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SUGGESTED

**INSTRUCTIONAL**

**PLANNING GUIDE**

*for the Mississippi College- and Career-Readiness Standards*

**q Mathematics**

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| **Grade 7** |

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**INTRODUCTION**

The unprecedented, nationwide school closures in the spring of 2020 due to the COVID-19 pandemic have created a shift in how districts plan for school re-entry. Instead of the traditional brick-and-mortar planning, administrators are now identifying models that will support a variety of instructional delivery scenarios as they plan for school reopening. The traditional methods of planning and delivery are nearly impossible to implement as a stand-alone model; instead, innovative educators are developing and identifying strategies and resources to support a variety of distance learning scenarios as part of their plans. When using new models of delivery, it is important to recognize that the traditional approach to remediation—providing work better suited for earlier grades—may be insufficient. Instead, the conventional approach to remediation will likely compound the problem educators are trying to correct. According to a 2018 study, [The Opportunity Myth[[1]](#footnote-2)](https://tntp.org/assets/documents/TNTP_The-Opportunity-Myth_Web.pdf), the approach of “meeting students where they are”, while often well-intended, only widens the achievement gap. Instead of remediation, teachers and administrators are encouraged to look toward acceleration methods to support student growth and close the gaps.

**PURPOSE**

The purpose of the *Suggested Mississippi College- and Career-Readiness Standards Instructional Planning Guides* is to provide a *SUGGESTED* guide to assist teachers in planning rigorous, coherent lessons that focus on the critical content of each grade level. Providing curriculum guidance through intentional standard grouping and consideration for the time needed to address different objectives, should encourage consistent instruction that fully aligns to the Mississippi College- and Career-Readiness Standards. The use of this guide can also foster collaborative planning across schools and districts throughout the state.

**DEVELOPMENT**

The following planning and subsequent grouping of standards were determined through a collaborative process among state-level content specialists. By connecting standards through common conceptual understandings and relationships, the expectation is that conceptual connections will promote a cohesive process and avoid the teaching of standards in isolation. Additionally, it promotes a deeper understanding and a more authentic acquisition of mathematical knowledge and skills. The Standards for Mathematical Practices (SMPs) presented are those suggested to be highlighted within the respective standard; however, this does not exclude the inclusion of other SMPs. The standards determined as “**priority**” have been bolded and are standards identified as critical to the mastery of other standards. A standard’s “**priority**” status does *NOT* have a direct correlation with test item frequency. Additionally, some standards may appear multiple times throughout the course with a portion of the standard highlighted to depict that only that portion of the standard is to be taught within that unit.

**RESOURCES FOR CONSIDERATION**

The resources listed below may be referenced to support classroom teachers in the development of lesson plans and instruction at the local level. This list is not meant to be exhaustive, rather it represents consultative resources that align with the Units/Themes provided in the Instructional Planning Guides. Educators are encouraged to use these resources in addition to those curriculum materials that meet the needs of the students they serve.

