7th MATH: Module 2 Ratios and Proportional Relationships
Lessons 1-5

OVERVIEW

In these lessons, students find unit rates in ratios involving fractional quantities. Make connections to 6th grade Proportional Relationships Learning. Students learned to make sense and conceptualize these relationships using tape diagrams, double number lines, and ratio tables. Students should use these methods to solve proportional relationship problems to relating proportional relationships to equivalent fractions.

7th Grade SBAC Evidence Statements for Proportional Relationships:

- ➔ The student computes unit rates and finds the constant of proportionality of proportional relationships in various forms.
- ➔ The student determines whether two quantities, shown in various forms, are in a proportional relationship.
- ➔ The student represents proportional relationships between quantities using equations.
- ➔ The student interprets specific values from a proportional relationship in the context of a problem situation.

Lesson 1	Lesson 2	Lesson 3	Lesson 4	Lesson 5
Unit Rate with Whole Numbers	Unit Rate with Fractions	Unit Rate with Fractions	Recognize and Represent Relationships (tables, graphs) Determine if table and graph are proportional	

LESSON 1

Unit Rates, Equivalent Ratios, Comparing Ratios	Overview Presentation Today's focus will be on unit rates associated with ratios of whole numbers to prepare students for unit rates with ratios of fractions in the next lesson.
Target A **Standard 7.RP.1**	Compute unit rates associated with ratios of fractions, including ratios of lengths, areas and other quantities measured in like or different units.
Learning Intention **Success Criteria**	**Learning Intention:** I will find the unit rate of ratios involving whole numbers. **Success Criteria: I will be successful by correctly:** • determining what the question is asking. • putting labels • setting up the ratio with the numerator and denominator • describing the unit rate with a sentence frame
Skills	• describe relationships between two quantities • create tables and graphs • explain informally your thinking through verbal/written form • find unit rates in ratios • use reasoning about equivalent fractions (whole number first to practice notation) • use other quantities measured in like or different units
Vocabulary	Unit rate (constant of proportionality), equivalent ratios, quantities, for each, per
Sentence Frames	For every _____, there are _____. The unit rate is _____ per _____. The constant of proportionality is _____.
Intro	**Opening** **Warm Up: Encourage students to fill in the ratio table using the unit rate** 
Lesson **Closing**	Overview Presentation
Resources	Youtube Tape Diagram Examples, Youtube Tape Diagram Examples #2 Math Behaviors (English and Spanish) Math Frameworks pg 332 7th Unit 1 Pg. 7 Learn Zillion Proportional Relationships Examples: Multiple Representations desmos.com, learn.desmos.com, teacher.desmos.com student.desmos.com

Packs of gum	1	2		7
Cost	$1.50		$4.50	

LESSON 2

Unit Rates, Tables/Graphs	Practice Problems
Target A **Standard 7.RP.1**	Compute unit rates associated with ratios of fractions, including ratios of lengths, areas and other quantities measured in like or different units.
Learning Intention **Success Criteria**	**Learning Intention:** I will find the unit rate of ratios involving fractions. **Success Criteria: I will be successful by correctly:** • determining what the question is asking. • putting labels • setting up the ratio with the numerator and denominator • describing the unit rate with a sentence frame *using (keep it, change it, reciprocal) when dividing fractions
Skills	• compare ratios/equivalent ratios • describe relationships between two quantities • create tables and graphs • explain informally your thinking through verbal/written form
Vocabulary	rate, ratio, quantities, for each, per, **variables (as numerical values)
Sentence Frames	For every _____, there are _____. The rate is _____ per _____.
Intro	**Warm-up** Continue to build off from the previous day to complete the ratio table.
Lesson	**Model/Think Aloud:** Practice Problems
Closing	**Suggestions for closing include:** **Exit ticket: Students create a table that illustrates these relationships.** • If you mow ¼ of a lawn with ½ of a gallon of gas, how much lawn will you mow with 1 gallon of gas? • How many gallons of gas will you use for 1 ½ lawns mowed?
Resources	Youtube Tape Diagram Examples, Youtube Tape Diagram Examples #2 Math Behaviors (English and Spanish) Math Frameworks pg 332 7th Unit 1 Pg. 7 Learn Zillion Proportional Relationships Examples: Multiple Representations desmos.com, learn.desmos.com, teacher.desmos.com student.desmos.com

