# *Grade 7 Mathematics Curriculum Guide*

| **Grade Level/Course Title:** Grade 7 | **Quarter** 1 | **Academic Year:** 2018-2019 |
|---|---|---|

**Grade Level Mathematics Focus:**
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.

**Essential Questions for this Unit:**
1.  How can 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?
2.  How can 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?
3.  How can students apply these properties, and view negative numbers in terms of everyday contexts (e.g., amounts owed or temperatures below zero), explain and interpret the rules for adding, subtracting, multiplying, and dividing with negative numbers?

| Unit (Time) | CCSS | Standard Description | Content | Resources |
|---|---|---|---|---|
| **(Aug-Oct)**<br><br>**Unit 1:**<br><br>**Number**<br><br>**Systems**<br><br>**(31 days)** | 7.NS.1 | **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.**<br>    a.  Describe situations in which opposite quantities combine to make 0.<br>    b.  Understand $p + q$ as the number located a distance $\|q\|$ from $p$, in the positive or negative direction depending on whether $q$ is positive or negative.  Show that a number and its opposite have a sum of 0 (are additive inverses).<br>    c.  Understand subtraction of rational numbers as adding the additive inverse, $p - q = p + (-q)$.  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.<br>    d.  Apply properties of operations as strategies to add and subtract rational numbers | •  Understand and apply properties of numbers<br>•  Syntax<br>•  Grouping symbols<br>•  Zero pairs<br>•  Decomposition<br>•  Using number lines to show addition and subtraction of integers<br>•  Use tile spacers and number lines to model zero pairs/opposites<br>•  Use number lines to show absolute value | **Properties of Numbers and Order of Operations**<br><br>Properties of Numbers<br> • Commutative and Associative **(1 day)**<br>The order of Operations **(1 day)**<br>  Order of Operations [L]<br>  Simplifying Expressions with Two Column Proofs [CP]<br>  Simplifying Expressions with Two Column Proofs [L]<br><br>**Chapter 1: Integers**<br><br>General Resources<br>  Integer Operations – Multiple Representations [CP]<br>  Adding/Subtraction Integers Worksheet [WS]<br>  Dynamic Classroom → Tools → Integer Counters<br><br>1.1 Integers and Absolute Value<br> • Activities 1-3 **(1 day)**<br> • Lesson **(1 day)**<br>1.2 Adding Integers<br> • Activities 1-4 **(1 day)**<br>  Weights and Balloons Video<br> • Lesson (include word problems) **(2 days)**<br>  Adding Integers Worksheet [WS]<br>  Adding Integers [L] |

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**Essential Questions for this Unit:**
1. How can 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?
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3. How can students apply these properties, and view negative numbers in terms of everyday contexts (e.g., amounts owed or temperatures below zero), explain and interpret the rules for adding, subtracting, multiplying, and dividing with negative numbers?

| Unit (Time) | CCSS | Standard Description | Content | Resources |
|---|---|---|---|---|
| **(Aug-Oct)**<br><br>**Unit 1:**<br><br>**Number Systems**<br><br><br>**(31 days)** | 7.NS.1 | **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.**<br>　a. Describe situations in which opposite quantities combine to make 0.<br>　b. Understand $p + q$ as the number located a distance $|q|$ from $p$, in the positive or negative direction depending on whether $q$ is positive or negative. Show that a number and its opposite have a sum of 0 (are additive inverses).<br>　c. Understand subtraction of rational numbers as adding the additive inverse, $p - q = p + (-q)$. 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.<br>　d. Apply properties of operations as strategies to add and subtract rational numbers | • Understand and apply properties of numbers<br>• Decomposition<br>• Using number lines to show addition and subtraction of integers<br>• Use tile spacers and number lines to model zero pairs/opposites<br>• Learn Operations with signed rational numbers<br>• Use number lines to show absolute value<br>• Understand multiplication as repeated addition | **Chapter 1: Integers (Continued)**<br><br>1.3 Subtracting Integers<br>• Activities 1-4 **(1 day)**<br>• Lesson (include word problems) **(2 days)**<br>　Subtracting Integers [L]<br>　Number Line Subtraction [L]<br>　PT: Operations on a Number Line [IMT]<br>　PT: Differences of Integers [IMT]<br>1.4 Multiplying Integers<br>• Activities 1-4 and lesson **(1 day)**<br>　Integers – Multiplying [L]<br>1.5 Dividing Integers<br>• Activities 1-3 and lesson **(1 day)**<br><br>Review, Assess, Reteach **(3 days)**<br>　PT: Bookstore Account [IMT] |

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1. How can 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?
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3. How can students apply these properties, and view negative numbers in terms of everyday contexts (e.g., amounts owed or temperatures below zero), explain and interpret the rules for adding, subtracting, multiplying, and dividing with negative numbers?

