Integrated Math 3 Mathematics Instructional Materials Scoring Rubric

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.

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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: • 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	

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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	

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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.

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**
M3.N.Q.A.1 Use units as a way to understand real-world problems.★				
M3.N.Q.A.1a Choose and interpret the scale and the origin in graphs and data displays.				
M3.N.Q.A.1b Use appropriate quantities in formulas, converting units as necessary.				
M3.N.Q.A.1c ***Define and justify appropriate quantities*** within a context ***for the purpose of modeling.***				
M3.N.Q.A.1d Choose an appropriate level of accuracy when reporting quantities.				
M3.A.SSE.A.1 ***Interpret expressions that represent a quantity*** in terms of its context.★				
M3.A.SSE.A.1a Interpret parts of an expression, such as terms, factors, and coefficients.				
M3.A.SSE.A.1b Interpret complicated expressions by viewing one or more of their parts as a single entity.				
M3.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).***				
M3.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.				
M3.A.CED.A.1 ***Create equations and inequalities in one variable*** and use them to solve problems in a real-world context.★				
M3.A.CED.A.2 ***Create equations and inequalities in two variables to represent relationships between quantities*** and use them to solve problems in a real-world context.				

Graph equations with two variables on coordinate axes with labels and scales, and ***use the graphs to make predictions.*** ★				
M3.A.CED.A.3 Rearrange formulas to isolate a quantity of interest ***using algebraic reasoning***. ★				
M3.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.				
M3.A.REI.A.2 Solve radical equations in one variable and ***identify extraneous solutions when they exist.***				
M3.F.IF.A.1 Use function notation.★				
M3.F.IF.A.1b ***Interpret statements that use function notation*** in terms of a context.				
M3.F.IF.A.2 Understand geometric formulas as functions.★				
M3.F.IF.B.3 ***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. ★				
M3.F.IF.B.4 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***. ★				
M3.F.IF.C.6 Compare properties of functions represented algebraically, graphically, numerically in tables, or by verbal descriptions. ★				
M3.F.IF.C.6a Compare properties of two different functions. Functions may be of different types and/or represented in different ways.★				
M3.F.IF.C.6b Compare properties of the same function on two different intervals or represented in two different ways.★				
M3.F.BF.A.2 ***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 graphs.				
M3.F.BF.A.3a Determine whether a function is one-to-one.				
M3.F.BF.A.3c Given an invertible function on an appropriate domain, identify the domain of the inverse function.				

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M3.F.LE.A.1 Know that a quantity increasing exponentially eventually exceeds a quantity increasing linearly, quadratically, or cubically. ★				
M3.F.LE.A.2 Know the relationship between exponential functions and logarithmic functions. ★				
M3.F.LE.A.2a Solve exponential equations ***using a variety of strategies***, including logarithms.				
M3.F.LE.A.2b Understand that a logarithm is the solution to $ab^{ct} = d$, where *a, b, c,* and *d* are numbers.				
M3.G.C.A.1 ***Use proportional relationships between the area of a circle and the area of a sector within the circle*** to solve problems and represent solutions in a real-world context.★				
M3.G.SRT.A.1 Use side ratios in right triangles to define trigonometric ratios.				
M3.G.SRT.A.1a Understand that by similarity, side ratios in right triangles are properties of the angles in the triangle, leading to definitions of trigonometric ratios for acute angles.				
M3.G.SRT.A.1b ***Explain*** and use ***the relationship between the sine and cosine of complementary angles.***				
M3.G.SRT.A.2a ***Know*** and use ***the Pythagorean Theorem and trigonometric ratios (sine, cosine, tangent, and their inverses)*** to solve right triangles in a real-world context.★				
M3.G.SRT.A.2b ***Know*** and use ***relationships within special right triangles*** to solve problems in a real-world context.★				
M3.G.SRT.A.2c ***Use the Law of Sines and Law of Cosines*** *to* solve non-right triangles in a real-world context.★				
M3.G.GMD.A.1 Understand and explain the formulas for the volume and surface area of a cylinder, cone, prism, and pyramid.				
M3.G.MG.A.2 ***Use geometric shapes, their measures, and their properties to model objects*** found in a real-world context ***for the purpose of approximating solutions to problems.★***				
M3.S.ID.A.2 Use statistics appropriate to the shape of the data distribution to compare center (mean, median, and/or mode) and spread (range, interquartile range, and standard deviation) of two or more different data sets.★				
M3.S.ID.A.3 Interpret differences in shape, center, and spread in the context of the data sets, accounting for possible effects of extreme data points.★				