| High-Quality Instructional Materials (HQIM) | Instruction and Planning Resources | | | Standards for Mathematical Practices (SMPs) | Assessment  Resources | | | Professional Development |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| * [MS HQIM Defined](https://mdek12.org/HQIM) * [MS Adopted HQIM (Textbooks)](https://www.mdek12.org/caravan2019) * [Illustrative Mathematics Grade 7 Scope and Sequence](https://curriculum.illustrativemathematics.org/MS/teachers/2/index.html) * [Carnegie Learning Course 2 Pacing](https://cdn.carnegielearning.com/assets/mathiax-pdfs/C02_TIG_SS.pdf) * [enVision Math 2.0 Correlation the MS CCRS 6-8](https://assets.savvas.com/correlations/MS_2017_enV2.0_G6-8.pdf?_ga=2.102570627.329201468.1593197914-1093477658.1593035292) * [Great Minds (Eureka Math) Teacher Resource Pack](https://eurekamath.greatminds.org/teacher-resource-pack) * [Great Minds Alignment to MSCCRS](https://greatminds.org/resources/products/mississippi-standards-alignment-study) * [Kendall Hunt-Illustrative Mathematics Curriculum](https://im.kendallhunt.com/) | | * [Achieve the Core Coherence Map-7th Grade Math](https://achievethecore.org/coherence-map/7) * [Standards Dependency and Flow View](http://jeffbaumes.github.io/standards/) * *Scaffolding Instruction for ELLs* * [Achieve the Core CCR Shifts in Mathematics](https://achievethecore.org/content/upload/SAP_ShiftsAtAGlance_02.pdf) * [Standards Progressions for Mathematics Progression Documents](http://ime.math.arizona.edu/progressions/) * [Teacher Desmos](https://teacher.desmos.com/) * [SFUSD Manipulatives List](http://www.sfusdmath.org/manipulatives.html) * [Printable Manipulatives](https://www.mathematicalpractices.com/mp1e/content/printable-manipulatives/) * [Achieve the Core Instructional Practice Guide K-8](https://achievethecore.org/category/1155/printable-versions) * [Mississippi Exemplar Units and Lesson Plans-Grade 7 Math](https://www.mdek12.org/sites/default/files/documents/OAE/OEER/Exemplar%20Units/math/7th-Grade-Exemplar-FINAL_20181126.pdf) * [Mississippi CCRS Exemplar Lesson Plans](https://mdek12.org/ESE/math/lesson-plans) * [LearnZillion 7th Grade Course Resources](https://learnzillion.com/wikis/235594-learnzillion-illustrative-mathematics-grade-7-course/) * [LearnZillion Instructional Videos](https://learnzillion.com/wikis/99913-math-instructional-videos/) * [Open-up Resources Mathematics- Family Support Center-Grade 7](https://access.openupresources.org/curricula/our6-8math-v1/7/families/index.html) * [MS CCRS Scaffolding Documents](https://mdek12.org/ese/ccr) * [Access for All Guidance](https://mdek12.org/sites/default/files/documents/OAE/OAE/2019-access-for-all-guide.pdf) * [MDE Family Guides for Student Success](https://mdek12.org/OAE/OEER/FamilyGuidesEnglish)\* * (Alternative Language: [Spanish](https://mdek12.org/OAE/OEER/FamilyGuidesSpanish))   *\*This resource can be used for standards reinforcement of previous grades.