



**Course 2 © 2020**

**Next Generation Mathematics  
Learning Standards  
Grade 7**



Primary references are bold. Supporting references are italicized.

STANDARDS	LESSON(S)
<b>Mathematical Practices</b>	
<b>1. Make sense of problems and persevere in solving them.</b>	<p>A strong problem-solving strand is present throughout the program with an emphasis on having students explain to themselves and others the meanings of problems and plan their solution strategies. Look for the <b>Apply</b> problems and exercises labeled as <b>Persevere with Problems</b>. In the Teacher Edition, look for the <b>Teaching the Mathematical Practices</b> tips labeled as this mathematical practice.</p> <p><i>Throughout the program, for example:</i></p> <p><i>Interactive Student Edition and Teacher Edition:</i></p> <ul style="list-style-type: none"><li>• Lesson 2-5, Example 4, Apply</li><li>• Lesson 2-6, Apply</li><li>• Lesson 5-2, Apply</li><li>• Lesson 9-3, Apply</li></ul>
<b>2. Reason abstractly and quantitatively.</b>	<p>Students are routinely asked to make sense of quantities and their relationships and attend to the meaning of quantities as opposed to just computing with them. Look for the exercises labeled as <b>Reason Abstractly</b>. Many <b>Talk About It!</b> question prompts ask students to reason about relationships between quantities. In the Teacher Edition, look for the <b>Teaching the Mathematical Practices</b> tips labeled as this mathematical practice.</p> <p><i>Throughout the program, for example:</i></p> <p><i>Interactive Student Edition and Teacher Edition:</i></p> <ul style="list-style-type: none"><li>• Lesson 1-1, Examples 1-2</li><li>• Lesson 1-4, Example 4</li><li>• Lesson 2-2, Example 1</li><li>• Lesson 9-1, Learn <i>Circumference of Circles</i></li><li>• Lesson 9-4, Example 5</li></ul>

STANDARDS	LESSON(S)
<p><b>3. Construct viable arguments and critique the reasoning of others.</b></p>	<p>Students are required to justify their reasoning and to find the errors in another student’s reasoning or work. Look for the <b>Apply</b> problems (Step 4) and the exercises labeled as <b>Make a Conjecture, Find the Error, Use a Counterexample, Make and Argument, or Justify Conclusions</b>. Many <i>Talk About It!</i> question prompts ask students to justify conclusions and/or critique another student’s reasoning. In the Teacher Edition, look for the <b>Teaching the Mathematical Practices</b> tips labeled as this mathematical practice.</p> <p><i>Throughout the program, for example:</i>  <i>Interactive Student Edition and Teacher Edition:</i></p> <ul style="list-style-type: none"> <li>• Lesson 1-1, Practice Exercise 14</li> <li>• Lesson 2-4, Example 1, <i>Talk About It!</i></li> <li>• Lesson 4-2, Practice Exercises 20 and 21</li> <li>• Lesson 8-3, Learn <i>Classify Triangles, Talk About It!</i></li> <li>• Lesson 8-5, Example 3, <i>Talk About It!</i></li> <li>• Lesson 9-6, Example 2</li> </ul>
<p><b>4. Model with mathematics.</b></p>	<p>Students apply the mathematics they know to solve real-world problems by using mathematical modeling. For example, students write equations to model real-world situations. Look for the exercises labeled as <b>Model with Mathematics</b>. In the Teacher Edition, look for the <b>Teaching the Mathematical Practices</b> tips labeled as this mathematical practice.</p> <p><i>Throughout the program, for example:</i>  <i>Interactive Student Edition and Teacher Edition:</i></p> <ul style="list-style-type: none"> <li>• Lesson 6-3, Examples 1-2</li> <li>• Lesson 6-5, Examples 1-2</li> <li>• Lesson 7-2, Examples 1-2</li> <li>• Lesson 7-5, Examples 1-2</li> </ul>

