

MS Accelerated 14-15
(EngageNY Grade 7 Module 1)

Topic A: Proportional Relationships

7.RP.2a Recognize and represent proportional relationships between quantities.

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.





Lesson 1: An Experience in Relationships as Measuring Rate

| Lesson Hints | Additional Supports & Materials | ICAN Statements | SBAC Connections |
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| <ul style="list-style-type: none"> Students should take Cornell Notes using the lesson summary as a guide Pre-view and have video ready for the exit task. Exist Task discussion | <ul style="list-style-type: none"> Alternative lesson: | <ul style="list-style-type: none"> Compare two ratios in a proportion. Compute unit rate as a complex fraction. | <p>7.G.1 and 7.RP.2</p> <p>A company designed two rectangular maps of the same region. These maps are described below.</p> <p>Map 1: The dimensions are 8 inches by 10 inches. The scale is $\frac{3}{4}$ mile to 1 inch.</p> <p>Map 2: The dimensions are 4 inches by 5 inches.</p> <p>Which ratio represents the scale on Map 2?</p> <p>(A) $\frac{1}{2}$ mile to $\frac{3}{4}$ inch (B) $\frac{3}{4}$ mile to $\frac{1}{2}$ inch (C) $\frac{1}{4}$ mile to 1 inch (D) $\frac{3}{8}$ mile to 1 inch</p> |



Lesson 2: Proportional Relationships

| Lesson Helps | Additional Supports & Materials | ICAN Statements | |
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| <ul style="list-style-type: none"> Defining unit rate with double number lines and tables. | | <ul style="list-style-type: none"> Determine if two quantities are proportional. | |

|  Lesson 3 – 4: Identifying Proportional and Non-Proportional Relationships in Tables | | |
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| Lesson Hints | Additional Supports & Materials | ICAN Statements |
| <ul style="list-style-type: none"> • SKIP Lesson 4 • Identify proportional relationships in tables. • Ask questions to insure that students understand what the ratios mean in the examples. • Ask students questions to insure that they know how to use given information. • Connect vocabulary from 6th grade (ex: constant rate of change, slope, unit rate, etc.) | | <ul style="list-style-type: none"> • Simplify a rate, unit rate, ratio by dividing. |
|  Lesson 5- 6: Identifying Proportional and Non-Proportional Relationships in Graphs | | |
| Lesson Hints | Additional Supports & Materials | ICAN Statements |
| <ul style="list-style-type: none"> • Opening exercise used as a launch into the lesson followed by the discussion questions. • Make student edition graphs larger or have students use graph paper. • This lesson does a great job tying tables and graphs together. • Lesson 6: Gallery walk (ties tables & graphs) | <p>Lesson 6: poster paper, graph paper, prepare ratios in envelopes and sticky notes.</p> <ul style="list-style-type: none"> • Prop vs non-proportional in graphs. • Gallery Walk of posters is a great strategy. (ties, tables and graphs together) | <ul style="list-style-type: none"> • Determine if two quantities are proportional relationship by using equivalent ratios or graphing on a coordinate plane. |



Topic B: Unit Rate and Constant of Proportionality




7.RP.2b, 7.RP.2c, 7.RP.2d Recognize and represent proportional relationships between quantities.


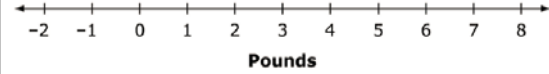


- b. Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships.
- c. Represent proportional relationships by equations. *For example, if total cost t is proportional to the number n of items purchased at a constant price p , the relationship between the total cost and the number of items can be expressed as $t = pn$.*
- 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

7.EE.4a Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities.

- a. Solve word problems leading to equations of the form $px + q = r$ and $p(x + q) = r$, where $p, q,$ and r are specific rational numbers. Solve equations of these forms fluently. Compare an algebraic solution to an arithmetic solution, identifying the sequence of the operations used in each approach. *For example, the perimeter of a rectangle is 54 cm. Its length is 6 cm. What is its width?*