* | * [Illustrative Mathematics Understanding the Standards for Mathematical Practices (SMPs)](http://tasks.illustrativemathematics.org/practice-standards/) * [Inside Mathematics Mathematical Practice Standards](https://www.insidemathematics.org/common-core-resources/mathematical-practice-standards) * [Inside Mathematics Mentors of Mathematical Practice](https://www.insidemathematics.org/common-core-resources/mentors-of-mathematical-practice) | | | * [MS MAAP Program](https://mdek12.org/OSA/MAAP) * [MS MAAP-A Program](https://mdek12.org/OSA/SP/MAAP-A) * [MS MAAP Mathematics Resources](https://districtaccess.mde.k12.ms.us/studentassessment/Public%20Access/Forms/AllItems.aspx?RootFolder=%2Fstudentassessment%2FPublic%20Access%2FStatewide%5FAssessment%5FPrograms%2FMAAP%2DMississippi%20Academic%20Assessment%20Program%2FMath%5FGuidance) * [Desmos Four-Function Calculator](https://www.desmos.com/fourfunction) * [Inside Mathematics Performance Tasks 2-HS](https://www.insidemathematics.org/performance-assessment-tasks) * [Illustrative Mathematics Grade 7 Tasks](http://tasks.illustrativemathematics.org/content-standards/7) * [MARS Mathematics Assessment Project (6-HS)](https://www.map.mathshell.org/index.php) * [Goalbook Pathways Grade 7](https://goalbookapp.com/pathways/?ref=topic" \l "!/browse-topics/math/7) * [Khan Academy 7 Math](https://www.khanacademy.org/math/cc-seventh-grade-math) * [Open-up Resources Mathematics-Student Resources-Grade 7](https://access.openupresources.org/curricula/our6-8math-v1/7/students/index.html) | * [MDE Professional Development Resources](https://www.mdek12.org/OPD/home) * [SchoolKit and IM Video Lessons-Grade 7](http://schoolkitgroup.com/video-grade-7/) * [MARS Prototype Professional Development Modules](https://www.map.mathshell.org/pd.php) * [NCTM Professional Development Resources](https://www.nctm.org/Conferences-and-Professional-Development/Professional-Development-Resources/) * [Inside Mathematics Classroom Videos](https://www.insidemathematics.org/classroom-videos) * [NCTM Math Forum](https://www.nctm.org/tmf/mathed/mathed.research.new.html) * [Great Minds (Eureka) Webinars](https://eurekamath.greatminds.org/webinar-library) * [Using Manipulatives in the Classroom](https://www.teachervision.com/professional-development/using-manipulatives) | |
| Applets, Demos, Interactives, and Virtual Manipulatives | | | | | | | | |
| * [CPM Tiles](https://technology.cpm.org/general/tiles/) * [Didax Virtual Manipulatives](https://www.didax.com/math/virtual-manipulatives.html) * [Didax Free Activity Guides for Virtual Manipulatives](https://www.didax.com/virtual-manipulatives-activities) * [GeoGebra Virtual Manipulatives](https://www.geogebra.org/m/NPDu3rCm) * [Houghton Mifflin and Harcourt iTools](https://www-k6.thinkcentral.com/content/hsp/math/hspmath/na/common/itools_int_9780547584997_/main.html) * [Math Playground Math Manipulatives](https://www.mathplayground.com/math_manipulatives.html) * [McGraw Hill (Glencoe) Virtual Manipulatives](http://www.glencoe.com/sites/common_assets/mathematics/ebook_assets/vmf/VMF-Interface.html) * [The Math Learning Center Math Apps](https://www.mathlearningcenter.org/apps) * [Toy Theatre Virtual Manipulatives](https://toytheater.com/category/teacher-tools/virtual-manipulatives/) * [Visnos Mathematical Demonstrations](https://www.visnos.com/demos) | | | | | | | | |