| Unit (Time) | CCSS | Standard Description | Content | Resources |
|---|---|---|---|---|
| **(Aug-Oct)**<br><br>**Unit 1:**<br>**(Continued)**<br><br>**Number**<br>**Systems**<br><br><br>**(31 days)** | 7.NS.2 | **Apply & extend previous understandings of multiplication & division & of fractions to multiply & divide rational numbers.**<br>  a. Understand that multiplication is extended from fractions to rational #'s by requiring that operations continue to satisfy the properties of operations, particularly the distributive property, leading to products such as $(-1)(-1) = 1$ and the rules for multiplying signed numbers.<br>  b. Understand that integers can be divided, provided that the divisor is not zero, and every quotient of integers (with nonzero divisor) is a rational number.<br>  c. Apply properties of operations as strategies to multiply and divide rational numbers.<br>  d. 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. | • Using the "bubble method" to find the LCM of a number<br>• Convert between fractions, decimals, and percents<br>• Learn the difference between terminating and repeating decimals.<br>• Compare fractions using common denominators, and by converting to decimals.<br>• Add and subtract unlike fractions using common Denominators<br>• Multiply and divide fractions | **Chapter 2: Rational Numbers**<br><br>General Resources<br>  Simplifying Fractions [CP]<br>  Simplifying Fractions Activity [L]<br>  Simplifying and Multiplying Fractions Sort [L]<br>  Converting Fractions, Decimals, and Percents [L]<br>2.1 Rational Numbers<br>  • Activity 1 **(1 day)**<br>  • Lesson **(2 days)**<br>  Comparing and Ordering Fractions [CP]<br>  Comparing and Ordering Fractions [L]<br>2.2 Adding Rational Numbers<br>  • Activities 1-3 **(1 day)**<br>  • Lesson (Adding decimals) **(1 day)**<br>  • Lesson (Adding fractions) **(1 day)**<br>  Simplifying and Multiplying Fractions Sort [L]<br>  Multiplying Fractions [CP]<br><br>2.1–2.2 Quiz and review/extension activity **(1 day)** |
| | 7.NS.3 | Solve real-world & mathematical problems involving the four operations w/ rational #'s. | | |

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| **Grade Level/Course Title:** Grade 7 | **Quarter** 1 | **Academic Year:** 2018-2019 |
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**Grade Level Mathematics Focus:**
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.

**Essential Questions for this Unit:**
4. How can 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?
5. How can 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?
6. How can students apply these properties, and view negative numbers in terms of everyday contexts (e.g., amounts owed or temperatures below zero), explain and interpret the rules for adding, subtracting, multiplying, and dividing with negative numbers?

| **Unit (Time)** | **CCSS** | **Standard Description** | **Content** | **Resources** |
|---|---|---|---|---|
| **(Aug-Oct)**<br><br>**Unit 1:**<br>**(Continued)**<br><br>**Number**<br>**Systems**<br><br><br>**(31 days)** | 7.NS.2 | **Apply & extend previous understandings of multiplication & division & of fractions to multiply & divide rational numbers.**<br>  a. Understand that multiplication is extended from fractions to rational #'s by requiring that operations continue to satisfy the properties of operations, particularly the distributive property, leading to products such as $(-1)(-1) = 1$ and the rules for multiplying signed numbers.<br>  b. Understand that integers can be divided, provided that the divisor is not zero, and every quotient of integers (with nonzero divisor) is a rational number.<br>  c. Apply properties of operations as strategies to multiply and divide rational numbers.<br>  d. 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. | • Using the "bubble method" to find the LCM of a number<br>• Convert between fractions, decimals, and percents<br>• Learn the difference between terminating and repeating decimals.<br>• Compare fractions using common denominators, and by converting to decimals.<br>• Add and subtract unlike fractions using common Denominators<br>• Multiply and divide fractions | **Chapter 2: Rational Numbers (Continued)**<br><br>2.3 Subtracting Rational Numbers<br>  • Activities 1-3 **(1 day)**<br>  • Lesson **(2 days)**<br>2.4 Multiplying and Dividing Rational Numbers<br>  • Activities 1-3 **(1 day)**<br>  [Modeling Division of a Whole Number by a Fraction](#) [L]<br>  [Modeling Division of a Fraction by a Fraction](#) [L]<br>  • Lesson – Multiplying **(1 day)**<br>  • Lesson – Dividing **(1 day)**<br>  [Dividing Fractions](#) [CP]<br><br>Review, Assess, Reteach **(3 days)** |
| | 7.NS.3 | Solve real-world & mathematical problems involving the four operations w/ rational #'s. | | |

# *Grade 7 Mathematics Curriculum Guide*

| **Grade Level/Course Title:** Grade 7 | **Quarter** 1/2 | **Academic Year:** 2018-2019 |
|---|---|---|

**Grade Level Mathematics Focus:**
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.

**Essential Questions for this Unit:**
1.   How can students use the arithmetic of rational numbers as they formulate expressions and equations in one variable and use these equations to solve problems?

| **Unit (Time)** | **CCSS** | **Standard Description** | **Content** | **Resources** |
|---|---|---|---|---|
| **(Oct-Dec)**<br><br>**Unit 2:**<br><br>**Expressions and Equations**<br><br>**(38 days)** | 7.EE.1 | Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients. | • Decomposition<br>• Commutative Property<br>• Associative Property<br>• Identity Property<br>• Inverse Property<br>• Distributive Property<br>• Variable expressions<br>• Numerical expressions<br>• Zero pairs<br>• Using multiple methods to simplify expressions (i.e. decomposition, bar models, algebra tiles, number lines)<br>• Combine like terms through addition and subtraction | **Chapter 3: Expressions and Equations**<br><br>**Expressions**<br>General resources for use throughout "Expressions"<br>    Translating Expressions [L]<br>    PT: Guess My Number [IMT]<br><br>The Distributive Property<br>  • Algebra tiles, area model, decomposition **(1 day)**<br>  • Generic rectangle, traditional **(1 day)**<br>    Distributive Property [CP]<br>    Distributive Property – an Introduction [L]<br>3.1 Algebraic Expressions<br>  • Lesson **(2 days)**<br>    Combining Like Terms [L]<br>3.2 Adding and Subtracting Linear Expressions<br>  • Lesson **(2 days)**<br><br>3.1–3.2 Quiz and review/extension activity **(1 day)**<br>    PT: Writing Expressions [IMT]<br>    PT: Ticket to Ride [IMT] |
| | 7.EE.2 | Understand that rewriting an expression in different forms in a problem context can shed light on the problem and how the quantities in it are related. *For example, a + 0.05a = 1.05a means that "increase by 5%" is the same as "multiply by 1.05."* | | |
| | 7.EE.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 as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies. | | |

