Name ______________________________ Period ______

Proportional Relationships

Two quantities are ______________ ______ ________ _________ when there is a ______________(number) such that each measure in the first quantity (x) ______________ by this constant gives the corresponding measure in the second quantity (y).

Identify the measures in the first number with ______ and the measures in the second number with ________. The second quantity, y, is ______________ to the first quantity, x, if ______________ for some positive number ________.

Example 1

A new self-serve frozen yogurt store opened this summer that sells its yogurt at a price based upon the total weight of the yogurt and its toppings in a dish. Each member of your family weighed their dish and this is what you found:

Weight (ounces)	12.5	10	5	8
Cost ($)	5	4	2	3.20

Cost ______________________Weight.

1) Does everyone pay the same cost per ounce? __________ How do you know?

____

2) You have a relative that takes an extra-long time to create a dish of yogurt. When it is placed on the scale, it weighs 15 ounces. If everyone pays the same rate in this store, how much will this dish cost? ____________________

Conclusion: ______________________________

3) What happens if you do not serve yourself yogurt or toppings?

____

Does the relationship above still hold true? ______________________

Lesson Summary

How can you use a table to determine whether the relationship between two quantities is proportional? ____

____

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

In each table determine if **y** is proportional to **x**.

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

Identifying Proportional & Non-Proportional Relationships in Tables

Examine the situations and decide whether two quantities are proportional to each other by checking for a constant multiple between measures of **x** and measures of **y**.

Example 1

Example 1: Which Team Will Win the Race?

You have decided to run in a long distance race. There are two teams that you can join. Team A runs at a constant rate of 2.5 miles per hour. Team B runs 4 miles the first hour and then 2 miles per hour after that.

Task: Create a table for each team showing the distances that would be run for times of 1, 2, 3, 4, 5, and 6 hours. Using your tables, answer the questions that follow:

Team A	
Time (hrs)	Distance (miles)
1	2.5
2	5
3	7.5
4	10
5	12.5
6	15

Team B	
Time (hrs)	Distance (miles)
1	4
2	6
3	8
4	10
5	12
6	14

1) For which team is distance proportional to time? Explain.

2) Explain how you know if either team is not proportional to time.

3) If the race were 35 miles long, which team would win? Explain.

4) If the race were 4.5 miles long, which team would win? Explain.

5) For what length race would it be better to be on Team B than Team A?

6) Will there always be a winning team? Explain.

Identifying Proportional & Non-Proportional Relationships in Graphs

Two quantities are ______________________ to each other by ______________

On a coordinate plane and observing whether the graph is a ____________________

__________ through the ______________.

Opening Exercise

Isaiah sold candy bars to help raise money for his scouting troop. The table shows the amount of candy he sold to the money he received.

Is the amount of candy bars sold proportional to the money Isaiah received? How do you know?

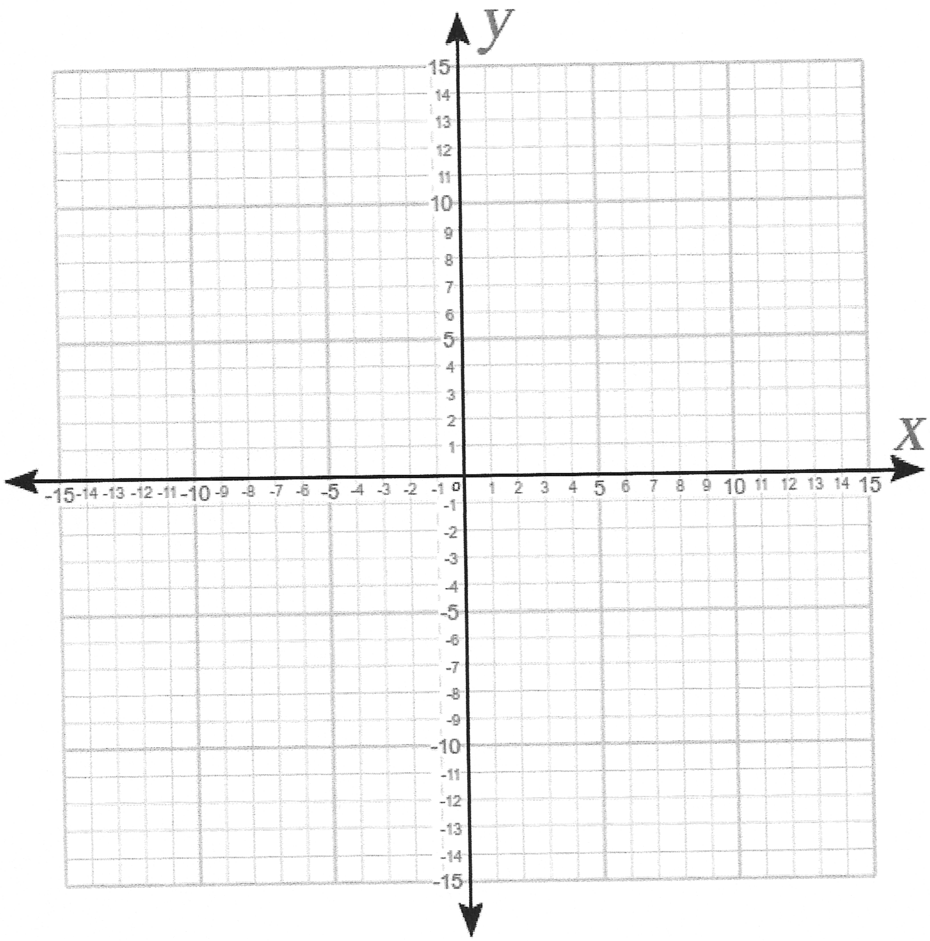
The two quantities are not proportional to each other because a constant describing the proportion does not exist.

