

# Orange Public Schools

Office of Curriculum & Instruction  
2019-2020 Mathematics Curriculum Guide



## 7<sup>th</sup> Grade Mathematics

Math in Focus - Unit 3: Ratios & Proportional Relationships

*January 31, 2020 – April 9, 2020*

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## From the Common Core State Standards:

In **Grade 7**, instructional time should focus on four critical areas: (1) developing understanding of and applying proportional relationships; (2) developing understanding of operations with rational numbers and working with expressions and linear equations; (3) solving problems involving scale drawings and informal geometric constructions, and working with two- and three-dimensional shapes to solve problems involving area, surface area, and volume; and (4) drawing inferences about populations based on samples.

1. Students extend their understanding of ratios and develop understanding of proportionality to solve single- and multi-step problems. Students use their understanding of ratios and proportionality to solve a wide variety of percent problems, including those involving discounts, interest, taxes, tips, and percent increase or decrease. Students solve problems about scale drawings by relating corresponding lengths between the objects or by using the fact that relationships of lengths within an object are preserved in similar objects. Students graph proportional relationships and understand the unit rate informally as a measure of the steepness of the related line, called the slope. They distinguish proportional relationships from other relationships.

2. Students develop a unified understanding of number, recognizing fractions, decimals (that have a finite or a repeating decimal representation), and percents as different representations of rational numbers. Students extend addition, subtraction, multiplication, and division to all rational numbers, maintaining the properties of operations and the relationships between addition and subtraction, and multiplication and division. By applying these properties, and by viewing negative numbers in terms of everyday contexts (e.g., amounts owed or temperatures below zero), students explain and interpret the rules for adding, subtracting, multiplying, and dividing with negative numbers. They use the arithmetic of rational numbers as they formulate expressions and equations in one variable and use these equations to solve problems.

3. Students continue their work with area from Grade 6, solving problems involving the area and circumference of a circle and surface area of three dimensional objects. In preparation for work on congruence and similarity in Grade 8 they reason about relationships among two-dimensional figures using scale drawings and informal geometric constructions, and they gain familiarity with the relationships between angles formed by intersecting lines. Students work with three-dimensional figures, relating them to two-dimensional figures by examining cross-sections. They solve real-world and mathematical problems involving area, surface area, and volume of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes and right prisms.

4. Students build on their previous work with single data distributions to compare two data distributions and address questions about differences between populations. They begin informal work with random sampling to generate data sets and learn about the importance of representative samples for drawing inferences.

## A STORY OF UNITS

	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	
K											
1											
2											
3											
4											
5											
6											
7	The Number System			Expressions & Equations		Ratios & Proportional Relationships		Statistics & Probability / Geometry			



**The Number System:**  
Operations with Rational Numbers



**Expressions & Equations:** Use properties of operations to generate equivalent fractions and solve real-life problems using numerical & algebraic expressions & equations



**Ratios & Proportional Relationships:** Analyze proportional relationships and use them to solve real-world and mathematical problems



**Statistics & Probability / Geometry:** Use random sampling, draw inferences, investigate chance processes, evaluate probability models, construct geometrical figures, and solve real-life problems.

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## References

“Math in Focus” *Houghton Mifflin Harcourt*. 2015 <<https://my.hrw.com>>

## I. Unit Overview

**Chapter 5: Direct and Inverse Proportion:** In this chapter, students extend their knowledge of ratios and rates to the concepts of direct and inverse proportion. They identify both direct and inverse proportion, recognize that a constant of proportionality can be a constant rate, and solve real-world proportional-relationship problems. In addition, students use visual bar models to interpret and solve direct and inverse proportion problems.

### Essential Questions

- What is a ratio?
- What is a unit rate?
- What is the constant of proportionality?
- How are unit rates used in the real world?
- How can we compute unit rates for ratios and rates specified by rational numbers?
- How do you determine a proportional relationship? What about non-proportional relationships?
- How can we represent proportionality using a table, graph, equation, and or verbal description?
- How can the constant of proportionality be found in various representations of linear data?
- What is a percent?
- How can we determine the percent of any given number?
- What is the percent equation?
- How do proportions relate to percentages?
- How can proportional relationships be used to solve percent problems?
- What is the difference between a markup and markdown?
- What is the correlation between percent increase and percent decrease?

### Enduring Understanding

- Understand a proportional relationship when graphed is a straight line through the origin.
- Realize that a specific point  $(x,y)$  on a linear graph represents a rate.
- Understand that the point  $(1,r)$  on a linear graph represents the unit rate.
- Proportional relationships are made up of equivalent ratios.
- Recognize that relationships may be represented using tables, graphs, equations, and verbal descriptions.
- Percent literally means per 100 and can be represented as a ratio with 100 as the denominator.
- Understand and communicate information using the relationships of decimals, fractions, integers, and rational/irrational numbers.

- Make sense of percent problems by modeling the proportional relationship using an equation, a table, a graph, mental math, and factors of 100.
- Realize that tape diagrams can be used to solve multi-step percent problems.
- Understand the use of estimation to determine reasonableness, when solving percent word problems.
- Recognize that when they find a certain percent of a given quantity, the answer must be greater than the given quantity if they found more than 100% of it and less if they found less than 100% of it.
- Percent decreases and increases are measures of percent change, which is a relative measure based on absolute change.

