

# Extended Problems Answer Key

## Big Ideas: Extended Problems

Use or adapt the feedback in this Answer Key as you grade each student paper. Answers will vary. Therefore, you must examine each answer based upon its own merits. Representative examples are shown here.

### Total Score: 25 points

Rami's uncle owns a pet store. Rami and his friends, Juan and Raj, spent a day at the pet store to learn more about it.

1. Juan explores the dog food aisle. He notices that the bags of dry dog food are sold in 21-pound and 32-pound bags. The 21-pound bags contain puppy food. The 32-pound bags contain adult food.
  - (a) Juan counts 26 bags of adult food. Draw an area model to multiply 26 by 32 to find the total number of pounds of adult food.
  - (b) Juan also counts 18 bags of puppy food. He concludes that there is a total of 378 pounds of puppy food.
    - Use rounding to justify his solution.
    - Use the standard algorithm to justify his solution.

### Sample response for Part (a)

	20	6	
30	600	180	
2	40	12	

$$26 \times 32 = 600 + 180 + 40 + 12 = 832$$

There were 832 pounds of adult food.

### Sample response for Part (b)

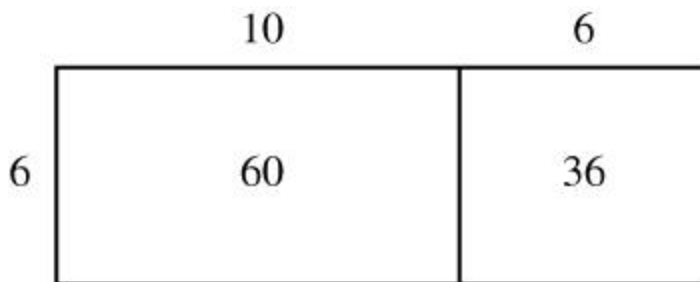
There were 18 bags of puppy food, which rounds to 20 bags. Each bag is 21 pounds, which rounds to 20 pounds. Therefore, there were about  $20 \times 20$ , or 400 pounds of puppy food, which is close to Juan's answer of 378 pounds.

$$\begin{array}{r}
 1 \\
 18 \\
 \times 21 \\
 18 \\
 + 360 \\
 \hline
 378
 \end{array}$$

There were 378 pounds of puppy food, so Juan's conclusion is correct.

2. Rami asks to help out in the storeroom. His uncle receives a shipment of 96 cans of Purrrfect Cat Food.
- (a) Rami separates the cans into 6 cases with the same number of cans in each case. Draw an area model to divide 96 by 6 to solve for the number of cans of Purrrfect Cat Food Rami puts in each case.
  - (b) Use the standard algorithm to divide 96 by 6 to solve for the number of cans Rami puts in each case.
  - (c) Rami's uncle also receives 152 cans of Kitty Meal Cat Food and 104 cans of Meow Meal Cat Food. Rami separates all of these cans evenly among 8 cases. He predicts that each case will hold a total of about 30 cans of cat food. Use estimation to determine whether Rami's prediction is reasonable.
  - (d) Use the information in part (c) to find the exact number of cans of cat food Rami puts in each case.

### Sample response for Part (a)



$$96 \div 6 = 10 + 6 = 16$$

Rami puts 16 cans in each case.

### Sample response for Part (b)

$$\begin{array}{r}
 16 \\
 6 \overline{)96} \\
 \underline{-60} \\
 36 \\
 \underline{-36} \\
 0
 \end{array}$$

Rami puts 16 cans in each case.

### Sample response for Part (c)

To find the number of cans of Kitty Meal Cat Food that will go in each case, divide  $152 \div 8$ . I used compatible numbers to estimate that about 20 cans of Kitty Meal Cat Food will go in each case.

$$160 \div 8 = 20$$

To find the number of cans of Meow Meal Cat Food that will go in each case, divide  $104 \div 8$ . I used compatible numbers to estimate that about 10 cans of Meow Meal Cat Food will go in each case.

$$100 \div 10 = 10$$

About  $20 + 10$ , or 30 cans of cat food will go in each case. Therefore, Rami's prediction is reasonable.

**Note:** Students may use follow a different estimation method to determine reasonableness. Accept any sound mathematical approach, including adding the total amount of cans first and then estimating to divide.