STANDARDS	LESSON(S)
<p><b>5. Use appropriate tools strategically.</b></p>	<p>In addition to traditional tools such as estimation, mental math, or measurement tools, students are encouraged to use digital tools, such as Web Sketchpad, eTools, etc. to help solve problems. Look for the exercises labeled as <b>Use Math Tools</b>. Many <b>Explore</b> activities ask students to select and use appropriate tools as they progress through the activities. In the Teacher Edition, look for the <b>Teaching the Mathematical Practices</b> tips labeled as this mathematical practice.</p> <p><i>Throughout the program, for example:</i>  <i>Interactive Student Edition and Teacher Edition:</i></p> <ul style="list-style-type: none"> <li>• Lesson 5-2, Example 1</li> <li>• Lesson 6-2, Explore activities <i>Solve Two-Step Equations Using Bar Diagrams</i> and <i>Solve Two-Step Equations Using Algebra Tiles</i></li> <li>• Lesson 6-4, Explore activities <i>Solve Two-Step Equations Using Bar Diagrams</i> and <i>Solve Two-Step Equations Using Algebra Tiles</i></li> <li>• Lesson 8-3, online Explore activity <i>Create Triangles</i></li> <li>• Lesson 8-3, Learn <i>Draw Triangles Using Tools</i>, Examples 2-3</li> </ul>
<p><b>6. Attend to precision.</b></p>	<p>Students are routinely required to communicate precisely to partners, the teacher, or the entire class by using precise definitions and mathematical vocabulary. Look for the exercises labeled as <b>Be Precise</b>. Many <b>Talk About It!</b> question prompts ask students to clearly and precisely explain their reasoning. In the Teacher Edition, look for the <b>Teaching the Mathematical Practices</b> tips labeled as this mathematical practice.</p> <p><i>Throughout the program, for example:</i>  <i>Interactive Student Edition and Teacher Edition:</i></p> <ul style="list-style-type: none"> <li>• Lesson 1-4, Example 4</li> <li>• Lesson 4-3, Example 1</li> <li>• Lesson 8-3, Example 1</li> <li>• Lesson 9-4, Example 5</li> </ul>

STANDARDS	LESSON(S)
<p><b>7. Look for and make use of structure.</b></p>	<p>Students are routinely encouraged to look for patterns or structure present in problem situations. Look for the exercises labeled as <b>Identify Structure</b>. Many <b>Talk About It!</b> question prompts ask students to study the structure of expressions and figures. In the Teacher Edition, look for the <b>Teaching the Mathematical Practices</b> tips labeled as this mathematical practice.</p> <p><i>Throughout the program, for example:</i>  <i>Interactive Student Edition and Teacher Edition:</i></p> <ul style="list-style-type: none"> <li>• Lesson 9-3, Examples 1-2</li> <li>• Lesson 9-4, Example 5</li> <li>• Lesson 9-5, Example 2</li> <li>• Lesson 9-6, Example 1, Learn <i>Surface Area of Composite Figures</i>, Example 2</li> </ul>
<p><b>8. Look for and express regularity in repeated reasoning.</b></p>	<p>Students are encouraged to look for repeated calculations that lead them to sound mathematical conclusions. Look for the exercises labeled as <b>Identify Repeated Reasoning</b>. Several <b>Talk About It!</b> question prompts ask students to look for repeated calculations. In the Teacher Edition, look for the <b>Teaching the Mathematical Practices</b> tips labeled as this mathematical practice.</p> <p><i>Throughout the program, for example:</i>  <i>Interactive Student Edition and Teacher Edition:</i></p> <ul style="list-style-type: none"> <li>• Lesson 3-3, Learn <i>Multiply Integers with the Same Sign</i></li> <li>• Lesson 4-1, Examples 1-2</li> <li>• Lesson 5-3, Learn <i>Additive Inverses of Expressions</i></li> <li>• Lesson 5-3, Example 2</li> </ul>

NY-7.RP

**Ratios and Proportional Relationships**

Analyze proportional relationships and use them to solve real-world and mathematical problems.

<p><b>1.</b> Compute unit rates associated with ratios of fractions.</p>	<p><b>Lesson(s) 1-1</b></p>
<p><b>2.</b> Recognize and represent proportional relationships between quantities.</p>	<p><b>Lesson(s) 1-2, 1-3, 1-4, 1-5, 1-6, 8-4, 11-2, 11-3</b></p>
<p><b>a.</b> Decide whether two quantities are in a proportional relationship.</p>	<p><b>Lesson(s) 1-3, 1-4</b></p>
<p><b>b.</b> Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships.</p>	<p><b>Lesson(s) 1-3, 1-4, 1-5, 8-4</b></p>
<p><b>c.</b> Represent a proportional relationship using an equation.</p>	<p><b>Lesson(s) 1-5</b></p>

