Warm Up Problem of the Day Lesson Presentation Lesson Quizzes

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Problem of the Day

Tickets to the district swim meet cost \$7.50 for adults, \$3.50 for children, \$5.00 for senior citizens, and \$4.00 for students. The total revenue for the meet was \$8,570. What information is needed to find how many senior citizens were at the meet?

number of adults, children, and students who attended the meet

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Learn to multiply decimals.



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You can use decimal grids to model multiplication of decimals. Each large square represents 1. Each row and column represents 0.1. Each small square represents 0.01. The area where the shading overlaps shows the product of the two decimals.



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To multiply decimals, multiply as you would with integers. To place the decimal point in the product, count the number of decimal places in each factor. The product should have the same number of decimal places in the factors.



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Additional Example 1: Multiplying Integers by Decimals

as a place holder.

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Multiply. A.7 · 0.1 0 decimal places × 0.1 1 decimal place 0.7 0 + 1 = 1 decimal place $B_{-3} \cdot 0.03$ 0 decimal places -3 × 0.03 2 decimal places -0.090 + 2 = 2 decimal places. Use zero

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Additional Example 1: Multiplying Integers by Decimals

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- Multiply.
- C. 2.45 · 35

2.45

 \times 35

2 decimal places 0 decimal places

- 12 25 + 73 50
 - 85.75 2 + 0 = 2 decimal places

Check It Out: Example 1

0 + 2 = 2 decimal places. Use zero

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Multiply. A. 8 · 0.3	
8	0 decimal places
× 0.3	1 decimal place
2.4	0 + 1 = 1 decimal place
B. –2 · 0.04	
-2	0 decimal places
× 0.04	2 decimal places

as a place holder.

-0.08

Check It Out: Example 1

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Multiply.	
C. 3.65 · 15	
3.65 × 15	2 decimal places 0 decimal places
18 25	
+ 36 50	
54.75	2 + 0 = 2 decimal places

Additional Example 2A: Multiplying Decimals by Decimals

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Multiply. Estimate to check whether each answer is reasonable.

2.4 · **1.8**

2.4 × 1.8	1 decimal place 1 decimal place
1 92	
+ 2 40	
4.32	1 + 1 = 2 decimal places
Estimate	
$2 \cdot 2 = 4$	4.32 is a reasonable answer.

Additional Example 2B: Multiplying Decimals by Decimals

Multiply. Estimate to check whether each answer is reasonable.

- $-3.84 \cdot 0.9$
 - $\begin{array}{rrr} -3.84 \\ \times \ 0.9 \end{array} & \begin{array}{r} 2 \ decimal \ places \\ 1 \ decimal \ place \\ 2 + 1 = 3 \ decimal \ places \end{array}$

Estimate

 $-4 \cdot 1 = -4$ -3.456 is a reasonable answer.

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Check It Out: Example 2A

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Multiply. Estimate to check whether each answer is reasonable.

3.2 · 1.6 3.2 · 1.6 $\times 1.6$ 1 decimal place 1 decimal place + 3 20 5.12 1 + 1 = 2 decimal places Estimate $3 \cdot 2 = 6$ 5.12 is a reasonable answer.

Check It Out: Example 2B

Multiply. Estimate to check whether each answer is reasonable.

- -2.96 · 0.7
 - $\begin{array}{rrr} -2.96 & 2 \ decimal \ places \\ \times \ 0.7 & 1 \ decimal \ place \\ \hline -2.072 & 2 + 1 = 3 \ decimal \ places \end{array}$

Estimate

 $-3 \cdot 1 = -3$ -2.072 is a reasonable answer.

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Additional Example 3: *Application*

To find your weight on another planet, multiply the relative gravitational pull of the planet and your weight. The relative gravitational pull on Mars is 0.38. What would a person who weighs 85 pounds on Earth weigh on Mars?

- 0.38 <u>× 85</u> 1 90 + <u>30 40</u> <u>32.30</u>
- 2 decimal places
- 0 decimal places
- 2 + 0 = 2 decimal places

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Additional Example 3 Continued

To find your weight on another planet, multiply the relative gravitational pull of the planet and your weight. The relative gravitational pull on Mars is 0.38. What would a person who weighs 85 pounds on Earth weigh on Mars?

Estimate

0.5 • 80 = 40 32.30 is a reasonable answer.

The person would weigh 32.30 pounds on Mars.

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Check It Out: Example 3

Jet fuel weighs approximately 6.2 pounds per gallon. If a plane was serviced with 1,012 gallons of fuel, how many pounds of fuel were used?



0 decimal places 1 decimal place

1 + 0 = 1 decimal place

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Check It Out: Example 3 Continued

Jet fuel weighs approximately 6.2 pounds per gallon. If a plane was serviced with 1,012 gallons of fuel, how many pounds of fuel were used?

Estimate

6.0 • 1,000 = 6,000 *6,274.4 is a reasonable answer.*

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A plane would use 6,274.4 pounds of fuel.

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Multiply.

- **1.** 9 · 0.7 **6.3**
- **2.** 1.6 · 1.5 **2.4**

Multiply. Estimate to check whether each answer is reasonable. 3. 3.4 ·

4.1 13.94; *Estimate:* 3 • 4 = 12

4. 7.62 (-5.4) -41.148; *Estimate:* 8 • (-5) = -40

5. Dennis runs 7.2 miles per day. How far does he run in 5 days? **36 miles**

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- 1. Multiply.
- 7 · 0.5
- **A.** 35
- **B.**3.5
- **C.** 0.35
- **D.** 0.035



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- 2. Multiply.
- 4.5 · 3.6
- **A.** 12
- **B.** 15.4



D. 20



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3. Multiply and then estimate to check whether the answer is reasonable.

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2.4 · 3.2

- A. 12; estimate: $4 \cdot 3 = 12$ B. 7.68; estimate: $2 \cdot 3 = 6$ C. 6.8; estimate: $2 \cdot 3 = 6$
- **D.** 6; estimate: $2 \cdot 3 = 6$

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4. Multiply and then estimate to check whether the answer is reasonable.

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8.53 · (-6.3)

A.
$$-47.891$$
; estimate: $8 \cdot (-6) = -48$

B. -48.739; estimate:
$$8 \cdot (-6) = -48$$

C. -53.739; estimate: $9 \cdot (-6) = -54$
D. -54.891; estimate: $9 \cdot (-6) = -54$

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- 5. Kenneth travels 4.5 miles per day. How much does he travel in 6 days?
- A. 30 miles
- **B.** 28 miles
- C.27 miles
- **D.** 24 miles