

<p>Unit:1</p> <p>Unit Objective(s)/Big Ideas:</p> <ol style="list-style-type: none"> Analyze proportional relationships and use them to solve real world and mathematical problems. Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers. Solve real-life and mathematical problems using numerical and algebraic expressions and equations. Draw, construct and describe geometrical figures and describe the relationships between them. 	<p>Lesson: 1 of 1 Continued Date: 10-13-2016</p> <p>Lesson Objective(s):</p> <p>7.RP.2 Recognize and represent proportional relationships between quantities.</p> <p>7.RP.2a Decide whether two quantities are in a proportional relationship, e.g., by testing for equivalent ratios in a table or graphing on a coordinate plane and observing whether the graph is a straight line through the origin.</p> <p>7.RP.2b Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships.</p> <p>Students will Use direct variation to solve problems</p> <p>Essential Question(s): How can I show that 2 objects are proportional?</p>
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I = Introduction T = Teacher Directed S = Student Centered Learning Activities C = Closure H = Homework

Mark on the chart below the instructional methods and strategies used in each section.

Instructional Delivery Method					Instructional Strategy					
Method	I	T	S	C	Strategy	I	T	S	C	H
Class discussion					Similarities & Differences					
Guided practice/modeling					Summarizing & Note Taking		x			
Hands on/experiment/lab			x		Reinforcing Effort & Recognition		x			
Learning centers					Homework and Practice			x		
Lecture					Nonlinguistic Representations					
Peer evaluation					Cooperative Learning					
Seatwork		x			Setting Objectives & Feedback	x	x	x		
Student presentations					Generating and Testing Hypotheses					
Technology			x		Questions, Cues, Advance Organizers					
Cooperative Learning					Vocabulary		x	x		
Culturally Responsive Teaching					Technology					x
Other: _____					Culturally Responsive Teaching					

Section	Detailed Explanation
I	As students enter the classroom, have them begin data binder for math.

<p>Introduction Prior Knowledge</p>	<p>They will also spend time completing their quiz over slope and proportionality.</p> <p>Students will also be working on ALEKS when finished with today's lesson for approx 30 minutes.</p>
<p>T Teacher Directed Instruction</p>	<p>There are two ways to tell if two ratios form a proportion. You must either show that the ratios are equivalent fractions or show that the cross products are equal.</p> <p>It is usually easier to simplify ratios before finding equivalent fractions or multiplying to find cross products.</p> <p>A proportion can be written in a variety of ways as long as there is a relationship among the ratios involved.</p> <p>A relation that does not have these characteristics is not a proportion.</p> <p>The rate ratio is written as a fraction, which implies the operation of division. Remind students that this is a clue for how to find the unit rate.</p> <p>A rate of change describes how one quantity changes in relation to another.</p>
<p>S Student Learning Activities</p>	<p>Ask the scaffolded questions for each example to differentiate instruction. page 81-88</p> <p>1. Find a constant ratio.</p> <ul style="list-style-type: none"> • How does the graph show that there is a constant rate of change? The graph is a straight line. • How do you determine if there is a constant ratio between the two quantities? Divide the height by the time. • Are the quantities proportional? Explain. Yes, they are proportional because they have a constant ratio. • How does the graph show that the relationship is proportional? It is a straight line that passes through the origin. • What is the difference between a constant rate of change and a constant of proportionality? The constant rate of change is the change in y compared to the change in x. The constant of proportionality is the ratio of y to x. If there is a constant rate of change, there may or may not be a constant of proportionality. <p>Need Another Example?</p>

The amount of money Serena earns at her job is shown in the graph. Determine the rate in dollars per hour. **\$10 per hour**

2. Identify and explain what the constant of proportionality represents.

- **Does the amount of money Julio earns each hour change? No, it is always \$10 per hour.**
- **What does "k" represent? the constant rate of change**
- **In your own words, what does the "constant of proportionality" mean? Sample answer: The two quantities are always in the same (constant) proportion (ratio) to one another.**
- **Describe what this relationship would look like, if graphed. a straight line that passes through the origin**
- **What would be some of the ordered pairs on the line? Sample answer: (0,0), (1, 10), (2, 20), (3, 30), (4, 40)**

Need Another Example?

Neil is practicing for his typing test. The equation $y = 45x$ represents the total number of words y he can type in x minutes. Identify the constant of proportionality. Then explain what it represents in this situation. **45; Neil can type 45 words per minute.**

3. Determine direct variation.

- **How do you find each cost in the table? Multiply the number of pizzas by \$8. Then add \$3 for the delivery charge.**
- **How do you find each ratio? Divide each cost by the number of pizzas.**
- **How do you know that this relationship is not a direct variation? The ratios are not the same and the line does not pass through the origin.**
- **How could you alter the scenario so that the relationship would be a direct variation? Sample answer: Eliminate the \$3 delivery charge.**

Need Another Example?

A photographer charges a \$30 sitting fee and then \$6 for each photograph ordered. Make a table and a graph to show the cost of 1, 2, 3, and 4 photographs. Is there a direct variation? Explain.

$$\frac{36}{1} \neq \frac{42}{2}$$

no; Sample answer: ; Because there is no constant ratio and the line does not go through the origin, there is no direct variation.

4. Determine direct variation

$$\frac{12}{1}$$

- **Are all of the ratios the same? If so, what are they? yes; or 12**
- **Does the amount of money earned each hour remain constant? Explain. Yes, the amount of money earned is a constant \$12 per hour.**
- **Does this table represent a direct variation? Explain. Yes, the ratios are the same.**
- **Why is the constant of proportionality a "constant"? The ratio always remains the same.**

Need Another Example?

Determine whether the relationship is a direct variation. If so, state the constant of proportionality. no

continue from here

page 85 and 87 and 88

Closure

Materials Needed: glencoe text pages 81-88

Assessment: HSD 7th grade Activity #5

Special Notes: ALEKS is assigned as homework for 30min a night 5 times a week

vocabulary: coordinate plane
quadrants
ordered pair
x-coordinate
y-coordinate
y-axis
origin
x-axis

direct variation
constant of variation
constant of proportionality

Quality Questions:
imbedded in lesson plan

HSD Lesson Plan Protocol

Teacher: Pearce

Subject: Math

Gr:7