



Campus: Clark & Southard Middle School

Author(s): Lawrence, Smith,
Thompson

Date Created / Revised: 7/28/2021

Six Weeks Period: 2nd six weeks

Grade Level & Course: 7th & 8th Math, 7th Grade Honors

Timeline: 6 days

Unit Title: Unit 4 Proportional
Reasoning with Ratios, Rates
and Percents

Lesson # 1 of 1

Stated Objectives:
TEK # and SE

7.4 Proportionality. The student applies mathematical process standards to represent and solve problems involving proportional relationships

7.4(B) calculate unit rates from rates in mathematical and real-world problems

7.4(D) solve problems involving ratios, rates, and percents, including multi-step problems involving percent increase and percent decrease, and financial literacy problems

7.4(E) convert between measurement systems, including the use of proportions and the use of unit rates

See Instructional Focus Document (IFD) for TEK Specificity

<p>Key Understandings</p>	<p>Numbers are an efficient way to represent quantities and numeric relationships.</p> <ul style="list-style-type: none"> • Why is it important to understand the value of numbers? • What relationships exist between and within numbers, and how are they used? • Why is it important to understand rational numbers? • How are different forms of rational numbers used in everyday situations? <p>Algebraic reasoning facilitates representing, generalizing, and formalizing patterns and relationships in everyday life.</p> <ul style="list-style-type: none"> • How can situations be identified and described algebraically? <p>Proportional reasoning can be used to describe and solve problems in everyday life.</p> <ul style="list-style-type: none"> • How can proportional reasoning be used to make predictions and comparisons in problem situations? <p>A problem-solving model can be applied to critical reasons through various problem situations in order to solve problems and analyze solutions.</p> <ul style="list-style-type: none"> • How can the information in a problem be analyzed to determine the question being asked and the relevant information provided and/or needed? • What types of plans and/or strategies can be used to solve problems? • How can solutions to problems be determined? • How can solutions to problems be justified? • How can the reasonableness of solutions and the problem solving process be evaluated
----------------------------------	---

Misconceptions

- Some students may only use additive thinking rather than multiplicative thinking when solving proportions.
- Some students may think ratios and rates may not be represented on a graph rather than realizing all ratios and rates can be viewed as ordered pairs.
- Some students may generate an "equivalent" ratio by exchanging the numbers in a ratio without their appropriate labels rather than interpreting the ratio as a comparison that must maintain the same relationship. (e.g., 2 girls:3 boys is not equivalent to 3 girls:2 boys)
- Some students may think that the order of the terms in a ratio or proportion is not important.
- Some students may think that generating an equivalent ratio is different from generating an equivalent fraction.
- Some students may think that all ratios are fractions, rather than understanding that a ratio may represent a part-to-part or part-to-whole relationship.
- Some students may think that rates are not related to ratios.
- Some students may think that a unit rate must have a denominator of one rather than understanding that a unit rate is a ratio between two different units where one of the terms is one.
- Some students may not make the connection between the constant rate of change r , in $d = rt$, to the constant of proportionality, k , in $y = kx$.
- Some students may not connect the constant rate of change to m in the equation $y = mx + b$.

<p>Key Vocabulary</p>	<ul style="list-style-type: none"> • Commission • Income tax • Markdown • Markup • Percent • Percent decrease • Percent increase • Rate • Ratio • Sales tax • Tax • Taxes • Tip • Unit rate 	
<p>Suggested Day 5E Model</p>	<p>Instructional Procedures (Engage, Explore, Explain, Extend/Elaborate, Evaluate)</p>	<p>Materials, Resources, Notes</p>

<p><i>Day 1</i></p> <p><i>Engage</i></p> <p><i>Explore</i></p> <p><i>Explain</i></p> <p><i>Extend/Elaborate</i></p> <p><i>Evaluate</i></p> <p>TEKS 7.4BD</p>	<p>Learning Objective: Students use ratios and proportions to solve problems</p> <p>Instructional Procedures:</p> <p>Bellwork - Students work on IXL 7th Grade</p> <p>Engage: Flocab Video on Proportional Relationships and Unit Rate or Schmoop</p> <p>https://www.shmoop.com/video/equivalent-ratios-and-proportions</p> <p>Explore: Students use their previous knowledge to review proportions.</p> <p>Vocab: Ratio, Rate, Unit Rate</p> <p>Explain: Teacher guides MtM Notes focusing on setting up proportions. Teacher guides #1-4 . Students work with partner on #5.</p> <p>Extend/Elaborate: Relate proportions back to real life scenarios at school when we could use this knowledge to help solve a problem.</p> <p>Evaluate: Students independently complete 10 questions to ensure they understand setting up proportions.</p> <p>Learning Objective: Students find and use unit rates.</p> <p>Engage:</p> <p>https://www.youtube.com/watch?v=iFh2VvM9iyM</p> <p>Explore: Students pair up and find their pulse. They count the number of heartbeats while their partner times one minute. Relate beats per minute to unit rate definition.</p> <p>Explain: Teacher guided MtM notes.</p>	<p>Bellwork - IXL 7th</p> <ul style="list-style-type: none"> • Ratios and Proportions - Notes and Assignments • IXL 7th Grade • Day 1 Folder • Desmos Activity: Marcellus the Giant
--	--	---