STANDARDS	LESSON(S)
<p><b>d.</b> Explain what a point <math>(x, y)</math> on the graph of a proportional relationship means in terms of the situation, with special attention to the points <math>(0, 0)</math> and <math>(1, r)</math> where <math>r</math> is the unit rate.</p>	<p><b>Lesson(s) 1-4</b></p>
<p><b>Standard 7.RP.3</b> Use proportional relationships to solve multi-step ratio and percent problems. <i>Examples: simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease, percent error.</i></p>	<p><b>Lesson(s) 1-6, 2-1, 2-2, 2-3, 2-4, 2-5, 2-6, 2-7, 8-4, 11-2</b></p>
<p><b>NY-7.NS</b> <b>The Number System</b></p>	
<p><b>Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers.</b></p>	
<p><b>1.</b> Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers. Represent addition and subtraction on a horizontal or vertical number line diagram.</p>	<p><b>Lesson(s) 3-1, 3-2, 3-5, 4-2, 4-3, 4-6</b></p>
<p><b>a.</b> Describe situations in which opposite quantities combine to make 0.</p>	<p><b>Lesson(s) 3-1, 4-2</b></p>
<p><b>b.</b> Understand addition of rational numbers; <math>p + q</math> as the number located a distance <math> q </math> from <math>p</math> in the positive or negative direction, depending on whether <math>q</math> is positive or negative. Show that a number and its opposite have a sum of 0 (are additive inverses). Interpret sums of rational numbers by describing real-world contexts.</p>	<p><b>Lesson(s) 3-1, 4-2</b></p>
<p><b>c.</b> Understand subtraction of rational numbers as adding the additive inverse, <math>p - q = p + (-q)</math>. Show that the distance between two rational numbers on the number line is the absolute value of their difference, and apply this principle in real-world contexts.</p>	<p><b>Lesson(s) 3-2, 4-3</b></p>
<p><b>d.</b> Apply properties of operations as strategies to add and subtract rational numbers.</p>	<p><b>Lesson(s) 3-1, 3-2, 3-4, 3-5, 4-2, 4-3, 4-4, 4-5, 4-6</b></p>
<p><b>2.</b> Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers.</p>	<p><b>Lesson(s) 3-3, 3-4, 3-5, 4-1, 4-4, 4-5, 4-6</b></p>
<p><b>a.</b> Understand that multiplication is extended from fractions to rational numbers by requiring that operations continue to satisfy the properties of operations, particularly the distributive property, leading to products such as <math>(-1)(-1) = 1</math> and the rules for multiplying signed numbers. Interpret products of rational numbers by describing real-world contexts.</p>	<p><b>Lesson(s) 3-3, 4-4, 4-5</b></p>

STANDARDS	LESSON(S)
<p><b>b.</b> Understand that integers can be divided, provided that the divisor is not zero, and every quotient of integers (with non-zero divisor) is a rational number. If <math>p</math> and <math>q</math> are integers, then <math>-(p/q) = (-p)/q = p/(-q)</math>. Interpret quotients of rational numbers by describing real-world contexts.</p>	<p><b>Lesson(s) 3-4, 4-1, 4-5</b></p>
<p><b>c.</b> Apply properties of operations as strategies to multiply and divide rational numbers.</p>	<p><b>Lesson(s) 3-3, 3-4, 3-5, 4-4, 4-5, 4-6</b></p>
<p><b>d.</b> Convert a rational number to a decimal using long division; know that the decimal form of a rational number terminates in 0s or eventually repeats.</p>	<p><b>Lesson(s) 4-1</b></p>
<p><b>3.</b> Solve real-world and mathematical problems involving the four operations with rational numbers. <b>Note:</b> Computations with rational numbers extend the rules for manipulating fractions to complex fractions limited to <math>a/b/c/d</math> where <math>a</math>, <math>b</math>, <math>c</math>, and <math>d</math> are integers and <math>b</math>, <math>c</math>, and <math>d \neq 0</math>.</p>	<p><b>Lesson(s) 3-1, 3-2, 3-3, 3-4, 3-5, 4-1, 4-2, 4-4, 4-5, 4-6, 6-1, 8-4, 9-1, 9-2, 9-3, 9-4, 9-5, 9-6</b></p>
<p><b>NY-7.EE Expressions, Equations, and Inequalities</b></p>	
<p><b>Use properties of operations to generate equivalent expressions.</b></p>	
<p><b>1.</b> Add, subtract, factor, and expand linear expressions with rational coefficients by applying the properties of operations.</p>	<p><b>Lesson(s) 5-1, 5-2, 5-3, 5-4, 5-5</b></p>
<p><b>2.</b> Understand that rewriting an expression in different forms in real-world and mathematical problems can reveal and explain how the quantities are related.</p>	<p><b>Lesson(s) 2-2, 2-3, 2-4, 2-6, 4-6, 5-1</b></p>
<p><b>Solve real-life and mathematical problems using numerical and algebraic expressions, equations, and inequalities.</b></p>	
<p><b>3.</b> 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. Assess the reasonableness of answers using mental computation and estimation strategies.</p>	<p><b>Lesson(s) 2-1, 2-2, 2-3, 2-4, 2-5, 2-6, 2-7, 3-1, 3-2, 3-3, 3-4, 3-5, 4-1, 4-2, 4-3, 4-4, 4-5, 4-6, 6-1, 6-2, 6-3, 6-4, 6-5, 7-1, 7-2, 7-3, 7-4, 7-5, 7-6, 8-1, 8-2, 8-4</b></p>
<p><b>4.</b> 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.</p>	<p><b>Lesson(s) 6-1, 6-2, 6-3, 6-4, 6-5, 7-1, 7-2, 7-3, 7-4, 7-5, 7-6, 9-1, 9-2, 9-3, 9-4</b></p>
<p><b>a.</b> Solve word problems leading to equations of the form <math>px + q = r</math> and <math>p(x + q) = r</math>, where <math>p</math>, <math>q</math>, and <math>r</math> are 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.</p>	<p><b>Lesson(s) 6-1, 6-2, 6-3, 6-4, 6-5, 8-1, 8-2, 9-1, 9-2, 9-3, 9-4</b></p>