## II. Pacing Guide

Activity	New Jersey State Learning Standards (NJSLS)	Estimated Time (Blocks)
Chapter 5 Opener	7.RP.A.1; 7.RP.A.2;7.RP.A.3;	1 ½
<b>Chapter 5 Pre-Test (MIF)</b>	7.RP.A.1; 7.RP.A.2; 7.RP.A.3	½
5.1- Understanding Direct Proportion	7.RP.A.2; 7.RP.A.2a; 7.RP.A.2b;	3
5.2- Representing Direct Proportion Graphically	7.RP.A.2b; 7.RP.A.2d;	1
5.3- Solving Direct Proportion Problems	7.RP.A.2c; 7.RP.A.3;	2
<b>Performance Task 1</b>	7.RP.A.1; 7.RP.A.2;	<b>1</b>
5.4- Solving Direct Proportion Problems	7.RP.A.1; 7.RP.A.2; 7.RP.A.3;	4
Chapter 5 Wrap Up/ Review Lesson	7.RP.A.1; 7.RP.A.2; 7.RP.A.3;	2
Chapter 5 Test (MIF) *Optional*	7.RP.A.1; 7.RP.A.2; 7.RP.A.3;	1
Grade 7 Module 1 (Engage NY) Lesson 14	7.RP.A.3	1
Grade 6 Math in Focus 6.5-Percent of Change	7.RP.A.3	2
<b>Performance Task 2</b>	7.RP.A.3	<b>1</b>
7.5-Understanding Scale Drawings	7.RP.A.2; 7.G.A.1	3
Unit 3 Review Lesson	7.RP.A.1; 7.RP.A.2;7.RP.A.3;	1
<b>Unit 3 Assessment 1</b>	7.RP.A.1; 7.RP.A.2;7.RP.A.3;	<b>1</b>
Solidify Unit 2 Concepts / Project Based Learning	7.RP.A.1; 7.RP.A.2;7.RP.A.3;	5
<b>Total Time</b>		<b>30 Blocks</b>

Major Work Supporting Content Additional Content



### III. Pacing Calendar

Please complete the pacing calendar based on the suggested pacing (*see Pacing Guide*).

<b>FEBRUARY</b>						
<b>Sunday</b>	<b>Monday</b>	<b>Tuesday</b>	<b>Wednesday</b>	<b>Thursday</b>	<b>Friday</b>	<b>Saturday</b>
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28			

<b>MARCH</b>						
<b>Sunday</b>	<b>Monday</b>	<b>Tuesday</b>	<b>Wednesday</b>	<b>Thursday</b>	<b>Friday</b>	<b>Saturday</b>
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

<b>APRIL</b>						
<b>Sunday</b>	<b>Monday</b>	<b>Tuesday</b>	<b>Wednesday</b>	<b>Thursday</b>	<b>Friday</b>	<b>Saturday</b>
<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>
<b>8</b>	<b>9</b>	<b>10</b>	<b>11</b>	<b>12</b>	<b>13</b>	<b>14</b>
<b>15</b>	<b>16</b>	<b>17</b>	<b>18</b>	<b>19</b>	<b>20</b>	<b>21</b>
<b>22</b>	<b>23</b>	<b>24</b>	<b>25</b>	<b>26</b>	<b>27</b>	<b>28</b>
<b>29</b>	<b>30</b>					

## IV. NJSLA Assessment Evidence Statements

Type I



Type II

Type III

NJSLS	Evidence Statement	Clarification	Math Practices	Calculator ?
<u>7.RP.A.2</u>	Base explanations/reasoning on a coordinate plane diagram (whether provided in the prompt or constructed by the student in her response). Content Scope: Knowledge and skills articulated in 7.RP.A	i) Tasks use only coordinates in Quadrant 1 and use only a positive constant of proportionality.	MP.2 MP.3 MP.5 MP.6	Yes
<u>7.RP.A.2</u>	Construct, autonomously, chains of reasoning that will justify or refute propositions or conjectures. Content Scope: Knowledge and skills articulated in 7.RP.2	i) Tasks use only coordinates in Quadrant 1 and use only a positive constant of proportionality.	MP.2 MP.3 MP.6	Yes
<u>7.RP.A.3</u>	Present solutions to multi-step problems in the form of valid chains of reasoning, using symbols such as equals signs appropriately (for example, rubrics award less than full credit for the presence of nonsense statements such as $1 + 4 = 5 + 7 = 12$ , even if the final answer is correct), or identify or describe errors in solutions to multi-step problems and present corrected solutions. Content Scope: Knowledge and skills articulated in 7.RP.3	i) Tasks use only coordinates in Quadrant 1 and use only a positive constant of proportionality	MP.1 MP.3 MP.6 MP.7 MP.8	Yes
<u>6.RP.A</u>	Solve multi-step contextual problems with degree of difficulty appropriate to grade 7, requiring application of knowledge and skills articulated in 6.RP.A, 6.EE.C, 6.G.	i) Tasks may have scaffolding, if necessary, in order to yield a degree of difficulty appropriate to grade 7.	MP.1 MP.2 MP.4 MP.5 MP.7	Yes