| TERM 1  UNIT OF STUDY  (REAL-WORLD APPLICATION) q | MS CCR STANDARDS q | STANDARDS FOR MATHEMATICAL  PRACTICE (SMPs) q | CORE ACADEMIC VOCABULARY TERMS q |
| --- | --- | --- | --- |
| **Unit 1: Addition and Subtraction of Rational Numbers: Integers**  (Students learn to add and subtract rational numbers. Visual representations may be helpful in the beginning as students build computational fluency. This skill expands the use of number lines developed in 6th grade. Mastery of operations with Rational Numbers lays the foundation for more complex math work with Rational Numbers) | **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.**  **7.NS.1a Describe situations in which opposite quantities combine to make 0. For example, a hydrogen atom has 0 charge because its two constituents are oppositely charged.**  **7.NS.1b 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). Interpret sums of rational numbers by describing real-world contexts.**  **7.NS.1c 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**  **7.NS.1d Apply properties of operations as strategies to add and subtract rational numbers.** | * **SMP 2** Reason abstractly and quantitatively. * **SMP 4** Model with Mathematics * **SMP 7** Look for and make use of structure. | Absolute Value  Additive Inverse  Integer  Inverse Operation  Negative  Number Properties  Opposite  Positive  Ratio  Rational Number |
| **Unit 2: Addition and Subtraction of Rational Numbers: Fractions, Decimals, & Percent**  (Students learn to add and subtract rational numbers. Visual representations may be helpful in the beginning as students build computational fluency. This skill expands the use of number lines developed in 6th grade. Mastery of operations with Rational Numbers lays the foundation for more complex math work with Rational Numbers) | | **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.**  **7.NS.1c 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**  **7.NS.1d Apply properties of operations as strategies to add and subtract rational numbers.** | * **SMP 2** Reason abstractly and quantitatively. * **SMP 4** Model with Mathematics * **SMP 7** Look for and make use of structure. | Absolute Value  Additive Inverse  Integer  Inverse Operation  Negative  Number Properties  Opposite  Positive  Ratio  Rational Number |
|  | | **7.NS.2d 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. \*** | * **SMP 2** Reason abstractly and quantitatively. * **SMP 4** Model with Mathematics * **SMP 7** Look for and make use of structure. | Convert  Fraction  Decimal  Percent  Rational Number  Repeating Decimal  Terminating Decimal  Terminate |
| **Unit 3: Multiplication and Division of Rational Numbers: Integers**  (Students learn to multiply and divide rational numbers. Visual representations may be helpful in the beginning as students build computational fluency. Mastery of operations with Rational Numbers lays the foundation for more complex math skills where students will need to be fluent in these operations.) | | **7.NS.2 Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers. \***  **7.NS.2a 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 (–1)(–1) = 1 and the rules for multiplying signed numbers. Interpret products of rational numbers by describing real-world contexts.**  **7.NS.2b 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 p and q are integers, then -(p/q) = (-p)/q = p/(-q). Interpret quotients of rational numbers by describing real-world contexts.**  **7.NS.2c Apply properties of operations as strategies to multiply and divide rational numbers.** | * **SMP 2** Reason abstractly and quantitatively. * **SMP 4** Model with Mathematics * **SMP 7** Look for and make use of structure. | Convert  Integer  Inverse Operation  Multiplicative Inverse  Negative  Number Properties  Opposite  Percent  Positive  Ratio  Rational Number  Reciprocal |
| **Unit 4: Multiplication and Division of Rational Numbers: Fractions, Decimals, & Percent**  (Students learn to multiply and divide rational numbers. Visual representations may be helpful in the beginning as students build computational fluency. Mastery of operations with Rational Numbers lays the foundation for more complex math skills where students will need to be fluent in these operations.) | | **7.NS.2 Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers. \***  **7.NS.2a 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 (–1)(–1) = 1 and the rules for multiplying signed numbers. Interpret products of rational numbers by describing real-world contexts.**  **7.NS.2b 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 p and q are integers, then -(p/q) = (-p)/q = p/(-q). Interpret quotients of rational numbers by describing real-world contexts.**  **7.NS.2c Apply properties of operations as strategies to multiply and divide rational numbers.** | * **SMP 2** Reason abstractly and quantitatively. * **SMP 4** Model with Mathematics * **SMP 7** Look for and make use of structure. | Convert  Inverse Operation  Least Common Multiple  Multiplicative Inverse  Negative  Number Property  Opposite  Percent  Positive  Ratio  Rational Number  Reciprocal |
| **Unit 5: Writing Expressions and Equations with Rational Coefficients**  (Students apply properties of operations and work with rational numbers (integers and positive / negative fractions and decimals) to write equivalent expressions. They will use this to build understanding on how numerical and algebraic expressions relate to real-world situations) | | **7.EE.1 Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients.** | * **SMP 2** Reason abstractly and quantitatively. * **SMP 6** Attend to precision. * **SMP 7** Look for and make use of structure. | Coefficient  Distributive Property  Factor  Like Terms |
|  | | **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.”*** | * **SMP 2** Reason abstractly and quantitatively. * **SMP 6** Attend to precision. * **SMP 7** Look for and make use of structure. * **SMP 8** Look for and express regularity in repeated reasoning. | Coefficient  Distributive Property  Factor  Like Terms |