|  Lesson 7: Unit Rate as the Constant of Proportionality | | | SBAC Connections |
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| Lesson Hints | Additional Supports & Materials | ICAN Statements | |
| <ul style="list-style-type: none"> • Students should do a quick vocabulary activity (ex: mind mapping, Frayer model, etc.) • Constant of proportionality | | <ul style="list-style-type: none"> • Identify a constant relationship of unit rates in tables and graphs. | |
|  Lesson 8-9: Representing Proportional Relationships with Equations | | | SBAC Connections |
| Lesson Hints | Additional Supports & Materials | ICAN Statements | |
| <ul style="list-style-type: none"> • Discuss different forms of an equation for example, $y=kx$ or $y=mx$. • Have students label all parts of the equation to help insure understanding. • Discuss independent vs dependent axis. | | <ul style="list-style-type: none"> • Identify a constant relationship of unit rates in equations. | |

|  Lesson 10: Interpreting Graphs of Proportional Relationships | | | |
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| Lesson Hints | Additional Supports & Materials | ICAN Statements | |
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| Topic C: Ratios and Rates Involving Fractions 7.RP.2b, 7.RP.2c, 7.RP.2d Recognize and represent proportional relationships between quantities. <ul style="list-style-type: none"> b. Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships. c. Represent proportional relationships by equations. <i>For example, if total cost t is proportional to the number n of items purchased at a constant price p, the relationship between the total cost and the number of items can be expressed as $t = pn$.</i> 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 7.EE.4a Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities. <ul style="list-style-type: none"> b. Solve word problems leading to equations of the form $px + q = r$ and $p(x + q) = r$, where $p, q,$ and r are specific rational numbers. Solve equations of these forms fluently. Compare an algebraic solution to an arithmetic solution, identifying the sequence of the operations used in each approach. <i>For example, the perimeter of a rectangle is 54 cm. Its length is 6 cm. What is its width?</i> | | | |
|  Lessons 11: Ratios of Fractions and Their Unit Rates | | | |
| Lesson Hints | Additional Supports & Materials | ICAN Statements | SBAC Connections |
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|  Lessons 12: Ratios of Fractions and Their Unit Rates | | | |
| Lesson Hints | Additional Supports & Materials | ICAN Statements | SBAC Connections |
| <ul style="list-style-type: none"> • Complex ratios—use excises in Student Book S50; Problem Set S51) | | <ul style="list-style-type: none"> • Compute unit rate as a complex fraction. • Identify a constant relationship of unit rates in equations. | |

|  Lessons 13: Finding Equivalent Ratios Given the Total Quantity | | | |
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| Lesson Hints | Additional Supports & Materials | ICAN Statements | 7.EE.4 |
| <ul style="list-style-type: none"> When possible use visual representations of dividing fractions and fraction strips. Example 2, Problem Set #2. | | <ul style="list-style-type: none"> Identify a constant relationship of unit rates in tables. | <p>David wants to buy 2 pineapples and some bananas.</p> <ul style="list-style-type: none"> The price of 1 pineapple is \$2.99. The price of bananas is \$0.67 per pound. <p>David wants to spend less than \$10.00. Write an inequality that represents the number of pounds of bananas, b, David can buy.</p> <div style="border: 1px solid black; width: 100px; height: 20px; margin: 10px auto;"></div> <p>On the number line below, draw a graph that represents the number of pounds of bananas David can buy.</p>  |
|  Lessons 14: Multistep Ratio Problems | | | |
| Lesson Hints | Additional Supports & Materials | ICAN Statements | |
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|  Lessons 15: Equations of Graphs of Proportional Relationships Involving Fractions | | | |
| Lesson Hints | Additional Supports & Materials | ICAN Statements | |
| <ul style="list-style-type: none"> Bring in fractions to tables, graphs & equations. | | <ul style="list-style-type: none"> Identify a constant relationship of unit rates in tables, graphs, and equations. | |

Topic D: Ratios of Scale Drawings

7.RP.2 Recognize and represent proportional relationships between quantities.

b. Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships.




7.G.1 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.


