

Introduction:

The following Instructional Materials Scoring Rubric for Mathematics is designed to score materials in the following categories:

- Instructional Focus
- Math Practices
- Aspects of Rigor
- Accessibility Features

Scoring:

Each section is to be scored using a 0, 1, or 2. For all sections, except for Rigor, use the following rubric when deciding on the appropriate rating:

- 0: The metric is not present within the material.
- 1: The metric is present within the material. The intent and/or frequency component of the metric is not fully met.
- 2: A rating of 2 indicates the metric is present and all aspects of the metric are fully met.

For Rigor:

- 0: The standard is not instructionally present within the material.
- 1: The standard is instructionally present but does not have an instructional focus on the indicated type of rigor.
- 2: The standard is instructionally present and has a clear instructional focus on the indicated type of rigor.

Note: Some standards appear under multiple aspects of rigor (i.e., Conceptual Understanding, Procedural Fluency, or Application). When scoring these standards, only score the part of the standard relevant to that aspect of rigor, which is identified by a bold, italics, larger font.

Gateway: The publisher must provide a Tennessee standards alignment guide as a part of the scope and sequence for the material. If this gateway is not met, the materials will not be scored.

Instructional Focus				
	0	1	2	Evidence
Connections to content from prior grades are clearly identified and explicitly related to grade-level work.				
Materials embed a minimum of 3 tasks in every unit. Each task has multiple entry-points and can be solved using a minimum of 2 solution strategies and/or representations.				
Materials give students opportunities to work problems within each lesson. Each problem set: <ul style="list-style-type: none"> Covers the full breadth of the standard(s) covered in the lesson Is aligned to on grade level expectations as identified in the standard(s) 				
Teacher resources indicate common student misconceptions in every unit and provide guidance on how to instructionally address the identified misconceptions.				
Materials provide educative supports (e.g., adult level explanations of the standards and strategies) in every lesson for teachers to ensure standards are taught accurately and to the appropriate level of rigor (i.e., conceptual understanding, procedural fluency, and application) as indicated by the standards.				
Materials develop student understanding of multiple representations (i.e., concrete, representational, abstract) for relevant standards which are identified in the state's Instructional Focus Documents.				
Materials include problems and activities in every unit that connect two or more grade level standards in a domain (e.g., 2.MD.A.1 and 2.MD.A.2).				
Materials include problems and activities in every unit that connect two or more grade level domains. (e.g., 2.MD.B.6 and 2.OA.A.1)				
Materials provide opportunities for students to participate in a spiraled review in every unit.				
Total				

Mathematical Practices				
Math Practices/Literacy Skills for Math Proficiency	0	1	2	Evidence
Materials embed the eight math practice standards in every unit.				
Math practice standards are clearly identified in both teacher and student materials.				
Materials use appropriate math vocabulary which is aligned to the grade level standards.				
Materials support students in discussing and articulating mathematical ideas. Within each lesson students either write or verbally justify their thoughts.				
			Total	

Accessibility Features				
Digital Materials	0	1	2	Evidence
All lessons within the materials are available in digital form and include a printable option.				
In every lesson, materials include recommended supports, accommodations, and modifications for Students with Disabilities and English Language Learners that will support their regular and active participation in accessing on grade level material (e.g., modifying vocabulary words within word problems, sentence starters, etc.).				
			Total	