| **TERM 2**  **UNIT OF STUDY**  (REAL-WORLD APPLICATION) **q** | **MS CCR STANDARDS q** | **STANDARDS FOR MATHEMATICAL  PRACTICE (SMPs) q** | CORE ACADEMIC **VOCABULARY TERMS q** |
| --- | --- | --- | --- |
| **Unit 6: Solving Real-World Problems with Rational numbers** (Students apply their knowledge of operation with rational numbers and number properties to solve a range of real-world problems such as recipe conversions or determining temperature.) | **7.NS.3 Solve real-world and mathematical problems involving the four operations with rational numbers. \*\*** | * **SMP 1** Make sense of problems and persevere in solving them. * **SMP 2** Reason abstractly and quantitatively. * **SMP 5** Use appropriate tools strategically. * **SMP 6** Attend to precision. * **SMP 7** Look for and make use of structure. * **SMP 8** Look for and express regularity in repeated reasoning. | Absolute Value  Additive Inverse  Convert  Integer  Inverse Operation  Least Common Multiple  Negative  Number Properties  Multiplicative Inverse  Opposite  Percent  Positive  Ratio  Rational Number  Reciprocal |
| **Unit 7: Writing Equations and Inequalities to Solve Real-World Problems**  (Students apply writing expression, equations, inequalities and converting between fractions, decimals, and percent as needed to solve the problem. This builds on computational fluency to the application in real-world context.) | **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 properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies. *For example: If a woman making $25 an hour gets a 10% raise, she will make an additional 1/10 of her salary an hour, or $2.50, for a new* *salary of $27.50. If you want to place a towel bar 9 3/4 inches long in the center of a door that is 27 1/2 inches wide, you will need to place the bar about 9 inches from each edge; this estimate can be used as a check on the exact computation*.** | * **SMP 1** Make sense of problems and persevere in solving them. * **SMP 2** Reason abstractly and quantitatively. * **SMP 3** Construct viable arguments and critique the reasoning of others. * **SMP 4** Model with Mathematics. * **SMP 5** Use appropriate tools strategically. * **SMP 6** Attend to precision. * **SMP 7** Look for and make use of structure. * **SMP 8** Look for and express regularity in repeated reasoning. | Absolute Value  Additive Inverse  Convert  Equation  Expression  Integer  Inverse Operation  Least Common Multiple  Multiplicative Inverse  Negative  Number Properties  Opposite  Percent  Positive  Ratio  Rational Number  Reciprocal |
|  | **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.**  **7.EE.4a 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?***  **7.EE.4b 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.*** | * **SMP 1** Make sense of problems and persevere in solving them. * **SMP 2** Reason abstractly and quantitatively. * **SMP 3** Construct viable arguments and critique the reasoning of others. * **SMP 4** Model with Mathematics. * **SMP 5** Use appropriate tools strategically. * **SMP 6** Attend to precision. * **SMP 7** Look for and make use of structure. * **SMP 8** Look for and express regularity in repeated reasoning. | Absolute Value  Additive Inverse  Convert  Equation  Expression  Inequality  Integer  Inverse Operation  Least Common Multiple  Maximum  Minimum  Multiplicative Inverse  Negative  Number Properties  Opposite  Percent  Positive  Ratio  Rational Number  Reciprocal |
| **Unit 8: Proportional Relationships: Complex Fractions, Unit Rate, and Scaling**  Students expand 6th grade work with unit rates; now including fractions compared to fractions. Units can be like or different. Proper and improper fractions are to be included as well. Additionally, students apply this knowledge to Geometry through scaling.) | **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.*** | * **SMP 2** Reason abstractly and quantitatively. * **SMP 6** Attend to precision. | Complex Fractions  Rate  Ratio  Proportion  Proportional Relationship  Unit Rate |
|  | 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. | * **SMP 1** Make sense of problems and persevere in solving them. * **SMP 2** Reason abstractly and quantitatively. * **SMP 3** Construct viable arguments and critique the reasoning of others. * **SMP 4** Model with Mathematics * **SMP 5** Use appropriate tools strategically. * **SMP 6** Attend to precision. * **SMP 7** Look for and make use of structure. * **SMP 8** Look for and express regularity in repeated reasoning. | Complex Fraction  Dimensions  Proportion  Proportional Relationship  Scale  Scale Drawing |
| **Unit 9: Constant of Proportionality and Unit Rate**  (Students determine if two quantities are in a proportional relationship from a table, equation, or graph. Based on this proportional relationship students can determine unit rate or make projections for future events. This skill can be applied to real-world situations such as determining cost for a family event or budgeting for groceries.) | **7.RP.2 Recognize and represent proportional relationships between quantities.**  **7.RP.2a 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.**  **7.RP.2b Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships.**  **7.RP.2c 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.***  ***7.RP.2d 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.*** | * **SMP 1** Make sense of problems and persevere in solving them. * **SMP 2** Reason abstractly and quantitatively. * **SMP 3** Construct viable arguments and critique the reasoning of others. * **SMP 4** Model with Mathematics. * **SMP 5** Use appropriate tools strategically. * **SMP 6** Attend to precision. * **SMP 7** Look for and make use of structure. * **SMP 8** Look for and express regularity in repeated reasoning. | Complex Fractions Constant of Proportionality  Rate  Ratio  Proportion  Proportional Relationship  Unit Rate |
| **Unit 10: Using Proportional Relationships to solve Real-World Problems**  (Students apply their knowledge or proportional relationships and computational skills of operations with rational numbers specifically percent, and solve real-world problems such as tax, gratuity, simple interest, markup, markdown, commission, etc.) | **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.*** | * **SMP 1** Make sense of problems and persevere in solving them. * **SMP 2** Reason abstractly and quantitatively. * **SMP 3** Construct viable arguments and critique the reasoning of others. * **SMP 4** Model with Mathematics. * **SMP 5** Use appropriate tools strategically. * **SMP 6** Attend to precision. * **SMP 7** Look for and make use of structure. * **SMP 8** Look for and express regularity in repeated reasoning. | Commission  Fee  Gratuity (Tip)  Markdown  Markup  Percent Decrease  Percent Error  Percent Increase  Proportion  Proportional Relationship  Rate  Ratio  Simple Interest  Tax  Unit Rate |

