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SUGGESTED

**INSTRUCTIONAL**

**PLANNING GUIDE**

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

**q Mathematics**

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| **Grade 8** |

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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) | AssessmentResources | Professional Development |
| --- | --- | --- | --- | --- |
| * [MS HQIM Defined](https://mdek12.org/HQIM)
* [MS Adopted HQIM (Textbooks)](https://www.mdek12.org/caravan2019)
* [Illustrative Mathematics Grade 8 Scope and Sequence](https://curriculum.illustrativemathematics.org/MS/teachers/3/index.html)
* [Carnegie Learning Course 3 Pacing](https://cdn.carnegielearning.com/assets/mathiax-pdfs/C03_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-8th Grade Math](https://achievethecore.org/coherence-map/8)
* [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 8 Math](https://www.mdek12.org/sites/default/files/documents/OAE/OEER/Exemplar%20Units/math/8th-Grade-Exemplar-FINAL_20181126.pdf)
* [Mississippi CCRS Exemplar Lesson Plans](https://mdek12.org/ESE/math/lesson-plans)
* [LearnZillion 8th Grade Course Resources](https://learnzillion.com/wikis/235595-learnzillion-illustrative-mathematics-grade-8-course/)
* [LearnZillion Instructional Videos](https://learnzillion.com/wikis/99913-math-instructional-videos/)
* [Open-up Resources Mathematics- Family Support Center-Grade 8](https://access.openupresources.org/curricula/our6-8math-v1/8/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 Scientific Calculator](https://www.desmos.com/scientific)
* [Inside Mathematics Performance Tasks 2-HS](https://www.insidemathematics.org/performance-assessment-tasks)
* [Illustrative Mathematics Grade 8 Tasks](http://tasks.illustrativemathematics.org/content-standards/8)
* [MARS Mathematics Assessment Project (6-HS)](https://www.map.mathshell.org/index.php)
* [Goalbook Pathways Grade 8](https://goalbookapp.com/pathways/?ref=topic" \l "!/browse-topics/math/8)
* [Khan Academy 8 Math](https://www.khanacademy.org/math/cc-eighth-grade-math)
* [Open-up Resources Mathematics-Student Resources-Grade 8](https://access.openupresources.org/curricula/our6-8math-v1/8/students/index.html)
 | * [MDE Professional Development Resources](https://www.mdek12.org/OPD/home)
* [SchoolKit and IM Video Lessons](http://schoolkitgroup.com/video-grade-8/)-Grade 8
* [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)
* [Learn Desmos](https://learn.desmos.com/)
 |
| 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)
* [Geometry Playground](https://www.maa.org/press/periodicals/loci/resources/geometry-playground)
* [Houghton Mifflin and Harcourt iTools](https://www-k6.thinkcentral.com/content/hsp/math/hspmath/na/common/itools_int_9780547584997_/main.html)
* [Interactive Mathematics Applications](https://www.intmath.com/help/interactive-math-applications.php)
* [Interactivate Tools](http://www.shodor.org/interactivate/tools/)
* [Key Curriculum Geometers Sketchpad](https://www.keycurriculum.com/training)
* [Mathed Applets](https://www.mathed.page/applets.html)
* [Mathies Learning Tools](https://www.mathies.ca/learningTools.php#gsc.tab=0)
* [Mathigon Polypad](https://mathigon.org/polypad)
* [Math Playground Math Manipulatives](https://www.mathplayground.com/math_manipulatives.html)
* [Mathsbot Manipulatives](https://mathsbot.com/manipulativeMenu)
* [McGraw Hill (Glencoe) Virtual Manipulatives](http://www.glencoe.com/sites/common_assets/mathematics/ebook_assets/vmf/VMF-Interface.html)
* [National Library of Virtual Manipulatives](http://nlvm.usu.edu/en/nav/vlibrary.html)
* [NCTM Illuminations Interactives](https://illuminations.nctm.org/)
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| **TERM 1****UNIT OF STUDY**(REAL-WORLD APPLICATION)**q** | **MS CCR STANDARDSq** | **STANDARDS FOR MATHEMATICAL PRACTICE (SMPs)q** | CORE ACADEMIC **VOCABULARY TERMSq** |
| --- | --- | --- | --- |
| **Unit 1: Rational vs Irrational Numbers** (Students learn the different systems of numbers and can identify types of numbers based on their attributes. This skill becomes a tool to use when approximating numbers in the absence of a calculator.) | 8.NS.1 Know that numbers that are not rational are called irrational. Understand informally that every number has a decimal expansion; for rational numbers show that the decimal expansion repeats eventually and convert a decimal expansion which repeats eventually into a rational number. | * **SMP 2** Reason abstractly and quantitatively.
* **SMP 6** Attend to precision.
* **SMP 7** Look for and make use of structure.
 | Cube RootDecimalDecimal ExpansionFractionIntegerIrrational NumberNatural NumberPerfect Square |
|  | 8.NS.2 Use rational approximations of irrational numbers to compare the size of irrational numbers, locate them approximately on a number line diagram, and estimate the value of expressions (e.g., π2). *For example, by truncating the decimal expansion of √2, show that √2 is between 1 and 2, then between 1.4 and 1.5, and explain how to continue to get better approximations*. | * **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.
 | Approximation |
| **Unit 2: Law of Exponents and Scientific Notation** (As an extension of approximations of numbers, students learn the use of exponents to write numbers in an abbreviated form. The skill of using exponents assists in STEM fields when having to calculate or notate extremely small or extremely large amounts.) | **8.EE.1 Know and apply the properties of integer exponents to generate equivalent numerical expressions.** **For example, 32 × 3-5 = 3-3 = 1/33 = 1/27.** | * **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.
 | Algebraic ExpressionBaseCommon BaseEquivalentExponentExponential FormFactorIntegerMultiplicative InverseNumerical ExpressionPowerReciprocalStandard Form |
|  | **8.EE.3 Use numbers expressed in the form of a single digit times an integer power of 10 to estimate very large or very small quantities, and to express how many times as much one is than the other. *For example, estimate the population of the United States as 3 times 108 and the population of the world as 7 times 109, and determine that the world population is more than 20 times larger*.** | * **SMP 2** Reason abstractly and quantitatively.
* **SMP 5** Use appropriate tools strategically.
* **SMP 6** Attend to precision.
 | BaseDecimal NotationExponentIntegerPowers of TenScientific NotationStandard Form |
|  | **8.EE.4 Perform operations with numbers expressed in scientific notation, including problems where both decimal and scientific notation are used. Use scientific notation and choose units of appropriate size for measurements of very large or very small quantities (e.g., use millimeters per year for seafloor spreading). Interpret scientific notation that has been generated by technology.** | * **SMP 2** Reason abstractly and quantitatively.
* **SMP 5** Use appropriate tools strategically.
* **SMP 6** Attend to precision.
 | Decimal NotationScientific NotationUnits of Measurement |
| **Unit 3: Solutions with Exponents and the Pythagorean Theorem** (Learning to use exponents within geometry standards such as Pythagorean Theorem, students obtain the skills of estimating distance and height when given limited data. This lays the foundation for more complex reasoning in occupations such as construction, engineering, and architecture.) | **8.EE.2** **Use square root and cube root symbols to represent solutions to equations of the form *x*2 = *p* and *x*3 = p, where *p* is a positive rational number. Evaluate square roots of small perfect squares and cube roots of small perfect cubes. Know that √2 is irrational.** | * **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.
 | BaseCubedCube RootExponentPerfect Cube RootPerfect Square RootPowerRadicalRadicandSquare Root Squared |
|  | **8.G.6 Explain a proof of the Pythagorean Theorem and its converse.** | * **SMP 3** Construct viable arguments and critique the reasoning of others.
* **SMP 4** Model with Mathematics.
* **SMP 6** Attend to precision.
* **SMP 7** Look for and make use of structure.
 | ConverseHypotenuseLegProofPythagorean TheoremRight TriangleSquareSquare root |
|  | **8.G.7 Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two and three dimensions.** | * **SMP 1** Make sense of problems and persevere in solving them.
* **SMP 2** Reason abstractly and quantitatively.
* **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.
 | Diagonal LengthHypotenuseLegPythagorean TheoremRight TriangleSide LengthSquareSquare RootThree-Dimensions Two-Dimensions |
|  | **8.G.8 Apply the Pythagorean Theorem to find the distance between two points in a coordinate system.** | * **SMP 1** Make sense of problems and persevere in solving them.
* **SMP 2** Reason abstractly and quantitatively.
* **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.
 | Coordinate SystemDistancePointPythagorean Theorem |
| **Unit 4: Formulas with Exponents and Volume** (Learning to use exponents within geometry standards such as Volume, students obtain the skills of spatial reasoning for everyday skills such as choosing the correct size package to ship an item. This lays the foundation for more complex reasoning in occupations such as architecture.) | 8.G.9 Know the formulas for the volumes of cones, cylinders, and spheres and use them to solve real-world and mathematical problems. | * **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.
 | BaseCircleConeCylinderDiameterFormulaHeightPiRadiusSphereVolume |

