Lesson 4-4

Friday, October 11, 2019 1:51 PM

Name MB 183

Lesson 4-4
Multiply a Decimal by a Whole Number

I can ...
multiply a decimal by a whole number.

Content Standard 5.NBT.B.7
Mathematical Practices MP.2, MP.5, MP.6, MP.8

Solve & Share

A car travels 1.15 kilometers in 1 minute. If it travels at a constant speed, how far will it travel in 3 minutes? in 5 minutes? *Solve this problem any way you choose!*

Generalize
You can connect what you know about whole-number multiplication to multiplying a decimal by a whole number.

Estimate & Solve

3 minutes

1.15 x 3 = d
1 x 3 = 3

$$\begin{array}{r} 1.15 \\ \times\ 3 \\ \hline 3.45 \end{array}$$ 2dp + 0dp = 2dp

3.45 km

5 Minutes

1.15 x 5 = k
1 x 5 = 5

$$\begin{array}{r} 1.15 \\ \times\ 5 \\ \hline 5.75 \end{array}$$ 2dp + 0dp = 2dp

5.75 km

Look Back! MP.2 Reasoning How can addition be used to answer the questions above?

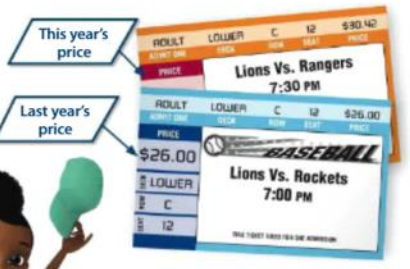
Multiplication is repeated addition.
1.15 + 1.15 + 1.15 = 3.45 km in 3 minutes.
1.15 + 1.15 + 1.15 + 1.15 + 1.15 = 5.75 km in 5 minutes.

Digital Resources at PearsonRealize.com Topic 4 | Lesson 4-4 183

Essential Question: How Do You Multiply a Decimal by a Whole Number?

A

The ticket price to a minor league baseball game increased by 0.17 times last year's ticket price. If last year's price was $26, how much is the increase?



You can multiply 0.17 × 26 by thinking about 17 × 26 and place-value patterns.

B Multiply as you would with whole numbers.

$$\begin{array}{r} {\scriptstyle 1\ 4}\\ 17\\ \times\ 26\\ \hline 102\\ +\ 340\\ \hline 442 \end{array}$$

C Use place-value patterns to help you place the decimal point.

Since 1.7 is $\frac{1}{10}$ of 17, $26 \times 17 = 442$

26×1.7 is $\frac{1}{10}$ of 442. $26 \times 1.7 = 44.2$

Since 0.17 is $\frac{1}{100}$ of 17,

26×0.17 is $\frac{1}{100}$ of 442. $26 \times 0.17 = 4.42$

The factors have a total of 2 decimal places, so the product has 2 decimal places.

The increase is $4.42.

Convince Me! MP.8 Generalize Here are two similar problems:

33	0.33
× 19	× 19
297	297
+ 330	+ 330
627	627

33 × 19 = 627.
30 × 20 = 600

0.33 × 19 = 6.27
0.3 × 20 = 6.0

The product should have the same place value as the estimate.

Place the decimal point correctly in each answer. Explain your thinking.

Name _____

Practice Buddy · Tools · Assessment

Guided Practice

Do You Understand?

1. What is the difference between multiplying a whole number by a decimal and multiplying two whole numbers?

When you multiply a whole number by a decimal you need to put a decimal in the product.

2. Use the admission information on the previous page. How much will admission cost to a minor league game this year? Explain how you found your answer.

$26 + 4.42 = $30.42

Do You Know How?

For **3–8**, find each product.

10 x 2 = 20

3. 9.8 × 2 → 19.6

4. 10.67 × 8 → 0dp + 0dp = 0dp

5. 34 × 5.3

6. 25 × 24 → 25 × 4.6 → 0dp + 1dp = 1dp → 126 + 840 = 966

5 x 20 = 100

7. 0.6 × 15

8. 55 × 1.1 → 55 × 1 = 55 → 55 × 1.1 → 0dp + 1dp = 1dp → 55 + 550 = 605

Complete # 14, 17, 25 $26

Independent Practice

For **9–20**, find each product.

Use what you know about whole-number multiplication to help you!

9. 34.6 × 9

10. 64.2 × 20

11. 40 × 0.22

12. 57 × 2.3

60 x 0.4 = 24.0

13. 5.8 × 11

14. 56 × 0.4 → 56 × 0.4 → 0dp + 1dp = 1dp → 22.4

15. 170 × 0.003

16. 0.3 × 99

30 x 2 = 60

17. 26 × 1.61 → 1.61 × 26 → 2dp + 0dp = 2dp → 966 + 3220 = 4186

18. 50 × 0.914

19. 10.76 × 100

20. 2.54 × 12

*For another example, see Set B on page 227

Math Practices and Problem Solving

21. **Math and Science** To meet peak energy demand, an electric power cooperative buys back electricity generated locally. They pay $0.07 per solar-powered kWh (kilowatt-hour). How much money does a school make when it sells back 956 kWh to the cooperative?

22. The airline that Vince is using has a baggage weight limit of 41 pounds. He has two green bags, each weighing 18.4 pounds, and one blue bag weighing 3.7 pounds. Are his bags within the weight limit? Explain.

23. **MP.6 Be Precise** Michael keeps track of how much time he uses his family's computer each week for 10 weeks. He created the frequency table with the data he collected. How many hours did Michael spend on the computer?

DATA

Number of Hours	Frequency
$3\frac{1}{2}$	2
4	4
$4\frac{1}{2}$	3
5	1

24. **MP.2 Reasoning** Sara is multiplying two factors, one with one decimal place and one with two decimal places. She says the product could have two decimal places. Is she correct? Explain your reasoning.

25. **Higher Order Thinking** Heather clears a rectangular region in her yard for a garden. If the length is a one-digit whole number and the width is 5.5 meters, what is the least possible area? What is the greatest possible area? Explain how you found your answers.

$1 \times 5.5 = 5.5\ m^2$

$9 \times 5.5 = 49.5\ m^2$

$\begin{array}{r} 5.5 \\ \times\ 9 \\ \hline 49.5 \end{array}$

The least area is $5.5\ m^2$ and the greatest is $49.5\ m^2$ because 1 is the smallest whole number and 9 is the greatest whole number.

Common Core Assessment

26. Which of the following equations is **NOT** true?

Ⓐ $75 \times 3 = 225$ True

Ⓑ $75 \times 0.3 = 22.5$ True

Ⓒ $7.5 \times 3 = 2.25$ F 22.5

Ⓓ $75 \times 0.03 = 2.25$ True

27. Which of the following equations is **NOT** true?

$\begin{array}{r} 75 \\ \times\ 3 \\ \hline 225 \end{array}$

Ⓐ $50 \times 12 = 600$

Ⓑ $50 \times 0.12 = 6$

Ⓒ $0.5 \times 12 = 60$

Ⓓ $50 \times 1.2 = 60$