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|---|---|---|

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**Essential Questions for this Unit:**
1.  How can students use the arithmetic of rational numbers as they formulate expressions and equations in one variable and use these equations to solve problems?

| **Unit (Time)** | **CCSS** | **Standard Description** | **Content** | **Resources** |
|---|---|---|---|---|
| **(Oct-Dec)**<br><br>**Unit 2:**<br><br>**(Continued)**<br><br>**Expressions and Equations**<br><br>**(38 days)** | 7.EE.4 | **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.**<br>    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?* | • Using multiple methods to solve equations and inequalities (i.e. decomposition, bar models, algebra tiles, number lines)<br><br>• Real life applications of expressions and equations | **Chapter 3: Expressions and Equations**<br><br>**Simple Equations**<br><br>General resources for use throughout "Solving Equations"<br>    Syntax – Expressions, Equations, and Inequalities [L]<br>    Solving Equations with Two Column Proofs [L]<br>    Solving Equations with Two Column Proofs [CP]<br>    Algebra Tiles- Big Ideas Online<br><br>Solving Equations Using + or –<br>• 3.3 Activity 4<br>• One-Step Equations [L] **(1 day)**<br>Solving Equations Using • or ÷<br>• 3.4 Activity 3<br>• One-Step Equations [L] **(1 day)**<br>Word Problems **(1 day)**<br>    PT: Bookstore Account [IMT]<br><br>Quiz and review/extension activity **(1 day)**<br><br>**Quarterly Assessment #1** |

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**Essential Questions for this Unit:**
1. How can students use the arithmetic of rational numbers as they formulate expressions and equations in one variable and use these equations to solve problems?

| Unit (Time) | CCSS | Standard Description | Content | Resources |
|---|---|---|---|---|
| **(Oct-Dec)**<br><br>**Unit 2:**<br>**(Continued)**<br><br>**Expressions and Equations**<br><br>**(38 days)** | 7.EE.4 | **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.**<br>    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?* | • Using multiple methods to solve equations and inequalities (i.e. decomposition, bar models, algebra tiles, number lines)<br>• Real life applications of expressions and equations | **Chapter 3: Expressions and Equations**<br><br>**Multi-Step Equations**<br><br>3.5 Solving Two-Step Equations (Example 1)<br> • Activities 1-3 **(1 day)**<br>  Equations with Algebra Tiles [L]<br> • Bar model and decomposition **(2 day)**<br> • Bar model, decomposition, inverse **(2 day)**<br>  Solving Equations – Multiple Methods [L]<br>  Solving Two-Step Equations with Number Lines [L]<br>3.5 Solving Two-Step Equations (Example 2) **(1 day)**<br>  Solving Rational Equations [L]<br>3.5 Solving Two-Step Equations (Example 3) **(1 day)**<br>3.5 Solving Two-Step Equations (Example 4) **(1 day)**<br>  PT: Gotham City Taxis [IMT]<br><br>Review, Assess, Reteach **(3 days)**<br><br><br>**Interim Assessment Blocks (IAB)  (2 days)**<br>• Unit 1 Number System<br>• Unit 2 Expressions and Equations |

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**Essential Questions for this Unit:**
1. How can students use the arithmetic of rational numbers as they formulate expressions and equations in one variable and use these equations to solve problems?

| Unit (Time) | CCSS | Standard Description | Content | Resources |
|---|---|---|---|---|
| **(Oct-Dec)**<br><br>**Unit 2:**<br>**(Continued)**<br><br>**Expressions and Equations**<br><br>**(38 days)** | 7.EE.4 | **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.**<br>  b. Solve word problems leading to inequalities of the form $px + q > r$ or $px + q < r$, where $p$, $q$, and $r$ are specific rational numbers.  Graph the solution set of the inequality and interpret it in the context of the problem.  *For example: As a salesperson, you are paid $50 per week plus $3 per sale.  This week you want your pay to be at least $100.  Write an inequality for the number of sales you need to make, and describe the solutions.* | • Using multiple methods to solve equations and inequalities (i.e. decomposition, bar models, algebra tiles, number lines)<br>• Real life applications of expressions and equations | **Chapter 4: Inequalities**<br><br>4.1 Writing and Graphing Inequalities<br> • Activities 1-2 **(1 day)**<br> • Lesson **(2 days)**<br>4.2 Solving Inequalities Using + or –<br> • Activity 1 and 2 **(1 day)**<br> • Lesson **(1 day)**<br>4.3 Solving Inequalities Using • or ÷<br> • Activities 1 and 3 **(1 day)**<br> • Lesson **(1 day)**<br><br>4.1–4.3 Quiz and review/extension activity **(1 day)**<br>  Inequalities Sort [L]<br><br>4.4 Solving Two-Step Inequalities (Example 1) **(1 day)**<br>4.4 Solving Two-Step Inequalities (Example 2) **(1 day)**<br>4.4 Solving Two-Step Inequalities (Example 3) **(1 day)**<br>  PT: Fishing Adventures 1 [IMT]<br>  PT: Fishing Adventures 2 [IMT]<br>  PT: Sports Equipment Set [IMT]<br><br>Review, Assess, Reteach **(3 days)**<br><br>**Quarterly Assessment #2** |

# *Grade 7 Mathematics Curriculum Guide*

| **Grade Level/Course Title:** Grade 7 | **Quarter** 2/3 | **Academic Year:** 2018-2019 |
|---|---|---|

**Grade Level Mathematics Focus:**
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.

**Essential Questions for this Unit:**
1. How can students extend their understanding of ratios and develop understanding of proportionality to solve single- and multi-step problems, and 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?
2. How can 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?
3. How can students graph proportional relationships and understand the unit rate informally as a measure of the steepness of the related line, called the slope, and distinguish proportional relationships from other relationships?