x Candy Bars Sold	y Money Received ($)
2	3
4	5
8	9
12	12

1) Create a ratio table that contains two sets of quantities that are proportional to each other using the first ratio on the original table.

x	y
2	3
4	
8	
12	

Express the ratios from this table as ordered pairs. ____________________________



1) Where is the origin? ______________

2) What should we label the x axis and the y axis? ________________________

3) Could the axis be switched (the other way around)? ____________________

____

4) Plot the ratio pairs on the graph.

5) What observation can you make about the arrangement of points? ________

____

6) Would all proportional relationships pass through the origin? __________

7) What can you infer about graphs of two quantities that are proportional to each other? ____

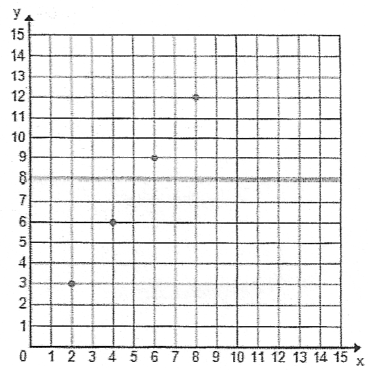
Example 1 Is this a proportional relationship? Why or why not?

____

____

Example 1: From a Table to Graph

x	y
2	3
4	6
6	9
8	12



Important Note:

Characteristics of graphs of proportional relationships:

1. *Points lie in a straight line.*
2. *Line goes through the origin.*

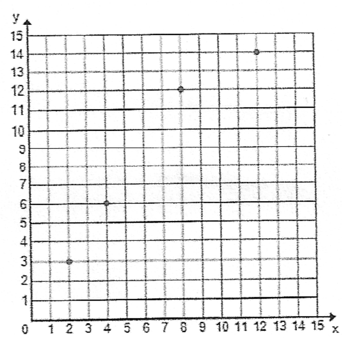
Example 2 Is this a proportional relationship? Why or why not?

____

____

Example 2

x	y
2	3
4	6
8	12
12	14



What can you predict about the graph of this ratio table?______________________

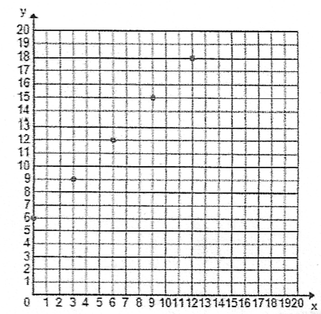
Example 3 Is this a proportional relationship? Why or Why not?

____

____

Example 3

x	y
0	6
3	9
6	12
9	15
12	18



Similarities with Example 1:

The points of both graphs fall in a line.

Differences from Example 1:

The points of Graph 1 fall in a line that pass through the origin. The points of Graph 3 fall in a line that do not pass through the origin.

What can you predict about the graph of this ratio table? ______________________

How are the graphs of the data in Example 1 and 3 similar? How are they different?

____

____

Lesson Summary:

When two proportional quantities are graphed on a coordinate plane, the points lie on a straight line that passes through the origin.