## V. Differentiated Instruction

**Chapter 5****Assessment and Intervention**

	ASSESSMENT	 STRUGGLING LEARNERS
<b>DIAGNOSTIC</b>	<ul style="list-style-type: none"> <li>Quick Check in Recall Prior Knowledge in Student Book A, pp. 245–247</li> <li>Chapter 5 Pre-Test in <i>Assessments</i></li> </ul>	<ul style="list-style-type: none"> <li>Skills 27–31 in <i>Transition Guide, Course 2</i></li> </ul>
<b>ON-GOING</b>	<ul style="list-style-type: none"> <li>Guided Practice</li> <li>Lesson Check</li> <li>Ticket Out the Door</li> </ul>	<ul style="list-style-type: none"> <li>Reteach worksheets</li> <li>Extra Practice worksheets. Chapters 3–5</li> <li>Cumulative Practice worksheets</li> <li>Activity Book, Chapter 5</li> </ul>
<b>END-OF-CHAPTER</b>	<ul style="list-style-type: none"> <li>Chapter Review/Test</li> <li>Chapter 5 Test, Mid-Course Test in <i>Assessments</i></li> <li> ExamView® Assessment Suite CD-ROM Course 2</li> </ul>	<ul style="list-style-type: none"> <li>Reteach worksheets</li> </ul>

**ELL ENGLISH LANGUAGE LEARNERS**

Review the terms *ratio* and *proportion*.

**Model** Draw a row of 2 open circles and below it a row of 3 shaded circles. Above the rows, write the ratio  $\frac{2}{3}$ .

**Say** A ratio compares two amounts. This ratio compares the number of open circles, 2, to the number of shaded circles, 3.

**Model** Draw 4 more open circles in the top row and 6 more shaded circles in the bottom row. Above them, next to the  $\frac{2}{3}$ , write  $= \frac{6}{9}$ .

**Say** A proportion tells you that two ratios are equal. This proportion says the ratio  $\frac{2}{3}$  is equal to the ratio  $\frac{6}{9}$ .

For definitions, see Glossary, page 308, and



Online Multi-Lingual Glossary.


**ADVANCED LEARNERS**

- Tell students that some proportional relationships demonstrate a concept known as “diminishing returns.” Ask them to investigate the concept and to consider how it pertains to some proportional relationships.
- As needed, provide direction for students. For instance, discuss the example about window cleaners on page 281 of the Student Book. Ask students to think about what would really happen if more and more window cleaners were added to the crew cleaning the windows. Students should realize that eventually the window cleaners could get in each other’s way, hampering efforts to clean effectively. Thus, the number of hours needed to clean the windows might increase as more cleaners are added. Ask students to think about how this would affect the graph in the example.

**To provide additional challenges use:**

- Enrichment*, Chapter 5
- Student Book A, Brain@Work problem

**Chapter 7****Assessment and Intervention**

	ASSESSMENT	 STRUGGLING LEARNERS
<b>DIAGNOSTIC</b>	<ul style="list-style-type: none"> <li>• Quick Check in Recall Prior Knowledge in Student Book B, pp. 63–68</li> <li>• Chapter 7 Pre-Test in Assessments</li> </ul>	<ul style="list-style-type: none"> <li>• Skills 34–39 in <i>Transition Guide, Course 2</i></li> </ul>
<b>ON-GOING</b>	<ul style="list-style-type: none"> <li>• Guided Practice</li> <li>• Lesson Check</li> <li>• Ticket Out the Door</li> </ul>	<ul style="list-style-type: none"> <li>• Reteach worksheets</li> <li>• Extra Practice worksheets</li> <li>• Activity Book, Chapter 7</li> </ul>
<b>END-OF-CHAPTER</b>	<ul style="list-style-type: none"> <li>• Chapter Review/Test</li> <li>• Chapter 7 Test in Assessments</li> <li>• ExamView® Assessment Suite CD-ROM Course 2</li> </ul>	<ul style="list-style-type: none"> <li>• Reteach worksheets</li> </ul>

**ELL ENGLISH LANGUAGE LEARNERS**

Review the terms *construct*, *midpoint*, and *equidistant*.

**Say** When you *construct* something you make it. You build it. You can construct a house of wood. You can construct a toy airplane of paper. You can construct an angle bisector with a compass and a straightedge. A thing you construct is called a *construction*.

**Model** Draw a line segment  $AB$ . Draw its perpendicular bisector.

**Say** The middle point of a line segment is called the *midpoint*. (*Mark the midpoint, C.*) The midpoint,  $C$ , divides  $\overline{AB}$  into two equal parts. (*Indicate the equal parts and write  $AC = CB$ .*) The distance from  $A$  to the midpoint,  $C$ , is the same as the distance from  $B$  to the midpoint,  $C$ . The midpoint is an equal distance from both ends of the segment. We say the midpoint is *equidistant* from both ends of the segment.

For definitions, see Glossary, page 321, and



Online Multi-Lingual Glossary.

**ADVANCED LEARNERS**

- Students can explore scale factors when a figure is enlarged and/or reduced repeatedly. Ask them to solve the following problem.