| **Unit (Time)** | **CCSS** | **Standard Description** | **Content** | **Resources** |
|---|---|---|---|---|
| **(Dec-Mar)**<br><br>**Unit 3:**<br><br>**Ratios and Proportional Relationships**<br><br>**(50 days)** | 7.RP.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 $^{1/2}/_{1/4}$ miles per hour, equivalently 2 miles per hour.* | • Complex fractions<br>• Equivalent fractions<br>• Equivalent forms of 1<br>• Rates | **General resources for Chapter 5**<br>Bar Model Template – 5% [Worksheet]<br>Bar Model Template – 10% [Worksheet]<br>Bar Model Percent Equivalency [Worksheet]<br>Fraction Bars/ Percent Bars [Worksheet]<br><br>**Chapter 5: Ratios and Proportions**<br>*Special Note: Horizontal tables are set up y over x in textbook examples. Practice problems on page 174 are set up x over y.*<br>5.1 Ratios and Rates<br> • Review graphing with ordered pairs **(1 day)**<br> • Complex Fractions [L] **(1 day)**<br>  PT: Molly's Run, Assessment Variation [IMT]<br> • Activities 1-4 **(1 day)**<br> • Lesson Ex. 1 – Finding Ratios and Rates **(1 day)**<br> • Lesson Ex. 2 & 3 – Tables and Graphs **(1 day)**<br> • Lesson Ex. 4 Solving Ratio Problem **(1 day)**<br>  Bar Models – Rate, Percent, Equations [L]<br>  Rates, Ratios, and Proportions [CP]<br>  PT: Cooking with a Cup [IMT]<br>  PT: Cider versus Juice [IMT]<br>5.2 Proportions<br> • Activities 1-3 **(1 day)**<br> • Lesson Ex. 1 & 2 **(1 day)**<br> • Lesson Ex. 3 **(1 day)**<br>  Proportional Relationships in Tables and Graphs<br>  PT: Gym Membership Plans [IMT] |

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**Essential Questions for this Unit:**
1. How can students extend their understanding of ratios and develop understanding of proportionality to solve single- and multi-step problems, and 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?
2. How can 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?
3. How can students graph proportional relationships and understand the unit rate informally as a measure of the steepness of the related line, called the slope, and distinguish proportional relationships from other relationships?

| Unit (Time) | CCSS | Standard Description | Content | Resources |
| --- | --- | --- | --- | --- |
| **(Dec-Mar)**<br><br>**Unit 3:**<br><br>**Ratios and Proportional Relationships**<br><br>**(50 days)** | 7.RP.2 | **Recognize and represent proportional relationships between quantities.**<br>    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.<br>    b.  Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships.<br>    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.*<br>    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. | • Using different methods to solve problems involving proportional relationships (i.e. bar model, tables, graphs, equations)<br>• Equivalent fractions<br>• Equivalent forms of 1<br>• Rates<br>• Constant of proportionality (unit rate)<br>• Proportions<br>• Testing proportionality<br>• Using different methods to solve problems involving distance | **Chapter 5: Ratios and Proportions (Continued)**<br>5.2 Ext. Graphing Proportional Relationships **(1 Day)**<br>  Proportional Relationships in Tables and Graphs<br>  Engage NY Module 1 – Lessons 6<br>  PT: Robot Races, Assessment Variation [IMT]<br>5.3 Writing Proportions<br>  • Activities 1-3 **(1 Day)**<br>  • Lesson **(1 Day)**<br><br>5.1-5.3 Quiz and review/extension activity **(1 day)**<br><br>5.4 Solving Proportions<br>  • Lesson Ex.1 & 2 **(1 day)**<br>  • Lesson Ex. 3 **(1 day)**<br>  Rates, Ratios, and Proportions [CP]<br>  Proportions [L]<br>5.5 Slope<br>  • Activities 1 & 2 **(2 days)**<br>  • Lesson **(1 day)**<br>5.6 Direct Variation<br>  • Lesson **(1 day)** *Accentuate Vocabulary*<br>  PT: Buying Coffee [IMT]<br>  PT: Proportionality [IMT]<br><br>Review, Assess, Reteach **(3 days)** |

# *Grade 7 Mathematics Curriculum Guide*

| **Grade Level/Course Title:** Grade 7 | **Quarter** 2/3 | **Academic Year:** 2018-2019 |
|---|---|---|

**Grade Level Mathematics Focus:**
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.

**Essential Questions for this Unit:**
1. How can students extend their understanding of ratios and develop understanding of proportionality to solve single- and multi-step problems, and 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?
2. How can 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?
3. How can students graph proportional relationships and understand the unit rate informally as a measure of the steepness of the related line, called the slope, and distinguish proportional relationships from other relationships?

| Unit (Time) | CCSS | Standard Description | Content | Resources |
|---|---|---|---|---|
| **(Dec-Mar)**<br><br>**Unit 3:**<br>**(Continued)**<br><br>**Ratios and**<br>**Proportional**<br>**Relationships**<br><br>**(50 days)** | 7.RP.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.* | • Market math (i.e. discount, commission, gratuity)<br>• Using bar models to represent sale price and discount<br>• Using percent proportions, percent equations, and bar models to solve equations involving percent | **General Resources for Chapter 6**<br>Converting Fractions, Decimals, and Percents [L]<br>Percent Problems – Multiple Methods [CP]<br>Bar Models – Rate, Percent, Equations [L]<br><br>**Chapter 6: Percents**<br>6.1 Percents and Decimals<br>• Activities 1-3 **(1 day)**<br>• Lesson Ex. 1-3 **(1 day)**<br>• Lesson Ex. 4 **(1 day)**<br>6.2 Comparing and Ordering<br>• Activities 1 & 2 **(1 day)**<br>• Lesson **(1 day)**<br>6.3 The Percent Proportion<br>• Activities 1-4 **(1 day)**<br>• Lesson Ex. 1-3 **(1 day)**<br>• Lesson Ex. 4 **(1 day)**<br>6.4 The Percent Equation<br>• Activities 1, 2, & 4 **(1 day)**<br>• Lesson Ex. 1, 2 & 3 **(1 day)**<br>• Lesson Ex. 4 **(1 day)**<br><br>6.1-6.4 Quiz and review/extension activity **(1 day)** |
|  | 7.EE.2 | Understand that rewriting an expression in different forms in a problem context can shed light on the problem and how the quantities in it are related. *For example, a + 0.05a = 1.05a means that "increase by 5% " is the same as "multiply by 1.05."* |  |  |

