Proportional Relationships: Create Graphs

Procedural Lesson

Grade 7 · Unit 3 · Lesson 8

MC: 7.RP.2d▲

MPs ✓Applied MP * Embedded MP

1	2	3	4	5	6	7	8
*	✓	✓*	*		*		*

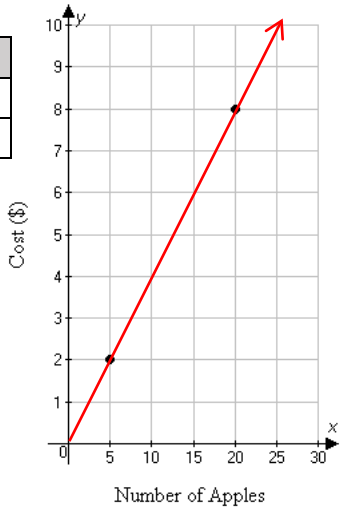
Problem of the Day

Objective: _____

Vocabulary

Proportional Relationship: a relationship between two equal ratios

Apples	Cost ($)
5	2
20	8



*The graph of a proportional relationship is a line that passes through the origin (0,0).

Ordered Pair: a pair of numbers used to locate a point on a coordinate plane; also, called the **coordinates**

(4, 3)

(*x*, *y*)

(horizontal, vertical)

Notes

Steps:

1. Convert data to ordered pairs.
2. Draw a coordinate plane.
3. Plot ordered pairs on the coordinate plane.
4. Draw a line connecting the points.
5. If the line is straight and goes through the origin (0,0), the relationship is proportional.

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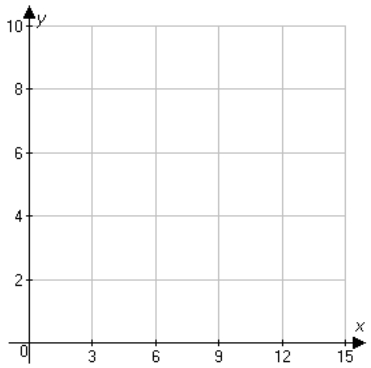
Structured Guided Practice

(A/B Partners Practice)

Directions: Graph to answer the following.

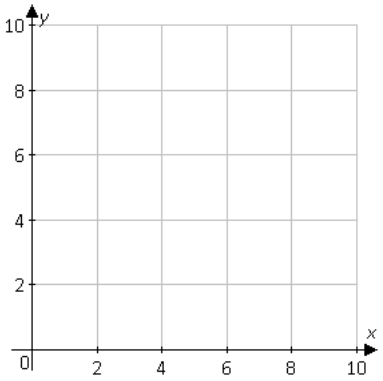
1. Convert the entries in the table to coordinate pairs, plot the coordinates on the coordinate plane, and determine which points lie on a straight line with the origin.

x	*y*
6	2
12	4
9	3



2. The table below gives the dimensions of two tents. Are the tents in proportion? How does it help to create a graph?

	Tent 1	**Tent 2**	**(*x*, *y*)**
Length	8 ft	4 ft	
Width	6 ft	3 ft	
Height	5 ft	3.5 ft	



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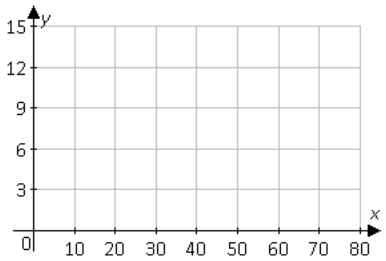
Final Check for Understanding

(Teacher Checks Work)

Directions: Graph to answer the following.

1. The table below gives the heights of several runners and their running speed. Is the ratio of each runner's height to speed proportional? How does it help to create a graph?

	Height	Speed
Runner 1	64 in.	6 mph
Runner 2	72 in.	12 mph
Runner 3	67 in.	8 mph



2. The table below gives the number of years several people have worked for a company and their salaries. Is the ratio of each person's number of years with company to salary proportional? How does it help to create a graph?