| **TERM 3**  **UNIT OF STUDY**  (REAL-WORLD APPLICATION) **q** | **MS CCR STANDARDS q** | **STANDARDS FOR MATHEMATICAL  PRACTICE (SMPs) q** | CORE ACADEMIC **VOCABULARY TERMS q** |
| --- | --- | --- | --- |
| **Unit 11: Sampling and Inferences**  (Students learn the foundational skills for conducting mathematical research and form the realization of the difficulty to gather statistics on an entire population. Instead, the use of a random sample can generate valid predictions as well. Students collect and use multiple samples of data to generalize) | 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. | * **SMP 3** Construct viable arguments and critique the reasoning of others. * **SMP 6** Attend to precision. | Bias  Inference  Population  Representative  Random Sampling  Sample  Statistics  Survey |
|  | 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.* | * **SMP 1** Make sense of problems and persevere in solving them. * **SMP 2** Reason abstractly and quantitatively. * **SMP 3** Construct viable arguments and critique the reasoning of others. * **SMP 5** Use appropriate tools strategically. * **SMP 6** Attend to precision. * **SMP 7** Look for and make use of structure. | Bias  Inference  Prediction  Population  Representative  Random Sampling  Sample  Statistics  Survey |
| **Unit 12: Comparing Inferences**  (Introduction of comparing two data sets; extension of central tendencies: Students learn to measure differences in numerical data distributions with similar variability. This skill can be used in situations such as comparing student grades or sport team performance.) | 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 on either team; on a dot plot, the separation between the two distributions of heights is noticeable.* | * **SMP 1** Make sense of problems and persevere in solving them. * **SMP 2** Reason abstractly and quantitatively. * **SMP 3** Construct viable arguments and critique the reasoning of others. * **SMP 4** Model with Mathematics * **SMP 5** Use appropriate tools strategically. * **SMP 6** Attend to precision. * **SMP 7** Look for and make use of structure. | Distribution Variability  Variation  Measures of Center  Measures of Variability |
|  | 7.SP.4 Use measures of center and measures of variability (i.e. inter-quartile range) 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.* | * **SMP 1** Make sense of problems and persevere in solving them. * **SMP 2** Reason abstractly and quantitatively. * **SMP 3** Construct viable arguments and critique the reasoning of others. * **SMP 4** Model with Mathematics. * **SMP 5** Use appropriate tools strategically. * **SMP 6** Attend to precision. * **SMP 7** Look for and make use of structure. | Distribution Variability  Variation  Measures of Center  Measures of Variability |
| **Unit 13: Probability**  (This is the introduction of students learning about probability and the likelihood of events. Students learn how to calculate chance. This skill is foundational for analyzation of statistical data.) | 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. | * **SMP 4** Model with Mathematics * **SMP 5** Use appropriate tools strategically. * **SMP 6** Attend to precision. * **SMP 7** Look for and make use of structure. | Certain  Equally Likely  Event  Impossible  Likely  Outcome  Probability  Unlikely |
|  | 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.* | * **SMP 1** Make sense of problems and persevere in solving them. * **SMP 2** Reason abstractly and quantitatively. * **SMP 3** Construct viable arguments and critique the reasoning of others. * **SMP 4** Model with Mathematics * **SMP 5** Use appropriate tools strategically. * **SMP 6** Attend to precision. * **SMP 7** Look for and make use of structure. * **SMP 8** Look for and express regularity in repeated reasoning. | Chance Event  Frequency  Outcome  Prediction  Probability |
|  | 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.  7.SP.7a 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.*  7.SP.7b 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?* | * **SMP 1** Make sense of problems and persevere in solving them. * **SMP 2** Reason abstractly and quantitatively. * **SMP 3** Construct viable arguments and critique the reasoning of others. * **SMP 4** Model with Mathematics. * **SMP 5** Use appropriate tools strategically. * **SMP 6** Attend to precision. * **SMP 7** Look for and make use of structure. * **SMP 8** Look for and express regularity in repeated reasoning. | Chance Event  Frequency  Outcome  Prediction  Probability  Simple Event |
|  | 7.SP.8 Find probabilities of compound events using organized lists, tables, tree diagrams, and simulation.  7.SP.8a 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.  7.SP.8b 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.  7.SP.8c 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?* | * **SMP 1** Make sense of problems and persevere in solving them. * **SMP 2** Reason abstractly and quantitatively. * **SMP 3** Construct viable arguments and critique the reasoning of others. * **SMP 4** Model with Mathematics. * **SMP 5** Use appropriate tools strategically. * **SMP 6** Attend to precision. * **SMP 7** Look for and make use of structure. * **SMP 8** Look for and express regularity in repeated reasoning. | Chance Event  Compound Event  Frequency  Outcome  Prediction  Probability  Simple Event |