Packs of gum	1	2		7	10			99
Cost	$1.50		$4.50			$37.50	$75.00	

LESSON 3

Unit Rate, Equivalent Ratios, Graphs	Overview Presentation
Prep for: **Target** A **Standard 7.RP.1**	Compute unit rates associated with ratios of fractions, including ratios of lengths, areas and other quantities measured in like or different units.
Learning Intention **Success Criteria**	**Learning Intention:** I will find the unit rate of ratios involving fractions. **Success Criteria: I will be successful by correctly:** • compute the unit rate (constant of proportionality) by dividing fractions or through reasoning of equivalent fractions • labeling quantities and parts of a graph • writing the unit rate as a ratio with a denominator of 1 • describing the unit rate with a sentence frame
Skills	• describe relationships between two quantities • create tables and graphs • explain informally your thinking through verbal/written form • find unit rates in ratios • use reasoning about equivalent fractions • use other quantities measured in like or different units
Vocabulary	Unit rate (constant of proportionality), equivalent ratios, quantities, for each, per
Sentence Frames	For every _____, there are _____. The unit rate is _____ per _____. The constant of proportionality is _____.
Intro	**Opening** Which One Doesn't Belong?
Lesson	**Task** Overview Presentation
Closing	**Check for Understanding:** Create a google form to answer the following questions. Example of Google Form (make a copy if you want to edit): • Short answer: What is the unit price per ticket? • Short answer: What does the ordered pair (2,20) represent on the graph?(graph is provided on slide deck)
Resources	Youtube (proportional or not?) Math Behaviors (English and Spanish) Math Frameworks pg 332 7th Unit 1 Pg. 7 Learn Zillion Proportional Relationships Examples: Multiple Representations desmos.com, learn.desmos.com, teacher.desmos.com student.desmos.com

LESSON 4

Proportional Relationships	Overview Presentation Today's focus is determining whether a table is proportional, as well as, graphing coordinate points and observing the behavior of the graph.
Prep for: **Target** A **Standard** 7.RP.2a	Recognize and represent proportional relationships between quantities. a. Decide whether two quantities are in a proportional relationship, eg., 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.
Learning Intention **Success Criteria**	**Learning Intention:** I will be able to determine if a table and a graph are proportional. **Success Criteria: I will know I am successful when I can:** ● observe whether the line passess through the origin (0,0) ● correctly label parts of a graph ● decide whether two ratios are equivalent ● observe whether the line is straight or not
Skills	● creating tables, graphs, and double number line representations ● explain informally your thinking through verbal/written form ● division/multiplication
Vocabulary	proportional, equivalent ratios, unit rate, coordinate plane/point, quadrants, x-axis, y-axis, origin
Sentence Frames	The table or graph is _____, because _____, _____, _____. The table or graph is not _____, because _____. The graph shows a _____ relationship, because _____,_____,_____.
Intro	Estimation 180 ● Students can discuss and share estimates before you reveal answers. This will allow them to practice number sense/reasoning.
Lesson	Overview Presentation
Closing	**Check for Understanding:** ● Create a google form, slide deck, doc, etc. and ask the students to look at tables, graphs, or a word problem to determine if a relationship is proportional. ○ Example: Example of Google Form (make a copy if you want to edit)
Resources	Youtube (proportional or not?) Math Behaviors (English and Spanish) Math Frameworks pg 332 7th Unit 1 Pg. 10 Examples: Multiple Representations Learn Zillion Proportional Relationships desmos.com, learn.desmos.com, teacher.desmos.com student.desmos.com

LESSON 5

Proportional Relationship (tables and graphs)	Overview Presentation
Prep for: **Target** A **Standard** 7.RP.2 *a*	Recognize and represent proportional relationships between quantities. a. Decide whether two quantities are in a proportional relationship, eg., 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.
Learning Intention **Success Criteria**	**Learning Intention:** I will be able to determine if a table and a graph are proportional. **Success Criteria: I will know I am successful when I can:** • observe whether the line passess through the origin (0,0) • correctly label parts of a graph • decide whether two ratios are equivalent • observe whether the line is straight or not
Skills	• tables, tape diagrams, and double number line representations • explain informally your thinking through verbal/written form • division
Vocabulary	proportional, constant of proportionality, equivalent ratios, unit rate, coordinate plane, quadrants, x-axis, y-axis, origin
Sentence Frames	The table or graph is _____, because _____, _____, _____. The table or graph is not _____, because _____. The graph shows a _____ relationship, because _____,_____,_____.
Intro	Estimation 180
Lesson	Overview Presentation
Closing	**Check for Understanding:** Create a google form to answer the following questions. Example of Google Form (make a copy if you want to edit)
Resources	Youtube (proportional or not?) Math Behaviors (English and Spanish) Math Frameworks pg 332 7th Unit 1 Pg. 10 Examples: Multiple Representations Learn Zillion Proportional Relationships Rule of Four Templates desmos.com, learn.desmos.com, teacher.desmos.com student.desmos.com