 **Lesson 16 Relate Scale Drawing to ratios and Rates (Mug Wumps)**

| Lesson Hints | Additional Supports & Materials | ICAN Statements | SBAC Connections |
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| <ul style="list-style-type: none"> • CMP Lesson of Wumps would be a great foundation. (look ahead to G7 Module 4, Topic B, Lesson 12 to incorporate percents) • Could personalize and use student's photographs and enlarge or reduce using a copier. | <p>Alternative Lesson:</p> <ul style="list-style-type: none"> • Student's photographs can be used to scale up or down. (<i>younger funny pictures are wonderful!</i>) • Rulers, protractors | <ul style="list-style-type: none"> • Understand that a scale drawing is either the reduction or the enlargement of a two-dimensional shape (length and area). | |

 **Lesson 17 The Unit Rate as Scale Factor (CMP lessons)**

| Lesson Hints | Additional Supports & Materials | ICAN Statements | SBAC Connections |
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| <ul style="list-style-type: none"> • Use different units of measurement to compare the scale factors. • Extension: Students can enlarge an image they want to draw or paint by drawing a grid using a ruler over their reference picture and drawing a grid of equal ratio on their work surface. Direct students to focus on one square at a time until the image is complete. | <p>Alternative Lesson:</p> <ul style="list-style-type: none"> • Rulers, protractors • Appropriate grid paper (cm, inch) <p><i>Rod Tamura</i> will adapt his lesson to a Smart Notebook.</p> | <ul style="list-style-type: none"> • Recognize the scale factor to be the constant of proportionality. • Make a scale drawing with a given scale factor given a picture or description of geometric figures. | |

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| <p>Have students compute the scale factor for the drawing.</p> | | | |
|  Lesson 18 Computing Actual Lengths from a Scale Drawing | | | |
| <p>Lesson Hints</p> | <p>Additional Supports & Materials</p> | <p>ICAN Statements</p> | <p>SBAC Connections</p> |
| <ul style="list-style-type: none"> Reminder for students to look at the given scale. | | <ul style="list-style-type: none"> Solve problems involving scale drawings, when given scale. | |
|  Lesson 19 Computing Actual Areas from a Scale Drawing | | | |
| <p>Lesson Hints</p> | <p>Additional Supports & Materials</p> | <p>ICAN Statements</p> | <p>SBAC Connections</p> |
| <ul style="list-style-type: none"> Students should use manipulatives to create meaning about the ratio of scale factor with the relationship of three dimensions. | | <ul style="list-style-type: none"> Compute the area in the actual picture, given a scale drawing. Identify the scale factor. | |
|  Lesson 20: An Exercise in Creating a Scale Drawing | | | |
| <p>Lesson Hints</p> | <p>Additional Supports & Materials</p> | <p>ICAN Statements</p> | <p>SBAC Connection</p> |
| <ul style="list-style-type: none"> Extension Lesson: Optional lesson- teachers may use as a project Have some students measure the perimeter of the classroom for the class beforehand. ----Could have students measure their own rooms instead. | <ul style="list-style-type: none"> Extension: Have students choose flooring and record the costs. Including the furniture, students can calculate the cost of the designed room. Meter sticks Grid paper (unit square if available) | <ul style="list-style-type: none"> Reproduce the drawing of a different scale using a given scale drawing | |

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| | www.PrintablePaper.net | | |
|  Lesson 21-22: An Exercise in Changing Scales (optional lesson – teacher use at their discretion) | | | |
| Lesson Hints | Additional Supports & Materials | ICAN Statements | SBAC Connection |
| <ul style="list-style-type: none"> Talks about scale drawing of a different scale by applying real life situations (similarities and differences of the original and new drawing). | <ul style="list-style-type: none"> Use drawings from Lesson 20 as original drawings Grid paper Rulers Calculators | <ul style="list-style-type: none"> Reproduce the drawing of a different scale using a given scale drawing | |

MS Accelerated 14-15
(EngageNY Grade 7 Module 4)

Topic A: Finding the Whole

7.RP.1A Compute unit rates associated with ratios of fractions, including ratios of lengths, areas and other quantities measured in like or different units. For example, if a person walks $\frac{1}{2}$ mile in each $\frac{1}{4}$ hour, compute the unit rate as the complex fraction $\frac{1/2}{1/4}$ miles per hour, equivalently 2 mph.

7.RP.A.2 Recognize and represent proportional relationships between quantities.

c. Represent proportional relationships by equations. For example, if total cost t is proportional to the number n of items purchased at a constant price p , the relationship between the total cost and the number of items can be expressed at $t = pn$.






7.RP.A.3 Use proportional relationships to solve multistep ratio and percent problems. Examples: simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease, percent error.