M3.S.ID.A.4 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.★				
M3.S.ID.A.5 Compute, ***interpret, and compare z-scores for normally distributed data*** in a real-world context.★				
M3.S.ID.B.6 ***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 solve problems in the context of the data.★				
M3.S.IC.A.1 Recognize the purposes of and differences among sample surveys, experiments, and observational studies.★				
M3.S.IC.A.2 Identify potential sources of bias in statistical studies.★				
M3.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. ★				
M3.S.CP.A.1 Use set notation to represent contextual situations. ★				
M3.S.CP.A.1a Describe events as subsets of a sample space (the set of outcomes) using characteristics (or categories) of the outcomes, or as unions, intersections, or complements of other events ("or", "and", "not").				
M3.S.CP.A.2 Recognize and explain the concepts of conditional probability and independence in everyday language and everyday situations. Categorize events as independent or dependent. ★				
M3.S.CP.B.4 Use the Law of Large Numbers to assess the validity of a statistical claim.★				
M3.S.CP.C.5 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.★				
M3.S.CP.C.6 Understand and apply the Addition Rule.★				
M3.S.CP.C.6a Explain the Addition Rule, P*(A or B) = P(A) + P(B) – P(A and B)* in terms of visual models (Venn diagrams, frequency tables, etc.).★				
M3.S.CP.C.6b ***Apply the Addition Rule*** to solve problems and ***interpret the answer*** in terms of the given context.★				

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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**
M3.N.Q.A.1b Use appropriate quantities in formulas, converting units as necessary.				
M3.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).***				
M3.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.***				
M3.A.CED.A.1 Create equations and inequalities in one variable and ***use them to solve problems*** in a real-world context.★				
M3.A.CED.A.2 Create equations and inequalities in two variables to represent relationships between quantities and ***use them to solve problems*** in a real-world context. **Graph equations with two variables on coordinate axes with labels and scales,** and use the graphs to make predictions.★				
M3.A.CED.A.3 ***Rearrange formulas to isolate a quantity of interest*** using algebraic reasoning.★				
M3.A.REI.A.2 ***Solve radical equations in one variable*** and identify extraneous solutions when they exist.				
M3.F.IF.A.1a Use function notation to evaluate functions for inputs in their domains, including functions of two variables.★				
M3.F.IF.B.3 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.*** ★				
M3.F.IF.B.4 ***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. ★				
M3.F.IF.C.5 Graph functions expressed algebraically and show key features of the graph by hand and using technology. ★				
M3.F.BF.A.1 Build a function that describes a relationship between two quantities.★				
M3.F.BF.A.1a Combine standard function types using composition.				
M3.F.BF.A.3 Find the inverse of a function.				

M3.F.BF.A.3b Find the inverse of a function on an appropriate domain.				
M3.F.LE.A.2a Solve exponential equations using a variety of strategies, including logarithms.				
M3.F.LE.A.2c Evaluate logarithms using technology.				
M3.G.C.A.1 ***Use proportional relationships between the area of a circle and the area of a sector within the circle to solve problems*** and represent solutions in a real-world context.★				
M3.G.SRT.A.1b Explain and ***use the relationship between the sine and cosine of complementary angles.***				
M3.G.SRT.A.2 Solve triangles.★				
M3.G.SRT.A.2a Know and ***use the Pythagorean Theorem and trigonometric ratios (sine, cosine, tangent, and their inverses) to solve right triangles*** in a real-world context.★				
M3.G.SRT.A.2b Know and ***use relationships within special right triangles to solve problems*** in a real-world context.★				
M3.G.SRT.A.2c ***Use the Law of Sines and Law of Cosines to solve non-right triangles*** in a real-world context.★				
M3.G.GMD.A.2 ***Use volume and surface area formulas for cylinders, cones, prisms, pyramids, and spheres to solve problems*** in a real-world context.★				
M3.S.ID.A.1 ***Use measures of center to solve*** real-world and mathematical ***problems***.★				
M3.S.ID.A.4 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.★				
M3.S.ID.A.5 ***Compute,*** interpret, and compare ***z-scores for normally distributed data*** in a real-world context.★				
M3.S.ID.B.6 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 solve problems*** in the context of the data.★				
M3.S.CP.A.1 Use set notation to represent contextual situations. ★				
M3.S.CP.A.1b Flexibly move between visual models (Venn diagrams, frequency tables, etc.) and set notation.				
M3.S.CP.B.3 Apply statistical counting techniques.★				
M3.S.CP.B.3a Use the Fundamental Counting Principle to compute probabilities of compound events and solve problems.★				