*West Contra Costa Unified School District*

# *Grade 7 Mathematics Curriculum Guide*

| **Grade Level/Course Title:** Grade 7 | **Quarter** 2/3 | **Academic Year:** 2018-2019 |
|---|---|---|

**Grade Level Mathematics Focus:**
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.

**Essential Questions for this Unit:**
4. How can students extend their understanding of ratios and develop understanding of proportionality to solve single- and multi-step problems, and 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?
5. How can 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?
6. How can students graph proportional relationships and understand the unit rate informally as a measure of the steepness of the related line, called the slope, and distinguish proportional relationships from other relationships?

| Unit (Time) | CCSS | Standard Description | Content | Resources |
|---|---|---|---|---|
| **(Dec-Mar)**<br><br>**Unit 3:**<br>**(Continued)**<br><br>**Ratios and**<br>**Proportional**<br>**Relationships**<br><br>**(50 days)** | 7.RP.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.* | • Market math (i.e. discount, commission, gratuity)<br>• Using bar models to represent sale price and discount<br>• Using percent proportions, percent equations, and bar models to solve equations involving percent | **General Resources for Chapter 6**<br>Percent Problems – Multiple Methods [CP]<br>Bar Models – Rate, Percent, Equations [L]<br>Bar Models – Sales Price, Markup, and Discount [L]<br>Bar Models – Sales Price, Markup, and Discount [CP]<br>Percent of Increase & Percent of Decrease [L]<br><br>**Chapter 6: Percents (Continued)**<br><br>6.5 Percents of Increase and Decrease<br>• Lesson Ex. 1 & 2 **(1 day)**<br>• Lesson Ex. 3 **(1 day)**<br>PT: Chess Club [IMT]<br>PT: Finding a 10% Increase [IMT]<br>6.6 Discounts and Markups<br>• Activities 1 & 2 **(1 day)**<br>• Activity 3 **(1 day)**<br>• Lesson Ex. 1 **(2 days)**<br>PT: Double Discount [IMT]<br>• Lesson Ex. 2 **(1 day)**<br>• Lesson Ex. 3 – Selling Price **(1 day)**<br>• Tax and Tip **(1 day)**<br>PT: Tax and Tip [IMT]<br>• Menu Activity??? **(1 day)** |
| | 7.EE.2 | Understand that rewriting an expression in different forms in a problem context can shed light on the problem and how the quantities in it are related. *For example, a + 0.05a = 1.05a means that "increase by 5% " is the same as "multiply by 1.05."* | | |

# *Grade 7 Mathematics Curriculum Guide*

| Grade Level/Course Title: Grade 7 | Quarter 2/3 | Academic Year: 2018-2019 |
|---|---|---|

**Grade Level Mathematics Focus:**
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.

**Essential Questions for this Unit:**
7. How can students extend their understanding of ratios and develop understanding of proportionality to solve single- and multi-step problems, and 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?
8. How can 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?
9. How can students graph proportional relationships and understand the unit rate informally as a measure of the steepness of the related line, called the slope, and distinguish proportional relationships from other relationships?

| Unit (Time) | CCSS | Standard Description | Content | Resources |
|---|---|---|---|---|
| **(Dec-Mar)**<br><br>**Unit 3:**<br>**(Continued)**<br><br>**Ratios and Proportional Relationships**<br><br><br>**(50 days)** | 7.RP.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.* | • Market math (i.e. discount, commission, gratuity)<br>• Using bar models to represent sale price and discount<br>• Using percent proportions, percent equations, and bar models to solve equations involving percent | **General Resources for Chapter 6**<br>Percent Problems – Multiple Methods [CP]<br>Bar Models – Rate, Percent, Equations [L]<br>Bar Models – Sales Price, Markup, and Discount [L]<br>Bar Models – Sales Price, Markup, and Discount [CP]<br>Percent of Increase & Percent of Decrease [L]<br><br>**Chapter 6: Percents (Continued)**<br><br>6.7 Simple Interest<br>• Activity 1 **(1 day)**<br>• Lesson Ex. 1 & 2 **(1 day)**<br>• Lesson Ex. 3 & 4 **(1 day)**<br><br>Review, Assess, Reteach **(3 days)** |
| | 7.EE.2 | Understand that rewriting an expression in different forms in a problem context can shed light on the problem and how the quantities in it are related. *For example, a + 0.05a = 1.05a means that "increase by 5% " is the same as "multiply by 1.05."* | | |

# *Grade 7 Mathematics Curriculum Guide*

| **Grade Level/Course Title:  Grade 7** | **Quarter** 3/4 | **Academic Year:** 2018-2019 |
|---|---|---|

**Grade Level Mathematics Focus:**
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.

**Essential Questions for this Unit:**
1.  How can 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?
2.  How can students, in preparation for work on congruence and similarity in Grade 8, reason about relationships among two-dimensional figures using scale drawings and informal geometric constructions, and gain familiarity with the relationships between angles formed by intersecting lines?
3.  How can students work with three-dimensional figures, relating them to two-dimensional figures by examining cross-sections?
4.  How can students 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?

