

## Lesson 3: Identifying Proportional and Non-Proportional Relationships in Tables

### Classwork

#### Example

You have been hired by your neighbors to babysit their children on Friday night. You are paid \$8 per hour. Complete the table relating your pay to the number of hours you worked.

Hours Worked	Pay
1	
2	
3	
4	
$4\frac{1}{2}$	
5	
6	
6.5	

Based on the table above, is the pay proportional to the hours worked? How do you know?

**Exercises**

For Exercises 1–3, determine if  $y$  is proportional to  $x$ . Justify your answer.

1. The table below represents the relationship of the amount of snowfall (in inches) in 5 counties to the amount of time (in hours) hours of a recent winter storm.

$x$ Time (h)	$y$ Snowfall (in.)
2	10
6	12
8	16
2.5	5
7	14

2. The table below shows the relationship between the cost of renting a movie (in dollars) to the number of days the movie is rented.

$x$ Number of Days	$y$ Cost (dollars)
6	2
9	3
24	8
3	1

3. The table below shows the relationship between the amount of candy bought (in pounds) and the total cost of the candy (in dollars).

$x$ Amount of Candy (pounds)	$y$ Cost (dollars)
5	10
4	8
6	12
8	16
10	20

4. Randy is planning to drive from New Jersey to Florida. Every time Randy stops for gas, he records the distance he traveled in miles and the total number of gallons used.

Assume that the number of miles driven is proportional to the number of gallons consumed in order to complete the table.

Gallons Consumed	2	4		8	10	12
Miles Driven	54		189	216		

### Lesson Summary

One quantity is proportional to a second if a constant (number) exists such that each measure in the first quantity multiplied by this constant gives the corresponding measure in the second quantity.

Steps to determine if two quantities in a table are proportional to each other:

1. For each given measure of Quantity  $A$  and Quantity  $B$ , find the value of  $\frac{B}{A}$ .
2. If the value of  $\frac{B}{A}$  is the same for each pair of numbers, then the quantities are proportional to each other.

### Problem Set

In each table determine if  $y$  is proportional to  $x$ . Explain why or why not.

1.

$x$	$y$
3	12
5	20
2	8
8	32

2.

$x$	$y$
3	15
4	17
5	19
6	21

3.

$x$	$y$
6	4
9	6
12	8
3	2

4. Kayla made observations about the selling price of a new brand of coffee that sold in three different sized bags. She recorded those observations in the following table:

Ounces of Coffee	6	8	16
Price in Dollars	\$2.10	\$2.80	\$5.60

- Is the price proportional to the amount of coffee? Why or why not?
  - Use the relationship to predict the cost of a 20 oz. bag of coffee?
5. You and your friends go to the movies. The cost of admission is \$9.50 per person. Create a table showing the relationship between the number of people going to the movies and the total cost of admission. Explain why the cost of admission is proportional to the amount of people.
6. For every 5 pages Gil can read, his daughter can read 3 pages. Let  $g$  represent the number of pages Gil reads and let  $d$  represent the number of pages his daughter reads. Create a table showing the relationship between the number of pages Gil reads and the number of pages his daughter reads. Is the number of pages Gil's daughter reads proportional to the number of pages he reads? Explain why or why not.

7. The table shows the relationship between the number of parents in a household and the number of children in the same household. Is the number of children proportional to the number of parents in the household? Explain why or why not.

Number of Parents	Number of Children
0	0
1	3
1	5
2	4
2	1

8. The table below shows the relationship between the number of cars sold and the amount of money earned by the car salesperson. Is the amount of money earned, in dollars, proportional to the number of cars sold? Explain why or why not.

Number of Cars Sold	Money Earned
1	250
2	600
3	950
4	1076
5	1555

9. Make your own example of a relationship between two quantities that is NOT proportional. Describe the situation and create a table to model it. Explain why one quantity is not proportional to the other.