Aspects of Rigor				
Conceptual Understanding: The materials support the intentional development of students' conceptual understanding of key mathematical concepts, especially where called for in specific content standards or clusters.	0	1	2	Evidence
A2.N.RN.A.1 Extend the properties of integer exponents to rational exponents.				1
A2.N.RN.A.1a Develop the meaning of rational exponents by applying the properties of integer exponents.				2
A2.N.RN.A.1b Explain why $x^{1/n}$ can be written as the n th root of x .				3
A2.N.RN.A.1c Rewrite expressions involving radicals and rational exponents <i>using the properties of exponents</i> .				4
A2.N.Q.A.1 Use units as a way to understand real-world problems. ★				5
A2.N.Q.A.1a Choose and interpret the scale and the origin in graphs and data displays.				6
A2.N.Q.A.1b Use appropriate quantities in formulas, converting units as necessary.				7
A2.N.Q.A.1c Define and justify appropriate quantities within a context for the purpose of modeling.				8
A2.N.Q.A.1d Choose an appropriate level of accuracy when reporting quantities.				9
A2.N.M.A.1 Use matrices to represent data in a real-world context. Interpret rows, columns, and dimensions of matrices in terms of the context. ★				10
A2.N.M.A.2d Describe the roles that zero matrices and identity matrices play in matrix addition and multiplication, recognizing that they are similar to the roles of 0 and 1 in the real number system.				11
A2.N.M.A.3 <i>Create</i> and use <i>augmented matrices to solve systems of linear equations</i> in real-world contexts, by hand and using technology. ★				12
A2.A.SSE.A.1 Interpret expressions that represent a quantity in terms of its context. ★				13

A2.A.SSE.A.1a Interpret parts of an expression, such as terms, factors, and coefficients.				14
A2.SSE.A.1b Interpret complicated expressions by viewing one or more of their parts as a single entity.				15
A2.A.APR.A.1 Know and apply the Factor Theorem: For a polynomial $p(x)$ and a number a , $p(a) = 0$ if and only if $(x - a)$ is a factor of $p(x)$.				16
A2.A.APR.A.2 <i>Identify zeros of polynomials when suitable factorizations are available</i> , and use the zeros to construct a rough graph of the function defined by the polynomial.				17
A2.A.CED.A.1 <i>Create equations and inequalities in one variable</i> and use them to solve problems in a real-world context. ★				18
A2.A.CED.A.2 <i>Create equations and inequalities in two variables to represent relationships between quantities</i> and use them to solve problems in a real-world context. Graph equations with two variables on coordinate axes with labels and scales, and <i>use the graphs to make predictions</i> . ★				19
A2.A.CED.A.3 Rearrange formulas to isolate a quantity of interest <i>using algebraic reasoning</i> .				20
A2.A.REI.A.1 Understand solving equations as a process of reasoning and explain the reasoning. Construct a viable argument to justify a solution method.				21
A2.A.REI.A.2 Solve radical equations in one variable, and <i>identify extraneous solutions when they exist</i> .				22
A2.F.IF.A.1 <i>For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities</i> , and sketch graphs showing key features given a verbal description of the relationship. ★				23
A2.F.IF.A.2 Calculate and <i>interpret the average rate of change of a function (presented algebraically or as a table) over a specified interval. Estimate and interpret the rate of change from a graph</i> . ★				24
A2.F.IF.A.3 Understand geometric formulas as functions. ★				25
A2.F.IF.B.5 Write a function defined by an expression in different but equivalent forms <i>to reveal and explain different properties of the function</i> . ★				26
A2.F.IF.B.5a Rewrite quadratic functions to <i>show zeros, extreme values, and symmetry of the graph, and interpret these in terms</i> of a real-world context.				27
A2.F.IF.B.5b <i>Know</i> and use <i>the properties of exponents</i> to <i>interpret expressions for exponential functions</i> in terms of a real-world context.				28