A photo has side lengths of 8 in. and 10 in. It is enlarged to three times its original size. Then the enlargement is reduced to half its size. What is the final size of the photo? (*12 in. by 15 in.*) What scale factor relates the final photo to the original?  $\left(\frac{3}{2}\right)$

- As needed, provide direction for students, such as suggesting they sketch each version of the photo.
- Finally, ask students to state a rule for finding the scale factor that compares an original figure to a version that has been reduced and/or enlarged multiple times. (*The scale factor that compares the original figure to the final figure is the product of all the individual scale factors.*)

**To provide additional challenges use:**

- *Enrichment*, Chapter 7
- Student Book B, Brain@Work problem

## VI. Vocabulary

Term	Definition
<b>Chapter 5</b>	
<i>constant of proportionality</i>	The constant value of the ratio of two quantities x and y that are in direct proportion. When x and y are inversely proportional, the constant of proportionality is the product of x and y.
<i>cross products</i>	A product found by multiplying the numerator of one fraction by the denominator of another fraction. If two fractions are equal, then their cross products are also equal.
<i>direct proportion</i>	A relationship between two quantities in which both quantities increase or decrease by the same factor
<i>inverse proportion</i>	A relationship between two quantities in which one quantity decreases as the other increases and vice versa so that the product of the two quantities remains constant
<i>proportion</i>	An equation that says two ratios are equivalent
<b>Chapter 7</b>	
<i>scale</i>	A comparison of a length in a scale drawing to the corresponding length in the actual object
<i>Scale factor</i>	The ratio of a length in a scale drawing to the corresponding length in the actual figure

## VII. Assessment Framework

<b>Unit 3 Assessment Framework</b>				
<b>Assessment</b>	<b>NJSLS</b>	<b>Estimated Time</b>	<b>Format</b>	<b>Graded ?</b>
<b>Chapter 5 Pretest</b> (Beginning of Unit) <i>Math in Focus</i>	7.RP.A.1; 7.RP.A.2; 7.RP.A.3	½ Block	Individual	Yes (No Weight)
<b>Unit 3 Assessment 1</b> (Conclusion of Unit) <i>District Assessment</i>	7.RP.A.1; 7.RP.A.2; 7.RP.A.3	½ Block	Individual	Yes
<b>Chapter 5 Test</b> (Optional) <i>Math in Focus</i>	7.RP.A.1; 7.RP.A.2; 7.RP.A.3	½ Block	Individual	Yes, if administered
<b>Grade 7 Interim Assessment 3</b> (Late March) <i>District Assessment</i>	7.RP.A.1; 7.RP.A.2a; 7.RP.A.2b; 7.RP.A.2c; 7.RP.A.2d	1 Block	Individual	Yes

<b>Unit 3 Performance Assessment Framework</b>				
<b>Assessment</b>	<b>NJSLS</b>	<b>Estimated Time</b>	<b>Format</b>	<b>Graded ?</b>
<b>Unit 3 Performance Task 1</b> (Mid-December) <i>Miles to Kilometers</i>	7.RP.A.1; 7.RP.A.2;	1 Block	Individual	Yes; Rubric
<b>Unit 3 Performance Task 2</b> (Mid-January) <i>Fishing Adventures</i>	7.RP.A.3	1 Block	Individual w/ Interview Opportunity	Yes; Rubric
<b>Extended Constructed Response (ECR)*</b> ( <a href="#">click here for access</a> )	Dependent on unit of study & month of administration	Up to 30 minutes	Individual	Yes; Rubric

\* Use the following links to access ECR protocol and district assessment scoring documents:

- [Assessment & Data in Mathematics Bulletin](#)
- [Extended Constructed Response Protocol](#)



## 7<sup>th</sup> Grade Portfolio Assessment: Unit 3 Performance Task 1

Name \_\_\_\_\_

Block \_\_\_\_\_

Date \_\_\_\_\_

### Cider versus Juice (7.RP.A.1, 7.RP.A.2b)

The price of a gallon of apple cider is \$7.00. The price of eight 4.23-ounce juice boxes is \$2.39.



- Suppose the juice was instead packaged like the cider. Approximately what is the cost per gallon of the juice?
- Suppose the cider was instead packaged like the juice. Approximately what is the cost per eight 4.23-ounce boxes of cider?
- Peter wants to have at least a gallon of either only cider or only juice. Which product is the better deal?
- State the unit rate(s) you used to compare the cost of cider versus juice in your answer to Question c.
- List two or more additional unit rates that could be used to make this comparison.

**Cider versus Juice Task – Rubric**

Name: \_\_\_\_\_ Date: \_\_\_\_\_

*NJSLS*: 7.RP.A.1; 7.RP.A.2b

Type: \_\_\_\_\_ Teacher: \_\_\_\_\_

<p><b>Task Description</b></p>	<ul style="list-style-type: none"> <li>• Clearly constructs and communicates a complete response based on concrete referents provided in the prompt or constructed by the student such as diagrams that are connected to a written (symbolic) method, number line diagrams or coordinate plane diagrams.</li> <li>• Clearly constructs and communicates a complete response by             <ul style="list-style-type: none"> <li>➤ using a logical approach based on a conjecture and/or stated assumptions</li> <li>➤ providing an efficient and logical progression of steps</li> <li>➤ using grade-level vocabulary, symbols, and labels</li> <li>➤ providing a justification of a conclusion with minor computational error</li> <li>➤ evaluating, interpreting and critiquing the validity and efficiency of others' responses</li> </ul> </li> </ul>				
<p><b>Command Level Description</b></p>	<p><b><i>Level 5:</i></b> <b><i>Distinguished Command</i></b></p> <p>Perform the task items accurately or with minor computation errors.</p>	<p><b><i>Level 4:</i></b> <b><i>Strong Command</i></b></p> <p>Perform the task items with some non-conceptual errors</p>	<p><b><i>Level 3:</i></b> <b><i>Moderate Command</i></b></p> <p>Perform the task items with minor conceptual errors and some computation errors.</p>	<p><b><i>Level 2:</i></b> <b><i>Partial Command</i></b></p> <p>Perform the task items with some errors on both math concept and computation.</p>	<p><b><i>Level 1:</i></b> <b><i>No Command</i></b></p> <p>Perform the task items with serious errors on both math concept and computation.</p>
<p><b>Score range</b></p>	<p><i>12-14 pts</i></p>	<p><i>9-11 pts</i></p>	<p><i>6-8 pts</i></p>	<p><i>3-5 pts</i></p>	<p><i>0-2 pts</i></p>
<p><b>Task Score &amp; PLD Assigned</b></p>					

