

## NJDOE MODEL CURRICULUM PROJECT

|                           |          |           |                                   |
|---------------------------|----------|-----------|-----------------------------------|
| CONTENT AREA: Mathematics | GRADE: 7 | UNIT #: 3 | UNIT NAME: Ratios and Proportions |
|---------------------------|----------|-----------|-----------------------------------|

| #        | STUDENT LEARNING OBJECTIVES  | CORRESPONDING CCSS   |
|----------|--|----------------------|
| <b>1</b> | Calculate and interpret unit rates of various quantities involving ratios of fractions that contain like and different units using real world examples such as speed and unit price. <i>For example, if a person walks 1/2 mile in each 1/4 hour, compute the unit rate as the complex fraction 1/2/1/4 miles per hour, equivalently 2 miles per hour.</i> | <b>7.RP.1</b>        |
| <b>2</b> | Determine if a proportional relationship exists between two quantities e.g. by testing for equivalent ratios in a table or graph on the coordinate plane and observing whether the graph is a straight line through the origin.  | <b>7.RP.2</b>        |
| <b>3</b> | Identify the constant of proportionality (unit rate) from tables, graphs, equations, diagrams, and verbal descriptions.  | <b>7.RP.2</b>        |
| <b>4</b> | Write equations to model proportional relationships in real world problems. <i>For example, if a recipe that serves 6 people calls for 2 1/2 cups of sugar. How much sugar is needed if you are serving only 2 people?</i>   | <b>7.RP.2</b>        |
| <b>5</b> | Represent real world problems with proportions on a graph and describe how the graph can be used to explain the values of any point (x, y) on the graph including the points (0, 0) and (1, r), recognizing that r is the unit rate.   | <b>7.RP.2</b>        |
| <b>6</b> | Solve multi-step ratio and percent problems using proportional relationships, including scale drawings of geometric figures, simple interest, tax, markups and markdowns, gratuities and commissions, and fees.  | <b>7.RP.3, 7.G.1</b> |
| <b>7</b> | Use freehand, mechanical (i.e. ruler, protractor) and technological tools to draw geometric shapes with given conditions (e.g. scale factor), focusing on constructing triangles.  | <b>7.G.2</b>         |

**Major Content** **Supporting Content** **Additional Content** (Identified by PARCC Model Content Frameworks).

***Bold type indicates grade level fluency requirements.*** (Identified by PARCC Model Content Frameworks).

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### Selected Opportunities for Connection to Mathematical Practices

- 1. Make sense of problems and persevere in solving them.**  
SLO 6 Use proportional relationships in real world context.
  - 2. Reason abstractly and quantitatively.**  
SLO 7 Notice geometric conditions that determine a unique triangle.
  3. Construct viable arguments and critique the reasoning of others.
  - 4. Model with mathematics.**  
SLO 6 Represent proportional relationships symbolically.
  - 5. Use appropriate tools strategically.**  
SLO 7 Use technology when available.
  6. Attend to precision.
  7. Look for and make use of structure.
  8. Look for and express regularity in repeated reasoning.
- All of the content presented at this grade level has connections to the standards for mathematical practices.*

***Bold type identifies possible starting points for connections to the SLOs in this unit.***

| Code #        | Common Core State Standards   |
|---------------|---|
| <b>7.RP.1</b> | Compute unit rates associated with ratios of fractions, including ratios of lengths, areas and other quantities measured in like or different units. <i>For example, if a person walks 1/2 mile in each 1/4 hour, compute the unit rate as the complex fraction 1/2/1/4 miles per hour, equivalently 2 miles per hour.</i>  |
| <b>7.RP.2</b> | Recognize and represent proportional relationships between quantities. <ol style="list-style-type: none"> <li>a. 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.</li> <li>b. Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships.</li> <li>c. Represent proportional relationships by equations. <i>For example, if total cost <math>t</math> is proportional to the number <math>n</math> of items purchased at a constant price <math>p</math>, the relationship between the total cost and the number of items can be expressed as <math>t = pn</math>.</i></li> </ol> |

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|               |   |
|---------------|---|
|               | d. Explain what a point $(x, y)$ on the graph of a proportional relationship means in terms of the situation, with special attention to the points $(0, 0)$ and $(1, r)$ where $r$ is the unit rate.  |
| <b>7.RP.3</b> | Use proportional relationships to solve multistep ratio and percent problems. <i>Examples: simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease, percent error.</i>   |
| <b>7.G.1</b>  | Solve problems involving scale drawings of geometric figures, including computing actual lengths and areas from a scale drawing and reproducing a scale drawing at a different scale.   |
| <b>7.G.2</b>  | Draw (freehand, with ruler and protractor, and with technology) geometric shapes with given conditions. Focus on constructing triangles from three measures of angles or sides, noticing when the conditions determine a unique triangle, more than one triangle, or no triangle. |

**Major Content** **Supporting Content** **Additional Content** (Identified by PARCC Model Content Frameworks).

***Bold type indicates grade level fluency requirements.*** (Identified by PARCC Model Content Frameworks).