	Years	Salary	(*x*, *y*)
Moe	10	$3005/month	
Joe	20	$6010/month	
Bo	30	$9015/month	

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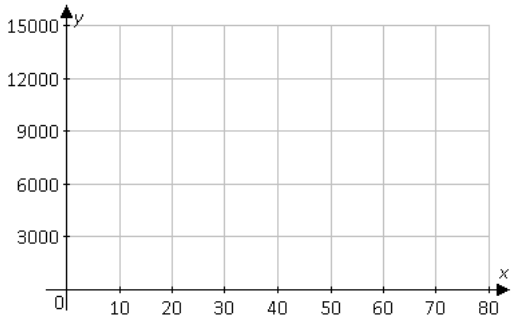

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Student Practice

Unit 3 · Lesson 8: Proportional Relationships: Create Graphs

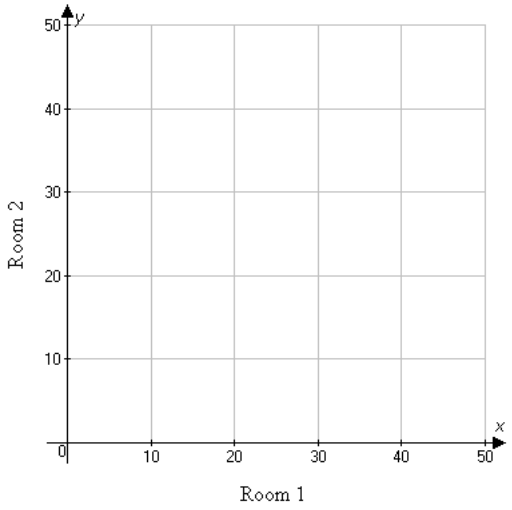
Name: _____

Date: _____

Directions: Graph to answer the following.

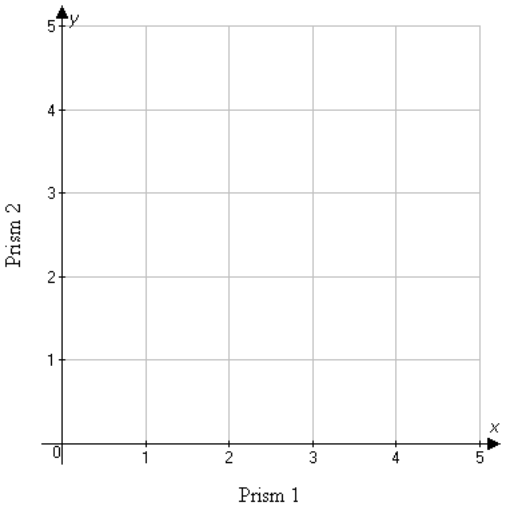
1. The table below gives the dimensions of two rooms. Are the rooms in proportion?

	Room 1	Room 2	(*x*, *y*)
Length	28 ft	42 ft	
Width	18 ft	27 ft	
Height	36 ft	54 ft	



2. The table below gives the dimensions of two prisms. Are the prisms in proportion?

	Prism 1	Prism 2	(*x*, *y*)
Length	5 in.	3 in.	
Width	3 in.	2 in.	
Height	5 in.	3 in.	



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Student Practice

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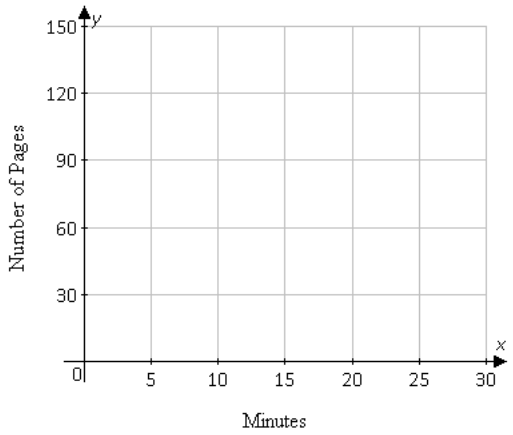
Directions: Graph to answer the following.

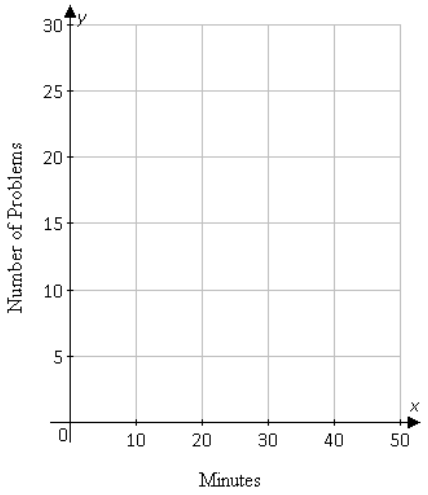
3. The table below gives the amount of time it took Dan to read a certain number of pages of his book each day. Is the number of pages to amount of time proportional?