#	Answer	Scoring
Part A	$\frac{2.39 \text{ dollars}}{33.84 \text{ ounces}} = \frac{x \text{ dollars}}{1 \text{ gallon}} \quad \frac{2.39 \text{ dollars}}{33.84 \text{ ounces}} \cdot \frac{128 \text{ ounces}}{1 \text{ gallon}} \approx \frac{9.04 \text{ dollars}}{1 \text{ gallon}},$ <p>so <math>x \approx 9.04</math>, and the price of the juice is about \$9.04 per gallon.</p>	<p>1 point for correctly setting up the proportion            2 points for the correct unit rate and showing the work.            1 point for the correct statement including the correct units.</p> <p><b>4 TOTAL POINTS</b></p>
Part B	$\frac{7 \text{ dollars}}{128 \text{ ounces}} = \frac{x \text{ dollars}}{1 \text{ package of boxes}} \quad \frac{7 \text{ dollars}}{128 \text{ ounces}} \cdot \frac{33.84 \text{ ounces}}{1 \text{ package of boxes}} \approx \frac{1.85 \text{ dollars}}{1 \text{ package of boxes}},$ <p>and <math>x \approx 1.85</math> and the price of the cider is about \$1.85 per eight 4.23-ounce boxes.</p>	<p>1 point for correctly setting up the proportion            2 points for the correct unit rate and showing the work.            1 point for the correct statement including the correct units.</p> <p><b>4 TOTAL POINTS</b></p>
Part C	<p>c. Utilizing our previous answers to part a and b, we see that the cider is the more cost-effective choice. (In fact, Peter would have to buy four 8-packs of juice to get at least a gallon, for a cost of \$9.56, much more than the \$7 it would take to get a gallon of cider.)</p>	<p>1 point for the correct statement            1 point for justifying</p> <p><b>2 TOTAL POINTS</b></p>

7<sup>th</sup> Grade Unit 3: Ratios & Proportional Relationships (MIF)

Part D	d. The unit rates we used in parts a and b are dollars per gallon and dollars per pack of eight 4.23-ounce boxes.	1 point for the correct units for the cider 1 point for the correct units for the juice  <b>2 TOTAL POINTS</b>
Part E	e. Additional unit rates could be dollars per ounce, cents per ounce, ounces per dollar, dollars per 4.23-ounce box, etc.	1 point for each additional unit rate  <b>2 TOTAL POINTS</b>

## 7<sup>th</sup> Grade Portfolio Assessment: Unit 3 Performance Task 2

Name \_\_\_\_\_

Block \_\_\_\_\_

Date \_\_\_\_\_

### Double Discounts (7.RP.A.3)

Emily has a coupon for 20 percent off of her purchase at the store. She finds a backpack that she likes on the discount rack. Its original price is \$60 but everything on the rack comes with a 30 percent discount. Emily says

***Thirty percent and twenty percent make fifty percent so it will cost \$30.***

a. Is Emily Correct? Explain

b. What price will Emily pay for the backpack?

<p><b>Task Description</b></p>	<ul style="list-style-type: none"> <li>• Clearly constructs and communicates a complete response based on concrete referents provided in the prompt or constructed by the student such as diagrams that are connected to a written (symbolic) method, number line diagrams or coordinate plane diagrams.</li> <li>• Clearly constructs and communicates a complete response by             <ul style="list-style-type: none"> <li>➤ using a logical approach based on a conjecture and/or stated assumptions</li> <li>➤ providing an efficient and logical progression of steps</li> <li>➤ using grade-level vocabulary, symbols, and labels</li> <li>➤ providing a justification of a conclusion with minor computational error</li> <li>➤ evaluating, interpreting and critiquing the validity and efficiency of others' responses</li> </ul> </li> </ul>				
<p><b>Command Level Description</b></p>	<p><b>Level 5:</b> <i>Distinguished Command</i> Perform the task items accurately or with minor computation errors.</p>	<p><b>Level 4:</b> <i>Strong Command</i> Perform the task items with some non-conceptual errors.</p>	<p><b>Level 3:</b> <i>Moderate Command</i> Perform the task items with minor conceptual errors and some computation errors.</p>	<p><b>Level 2:</b> <i>Partial Command</i> Perform the task items with some errors on both math concept and computation.</p>	<p><b>Level 1:</b> <i>No Command</i> Perform the task items with serious errors on both math concept and computation.</p>
<p><b>Score range</b></p>	<p>6 pts</p>	<p>4-5 pts</p>	<p>3pts</p>	<p>2pts</p>	<p>0-1pts</p>
<p><b>Task Score &amp; PLD Assigned</b></p>					