| **TERM 2****UNIT OF STUDY**(REAL-WORLD APPLICATION)**q** | **MS CCR STANDARDSq** | **STANDARDS FOR MATHEMATICAL PRACTICE (SMPs)q** | CORE ACADEMIC **VOCABULARY TERMSq** |
| --- | --- | --- | --- |
| **Unit 5: Transformations** (Students learn to determine congruency or similarity of a figure based on its attributes. This lays a foundation for understanding how figures are transposed in a multitude of areas such as gaming or computer graphic design.) | **8.G.1 Verify experimentally the properties of rotations, reflections, and translations:****8.G.1a Lines are taken to lines, and line segments to line segments of the same length.****8.G.1b Angles are taken to angles of the same measure.****8.G.1c Parallel lines are taken to parallel lines.** | * **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.
 | AngleCenter of RotationImageLine of ReflectionPre-ImageReflectionRigid TransformationRotationTransformationTranslation |
|  | **8.G.2 Understand that a two-dimensional figure is congruent to another if the second can be obtained from the first by a sequence of rotations, reflections, and translations; given two congruent figures, describe a sequence that exhibits the congruence between them.** | * **SMP 2** Reason abstractly and quantitatively.
* **SMP 4** Model with Mathematics.
* **SMP 6** Attend to precision.
* **SMP 7** Look for and make use of structure.
 | CongruentCongruent FigureRigid MotionSequenceSimilarSimilar Figure |
|  | **8.G.3 Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates.** | * **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.
 | Center of DilationDilationScale Factor |
|  | **8.G.4 Understand that a two-dimensional figure is similar to another if the second can be obtained from the first by a sequence of rotations, reflections, translations, and dilations; given two similar two-dimensional figures, describe a sequence that exhibits the similarity between them.** | * **SMP 2** Reason abstractly and quantitatively.
* **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.
 | CongruentCongruent FigureRigid MotionSequenceSimilarSimilar Figure |
| **Unit 6: Angles & Transversals**(Understanding how angles are constructed helps students to understand geometrical tasks such as figuring how to lay tile in a room or cut glass for a specifically shaped window.) | **8.G.5 Use informal arguments to establish facts about the angle sum and exterior angle of triangles, about the angles created when parallel lines are cut by a transversal, and the angle-angle criterion for similarity of triangles. *For example, arrange three copies of the same triangle so that the sum of the three angles appears to form a line, and give an argument in terms of transversals why this is so*.**  | * **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 AnglesAlternate Exterior AnglesAlternate Interior AnglesAngle SumAngle-Angle CriterionCorresponding AnglesExterior AngleInformal ArgumentParallel LinesSimilarSimilar TrianglesSupplementary AnglesTransversalVertical Angles |

