Integrated Math 2 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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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**
M2.N.RN.A.1 Extend the properties of integer exponents to rational exponents.★				**1**
M2.N.RN.A.1a Develop the meaning of rational exponents by applying the properties of integer exponents.				**2**
M2.N.RN.A.1b Explain why $x^{1/n}$ can be written as the nth root of x				**3**
M2.N.Q.A.1 Use units as a way to understand real-world problems.★				**4**
M2.N.Q.A.1a Choose and interpret the scale and the origin in graphs and data displays.				**5**
M2.N.Q.A.1b Choose and interpret the scale and the origin in graphs and data displays.				**6**
M2.N.Q.A.1c Define and justify appropriate quantities within a context for the purpose of modeling.				**7**
M2.N.Q.A.1d Choose an appropriate level of accuracy when reporting quantities.				**8**
M2.A.SSE.A.1 Interpret expressions that represent a quantity in terms of its context.★				**9**
M2.A.SSE.A.1a Interpret parts of an expression, such as terms, factors, and coefficients.				**10**
M2.A.SSE.A.1b Interpret complicated expressions by viewing one or more of their parts as a single entity.				**11**

M2.A.APR.A.1 Add, subtract, and multiply polynomials. ***Use these operations to demonstrate that polynomials form a closed system that adhere to the same properties of operations as the integers.***				**12**
M2.A.APR.B.2 ***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).***				**13**
M2.A.CED.A.1 ***Create equations and inequalities in one variable and use them to solve problems*** in a real-world context.★				**14**
M2.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.★				**15**
M2.A.CED.A.3 Rearrange formulas to isolate a quantity of interest using algebraic reasoning.★				**16**
M2.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.				**17**
M2.A.REI.B.2a Solve quadratic equations by inspection (e.g., for $x^2 = 49$), taking square roots, knowing and applying the quadratic formula, and factoring, as appropriate to the initial form of the equation. ***Recognize when a quadratic equation has non-real solutions.***				**18**
M2.A.REI.B.3 Solve radical equations in one variable and ***identify extraneous solutions when they exist.***				**19**
M2.A.REI.D.5 ***Explain why the x-coordinates of the points where the graphs of the equations y = f(x) and y = g(x) intersect are the solutions of the equation f(x) = g(x).*** Find approximate solutions by graphing the functions or making a table of values, using technology when appropriate.				**20**
M2.F.IF.A.1b ***Interpret statements that use function notation*** in terms of a context.				**21**
M2.F.IF.A.2 Understand geometric formulas as functions. ★				**22**
M2.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.★				**23**
M2.F.IF.B.4 ***Relate the domain of a function to its*** graph and, where applicable, to the context of the function it models.★				**24**

M2.F.IF.B.5 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***.★				**25**
M2.F.IF.C.6 Graph functions expressed algebraically and ***show key features of the graph by hand and using technology. ★***				**26**
M2.F.IF.C.7 Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function.★				**27**
M2.F.IF.C.7a ***Rewrite quadratic functions to show zeros, extreme values, and symmetry of the graph, and interpret these*** in terms of a real-world context.				**28**
M2.F.IF.C.7b ***Know*** and use ***the properties of exponents to interpret expressions for exponential functions*** in terms of a real-world context.				**29**
M2.F.IF.C.8 **Compare** properties of functions represented algebraically, graphically, numerically in tables, or by verbal descriptions.★				**30**
M2.F.IF.C.8a Compare properties of two different functions. Functions may be of different types and/or represented in different ways.				**31**
M2.F.IF.C.8b Compare properties of the same function on two different intervals or represented in two different ways.				**32**
M2.F.BF.A.1 Build a function that describes a relationship between two quantities.★				**33**
M2.F.BF.B.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.				**34**
M2.G.CO.A.1 Describe transformations as functions that take points in the plane (pre-image) as inputs and give other points (image) as outputs. Compare transformations that preserve distance and angle measure to those that do not, by hand for basic transformations and using technology for more complex cases.				**35**
M2.G.CO.A.2 Given a rectangle, parallelogram, trapezoid, or regular polygon, determine the transformations that carry the shape onto itself and describe them in terms of the symmetry of the figure.				**36**
M2.G.CO.A.3 Develop definitions of rotations, reflections, and translations in terms of angles, circles, perpendicular lines, parallel lines, and line segments.				**37**
M2.G.CO.A.4 Given a geometric figure, draw the image of the figure after a sequence of one or more rigid motions, by hand and using technology. ***Identify a sequence of rigid motions that will carry a given figure onto another.***				**38**