#	Answer	Scoring
Part A	<p>a. It is true that 20% and 30% make 50%. But in the context of sale prices it is essential to keep track of the wholes to which these percents apply. For the backpack, the 30% discount applies to the original \$60 price: 30% of \$60 is <math>0.3 \times 60 = 18</math> making the discount on the backpack \$18. So after using the coupon, the backpack price becomes \$42. Emily's additional 20% coupon applies not to the original backpack price but to the discounted price of \$42: 20% of \$42 is \$8.40. Emily would need to save an additional \$12 off the \$42 price in order to buy the backpack for \$30 so her calculations are not correct.</p>	<p>1 point for correctly stating Emily's statement is wrong 2 points for the explanation</p> <p><b>3 TOTAL POINTS</b></p>
Part B	<p>b. As seen in part (a), Emily's coupon lowers the discount rack price by \$8.40 so she will pay</p> $42 - 8.40 = 33.60$ <p>or \$33.60.</p>	<p>3 points: Student has correct answer, correct work, and units. 2 points: Student has correct discount amount and correct units but has a minor mistake. 1 point: student only has the correct discount amount</p> <p><b>3 TOTAL POINTS</b></p>

## IX. Modifications

Special Education/ 504:	English Language Learners:
<ul style="list-style-type: none"> <li>-Adhere to all modifications and health concerns stated in each IEP.</li> <li>-Give students a MENU options, allowing students to pick assignments from different levels based on difficulty.</li> <li>-Accommodate Instructional Strategies: reading aloud text, graphic organizers, one-on-one instruction, class website (Google Classroom), handouts, definition list with visuals, extended time</li> <li>-Allow students to demonstrate understanding of a problem by drawing the picture of the answer and then explaining the reasoning orally and/or writing , such as Read-Draw-Write</li> <li>-Provide breaks between tasks, use positive reinforcement, use proximity</li> <li>-Assure students have experiences that are on the Concrete- Pictorial- Abstract spectrum by using manipulatives</li> <li>-Implement supports for students with disabilities (<a href="#">click here</a>)</li> <li>- Make use of strategies imbedded within lessons</li> <li>-Common Core Approach to Differentiate Instruction: Students with Disabilities (<a href="#">pg 17-18</a>)</li> <li>- <a href="#">Strategies for students with 504 plans</a></li> </ul>	<ul style="list-style-type: none"> <li>- Use manipulatives to promote conceptual understanding and enhance vocabulary usage</li> <li>- Provide graphic representations, gestures, drawings, equations, realia, and pictures during all segments of instruction</li> <li>- During i-Ready lessons, click on “Español” to hear specific words in Spanish</li> <li>- Utilize graphic organizers which are concrete, pictorial ways of constructing knowledge and organizing information</li> <li>- Use sentence frames and questioning strategies so that students will explain their thinking/ process of how to solve word problems</li> <li>- Utilize program translations (if available) for L1/ L2 students</li> <li>- Reword questions in simpler language</li> <li>- Make use of the ELL Mathematical Language Routines (click <a href="#">here</a> for additional information)</li> <li>-Scaffolding instruction for ELL Learners</li> <li>-Common Core Approach to Differentiate Instruction: Students with Disabilities (<a href="#">pg 16-17</a>)</li> </ul>
Gifted and Talented:	Students at Risk for Failure:
<ul style="list-style-type: none"> <li>- Elevated contextual complexity</li> <li>- Inquiry based or open ended assignments and projects</li> <li>- More time to study concepts with greater depth</li> <li>- Promote the synthesis of concepts and making real world connections</li> <li>- Provide students with enrichment practice that are imbedded in the curriculum such as:                             <ul style="list-style-type: none"> <li>● Application / Conceptual Development</li> <li>● Are you ready for more?</li> </ul> </li> <li>- Provide opportunities for math competitions</li> <li>- Alternative instruction pathways available</li> <li>- Common Core Approach to Differentiate Instruction: Students with Disabilities (<a href="#">pg. 20</a>)</li> </ul>	<ul style="list-style-type: none"> <li>- Assure students have experiences that are on the Concrete- Pictorial- Abstract spectrum</li> <li>- Modify Instructional Strategies, reading aloud text, graphic organizers, one-on-one instruction, class website (Google Classroom), inclusion of more visuals and manipulatives, Peer Support</li> <li>- Constant parental/ guardian contact</li> <li>- Provide academic contracts to students &amp; guardians</li> <li>- Create an interactive notebook with samples, key vocabulary words, student goals/ objectives.</li> <li>- Plan to address students at risk in your learning tasks, instructions, and directions. Anticipate where the needs will be, then address them prior to lessons.</li> <li>-Common Core Approach to Differentiate Instruction: Students with Disabilities (<a href="#">pg 19</a>)</li> </ul>



## 21st Century Life and Career Skills:

Career Ready Practices describe the career-ready skills that all educators in all content areas should seek to develop in their students. They are practices that have been linked to increase college, career, and life success. Career Ready Practices should be taught and reinforced in all career exploration and preparation programs with increasingly higher levels of complexity and expectation as a student advances through a program of study.