| Unit (Time) | CCSS | Standard Description | Content | Resources |
|---|---|---|---|---|
| **(March-May)**<br><br>**Unit 4:**<br><br>**Geometry**<br><br>**(52 days)** | 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. | • Using tools: ruler, protractor, compass<br>• Similar figures and scale drawings<br>• Proportional ratios<br>• Discovering different types of angles and applying them to real world examples<br>• Angle relationships (i.e. vertical, supplementary, complementary, adjacent)<br>• Solve equations using angle relationships | **Chapter 7: Constructions and Scale Drawings**<br><br>**General Resources for Chapter 7**<br>[Geometry Investigations](#) [L]<br>[Geogebra Triangles](#)<br><br>7.1 Adjacent and Vertical Angles<br>• Activities 1-3 **(1 day)**<br>• Lesson Ex. 1 & 2 **(1 day)**<br>• Lesson Ex. 2 & 3 **(1 day)**<br>7.2 Complementary and Supplementary Angles<br>• Activities 2-4 **(1 day)**<br>• Lesson Ex. 1 & 2 **(1 day)**<br>• Lesson Ex. 2 & 3 **(1 day)**<br>7.3 Triangles<br>• Activities 1 & 2 **(1 day)**<br>• Activities 3 & 4 **(1 day)**<br>• Lesson Ex. 1 & 2 **(1 day)**<br>• Lesson Ex. 2 & 3 **(1 day)**<br>7.3 Extension: Angle Measures of Triangles **(1 day)**<br>    PT: [Walking Ladybug](#) [IMT]<br><br>7.1-7.3 Quiz and review/extension activity **(1 day)** |
|  | 7.G.2 | 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. |  |  |
|  | 7.G.3 | Describe the two-dimensional figures that result from slicing three-dimensional figures, as in plane sections of right rectangular prisms and right rectangular pyramids. |  |  |

# *Grade 7 Mathematics Curriculum Guide*

| **Grade Level/Course Title:  Grade 7** | **Quarter** 3/4 | **Academic Year:** 2018-2019 |
| --- | --- | --- |

**Grade Level Mathematics Focus:**
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.

**Essential Questions for this Unit:**
5.   How can 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?
6.   How can students, in preparation for work on congruence and similarity in Grade 8, reason about relationships among two-dimensional figures using scale drawings and informal geometric constructions, and gain familiarity with the relationships between angles formed by intersecting lines?
7.   How can students work with three-dimensional figures, relating them to two-dimensional figures by examining cross-sections?
8.   How can students 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?

| **Unit (Time)** | **CCSS** | **Standard Description** | **Content** | **Resources** |
| --- | --- | --- | --- | --- |
| **(March-May)**<br><br>**Unit 4:**<br><br>**Geometry**<br><br>**(52 days)** | 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. | • Using tools: ruler, protractor, compass<br>• Similar figures and scale drawings<br>• Proportional ratios<br>• Discovering different types of angles and applying them to real world examples<br>• Angle relationships (i.e. vertical, supplementary, complementary, adjacent)<br>• Solve equations using angle relationships | **Chapter 7 (Continued)**<br><br>7.4 Quadrilaterals<br>• Activities 1-3 (if you have geoboards) **(1 day)**<br>• Lesson Ex. 1 & 2 **(1 day)**<br>• Lesson Ex. 2 & 3 **(1 day)**<br>7.5 Scale Drawings<br>• Activities 1-4 **(1 day)**<br>• Lesson Ex. 1 & 2 **(1 day)**<br>• Lesson Ex. 3 & 4 **(2 days)**<br>  PT: Map distance [IMT]<br>  PT: Rescaling Washington Park [IMT]<br><br>Review, Assess, Reteach **(3 days)**<br><br>**Quarterly Assessment #3** |
|  | 7.G.2 | 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. |  |  |
|  | 7.G.3 | Describe the two-dimensional figures that result from slicing three-dimensional figures, as in plane sections of right rectangular prisms and right rectangular pyramids. |  |  |

# *Grade 7 Mathematics Curriculum Guide*

| Grade Level/Course Title:  Grade 7 | Quarter 3/4 | Academic Year: 2018-2019 |
|---|---|---|

**Grade Level Mathematics Focus:**
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.

**Essential Questions for this Unit:**
1. How can 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?
2. How can students, in preparation for work on congruence and similarity in Grade 8, reason about relationships among two-dimensional figures using scale drawings and informal geometric constructions, and gain familiarity with the relationships between angles formed by intersecting lines?
3. How can students work with three-dimensional figures, relating them to two-dimensional figures by examining cross-sections?
4. How can students 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?

| Unit (Time) | CCSS | Standard Description | Content | Resources |
|---|---|---|---|---|
| (March-May)<br><br>Unit 4:<br>(Continued)<br><br>Geometry<br><br>(52 days) | 7.G.4 | Know the formulas for the area and circumference of a circle and use them to solve problems; give an informal derivation of the relationship between the circumference and area of a circle. | • Definitions of 2D and 3D geometric shapes and figures<br>• Formulas: perimeter, area, circumference, volume, surface area<br>• Surface area: cubes and right prisms (use nets to find the surface area)<br>• Volume: cubes and right prisms (the area of the base multiplied by the height of the figure) | **Chapter 8: Circles and Area**<br><br>Circles **(1 day)**<br>  Circle Vocabulary Using Paper Plates [L]<br>  Circle Vocabulary [CP]<br>  PT: Circumference of a Circle [IMT]<br>8.1 Circles and Circumference<br>  • Lesson Ex. 1 & 2 **(1 day)**<br>  • Lesson Ex. 3 & 4 **(1 days)**<br>8.2 Perimeters of Composite Figures<br>  • Activities 1-3 **(1 day)**<br>  • Lesson Ex. 1 & 2 **(1 day)**<br>  • Lesson Ex. 2 & 3 **(1 day)**<br><br>8.1-8.2 Quiz and review/extension activity **(1 day)**<br><br>8.3 Areas of Circles<br>  • Activity 2 **(1 day)**<br>  • Lesson Ex. 1-3 **(1 day)**<br>  Area of a Circle [CP]<br>  Discovering Pi [L]<br>  PT: Wedges of a Circle [IMT]<br>8.4 Areas of Composite Figures<br>  • Activity 3 and Lesson Ex. 1 & 2 **(1 day)**<br>  • Lesson Ex. 3 **(1 day)**<br><br>Review, Assess, Reteach **(3 days)** |
| | 7.G.5 | 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. | | |
| | 7.G.6 | Solve real-world and mathematical problems involving area, volume and surface area of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes and right prisms. | | |

