

MB 505

Math Practices and Problem Solving
Lesson 8-9
Make Sense and Persevere

A rectangular dog park was built with the dimensions shown. The fencing that completely surrounds the park cost \$12 per square yard of grass sod that covers the entire park cost \$5. What was the total cost for the fencing and the sod? Solve the problem any way you choose.

$P \times 12 + A \times 5 =$ Thinking Habits

$P = (25\frac{1}{2} \times 2) + (8\frac{1}{4} \times 2)$
 $51 + 16\frac{1}{2}$
 $P = 67\frac{1}{2}$ yds
 $\$810 + 1,683 = \$2,493$

Look Back! **MP.1 Make Sense and Persevere** Before solving the problem, how do you know that the area of the dog park must be greater than 200 square yards?

$A = 25\frac{1}{2} \times 8\frac{1}{4}$
underestimate $25 \times 8 = 200$

$$67\frac{1}{2} \times 12 = \frac{135}{12} \times \frac{16}{1} = \frac{810}{1} = 810$$

$$67 \times 12 = 804$$

$$804 + 6 = 810$$

$A = l \times w$

$25\frac{1}{2} \times 8\frac{1}{4} = \frac{51}{2} \times \frac{33}{4} = \frac{1683}{8} = 210\frac{3}{8}$ yd²

$210\frac{3}{8} \times 8 = \frac{1683}{18} \times \frac{81}{1} = \frac{1683}{1} = \$1,683$

$8 \overline{) 1683} \begin{matrix} 210 \text{ r } 3 \\ \underline{-160} \\ 83 \\ \underline{-80} \\ 3 \end{matrix}$

$$\begin{array}{r} 810 \\ + 1683 \\ \hline 2493 \end{array}$$

How Can You Make Sense of Problems and Persevere in Solving Them?

Given is planning to tile the entire floor of the family room and kitchen. The cost \$12 per square foot. What is the total cost of tiling the family room and kitchen floors?

How can I make sense of and solve the problem?

I can:

- Identify the quantities given.
- understand how the quantities are related.
- choose and implement an appropriate strategy.
- check to be sure my work and answer make sense.

Find the area of the family room.
 $A = 17\frac{1}{2} \times 13\frac{1}{2} = \frac{35}{2} \times \frac{27}{2} = \frac{945}{4} = 236\frac{1}{4}$
The area of the family room is 236 square feet.

Find the area of the kitchen.
 $A = 12 \times 10\frac{1}{2} = 12 \times \frac{21}{2} = 126$
The area of the kitchen is 129 square feet.

Add to find the total area. $234 + 129 = 363$
Calculate the total cost. $363 \times 12 = 4,356$
The total cost is \$4,356.

Convince Me! **MP.1 Make Sense and Persevere** How much more does it cost to tile the family room floor than the kitchen floor? Show your work.

Difference in Area $\times 12$
 $(234\frac{1}{4} - 129\frac{1}{2}) \times 12$
 $105\frac{1}{4} \times 12 = \$1,260$

$$\begin{array}{r} 105 \\ \times 12 \\ \hline 210 \\ + 1050 \\ \hline 1260 \end{array}$$

Guided Practice

MP.1 Make Sense and Persevere A website has a daily trivia contest. On Mondays, Wednesdays, and Fridays, you have 12 hours to prepare an answer. On Tuesdays and Thursdays, you have 1 1/2 hours. On Saturdays and Sundays, you have only 1/2 of an hour. How many hours each week do you have to submit an answer?

1. Estimate the total hours each week you have to submit an answer. Write an equation to show your work.

$1\frac{1}{2} \times 2 + 1\frac{1}{4} \times 2 + \frac{1}{2} \times 7 = (3 \times 2) + (2 \times 2) + (7 \times \frac{1}{2}) = 6 + 4 + 3\frac{1}{2} = 13\frac{1}{2}$

2. Write an equation using multiplication and a variable to represent the problem. Then solve the equation.

$3 \times \frac{1}{2} + 2 \times \frac{1}{4} + 7 \times \frac{3}{4} = \frac{3}{2} + \frac{1}{2} + \frac{21}{4} = \frac{6}{4} + \frac{2}{4} + \frac{21}{4} = \frac{29}{4} = 7\frac{1}{4}$

$\frac{18}{4} + \frac{10}{4} + \frac{6}{4} = \frac{34}{4} = 8\frac{1}{2} \approx 8\frac{1}{2}$ hrs

Complete 3, 4, +5

Independent Practice

MP.1 Make Sense and Persevere Isabel is buying framing to go around the perimeter of one of her paintings. Each inch of framing costs \$0.40. What is the total cost of the framing for the painting?

3. What is the first step you need to do? What is the answer to the first step? Write an equation to show your work.

$P = (10\frac{1}{2} \times 2) + (6\frac{1}{4} \times 2)$
 $20\frac{1}{2} + 12\frac{1}{2} = 33$ in

4. What is the next step to solve the problem? What is the answer to the problem? Write an equation to show your work.

$33 \times 0.40 = c$ $c = 13.20$ 1320

5. How can you check that your answer makes sense?

Estimate for reasonableness
 $(10 \times 2) + (6 \times 2) = 20 + 12 = 32$
 $32 \times 0.5 = 16$

4. Write an equation to solve the problem. Write an equation to show your work.

$$33 \times 0.40 = c \quad c = \$13.20$$

$$\begin{array}{r} \times 0.40 \\ 33 \\ \hline 1320 \end{array}$$

5. How can you check that your answer makes sense?

Estimate for reasonableness

$$(10 \times 2) + (6 \times 2)$$

$$20 + 12 = 32$$

$$32 \times 0.5 = \$16$$

*For another example, see Set 1 on page 136.

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Math Practices and Problem Solving

Common Core Performance Assessment

Hiking Trails

The Farina family spent a week at the state park. Christine hiked the Evergreen trail twice and the Yellow River trail once. Brian hiked each of the three longest trails once. How many more miles did Brian hike than Christine?

| Name of Trail | Length (miles) |
|---------------|----------------|
| Evergreen | $4\frac{1}{2}$ |
| Hillcrest | 6 |
| Trout River | $2\frac{1}{2}$ |
| Yellow River | $3\frac{1}{2}$ |

6. **MP.1 Make Sense and Persevere** What do you know? What are you asked to find? What information do you not need?

7. **MP.1 Make Sense and Persevere** What information do you need to find before you can answer the final question?

8. **MP.4 Model with Math** Write equations to represent the information in Exercise 7.

9. **MP.1 Make Sense and Persevere** Solve the problem.

10. **MP.3 Construct Arguments** Explain why your answer makes sense.

Read the problem carefully so you can identify what you know and what you are asked to find.



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