A2.F.IF.B.6 Compare properties of functions represented algebraically, graphically, numerically in tables, or by verbal descriptions. ★				29
A2.F.IF.B.6a Compare properties of two different functions. Functions may be of different types and/or represented in different ways.				30
A2.F.IF.B.6b Compare properties of the same function on two different intervals or represented in two different ways.				31
A2.F.BF.A.2 <i>Define sequences as functions, including recursive definitions, whose domain is a subset of the integers.</i> Write explicit and recursive formulas for arithmetic and geometric sequences in context and <i>connect them to linear and exponential functions.</i> ★				32
A2.F.BF.B.3 Identify the effect on the graph of replacing $f(x)$ by $f(x) + k$, $k f(x)$, $f(kx)$, and $f(x + k)$ for specific values of k (both positive and negative); find the value of k given the graphs.				33
A2.F.BF.B.4a Determine whether a function is one-to-one.				34
A2.F.BF.B.4c Given an invertible function on an appropriate domain, identify the domain of the inverse function.				35
A2.F.LE.A.1 Know the relationship between exponential functions and logarithmic functions.				36
A2.F.LE.A.1b Understand that a logarithm is the solution to $ab^{ct} = d$, where a , b , c , and d are numbers.				37
A2.F.LE.A.2 Know that a quantity increasing exponentially eventually exceeds a quantity increasing linearly, quadratically, or cubically.				38
A2.S.ID.A.1 Use statistics appropriate to the shape of the data distribution to compare center (mean, median, and/or mode) and spread (range, standard deviation) of two or more different data sets. ★				39
A2.S.ID.A.2 <i>Use the mean and standard deviation of a data set</i> to fit it to a normal distribution and <i>to estimate population percentages using the Empirical Rule.</i> ★				40
A2.S.ID.A.3 Compute, <i>interpret, and compare z-scores for normally distributed data</i> in a real-world context. ★				41
A2.S.ID.B.4 <i>Represent data from two quantitative variables on a scatter plot, and describe how the variables are related.</i> Fit a function to the data; use functions fitted to data to solve problems in the context of the data. ★				42
A2.S.IC.A.1 Recognize the purposes of and differences among sample surveys, experiments, and observational studies. ★				43

A2.S.IC.A.2 Identify potential sources of bias in statistical studies. ★				44
A2.S.IC.A.3 <i>Distinguish between a statistic and a parameter</i> ; Evaluate reports based on data and recognize when poor conclusions are drawn from well-collected data .				45
A2.S.CP.A.1 Recognize and explain the concepts of conditional probability and independence in everyday language and everyday situations. Categorize events as independent or dependent. ★				46
A2.S.CP.B.3 Use the Law of Large Numbers to assess the validity of a statistical claim. ★				47
A2.S.CP.C.4 Find the conditional probability of A given B as the fraction of B's outcomes that also belong to A and interpret the answer in terms of the given context . ★				48
Procedural Skill and Fluency: The materials provide intentional opportunities for students to develop procedural skills and fluencies, especially where called for in specific content standards or clusters	0	1	2	Evidence
A2.N.RN.A.1c <i>Rewrite expressions involving radicals and rational exponents</i> using the properties of exponents.				1
A2.N.Q.A.1b Use appropriate quantities in formulas, converting units as necessary.				2
A2.N.M.A.2 <i>Perform operations on matrices</i> in a real-world context. ★				3
A2.N.M.A.2a Multiply a matrix by a scalar to produce a new matrix.				4
A2.N.M.A.2b Add and/or subtract matrices by hand and using technology.				5
A2.N.M.A.2c Multiply matrices of appropriate dimensions, by hand in simple cases and using technology for more complicated cases.				6
A2.N.M.A.3 Create and use augmented matrices to solve systems of linear equations in real-world contexts, by hand and using technology . ★				7
A2.A.APR.A.1 Know and apply the Factor Theorem: For a polynomial $p(x)$ and a number a , $p(a) = 0$ if and only if $(x - a)$ is a factor of $p(x)$.				8
A2.A.APR.A.2 Identify zeros of polynomials when suitable factorizations are available, and use the zeros to construct a rough graph of the function defined by the polynomial .				9
A2.A.CED.A.1 <i>Create equations and inequalities in one variable and use them to solve problems</i> in a real-world context. ★				10
A2.A.CED.A.2 <i>Create equations and inequalities in two variables to represent relationships between quantities and use them to solve problems</i> in a real-world				11