CP = Content Presentation    L = Lesson    WS = Worksheet    PT = Performance Task    IMT = Illustrative Mathematics Task    

# *Grade 7 Mathematics Curriculum Guide*

| Grade Level/Course Title: Grade 7 | Quarter 3/4 | Academic Year: 2018-2019 |
|---|---|---|

**Grade Level Mathematics Focus:**
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.

**Essential Questions for this Unit:**
5.  How can 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?
6.  How can students, in preparation for work on congruence and similarity in Grade 8, reason about relationships among two-dimensional figures using scale drawings and informal geometric constructions, and gain familiarity with the relationships between angles formed by intersecting lines?
7.  How can students work with three-dimensional figures, relating them to two-dimensional figures by examining cross-sections?
8.  How can students 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?

| Unit (Time) | CCSS | Standard Description | Content | Resources |
|---|---|---|---|---|
| **(March-May)**<br><br>**Unit 4:**<br>**(Continued)**<br><br>**Geometry**<br><br>**(52 days)** | 7.G.4 | Know the formulas for the area and circumference of a circle and use them to solve problems; give an informal derivation of the relationship between the circumference and area of a circle. | • Definitions of 2D and 3D geometric shapes and figures<br>• Formulas: perimeter, area, circumference, volume, surface area<br>• Surface area: cubes and right prisms (use nets to find the surface area)<br>• Volume: cubes and right prisms (the area of the base multiplied by the height of the figure) | **Chapter 9: Surface Area and Volume**<br><br>9.1 Surface Areas of Prisms<br>• Activities 1-3 **(1 day)**<br>• Lesson Ex. 1 **(1 day)**<br>• Lesson Ex. 2 **(1 day)**<br> Surface Area [CP]<br>9.2 Surface Area of Pyramids<br>• Lesson Ex. 1 & 2 **(1 day)**<br>• Lesson Ex. 3 **(1 day)**<br>9.3 Surface Areas of Cylinders<br>• Lesson Ex. 1 & 2 **(1 day)**<br>• Lesson Ex. 3 **(1 day)**<br><br>9.1-9.3 Quiz and review/extension activity **(1 day)**<br><br>9.4 Volumes of Prisms<br>• Activities 1 & 2 **(1 day)**<br>• Lesson Ex. 1 & 2 **(1 day)**<br>• Lesson Ex. 3 **(1 day)**<br>Volume of Prisms [CP]<br>9.5 Volumes of Pyramids<br>• Activity 1 and Lesson Ex. 1 **(1 day)**<br>• Lesson Ex. 2 & 3 **(1 day)**<br><br>Review, Assess, Reteach **(3 days)** |
| | 7.G.5 | 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. | | |
| | 7.G.6 | Solve real-world and mathematical problems involving area, volume and surface area of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes and right prisms. | | |

# *Grade 7 Mathematics Curriculum Guide*

| Grade Level/Course Title:  Grade 7 | | Quarter 4 | Academic Year: 2018-2019 |
|---|---|---|---|

**Grade Level Mathematics Focus:**
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.

**Essential Questions for this Unit:**
1.  How can students build on their previous work with single data distributions to compare two data distributions and address questions about differences between populations?
2.  How can students begin informal work with random sampling to generate data sets and learn about the importance of representative samples for drawing inferences?

| Unit (Time) | CCSS | Standard Description | Content | Resources |
|---|---|---|---|---|
| **(May-June)**<br><br>**Unit 5:**<br><br>**Statistics and Probability**<br><br><br>**(23 days)** | 7.SP.1 | Understand that statistics can be used to gain information about a population by examining a sample of the population; generalizations about a population from a sample are valid only if the sample is representative of that population. Understand that random sampling tends to produce representative samples and support valid inferences. | • Representative samples<br>• Recognizing trends in data and making predictions<br>• Valid inferences<br>• Random sample<br>• Measures of center (mean, median, mode)<br>• Measures of variability (i.e. range, quartile)<br>• Develop probability models<br>• Independent and dependent events<br>• Understanding the concept of compound events and apply to real-life events<br>• Use of lists, tables, and tree diagrams | **Chapter 10: Probability and Statistics**<br><br>10.1 Outcomes and Events<br>• Activities 1-3 **(1 day)**<br>• Lesson **(1 day)**<br>PT: Rolling Dice [IMT]<br>PT: Heads or Tails [IMT]<br>PT: How Many Buttons? [IMT]<br>PT: Rolling Dice [IMT]<br>10.2 Probability<br>• Activities 1-3 **(1 day)**<br>• Lesson Ex. 1 & 2 **(1 day)**<br>• Lesson Ex. 3 **(1 day)**<br>Probability [L]<br>10.3 Experimental and Theoretical Probability<br>• Activities 1 & 2 **(1 day)**<br>• Lesson Ex. 1 & 2 **(1 day)**<br>• Lesson Ex. 3 & 4 **(1 day)**<br>PT: Tossing Cylinders [IMT]<br>10.4 Compound Events<br>• Activities 1 & 2 **(1 day)**<br>• Lesson Ex. 1 **(1 day)**<br>• Lesson Ex. 2 & 3 **(1 day)**<br>• Lesson Ex. 4 & 5 **(1 day)**<br>Engage NY Module 5 – Lesson 6<br>Engage NY Module 5 – Lesson 7<br>PT: Rolling Twice [IMT] |
| | 7.SP.2 | Use data from a random sample to draw inferences about a population with an unknown characteristic of interest. Generate multiple samples (or simulated samples) of the same size to gauge the variation in estimates or predictions. *For example, estimate the mean word length in a book by randomly sampling words from the book; predict the winner of a school election based on randomly sampled survey data. Gauge how far off the estimate or prediction might be.* | | |
| | 7.SP.3 | Informally assess the degree of visual overlap of two numerical data distributions with similar variabilities, measuring the difference between the centers by expressing it as a multiple of a measure of variability. *For example, the mean height of players on the basketball team is 10 cm greater than the mean height of players on the soccer team, about twice the variability (mean absolute deviation) on either team; on a dot plot, the separation between the two distributions of heights is noticeable.* | | |
| | 7.SP.4 | Use measures of center and measures of variability for numerical data from random samples to draw informal comparative inferences about two populations. *For example, decide whether the words in a chapter of a seventh-grade science book are generally longer than the words in a chapter of a fourth-grade science book.* | | |

