Name _____ Date_____

Susan and John are buying cold drinks for a neighborhood picnic. Each person is expected to drink one can of soda. Susan says that if you multiply the unit price for a can of soda by the number of people attending the picnic, you will be able to determine the total cost of the soda. John says that if you divide the cost of a 12-pack of soda by the number of sodas, you will determine the total cost of the sodas. Who is right and why?

For each of the following problems, define the constant of proportionality to answer the follow-up question.

1. Bananas are $\$0.59$/pound.
   a. What is the constant of proportionality, k?
   b. How much will 25 pounds of bananas cost?

2. The dry cleaning fee for 3 pairs of pants is $\$18$.
   a. What is the constant of proportionality?
   b. How much will the dry cleaner charge for 11 pairs of pants?

3. For every $\$5$ that Micah saves, his parents give him $\$10$.
   a. What is the constant of proportionality?
   b. If Micah saves $\$150$, how much money will his parents give him?

4. Each school year, the 7^{th} graders who study Life Science participate in a special field trip to the city zoo. In 2010, the school paid $\$1{,}260$ for 84 students to enter the zoo. In 2011, the school paid $\$1{,}050$ for 70 students to enter the zoo. In 2012, the school paid $\$1{,}395$ for 93 students to enter the zoo.
   a. Is the price the school pays each year in entrance fees proportional to the number of students entering the zoo?
   b. Explain why or why not.
   c. Identify the constant of proportionality and explain what it means in the context of this situation.
   d. What would the school pay if 120 students entered the zoo?
   e. How many students would enter the zoo if the school paid $\$1{,}425$?

Susan and John are buying cold drinks for a neighborhood picnic. Each person is expected to drink one can of soda. Susan says that if you multiply the unit price for a can of soda by the number of people attending the picnic, you will be able to determine the total cost of the soda. John says that if you divide the cost of a 12-pack of soda by the number of sodas, you will determine the total cost of the sodas. Who is right and why?

Susan is correct. The table below shows that if you multiply the unit price, say 0.50, by the number of people, say 12, you will determine the total cost of the soda. I created a table to model the proportional relationship. I used a unit price of 0.50 to make the comparison.

Susan

Number of People	2	3	4	12
Total Cost of Soda (in dollars)	1	1.50	2	6

I used the same values to compare to John. $\frac{\textit{total cost}}{\textit{12 people}} = ?$

The total cost is $\$6$ and there 12 people. $\frac{6}{12} = \frac{1}{2}$*, which is $\$0.50$ or the unit cost, not the total cost*

For each of the following problems, define the constant of proportionality to answer the follow-up question.

1. **Bananas are $\$0.59$/pound.**
   a. **What is the constant of proportionality, *k*?**

      The constant of proportionality (k) is 0.59.

   b. **How much will 25 pounds of bananas cost?**

      $25(0.59) = \$14.75$

2. **The dry cleaning fee for 3 pairs of pants is $\$18$.**
   a. **What is the constant of proportionality?**

      $\frac{18}{3} = 6$*, so k is 6.*

   b. **How much will the dry cleaner charge for 11 pairs of pants?**

      $6(11) = \$66$

3. **For every $\$5$ that Micah saves, his parents give him $\$10$.**
   a. **What is the constant of proportionality?**

      $\frac{10}{5} = 2$*, so k is 2.*

   b. **If Micah saves $\$150$, how much money will his parents give him?**

      $2(150) = \$300$

4. Each school year, the 7^{th} graders who study Life Science participate in a special field trip to the city zoo. In 2010, the school paid $\$1,260$ for 84 students to enter the zoo. In 2011, the school paid $\$1,050$ for 70 students to enter the zoo. In 2012, the school paid $\$1,395$ for 93 students to enter the zoo.

a. Is the price the school pays each year in entrance fees proportional to the number of students entering the zoo?

Number of Students	*Price*	
84	$1,260$	$\frac{1,260}{84} = 15$
70	$1,050$	$\frac{1,050}{70} = 15$
93	$1,395$	$\frac{1,395}{93} = 15$

YES

b. Explain why or why not.

The price is proportional to the number of students because the ratio of the entrance fee paid per student was the same.

$\frac{1,260}{84} = 15$

c. Identify the constant of proportionality and explain what it means in the context of this situation.

The constant of proportionality (k) is 15. This represents the price per student.

d. What would the school pay if 120 students entered the zoo?

$120(15) = \$1,800$

e. How many students would enter the zoo if the school paid $\$1,425$?

$\frac{1,425}{15} = 95$ *students*