| **TERM 3****UNIT OF STUDY**(REAL-WORLD APPLICATION)**q** | **MS CCR STANDARDSq** | **STANDARDS FOR MATHEMATICAL PRACTICE (SMPs)q** | CORE ACADEMIC **VOCABULARY TERMSq** |
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| **Unit 7: Functions** (Students learn this skill to be able to interpret a pattern in data or the lack thereof, such as estimating a specific player’s stats or fluctuation in weight.) | **8.F.1 Understand that a function is a rule that assigns to each input exactly one output. The graph of a function is the set of ordered pairs consisting of an input and the corresponding output. \*** | * **SMP 2** Reason abstractly and quantitatively.
* **SMP 6** Attend to precision.
 | Algebraic EquationAlgebraic ExpressionCoordinate PlaneCoordinatesDataDependent VariableEquationExpressionFunctionGraphIndependent VariableInputNon-FunctionNon-Numerical DataOrdered PairsOutputRuleTableVerbal Description |
|  | **8.F.2 Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). *For example, given a linear function represented by a table of values and a linear function represented by an algebraic expression, determine which function has the greater rate of change*.** | * **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.
 | Linear FunctionPropertiesRate of ChangeX-InterceptY-Intercept |
|  | **8.F.3 Interpret the equation *y = mx + b* as defining a linear function, whose graph is a straight line; give examples of functions that are not linear. *For example, the function A = s2 giving the area of a square as a function of its side length is not linear because its graph contains the points (1,1), (2,4) and (3,9), which are not on a straight line*.** | * **SMP 2** Reason abstractly and quantitatively.
* **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.
 | Non-linear |
|  | **8.F.4 Construct a function to model a linear relationship between two quantities. Determine the rate of change and initial value of the function from a description of a relationship or from two (*x, y*) values, including reading these from a table or from a graph. Interpret the rate of change and initial value of a linear function in terms of the situation it models, and in terms of its graph or a table of values.** | * **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.
 | Linear FunctionLinear RelationshipRate of Change |
|  | **8.F.5 Describe qualitatively the functional relationship between two quantities by analyzing a graph (e.g., where the function is increasing or decreasing, linear or nonlinear). Sketch a graph that exhibits the qualitative features of a function that has been described verbally.** | * **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.
 | Functional Relationship |
|  | **8.EE.5 Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways. For example, compare a distance-time graph to a distance-time equation to determine which of two moving objects has greater speed.** | * **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.
 | Proportional RelationshipsUnit RateSlopeY-Intercept |
|  | **8.EE.6 Use similar triangles to explain why the slope m is the same between any two distinct points on a non-vertical line in the coordinate plane; derive the equation y = mx for a line through the origin and the equation *y* = *mx* + *b* for a line intercepting the vertical axis at *b*.** | * **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 7** Look for and make use of structure.
* **SMP 8** Look for and express regularity in repeated reasoning.
 | Similar TrianglesSlopeVerticalHorizontalY-Intercept |
| **Unit 8: Equations and Inequalities** (Students learn to write and solve equations and inequalities to find solutions to everyday problems; some as simple as ensuring the grocery list does not exceed the grocery budget.) | **8.EE.7 Solve linear equations in one variable.****8.EE.7a Give examples of linear equations in one variable with one solution, infinitely many solutions, or no solutions. Show which of these possibilities is the case by successively transforming the given equation into simpler forms, until an equivalent equation of the form *x* = *a*, *a* = *a*, or *a* = *b* results (where *a* and *b* are different numbers).****8.EE.7b Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms.** | * **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.
 | Distributive PropertyEquationEquivalentExpressionInfinitely Many SolutionsInverse OperationsLike TermsNo SolutionOne SolutionSolutionVariable |
| **Unit 9: Systems of Equations** (Systems of equations provide students with the ability to be able to compare two different sets of data to determine if or when there will be a correlation, *i.e*. finding the better deal between cell phone providers.) | **8.EE.8 Analyze and solve pairs of simultaneous linear equations.****8.EE.8a Understand that solutions to a system of two linear equations in two variables correspond to points of intersection of their graphs, because points of intersection satisfy both equations simultaneously.****8.EE.8b Solve systems of two linear equations in two variables algebraically and estimate solutions by graphing the equations. Solve simple cases by inspection. *For example, 3x + 2y = 5 and 3x + 2y = 6 have no solution because 3x + 2y cannot simultaneously be 5 and 6*.****8.EE.8c Solve real-world and mathematical problems leading to two linear equations in two variables. *For example, given coordinates for two pairs of points, determine whether the line through the first pair of points intersects the line through the second pair*.** | * **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.
 | Consistent DependentEliminationInconsistentIndependentInfinite Many SolutionsInspectionLinear EquationNo SolutionPoints of IntersectionSolutionSubstitutionSystem of Linear Equations |