	Time	# of Pages
Monday	5 min	15
Tuesday	30 min	90
Wednesday	15 min	45



4. The table below gives the amount of time it took Stan to complete a certain number of math problems each day. Is the number of problems to the amount of time proportional?

	Time	# of Problems
Monday	45 min	12
Tuesday	10 min	20
Wednesday	30 min	12



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Student Practice

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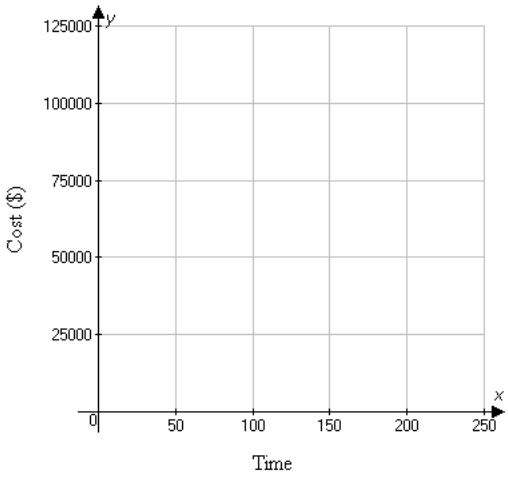
Name: _____

Date: _____

Directions: Graph to answer the following.

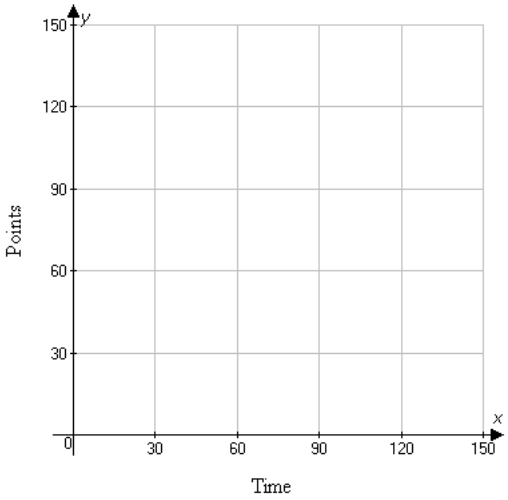
5. The table below gives the running time and production costs of two movies. Are the production costs proportional to the running time?

	Time	Costs
Movie A	54 min	$100,000
Movie B	2 hr 2 min	$50,000
Movie C	1 hr 36 min	$75,000



6. Several students' scores (out of 100) on an exam, along with how long they studied, are in the table below. Were their scores proportional to how long they studied?

	Study Time	Points
Lenny	2 hr	75
Benny	1 hr 36 min	60
Denny	2 hr 24 min	90



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Challenge Problems

Directions: Graph to answer the following.

1. Jan and Fran each drove from their houses. Their distances and driving times are below. Are their distances proportional to their times? If they are not proportional, what could either person have changed to make their distance and driving time proportional?

	Time	Distance
Jan	15 min	10 mi
Fran	2.5 hr	150 mi

2. Lou and Stu each made spaghetti. The table below gives how much spaghetti each made and how much sauce they used to make it. Was the amount of sauce used in proportion to the amount of spaghetti made? How does it help to create a graph?

	Spaghetti	Sauce
Lou	5 cups	$\frac{1}{3}$ cup
Stu	10 cups	$\frac{2}{3}$ cup

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Challenge Problems

Extension Activity

* **MP1:** Make sense of the problem and persevere in solving it.
* **MP4:** Apply mathematics in everyday life.

Fill in the table for the missing values.

Time (days)	$\frac{1}{2}$	1	2	3		
Amount of Book Read	$\frac{1}{4}$	$\frac{1}{2}$	1		$1\frac{1}{4}$	$3\frac{1}{2}$

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Closure

Reaching Consensus

**MP3:* *Do you agree or disagree with your classmate? Why or why not?*

Student Presentations

**MP1:* *What steps in the process are you most confident about?*
**MP6:* *Explain how you might show that your solution answers the problem.*

Closure

Recap today's lesson with one or more of the following questions:

✓*MP2:* *How are vertical coordinates related to horizontal coordinates in these problems?*
✓*MP3:* *How can you be sure that all of the given points in the problem are equivalent ratios?*

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Notes

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