Lesson 1: Percent



SBAC Connections





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| Lesson Hints | Additional Supports & Materials | ICAN Statements | |
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| | <ul style="list-style-type: none"> • SKIP | <ul style="list-style-type: none"> • | |
|  Lesson 2: Part of a Whole as Percent | | | |
| Lesson Hints | Additional Supports & Materials | ICAN Statements | |
| <ul style="list-style-type: none"> • Finding percent using ratios & equations. • Refer to Module 3 to know the “if-then” moves to rewrite an expression in an equation form. | | <ul style="list-style-type: none"> • Find a percent using a proportion or an equation. | |
|  Lesson 3: Comparing Quantities with Percent | | | |
| Lesson Hints | Additional Supports & Materials | ICAN Statements | |
| <ul style="list-style-type: none"> • Note: Sprints are provided at the end of this lesson – designed for teacher flexibility. | | <ul style="list-style-type: none"> • | |
|  Lesson 4: Percent Increase and Decrease | | | |
| Lesson Hints | Additional Supports & Materials | ICAN Statements | |
| <ul style="list-style-type: none"> • Percent of increase and decrease. • Create two lists of words: synonyms for “increase and decrease,” so students can recognize key words in context. | <ul style="list-style-type: none"> • Counters (different colors) • Pre-made double number lines (strategy for struggling learners) • Suggested problems: S21 for whole group discussion. | <ul style="list-style-type: none"> • Calculate percent of increase and decrease. | |
|  Lesson 5: Find One Hundred Percent Given Another Percent | | | |
| Lesson Hints | Additional Supports & Materials | ICAN Statements | |
| | <ul style="list-style-type: none"> • | <ul style="list-style-type: none"> • | |
|  Lesson 6: Fluency with Percents | | | |
| Lesson Hints | Additional Supports & Materials | ICAN Statements | |
| Note: Problem set is a good use for practice. | <ul style="list-style-type: none"> • Bingo game | <ul style="list-style-type: none"> • | |

Topic B: Percent Problems Including More than One Whole

- 7.RP.A.1** Compute unit rates associated with ratios of fractions, including ratios of lengths, areas and other quantities measured in like or different units. For example, if a person walks 1/2 mile in each 1/4 hour, compute the unit rate as the complex fraction $\frac{1/2}{1/4}$ miles per hour, equivalently 2 miles per hour.
- 7.RP.A.2** Recognize and represent proportional relationships between quantities.
- 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.
 - Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships.
 - Represent proportional relationships by equations. For example, if total cost t is proportional to the number n of items purchased at a constant price p , the relationship between the total cost and the number of items can be expressed as $t = pn$.
 - 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.
- 7.RP.A.3** Use proportional relationships to solve multistep ratio and percent problems. Examples: simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease, percent error.
- 7.EE.B.3** Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies. For example: If a woman making \$25 an hour gets a 10% raise, she will make an additional 1/10 of her salary an hour, or \$2.50, for a new salary of \$27.50. If you want to place a towel bar 9 3/4 inches long in the center of a door that is 27 1/2 inches wide, you will need to place the bar about 9 inches from each edge; this estimate can be used as a check on the exact computation.

|  Lesson 7: Markup and Markdown Problems | | | SBAC Connections |
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| Lesson Hints | Additional Supports & Materials | ICAN Statements | |
| <ul style="list-style-type: none"> Prior knowledge from 6th grade: building an algebraic equation $price(p) = 1.25n$ (number of items) Use sentence strips to create a word wall to help with financial terms Show the relationships of the words with synonyms (discount price, sales price, cost price and wholesale price) Use real life examples (sales flyers or internet adds) | <ul style="list-style-type: none"> Sentence strips for word wall | <ul style="list-style-type: none"> Understand the terms & equations for the <i>original price</i>, <i>selling price</i>, <i>markup</i>, <i>markdown</i>, <i>markup rate</i>, and <i>markdown rate</i>. | |
|  Lesson 8: Percent Error Problems | | | |
| Lesson Hints | Additional Supports & Materials | ICAN Statements | |
| <ul style="list-style-type: none"> Prior knowledge from 6th grade about Absolute value. This is the first time used this year. | <ul style="list-style-type: none"> Ruler Whiteboards Calculators | <ul style="list-style-type: none"> Understand the meaning of percent error and how to find it | |