context. Graph equations with two variables on coordinate axes with labels and scales , and use the graphs to make predictions. ★				
A2.A.CED.A.3 Rearrange formulas to isolate a quantity of interest using algebraic reasoning.				12
A2.A.REI.A.2 Solve radical equations in one variable , and identify extraneous solutions when they exist.				13
A2.A.REI.B.3 Write and solve a system of linear equations in a real-world context. ★				14
A2.A.REI.B.4 Solve a system consisting of a linear equation and a quadratic equation in two variables algebraically, graphically, and using technology.				15
A2.F.IF.A.1 For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship . ★				16
A2.F.IF.A.2 Calculate and interpret the average rate of change of a function (presented algebraically or as a table) over a specified interval . Estimate and interpret the rate of change from a graph. ★				17
A2.F.IF.B.4 Graph functions expressed algebraically and show key features of the graph by hand and using technology . ★				18
A2.F.IF.B.5 Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function. ★				19
A2.F.IF.B.5a Rewrite quadratic functions to show zeros, extreme values, and symmetry of the graph, and interpret these in terms of a real-world context.				20
A2.F.IF.B.5b Know and use the properties of exponents to interpret expressions for exponential functions in terms of a real-world context.				21
A2.F.BF.A.1 Build a function that describes a relationship between two quantities. ★				22
A2.F.BF.A.1a Combine standard function types using arithmetic operations.				23
A2.F.BF.A.1b Combine standard function types using composition.				24
A2.F.BF.A.2 Define sequences as functions, including recursive definitions, whose domain is a subset of the integers. Write explicit and recursive formulas for arithmetic and geometric sequences in context and connect them to linear and exponential functions. ★				25
A2.F.BF.B.4 Find the inverse of a function.				26
A2.F.BF.B.4b Find the inverse of a function on an appropriate domain.				27

A2.F.LE.A.1a Solve exponential equations using a variety of strategies, including logarithms.				28
A2.F.LE.A.1c Evaluate logarithms using technology.				29
A2.S.ID.A.1 <i>Use statistics appropriate to the shape of the data distribution</i> to compare center (mean, median, and/or mode) and spread (range, standard deviation) of two or more different data sets.★				30
A2.S.ID.A.2 <i>Use the mean and standard deviation of a data set</i> to fit it to a normal distribution and to estimate population percentages using the Empirical Rule.★				31
A2.S.ID.A.3 <i>Compute, interpret, and compare z-scores for normally distributed data</i> in a real-world context.★				32
A2.S.ID.B.4 Represent data from two quantitative variables on a scatter plot, and describe how the variables are related. <i>Fit a function to the data; use functions fitted to data to solve problems</i> in the context of the data.★				33
A2.S.CP.B.2 Apply statistical counting techniques.★				34
A2.S.CP.B.2a Use the Fundamental Counting Principle to compute probabilities of compound events and solve problems.				35
A2.S.CP.B.2b Use permutations and combinations to compute probabilities of compound events and solve problems.				36
A2.S.CP.C.4 <i>Find the conditional probability of A given B as the fraction of B's outcomes that also belong to A</i> and interpret the answer in terms of the given context.★				37
Applications: The materials support the intentional development of students' ability to utilize mathematical concepts and skills in engaging applications, especially where called for in specific content standards or clusters.	0	1	2	Evidence
A2.N.Q.A.1 Use units as a way to understand real-world problems.★				1
A2.N.Q.A.1a Choose and interpret the scale and the origin in graphs and data displays.				2
A2.N.Q.A.1b Use appropriate quantities in formulas, converting units as necessary.				3
A2.N.Q.A.1c Define and justify appropriate quantities <i>within a context for the purpose of modeling</i> .				4
A2.N.Q.A.1d Choose an appropriate level of accuracy when reporting quantities.				5
A2.N.M.A.1 Use matrices to represent data in a <i>real-world context</i> . Interpret rows, columns, and dimensions of matrices <i>in terms of the context</i> .★				6
A2.N.M.A.2 Perform operations on matrices in a <i>real-world context</i> .★				7

