⓓ $(71 \times 28) \times (100 \times 10)$

$\frac{4}{10} \times \frac{3}{10}$
$\left(4 \times \frac{1}{10}\right) \times \left(3 \times \frac{1}{10}\right)$ C