| **TERM 4**  **UNIT OF STUDY**  (REAL-WORLD APPLICATION) **q** | **MS CCR STANDARDS q** | **STANDARDS FOR MATHEMATICAL  PRACTICE (SMPs) q** | CORE ACADEMIC **VOCABULARY TERMS q** |
| --- | --- | --- | --- |
| **Unit 14: Slicing Three-Dimensional Figures**  (Students expand on knowledge of three-dimensional figures. They will learn that cuts made parallel will take the shape of the base; cuts made perpendicular will take the shape of the lateral (side) face; cuts made at an angle through the right rectangular prism will produce a parallelogram. This can be useful in math and engineering careers such as graphics design.) | 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. | * **SMP 1** Make sense of problems and persevere in solving them. * **SMP 2** Reason abstractly and quantitatively. * **SMP 3** Construct viable arguments and critique the reasoning of others. * **SMP 4** Model with Mathematics. * **SMP 5** Use appropriate tools strategically. * **SMP 6** Attend to precision. * **SMP 7** Look for and make use of structure. * **SMP 8** Look for and express regularity in repeated reasoning. | Plane Section  Right Rectangular Prism  Right Rectangular Pyramid |
| **Unit 15: Angles and Triangles**  (Foundational skill for advanced Geometry and Trigonometry; Given certain conditions student learn to draw triangles with unique attributes. Additionally, students will use their knowledge of writing and solving equations to determine angle measures.) | 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. | * **SMP 4** Model with Mathematics. * **SMP 5** Use appropriate tools strategically. * **SMP 6** Attend to precision. * **SMP 7** Look for and make use of structure. * **SMP 8** Look for and express regularity in repeated reasoning. | Acute Triangle  Isosceles Triangle  Obtuse Triangle  Right Scalene Triangle  Triangle Angle Sum Theorem  Triangle Inequality Theorem |
|  | 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. | * **SMP 3** Construct viable arguments and critique the reasoning of others. * **SMP 4** Model with Mathematics. * **SMP 5** Use appropriate tools strategically. * **SMP 6** Attend to precision. * **SMP 7** Look for and make use of structure. | Adjacent  Angle  Complementary  Supplementary  Vertical |
| **Unit 16: Using Geometry Formulas to Solve real-world problems: Area, Circumference, Surface Area, and Volume**  (An extension from 5th and 6th grade; this unit continues work with area, volume, and surface area of two-dimensional and three-dimensional objects. This work is foundational for mathematical and engineering careers such as but not limited to architecture and carpentry.) | 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. | * **SMP 1** Make sense of problems and persevere in solving them. * **SMP 2** Reason abstractly and quantitatively. * **SMP 3** Construct viable arguments and critique the reasoning of others. * **SMP 4** Model with Mathematics * **SMP 5** Use appropriate tools strategically. * **SMP 6** Attend to precision. * **SMP 7** Look for and make use of structure. * **SMP 8** Look for and express regularity in repeated reasoning. | Area  Circumference  Diameter  Pi  Radius |
|  | 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. | * **SMP 1** Make sense of problems and persevere in solving them. * **SMP 2** Reason abstractly and quantitatively. * **SMP 3** Construct viable arguments and critique the reasoning of others. * **SMP 4** Model with Mathematics * **SMP 5** Use appropriate tools strategically. * **SMP 6** Attend to precision. * **SMP 7** Look for and make use of structure. * **SMP 8** Look for and express regularity in repeated reasoning. | Area  Surface Area  Volume |

\****Include positives and negatives and conversion of Fractions, Decimals, and Percent***

***\*\* Computations with rational numbers extend the rules for manipulating fractions to complex fractions.***

1. *https://tntp.org/assets/documents/TNTP\_The-Opportunity-Myth\_Web.pdf* [↑](#footnote-ref-2)