M3.S.CP.B.3b Use permutations and combinations to compute probabilities of compound events and solve problems.★				
M3.S.CP.C.5 ***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.★				
M3.S.CP.C.6b ***Apply the Addition Rule to solve problems*** and interpret the answer in terms of the given context.★				
M3.S.CP.D.7 Calculate probabilities using geometric figures.★				
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**
M3.N.Q.A.1 Use units as a way to ***understand real-world problems***.★				
M3.N.Q.A.1a Choose and interpret the scale and the origin in graphs and data displays.				
M3.N.Q.A.1b Use appropriate quantities in formulas, converting units as necessary.				
M3.N.Q.A.1c Define and justify appropriate quantities ***within a context for the purpose of modeling.***				
M3.N.Q.A.1d Choose an appropriate level of accuracy when reporting quantities.				
M3.A.SSE.A.1 Interpret expressions that represent a quantity ***in terms of its context.*** ★				
M3.A.SSE.A.1a Interpret parts of an expression, such as terms, factors, and coefficients.				
M3.A.SSE.A.1b Interpret complicated expressions by viewing one or more of their parts as a single entity.				
M3.A.CED.A.1 Create equations and inequalities in one variable and use them to solve problems ***in a real-world context.*** ★				
M3.A.CED.A.2 Create equations and inequalities in two variables to represent relationships between quantities and use them to solve problems ***in a real-world context***. Graph equations with two variables on coordinate axes with labels and scales, and use the graphs to make predictions.★				
M3.A.CED.A.3 Rearrange formulas to isolate a quantity of interest using algebraic reasoning.★				

M3.F.IF.A.1 Use function notation.★				
M3.F.IF.A.1a Use function notation to evaluate functions for inputs in their domains, including functions of two variables.★				
M3.F.IF.A.1b Interpret statements that use function notation ***in terms of a context.***				
M3.F.IF.A.2 Understand geometric formulas as functions.★				
M3.F.IF.B.3 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. ★				
M3.F.IF.B.4 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. ★				
M3.F.IF.C.6 Compare properties of functions represented algebraically, graphically, numerically in tables, or by verbal descriptions. ★				
M3.F.IF.C.6a Compare properties of two different functions. Functions may be of different types and/or represented in different ways.★				
M3.F.IF.C.6b Compare properties of the same function on two different intervals or represented in two different ways.★				
M3.F.LE.A.2 Know the relationship between exponential functions and logarithmic functions. ★				
M3.F.LE.A.2a Solve exponential equations using a variety of strategies, including logarithms.				
M3.F.LE.A.2b Understand that a logarithm is the solution to $abct = d$, where a, b, c, and d are numbers.				
M3.F.LE.A.2c Evaluate logarithms using technology.				
M3.G.C.A.1 Use proportional relationships between the area of a circle and the area of a sector within the circle to solve problems and ***represent solutions in a real-world context.*** ★				
M3.G.SRT.A.2 Solve triangles.★				
M3.G.SRT.A.2a Know and use the Pythagorean Theorem and trigonometric ratios (sine, cosine, tangent, and their inverses) to solve right triangles ***in a real-world context.*** ★				

M3.G.SRT.A.2b Know and use relationships within special right triangles to ***solve problems in a real-world context.*** ★				
M3.G.SRT.A.2c Use the Law of Sines and Law of Cosines to solve non-right triangles ***in a real-world context.*** ★				
M3.G.MG.A.1 Use geometric shapes, their measures, and their properties to model objects found in a ***real-world context*** for the purpose of approximating solutions to problems.★				
M3.G.GMD.A.2 Use volume and surface area formulas for cylinders, cones, prisms, pyramids, and spheres to ***solve problems in a real-world context.*** ★				
M3.S.ID.A.1 Use measures of center to ***solve real-world*** and mathematical ***problems***.★				
M3.S.ID.A.2 Use statistics appropriate to the shape of the data distribution to compare center (mean, median, and/or mode) and spread (range, interquartile range, and standard deviation) of two or more different data sets.★				
M3.S.ID.A.3 Interpret differences in shape, center, and spread in the context of the data sets, accounting for possible effects of extreme data points.★				
M3.S.ID.A.4 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.★				
M3.S.ID.A.5 Compute, interpret, and compare z-scores for normally distributed data ***in a real-world context.*** ★				
M3.S.ID.B.6 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 ***solve problems in the context of the data.*** ★				
M3.S.IC.A.1 Recognize the purposes of and differences among sample surveys, experiments, and observational studies.★				
M3.S.IC.A.2 Identify potential sources of bias in statistical studies.★				
M3.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. ★				
M3.S.CP.A.1 Use set notation to ***represent contextual situations***. ★				

M3.S.CP.A.2 Recognize and explain the concepts of conditional probability and independence in everyday language and everyday situations. Categorize events as independent or dependent. ★				
M3.S.CP.B.3 Apply statistical counting techniques.★				
M3.S.CP.B.4 Use the Law of Large Numbers to assess the validity of a statistical claim.★				
M3.S.CP.C.5 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.*** ★				
M3.S.CP.C.6 Understand and apply the Addition Rule.★				
M3.S.CP.C.6b Apply the Addition Rule to solve problems and interpret the answer ***in terms of the given context.*** ★				
M3.S.CP.D.7 Calculate probabilities using geometric figures.★				
			Total	