	<p>Extend/Elaborate: Have students pair up with whiteboards. Go through 5 examples of real life "better deal" slides together and discuss.</p> <p>Evaluate: Students independently complete IXL 7th Grade M to master Unit Rates.</p> <p>Closing Task: Students write 5 Unit Rate examples.</p>	
<p>Day 2</p> <p><i>Engage</i></p> <p><i>Explore</i></p> <p><i>Explain</i></p> <p><i>Extend/Elaborate</i></p> <p><i>Evaluate</i></p> <p>TEKS 7.4E</p>	<p>Learning Objective: Students find conversion between measurement systems using proportions.</p> <p>Instructional Procedures:</p> <p>Bellwork - Students work on IXL 7th M.</p> <p>Engage: Introduce wanting to ride a ride at a theme park but needing to convert your height to ensure you are tall enough.</p> <p>Explore: Examine conversion chart and discuss the relationship between conversions and unit rate.</p> <p>Explain: Teacher guides MtM notes.</p> <p>Extend/Elaborate: Students will pair up and work on 5 Q conversion assignments.</p> <p>Evaluate: Students take a Rates and Proportion Quiz to ensure understanding before moving to the next concept.</p> <p>Closing Task: Students convert your teacher's height between measurement system</p>	<p>Bellwork - IXL 7th M</p> <ul style="list-style-type: none"> • Measurement Conversions - Notes and Assignments • IXL 7th Grade • Day 2 Folder

<p><i>Day 3</i></p> <p><i>Engage</i></p> <p><i>Explore</i></p> <p><i>Explain</i></p> <p><i>Extend/Elaborate</i></p> <p><i>Evaluate</i></p> <p>TEKS 7.4D</p>	<p>Learning Objective: Students learn and apply Modeling Percents, Percent Proportions and Equations.</p> <p>Instructional Procedures:</p> <p>Bellwork - Students work on IXL 7th Grade M.</p> <p>Engage: Students review modelig percents in various ways. (percent strips, %/100 etc.)</p> <p>Explore: Students discuss real-life situations involving percents.</p> <p>Explain: Teacher guides notes and discusses with students about various ways to solve percent problems.</p> <p>Extend/Elaborate: Students extend their knowledge to apply percent problems in pairs, guided by a teacher or independently.</p> <p>Evaluate: Students independently complete IXL 7th grade L.</p> <p>Closing Task: Students use their percent strategies to find a percent of a number.</p>	<p>Bellwork - IXL 7th M</p> <ul style="list-style-type: none"> • Modeling Percents - Notes and Assignments • Percent Proportions and Equations - Notes and Assignments • IXL 7th Grade L • Day 3 Folder
<p><i>Day 4</i></p> <p><i>Engage</i></p> <p><i>Explore</i></p> <p><i>Explain</i></p> <p><i>Extend/Elaborate</i></p> <p><i>Evaluate</i></p> <p>TEKS 7.4D</p>	<p>Learning Objective: Students use their knowledge to apply percent problems and take a quiz.</p> <p>Instructional Procedures:</p> <p>Bellwork - Students work on IXL 7th Grade L .</p> <p>Engage: Students review several different percent strategies.</p> <p>Explore: Teacher and students discuss real-life situations such as markdown, mark up, discount, tip etc.</p>	<p>Bellwork - IXL 7th L</p> <ul style="list-style-type: none"> • Percent Application - Notes and Assignments • Percent Quiz • IXL 7th Grade • Day 4 Folder

	<p>Explain: Teacher guides notes and shows various ways to solve percent problems.</p> <p>Extend/Elaborate: Students extend their knowledge and apply percent problems in pairs, guided by a teacher or independently.</p> <p>Evaluate: Students take a percent quiz.</p> <p>Closing Task: Students write a process to find a sales price of an item.</p>	
<p><i>Day 5</i></p> <p><i>Engage</i></p> <p><i>Explore</i></p> <p><i>Explain</i></p> <p><i>Extend/Elaborate</i></p> <p><i>Evaluate</i></p> <p>TEKS 7.4D</p>	<p>Learning Objective: Students learn and apply Percent Change.</p> <p>Instructional Procedures:</p> <p>Bellwork - Students work on IXL 7th.</p> <p>Engage: Students review percent proportion.</p> <p>Explore: Students discuss real-life situations involving number increase and decrease.</p> <p>Explain: Teacher guides notes and discusses with students about the percent change and relates to real-life situations. Teacher shows the process of finding percent change.</p> <p>Extend/Elaborate: Students extend their knowledge and practice finding percent change in pairs, guided by a teacher, or independently.</p> <p>Evaluate: Students independently complete IXL 7th grade L.</p> <p>Closing Task: Students write the process to find the percent change.</p> <p>Pass out Unit Study Guide to work on at home</p>	<p>Bellwork - IXL 7th</p> <ul style="list-style-type: none"> • Percent Change - Notes and Assignments • Unit Study Guide • IXL 7th Grade L • Day 5 Folder

<p><i>Day 6</i></p> <p><i>Extend/Elaborate</i></p> <p><i>Evaluate</i></p> <p>TEKS 7.4BDE</p>	<p>Learning Objective: Students take the Proportionality Unit Test</p> <p>Instructional Procedures:</p> <p>Bellwork - Students work on IXL 7th Grade L .</p> <p>Extend/Elaborate: Teacher and students go over the study guide.</p> <p>Evaluate: Students take the Proportionality Unit Test.</p> <p>Closing Task: Students write about percent strategies as many as they can.</p>	<p>Bellwork - IXL 7th L</p> <ul style="list-style-type: none"> • Proportionality Unit Test • IXL 7th Grade • Day 6 Folder
--	--	--

<p>Accommodations for Special Populations</p>	<p>Accommodations for instruction will be provided as stated on each student's (IEP) Individual Education Plan for special education, 504, at risk, and ESL/Bilingual.</p>
--	--