<https://www.state.nj.us/education/cccs/2014/career/9.pdf>

- |  |  |
|--|--|
| <ul style="list-style-type: none"><li>● <b>CRP1.</b> Act as a responsible and contributing citizen and employee.</li><li>● <b>CRP2.</b> Apply appropriate academic and technical skills.</li><li>● <b>CRP3.</b> Attend to personal health and financial well-being.</li><li>● <b>CRP4.</b> Communicate clearly and effectively and with reason.</li><li>● <b>CRP5.</b> Consider the environmental, social and economic impacts of decisions.</li><li>● <b>CRP6.</b> Demonstrate creativity and innovation.</li></ul> | <ul style="list-style-type: none"><li>● <b>CRP7.</b> Employ valid and reliable research strategies.</li><li>● <b>CRP8.</b> Utilize critical thinking to make sense of problems and persevere in solving them.</li><li>● <b>CRP9.</b> Model integrity, ethical leadership and effective management.</li><li>● <b>CRP10.</b> Plan education and career paths aligned to personal goals.</li><li>● <b>CRP11.</b> Use technology to enhance productivity.</li><li>● <b>CRP12.</b> Work productively in teams while using cultural global competence.</li></ul> |
|--|--|

**Students are given an opportunity to communicate with peers effectively, clearly, and with the use of technical language. They are encouraged to reason through experiences that promote critical thinking and emphasize the importance of perseverance. Students are exposed to various mediums of technology, such as digital learning, calculators, and educational websites.**

## Technology Standards:

All students will be prepared to meet the challenge of a dynamic global society in which they participate, contribute, achieve, and flourish through universal access to people, information, and ideas.

<https://www.state.nj.us/education/cccs/2014/tech/>

### 8.1 Educational Technology:

All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and to create and communicate knowledge.

- A. **Technology Operations and Concepts:** Students demonstrate a sound understanding of technology concepts, systems and operations.
- B. **Creativity and Innovation:** Students demonstrate creative thinking, construct knowledge and develop innovative products and process using technology.
- C. **Communication and Collaboration:** Students use digital media and environments to communicate and work collaboratively, including at a distance, to support individual learning and contribute to the learning of others.
- D. **Digital Citizenship:** Students understand human, cultural, and societal issues related to technology and practice legal and ethical behavior.
- E. **Research and Information Fluency:** Students apply digital tools to gather, evaluate, and use of information.
- F. **Critical thinking, problem solving, and decision making:** Students use critical thinking skills to plan and conduct research, manage projects, solve problems, and make informed decisions using appropriate digital tools and resources.

### 8.2 Technology Education, Engineering, Design, and Computational Thinking - Programming:

All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment.

- A. **The Nature of Technology: Creativity and Innovation-** Technology systems impact every aspect of the world in which we live.
- B. **Technology and Society:** Knowledge and understanding of human, cultural, and societal values are fundamental when designing technological systems and products in the global society.
- C. **Design:** The design process is a systematic approach to solving problems.
- D. **Abilities in a Technological World:** The designed world in a product of a design process that provides the means to convert resources into products and systems.
- E. **Computational Thinking: Programming-** Computational thinking builds and enhances problem solving, allowing students to move beyond using knowledge to creating knowledge.

**Interdisciplinary Connections:**

**English Language Arts:**

L.7.3	Use knowledge of language and its conventions when writing, speaking, reading, or listening.
SL.7.1	Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 7 topics, texts, and issues, building on others' ideas and expressing their own clearly.
W.7.1	Write arguments to support claims with clear reasons and relevant evidence.

## X. Core Instruction & Supplemental Resources

### Core Instruction

**MATH IN FOCUS v. 2015**  
(HOUGHTON MIFFLIN HARCOURT)

GRADE	TEACHER RESOURCES	STUDENT RESOURCES
2-5	<ul style="list-style-type: none"><li>• <b>Teacher Edition (A &amp; B)</b></li><li>• Implementation Guide</li><li>• Assessment Package</li><li>• Enrichment Bundle</li><li>• Extra Practice Guide</li><li>• Transition Guides</li><li>• Reteaching Guide</li><li>• Home -to- School Connection Book</li><li>• Online Teacher Technology Kit</li><li>• Fact Fluency</li><li>• Online Interactive Whiteboard Lessons</li></ul>	<ul style="list-style-type: none"><li>• Student Texts (A &amp; B)</li><li>• Student Workbooks</li><li>• Online Student Technology Kit</li><li>• Student Interactivities</li></ul>
6-7	<ul style="list-style-type: none"><li>• <b>Teacher Edition (A &amp; B)</b></li><li>• Implementation Guide</li><li>• Assessment Package</li><li>• Enrichment Bundle</li><li>• Extra Practice Guide</li><li>• Transition Guides</li><li>• Reteaching Guide</li><li>• Home -to- School Connection Book</li><li>• Online Teacher Technology Kit</li></ul>	<ul style="list-style-type: none"><li>• Student Texts (A &amp; B)</li><li>• Online Student Interactive Manipulatives</li></ul>

## 5 Practices for Orchestrating Productive Mathematics Discussions

### Anticipate

Consider how students might mathematically interpret a problem, the array of strategies—both correct and incorrect—that they might use to tackle it, and how those strategies and interpretations might relate to the mathematical concepts, representations, procedures, and practices that you would like the students to learn.