### Sample response for Part (d)

Number of cans of Kitty Meal Cat Food per case:

$$\begin{array}{r} 19 \\ 8 \overline{)152} \\ \underline{-80} \\ 72 \\ \underline{-72} \\ 0 \end{array}$$

Rami places 19 cans of Kitty Meal Cat Food in each case.

Number of cans of Meow Meal Cat Food per case:

$$\begin{array}{r} 13 \\ 8 \overline{)104} \\ \underline{-80} \\ 24 \\ \underline{-24} \\ 0 \end{array}$$

Rami places 13 cans of Meow Meal Cat Food in each case.

Rami places  $19 + 13$ , or 32 cans of cat food in each case.

**Note:** Students may take a different approach than that shown here by first adding  $152 + 104$  to get a total of 256 cans. They may then divide 256 by 8 to get 32 cans per case.

3. Raj checks out the dog crates. He sees that the cost of an extra-large dog crate is four times the cost of a small dog crate. An extra-large crate costs \$124.

(a) Find the cost of a small dog crate.

(b) A large dog crate costs three times as much as a small dog crate. Find the cost of a large dog crate.

### Sample response for Part (a)

$$\begin{array}{r} 31 \\ 4 \overline{)124} \\ \underline{-120} \\ 4 \\ \underline{-4} \\ 0 \end{array}$$

A small dog crate costs \$31.

(c) A

**Sample response for Part (b)**

$$\begin{array}{r} 31 \\ \times 3 \\ \hline 93 \end{array}$$

A large dog crate costs \$93.

4. Rami's uncle receives a shipment of two kinds of canned dog food. He receives 195 cans of Doggy Delicious and 218 cans of Pup's Palate. All three boys help Rami's uncle separate the cans into boxes. Each box is to hold 8 cans of Doggy Delicious or 8 cans of Pup's Palate.

- Draw an area model to divide 195 by 8 to solve for the number of boxes of Doggy Delicious that they can completely fill.
- Are there any cans of Doggy Delicious left over after filling the boxes? Explain how you know.
- Use the standard algorithm to divide 218 by 8 to solve for the number of boxes of Pup's Palate that they can completely fill.
- Are there any cans of Pup's Palate left over after filling the boxes? Explain how you know.
- By the end of the month, Rami's uncle will sell all of the boxes that the boys filled as well as all of the leftover cans. This table shows the prices for the canned dog food.

**Canned Dog Food Prices**

Dog Food Brand	Price Per Box	Price per Leftover Can
Doggy Delicious	\$21	\$3
Pup's Palate	\$32	\$5

Use your answers in parts (a)-(d) to find how much money Rami's uncle will earn from selling all of the boxes and leftover cans of dog food.

**Sample response for Part (a)**

	20	4	
8	160	32	3

$$195 \div 8 = 24 \text{ R}3$$

They can completely fill 24 boxes.

**Sample response for Part (b)**

When we divide 195 by 8, there is a remainder of 3. Therefore, there are 3 cans of Doggy Delicious left over.

**Sample response for Part (c)**

$$\begin{array}{r}
 27 \\
 8 \overline{)218} \\
 \underline{-160} \\
 58 \\
 \underline{-56} \\
 2
 \end{array}$$

They can completely fill 27 boxes.

**Sample response for Part (d)**

When we divide 218 by 8, there is a remainder of 2. Therefore, there are 2 cans of Pup's Palate left over.

**Sample response for Part (e)**

Money earned from selling the boxes of Doggy Delicious =  $24 \times \$21 = \$504$

Money earned from selling the leftover cans of Doggy Delicious =  $3 \times \$3 = \$9$

Money earned from the selling boxes of Pup's Palate =  $27 \times \$32 = \$864$

Money earned from selling the leftover cans of Pup's Palate =  $2 \times \$5 = \$10$

Total money earned from selling all of the dog food =  $\$504 + \$9 + \$864 + \$10 = \$1,387$

Rami's uncle earned \$1,387 from selling all the dog food.

**Note:** Students may take a different approach than that shown here by first finding the total amount earned from selling Doggy Delicious by adding  $\$504 + \$9$  to get a total of \$513. They may then find the total amount earned from selling Pup's Palate by adding  $\$864 + \$10$  to get a total of \$874. They may then add  $\$513 + \$874$  to get a total of \$1,387 earned.