A2.N.M.A.3 Create and use augmented matrices to solve systems of linear equations in <i>real-world contexts</i> , by hand and using technology. ★				8
A2.A.SSE.A.1 Interpret expressions that represent a quantity <i>in terms of its context</i> . ★				9
A2.A.SSE.A.1a Interpret parts of an expression, such as terms, factors, and coefficients.				10
A2.SSE.A.1b Interpret complicated expressions by viewing one or more of their parts as a single entity.				11
A2.A.CED.A.1 Create equations and inequalities in one variable and use them to <i>solve problems in a real-world context</i> . ★				12
A2.A.CED.A.2 Create equations and inequalities in two variables to represent relationships between quantities and use them to solve problems <i>in a real-world context</i> . Graph equations with two variables on coordinate axes with labels and scales, and use the graphs to make predictions. ★				13
A2.A.CED.A.3 Rearrange formulas to isolate a quantity of interest using algebraic reasoning.				14
A2.A.REI.B.3 Write and solve a system of linear equations <i>in a real-world context</i> . ★				15
A2.F.IF.A.1 For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. ★				16
A2.F.IF.A.2 Calculate and interpret the average rate of change of a function (presented algebraically or as a table) over a specified interval. Estimate and interpret the rate of change from a graph. ★				17
A2.F.IF.A.3 Understand geometric formulas as functions. ★				18
A2.F.IF.B.4 Graph functions expressed algebraically and show key features of the graph by hand and using technology. ★				19
A2.F.IF.B.5 Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function. ★				20
A2.F.IF.B.5a Rewrite quadratic functions to show zeros, extreme values, and symmetry of the graph, and interpret these <i>in terms of a real-world context</i> .				21
A2.F.IF.B.5b Know and use the properties of exponents to interpret expressions for exponential functions <i>in terms of a real-world context</i> .				22

A2.F.IF.B.6 Compare properties of functions represented algebraically, graphically, numerically in tables, or by verbal descriptions. ★				23
A2.F.BF.A.2 Define sequences as functions, including recursive definitions, whose domain is a subset of the integers. Write explicit and recursive formulas for arithmetic and geometric sequences <i>in context</i> and connect them to linear and exponential functions. ★				24
A2.S.ID.A.1 Use statistics appropriate to the shape of the data distribution to compare center (mean, median, and/or mode) and spread (range, standard deviation) of two or more different data sets. ★				25
A2.S.ID.A.2 Use the mean and standard deviation of a data set to fit it to a normal distribution and to estimate population percentages using the Empirical Rule. ★				26
A2.S.ID.A.3 Compute, interpret, and compare z-scores for normally distributed data in a <i>real-world context</i> . ★				27
A2.S.ID.B.4 Represent data from two quantitative variables on a scatter plot, and describe how the variables are related. Fit a function to the data; use functions fitted to data to <i>solve problems in the context of the data</i> . ★				28
A2.S.IC.A.1 Recognize the purposes of and differences among sample surveys, experiments, and observational studies. ★				29
A2.S.IC.A.2 Identify potential sources of bias in statistical studies. ★				30
A2.S.IC.A.3 Distinguish between a statistic and a parameter; Evaluate reports based on data and recognize when poor conclusions are drawn from well-collected data.				31
A2.S.CP.A.1 Recognize and explain the concepts of conditional probability and independence in everyday language and everyday situations. Categorize events as independent or dependent. ★				32
A2.S.CP.B.2 Apply statistical counting techniques. ★				33
A2.S.CP.B.3 Use the Law of Large Numbers to assess the validity of a statistical claim. ★				34
A2.S.CP.C.4 Find the conditional probability of A given B as the fraction of B's outcomes that also belong to A and <i>interpret the answer in terms of the given context</i> . ★				35
Total				