M2.G.CO.B.5 Given two figures, use the definition of congruence in terms of rigid motions to determine informally if they are congruent.				**39**
M2.G.CO.B.6 Use the definition of congruence in terms of rigid motions to show that two triangles are congruent if and only if corresponding pairs of sides and corresponding pairs of angles are congruent.				**40**
M2.G.CO.B.7 Explain how the criteria for triangle congruence (ASA, SAS, AAS, SSS, and HL) follow from the definition of congruence in terms of rigid motions.				**41**
M2.G.CO.C.8 ***Use definitions and theorems about triangles*** to solve problems and to ***justify relationships in geometric figures.***				**42**
M2.G.CO.C.9 ***Use definitions and theorems about parallelograms*** to solve problems and to ***justify relationships in geometric figures.***				**43**
M2.G.SRT.A.1 ***Use properties of dilations given by a center and a scale factor*** to solve problems and to ***justify relationships in geometric figures***.				**44**
M2.G.SRT.A.2 Define similarity in terms of transformations. Use transformations to determine whether two figures are similar.				**45**
M2.G.SRT.B.3 ***Use congruence and similarity criteria for triangles*** to solve problems and ***to justify relationships in geometric figures.***				**46**
M2.S.ID.A.1 ***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.★				**47**
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**
M2.N.RN.A.1c Rewrite expressions involving radicals and rational exponents using the properties of exponents.				**1**
M2.A.APR.A.1 ***Add, subtract, and multiply polynomials.*** Use these operations to demonstrate that polynomials form a closed system that adhere to the same properties of operations as the integers.				**2**
M2.A.APR.B.2 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).***				**3**
M2.A.CED.A.1 Create equations and inequalities in one variable and ***use them to solve problems*** in a real-world context.★				**4**
M2.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***				**5**

equations with two variables on coordinate axes with labels and scales, and use the graphs to make predictions.★				
M2.A.REI.B.2 Solve quadratic equations and inequalities in one variable.★				**7**
M2.A.REI.B.2a ***Solve quadratic equations by inspection (e.g., for $x^2 = 49$), taking square roots, knowing and applying the quadratic formula, and factoring, as appropriate to the initial form of the equation.*** Recognize when a quadratic equation has non-real solutions.				**8**
M2.A.REI.B.2b Solve quadratic inequalities using the graph of the related quadratic equation.				**9**
M2.A.REI.B.3 ***Solve radical equations in one variable*** and identify extraneous solutions when they exist.				**10**
M2.A.REI.C.4 Solve a system consisting of a linear equation and a quadratic equation in two variables algebraically, graphically, and using technology.★				**11**
M2.A.REI.D.5 Explain why the x-coordinates of the points where the graphs of the equations y = f(x) and y = g(x) intersect are the solutions of the equation f(x) = g(x). ***Find approximate solutions by graphing the functions or making a table of values, using technology when appropriate.***				**12**
M2.F.IF.A.1 Use function notation.★				**13**
M2.F.IF.A.1a Use function notation to evaluate functions for inputs in their domains, including functions of two variables.				**14**
M2.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.★***				**15**
M2.F.IF.B.5 ***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.★				**16**
M2.F.IF.C.6 ***Graph functions expressed algebraically*** and show key features of the graph ***by hand and using technology.*** ★				**17**
M2.F.IF.C.7 Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function.★				**18**
M2.F.IF.C.7a ***Rewrite quadratic functions*** to show zeros, extreme values, and symmetry of the graph, and interpret these in terms of a real-world context.				**19**
M2.F.BF.A.1a Combine standard function types using arithmetic operations.				**20**