STANDARDS	LESSON(S)
<p><b>b.</b> Solve word problems leading to inequalities of the form <math>px + q &gt; r</math>, <math>px + q \geq r</math>, <math>px + q \leq r</math>, or <math>px + q &lt; r</math>, where <math>p</math>, <math>q</math>, and <math>r</math> are rational numbers. Graph the solution set of the inequality on the number line and interpret it in the context of the problem.</p>	<p><b>Lesson(s) 7-1, 7-2, 7-3, 7-4, 7-5, 7-6</b></p>
<p><b>NY-7.G</b> <b>Geometry</b></p>	
<p><b>Draw, construct, and describe geometrical figures and describe the relationships between them.</b></p>	
<p><b>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.</p>	<p><b>Lesson(s) 8-4, 9-6</b></p>
<p><b>2.</b> Draw triangles when given measures of angles and/or sides, noticing when the conditions determine a unique triangle, more than one triangle, or no triangle.</p>	<p><b>Lesson(s) 8-3</b></p>
<p><b>3.</b> Describe the two-dimensional shapes that result from slicing three-dimensional solids parallel or perpendicular to the base.</p>	<p><b>Lesson(s) 8-5</b></p>
<p><b>Solve real-life and mathematical problems involving angle measure, area, surface area, and volume.</b></p>	
<p><b>4.</b> Apply the formulas for the area and circumference of a circle to solve problems.</p>	<p><b>Lesson(s) 9-1, 9-2, 9-3</b></p>
<p><b>5.</b> Use facts about supplementary, complementary, vertical, and adjacent angles in a multi-step problem to write and solve simple equations for an unknown angle in a figure.</p>	<p><b>Lesson(s) 8-1, 8-2</b></p>
<p><b>6.</b> Solve real-world and mathematical problems involving area of two-dimensional objects composed of triangles and trapezoids.</p>	<p><b>Lesson(s) 9-3, 9-4, 9-5, 9-6</b></p>
<p><b>NY-7.SP</b> <b>Statistics and Probability</b></p>	
<p><b>Draw informal comparative inferences about two populations.</b></p>	
<p><b>1.</b> Construct and interpret box-plots, find the interquartile range, and determine if a data point is an outlier.</p>	<p>See <i>Reveal Math Course 1</i> © 2020 <b>Lesson 10-4, 10-6</b></p>
<p><b>3.</b> Informally assess the degree of visual overlap of two quantitative data distributions.</p>	<p><b>Lesson(s) 11-5</b></p>
<p><b>4.</b> Use measures of center and measures of variability for quantitative data from random samples or populations to draw informal comparative inferences about the populations.</p>	<p><b>Lesson(s) 11-4</b></p>



STANDARDS	LESSON(S)
<b>Investigate chance processes and develop, use, and evaluate probability models.</b>	
<b>8.</b> Find probabilities of compound events using organized lists, sample space tables, tree diagrams, and simulation.	<b>Lesson(s) 10-5, 10-6</b>
<b>a.</b> Understand that, just as with simple events, the probability of a compound event is the fraction of outcomes in the sample space for which the compound event occurs.	<b>Lesson(s) 10-5</b>
<b>b.</b> Represent sample spaces for compound events using methods such as organized lists, tables and tree diagrams. For an event described in everyday language identify the outcomes in the sample space which compose the event.	<b>Lesson(s) 10-5</b>
<b>c.</b> Design and use a simulation to generate frequencies for compound events.	<b>Lesson(s) 10-6</b>