| **TERM 4****UNIT OF STUDY**(REAL-WORLD APPLICATION)**q** | **MS CCR STANDARDSq** | **STANDARDS FOR MATHEMATICAL PRACTICE (SMPs)q** | CORE ACADEMIC **VOCABULARY TERMSq** |
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| **Unit 10: Scatterplots** (Very similar to functions, students learn this skill to be able to interpret a pattern in data or the lack thereof, such as estimating the amount of sunlight needed for optimal plant growth.) | 8.SP.1 Construct and interpret scatter plots for bivariate measurement data to investigate patterns of association between two quantities. Describe patterns such as clustering, outliers, positive or negative association, linear association, and nonlinear association. | * **SMP 2** Reason abstractly and quantitatively.
* **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.
 | Bivariate Measurement DataClusteringLinear AssociationNegative AssociationOutlierPositive AssociationScatter Plot |
|  | 8.SP.2 Know that straight lines are widely used to model relationships between two quantitative variables. For scatter plots that suggest a linear association, informally fit a straight line, and informally assess the model fit by judging the closeness of the data points to the line. | * **SMP 2** Reason abstractly and quantitatively.
* **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.
 | Line of Best FitLinear AssociationQuantitative VariableScatter Plot |
|  | 8.SP.3 Use the equation of a linear model to solve problems in the context of bivariate measurement data, interpreting the slope and intercept. *For example, in a linear model for a biology experiment, interpret a slope of 1.5 cm/hr as meaning that an additional hour of sunlight each day is associated with an additional 1.5 cm in mature plant height*. | * **SMP 2** Reason abstractly and quantitatively.
* **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.
 | Bivariate Measurement DataLinear ModelSlopeSlope Intercept |
| **Unit 11: Constructing and Interpreting Two-way Frequency Tables** (Students learn to interpret two-way frequency tables when collecting data for research purposes.) | 8.SP.4 Understand that patterns of association can also be seen in bivariate categorical data by displaying frequencies and relative frequencies in a two-way table. Construct and interpret a two-way table summarizing data on two categorical variables collected from the same subjects. Use relative frequencies calculated for rows or columns to describe possible association between the two variables. *For example, collect data from students in your class on whether or not they have a curfew on school nights and whether or not they have assigned chores at home. Is there evidence that those who have a curfew also tend to have chores?* | * **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.
 | Bivariate Categorical DataCategorical Variables FrequenciesPattern of AssociationRelative Frequencies |

 \* ***Function notation is not required in Grade 8***

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