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| <ul style="list-style-type: none"> Diagonal of a screen tells the screen's size. | | | |
|  Lesson 9: Problem Solving when the Percent Changes | | | |
| Lesson Hints | Additional Supports & Materials | ICAN Statements | |
| | | <ul style="list-style-type: none"> | |
|  Lesson 10: Simple Interest | | | |
| Lesson Hints | Additional Supports & Materials | ICAN Statements | |
| <ul style="list-style-type: none"> New vocabulary: Principal, interest, Semi, quarterly and annual (may need to be on word wall) Teacher may want to use a simpler value such as a whole number (2 or 5%) to begin the lesson. Remind students about graphing using TAILS New vocabulary: Semi, quarterly and annual (may need to be on word wall) | <ul style="list-style-type: none"> Calculators (using the $y=$) to see the table and graph created. Graph paper: Numbered coordinate plane (x and y axis) | <ul style="list-style-type: none"> Solve simple interest problems using the formula $I = Prt$ Use the formula $I=Prt$ to recognize that units for both interest rate and time must be compatible. | |
|  Lesson 11: Tax, Commissions, Fees, and Other Real-World Percent Problems | | | |
| Lesson Hints | Additional Supports & Materials | ICAN Statements | |
| | | <ul style="list-style-type: none"> | |
| Topic C: Scale Drawings 7.RP.A.2b Recognize and represent proportional relationships between quantities. b. Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships. 7.G.A.1 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. | | | |
|  Lesson 12: The Scale Factor as a Percent for a Scale Drawing | | | SBAC Connections |
| Lesson Hints | Additional Supports & Materials | ICAN Statements | |
| <ul style="list-style-type: none"> Review the meaning of scale and what it means in this context. Use guidelines when drawing using scale factor. Review the meaning of the words: | <ul style="list-style-type: none"> Coordinate grid paper Straight edge Rulers, protractors CMP Lesson of Wumps would be a great review to use with | <ul style="list-style-type: none"> Develop the definition of circle using diameter and radius. Discover that the ratio of the circumference to the diameter of a circle is π. | |

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| <p>horizontal, vertical, and diagonal.</p> | <p>Scale & Percent.</p> <ul style="list-style-type: none"> • Student’s photographs can be used to scale up or down. (<i>younger funny pictures are wonderful!</i>) • Meter sticks <p>Grid paper (unit square if available) www.PrintablePaper.net</p> | <ul style="list-style-type: none"> • Use scale models to derive the formulas for the circumference of a circle of diameter and radius. • Use scale models to derive the formulas for the circumference of a circle of diameter and radius. | |
| <p> Lesson 13: Changing Scales</p> | | | |
| <p>Lesson Hints</p> | <p>Additional Supports & Materials</p> | <p>ICAN Statements</p> | |
| <ul style="list-style-type: none"> • Reduction and enlargements can be written using the relationship less than or greater than 100%. • Use regular polygons or different quadrilaterals. | <ul style="list-style-type: none"> • Coordinate grid paper • Straight edge | <ul style="list-style-type: none"> • Explain the relationship between the circumference and area of a circle • I know the formula for the area of a circle and use it to solve problems | |
| <p> Lesson 14: Computing Actual Lengths from a Scale Drawing</p> | | | |
| <p>Lesson Hints</p> | <p>Additional Supports & Materials</p> | <p>ICAN Statements</p> | |
| <ul style="list-style-type: none"> • Might want to modify this assignment to regular polygons or different quadrilaterals to build understanding. | <ul style="list-style-type: none"> • Coordinate grid paper • Straight edge | <ul style="list-style-type: none"> • Examine the meaning of quarter circle and semicircle. • Solve area and perimeter problems for regions made out of rectangles, quarter circles, semicircles, and circles, including solving for unknown lengths when the area or perimeter is given. | |
| <p> Lesson 15: Solving Area Problems Using Scale Drawings</p> | | | |

Sept. 18, 2015

| Lesson Hints | Additional Supports & Materials | ICAN Statements | |
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| <ul style="list-style-type: none">• Start with rectangles on coordinate grid paper so students can count the square units. This gives a foundational, manipulative approach to use apply area.• Connection of area and scale factor squared. | <ul style="list-style-type: none">• Coordinate grid paper• Straight edge | <ul style="list-style-type: none">• Find the areas of triangles and polygons on a coordinate plane. | |