M2.F.BF.B.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.***				**21**
M2.G.CO.A.4 ***Given a geometric figure, draw the image of the figure after a sequence of one or more rigid motions, by hand and using technology***. Identify a sequence of rigid motions that will carry a given figure onto another.				**22**
M2.G.CO.C.8 ***Use definitions and theorems about triangles to solve problems*** and to justify relationships in geometric figures.				**23**
M2.G.CO.C.9 Use definitions and theorems about parallelograms to solve problems and to justify relationships in geometric figures.				**24**
M2.G.SRT.A.1 ***Use properties of dilations given by a center and a scale factor to solve problems*** and to justify relationships in geometric figures.				**25**
M2.G.SRT.B.3 ***Use congruence and similarity criteria for triangles to solve problems*** and to justify relationships in geometric figures.				**26**
M2.S.ID.A.1 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.★				**27**
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**
M2.N.Q.A.1 Use units as a way to understand real-world problems.★				**1**
M2.N.Q.A.1a Choose and interpret the scale and the origin in graphs and data displays.				**2**
M2.N.Q.A.1b Choose and interpret the scale and the origin in graphs and data displays.				**3**
M2.N.Q.A.1c Define and justify appropriate quantities within a context for the purpose of modeling.				**4**
M2.N.Q.A.1d Choose an appropriate level of accuracy when reporting quantities.				**5**
M2.A.SSE.A.1 Interpret expressions that represent a quantity ***in terms of its context.*** ★				**6**
M2.A.SSE.A.1a Interpret parts of an expression, such as terms, factors, and coefficients.				**7**
M2.A.SSE.A.1b Interpret complicated expressions by viewing one or more of their parts as a single entity.				**8**

M2.A.CED.A.1 Create equations and inequalities in one variable and use them to solve problems ***in a real-world context.*** ★				**9**
M2.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.★				**10**
M2.A.CED.A.3 Rearrange formulas to isolate a quantity of interest using algebraic reasoning.★				**11**
M2.A.REI.B.2 Solve quadratic equations and inequalities in one variable.★				**12**
M2.A.REI.B.2a Solve quadratic equations by inspection (e.g., for $x^2 = 49$), taking square roots, knowing and applying the quadratic formula, and factoring, as appropriate to the initial form of the equation. Recognize when a quadratic equation has non-real solutions.				**13**
M2.A.REI.B.2b Solve quadratic inequalities using the graph of the related quadratic equation.				**14**
M2.A.REI.C.4 Solve a system consisting of a linear equation and a quadratic equation in two variables algebraically, graphically, and using technology.★				**15**
M2.F.IF.A.1 Use function notation.★				**16**
M2.F.IF.A.1a Use function notation to evaluate functions for inputs in their domains, including functions of two variables.				**17**
M2.F.IF.A.1b Interpret statements that use function notation *in terms of a* ***context***.				**18**
M2.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.★				**19**
M2.F.IF.B.4 Relate the domain of a function to its graph and, where applicable, ***to the context of the function it models.*** ★				**20**
M2.F.IF.B.5 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.★				**21**
M2.F.IF.C.6 Graph functions expressed algebraically and show key features of the graph by hand and using technology. ★				**22**

M2.F.IF.C.7 Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function.★				**23**
M2.F.IF.C.7a Rewrite quadratic functions to show zeros, extreme values, and symmetry of the graph, and interpret these ***in terms of a real-world context***.				**24**
M2.F.IF.C.7b Know and use the properties of exponents to interpret expressions for exponential functions ***in terms of a real-world context.***				**25**
M2.F.IF.C.8 Compare properties of functions represented algebraically, graphically, numerically in tables, or by verbal descriptions.★				**26**
M2.F.IF.C.8a Compare properties of two different functions. Functions may be of different types and/or represented in different ways.				**27**
M2.F.IF.C.8b Compare properties of the same function on two different intervals or represented in two different ways.				**28**
M2.F.BF.A.1 Build a function that describes a relationship between two quantities.★				**29**
M2.F.BF.A.1a Combine standard function types using arithmetic operations.				**30**
M2.S.ID.A.1 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***.★				**31**
			Total	