- Solve the problem yourself first. If possible work with colleagues.
- Ask yourself the following questions:
  - What strategies have students used in the past?
  - What representations are students most likely to use?
  - What incorrect or unproductive strategies are students likely to try?
  - What things might get in the way of students being able to engage with the problem? How can you remove those barriers?
  - What questions will you ask those who struggle?

### Monitor

Pay close attention to students' mathematical thinking and solution strategies as they work on the task.

- Create a list of strategies the students may produce.
- Circulate the room. Watch and listen to students as they work.
- If any students use strategies you anticipated, write their name or group number on your list.
- Ask questions that will help students make their thinking visible.
- Ask questions that will help students clarify their thinking.
- Press students to consider aspects of the task to which they need to attend.

### Select

Select particular students to share their work with the rest of the class to get specific mathematics into the open for discussion. The selection of particular students and their solutions is guided by the previously anticipated strategies and your assessment of how each approach will contribute to that goal.

- Based on the previously anticipated strategies and the mathematical goal of the activity, decide which student strategies to highlight.
- Select students who will share their work with the class.

### Sequence

Make purposeful choices about the order in which students' work is shared to maximize the chances of achieving the mathematical goals for the discussion.

- Based on the mathematical goal, decide on the purpose for the sequence of work. For example: least efficient to most efficient, concrete to abstract, misconceptions to conceptions, or building representations.
- Decide in which order students will present their work.

### Connect

Help students draw connections between their solutions and other students' solutions as well as the key mathematical ideas in the lesson. Help students to make judgments about the consequences of different approaches for the range of problems that can be solved, one's likely accuracy and efficiency in solving them, and the kinds of mathematical patterns that can be most easily discerned. Know where you want the discussion to "land" and make choices that are likely to get you there. If necessary, you may have to demonstrate an approach that students didn't come up with themselves.

- As students share, ask questions to elicit and clarify student thinking.
- After each student shares, ask questions to connect it to previously shared work or ask a student to summarize what another student said in their own words.
- Ask students to compare and contrast strategies or representations during the discussion.
- If students did not come up with an approach that you need them to see in order for the discussion to "land," demonstrate this approach and connect it to the work that students did.

IDEAL MATH BLOCK				
Whole Group Instruction	55min	<p>INSTRUCTION (Grades 3 – 8) Daily Routine: Mathematical Content or Language Routine (7 – 10 min)</p> <p>Anchor Task: Anticipate, Monitor, Select, Sequence, Connect Tech Integration: Digital applets embedded within lessons designed to enhance student learning</p> <p>Collaborative Work* Guided Learning/Guided Practice</p> <p>Independent Work (Demonstration of Student Thinking) Additional Activities / Let's Practice</p>		
Rotation Stations (Student Notebooks & Chromebooks Needed)	1-2X 30 min	<p>STATION 1: Focus on current Grade Level Content</p> <p>STUDENT EXPLORATION* Independent or groups of 2-3 Emphasis on MP's 3, 6 (Reasoning and Precision) And MP's 1 &amp; 4 (Problem Solving and Application)</p> <p>TOOLS/RESOURCES Practice Problems Extra Practice/Enrichment Are you ready for more? Put Your Thinking Cap On</p>	<p>STATION 2: Focus on Student Needs</p> <p>TECH STATION Independent</p> <p>TECH INTEGRATION iReady - <i>i-Ready</i> delivers online lessons driven by student data to provide tailored instruction that meets students where they are in their learning trajectory.</p> <p>Dreambox (ELL) – Adaptive online learning platform.</p>	<p>TEACHER STATION: Focus on Grade Level Content; heavily scaffolded to connect deficiencies</p> <p>TARGETED INSTRUCTION 4 – 5 Students</p> <p>TOOLS/ RESOURCES Homework Manipulatives Reteach Workbook Transition Guide *all students seen in 2 weeks</p>
Closure	5 min	<p>INSTRUCTION Exit Ticket (Demonstration of Student Thinking)</p> <p>TOOLS/RESOURCES Notebooks or Exit Ticket Slips</p>		

\* Promotes discourse and collaboration



## Supplemental Resources

### **Achieve the Core**

Tasks - <https://achievethecore.org/category/416/mathematics-tasks>

Coherence Map - <https://achievethecore.org/page/1118/coherence-map>

### **Embarc**

<https://embarc.online/>

### **Engage NY**

[https://www.engageny.org/ccss-library/?f%5B0%5D=field\\_subject%253Aparents\\_all%3A13601](https://www.engageny.org/ccss-library/?f%5B0%5D=field_subject%253Aparents_all%3A13601)

### **iReady Digital Platform**

<https://login.i-ready.com/>

### **Math in Focus**

<https://my.hrw.com/>

### **Illustrative Mathematics**

Content Standard Tasks - <https://tasks.illustrativemathematics.org/content-standards>

Practice Standard Tasks - <https://tasks.illustrativemathematics.org/practice-standards>

Open Up Resources - [https://access.openupresources.org/sign\\_in](https://access.openupresources.org/sign_in)

iM Additional Resources - <https://bit.ly/imshare>

### **Khan Academy**

<https://www.khanacademy.org/math/illustrative-math>

### **NJDOE Digital Item Library**

<https://nj.digitalitemlibrary.com/home?subject=Math>

### **Ready Teacher Toolbox**

<https://teacher-toolbox.com/>