# *Grade 7 Mathematics Curriculum Guide*

| Grade Level/Course Title: Grade 7 | Quarter 4 | Academic Year: 2018-2019 |
|---|---|---|

**Grade Level Mathematics Focus:**
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.

**Essential Questions for this Unit:**
1.  How can students build on their previous work with single data distributions to compare two data distributions and address questions about differences between populations?
2.  How can students begin informal work with random sampling to generate data sets and learn about the importance of representative samples for drawing inferences?

| Unit (Time) | Standard | Standard Description | Content | Resources |
|---|---|---|---|---|
| **(May-June)**<br><br>**Unit 5:**<br>**(Continued)**<br><br>**Statistics and Probability**<br><br>**(23 days)** | 7.SP.5 | Understand that the probability of a chance event is a number between 0 and 1 that expresses the likelihood of the event occurring. Larger numbers indicate greater likelihood. A probability near 0 indicates an unlikely event, a probability around 1/2 indicates an event that is neither unlikely nor likely, and a probability near 1 indicates a likely event. | • Develop probability models<br><br>• Independent and dependent events<br><br>• Understanding the concept of compound events and apply to real-life events<br>Use of lists, tables, and tree diagrams | **Chapter 10 (Continued)**<br><br>10.5 Independent and Dependent Variables<br>• Activities 1-3 **(1 day)**<br>• Lesson Ex. 1 & 2 **(1 day)**<br>• Lesson Ex. 3 **(1 day)**<br><br>10.1-10.5 Quiz and review/extension activity **(1 day)**<br><br>10.6 Samples and Populations<br>• Activities 1-3 **(1 day)**<br>• Lesson **(1 day)**<br>Inferences from Random Samples [L]<br>PT: Mr. Briggs's Class Likes Math [IMT]<br>PT: Valentine Marbles [IMT]<br>10.7 Comparing Populations<br>• Activities 1 & 2 **(1 day)**<br>• Lesson **(1 day)**<br>Comparing Data Displays [L]<br>Mean Absolute Deviation [L]<br>PT: College Athletes [IMT]<br>PT: Offensive Lineman [IMT]<br><br>Review, Assess, Reteach **(3 days)**<br><br>**Quarterly Assessment #4** |
|  | 7.SP.6 | Approximate the probability of a chance event by collecting data on the chance process that produces it and observing its long-run relative frequency, and predict the approximate relative frequency given the probability. *For example, when rolling a number cube 600 times, predict that a 3 or 6 would be rolled roughly 200 times, but probably not exactly 200 times.* |  |  |
|  | 7.SP.7 | **Develop a probability model and use it to find probabilities of events. Compare probabilities from a model to observed frequencies; if the agreement is not good, explain possible sources of the discrepancy.**<br>    a.  Develop a uniform probability model by assigning equal probability to all outcomes, and use the model to determine probabilities of events. *For example, if a student is selected at random from a class, find the probability that Jane will be selected and the probability that a girl will be selected.*<br>    b.  Develop a probability model (which may not be uniform) by observing frequencies in data generated from a chance process. *For example, find the approximate probability that a spinning penny will land heads up or that a tossed paper cup will land open-end down. Do the outcomes for the spinning penny appear to be equally likely based on the observed frequencies?* |  |  |

# *Grade 7 Mathematics Curriculum Guide*

| Grade Level/Course Title:  Grade 7 | **Quarter** 4 | **Academic Year:** 2018-2019 |
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**Grade Level Mathematics Focus:**
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.

**Essential Questions for this Unit:**
1.  How can students build on their previous work with single data distributions to compare two data distributions and address questions about differences between populations?
2.  How can students begin informal work with random sampling to generate data sets and learn about the importance of representative samples for drawing inferences?

| Unit (Time) | Standard | Standard Description | Content | Resources |
| --- | --- | --- | --- | --- |
| **(May-June)**<br><br>**Unit 5:**<br>**(Continued)**<br><br>**Statistics and Probability**<br><br><br>**(23 days)** | 7.SP.8 | **Find probabilities of compound events using organized lists, tables, tree diagrams, and simulation.**<br>  a.  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.<br>  b.  Represent sample spaces for compound events using methods such as organized lists, tables and tree diagrams. For an event described in everyday language (e.g., "rolling double sixes"), identify the outcomes in the sample space which compose the event.<br>  c.  Design and use a simulation to generate frequencies for compound events. *For example, use random digits as a simulation tool to approximate the answer to the question: If 40% of donors have type A blood, what is the probability that it will take at least 4 donors to find one with type A blood?* | | |