Grade 4 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.

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., 4.OA.A.1 and 4.OA.A.2).				
Materials include problems and activities in every unit that connect two or more grade level domains. (e.g., 4.MD.A.2 and 4.OA.A.3)				
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
4.OA.A.1 Interpret a multiplication equation as a comparison. Represent verbal/written statements of multiplicative comparisons as multiplication equations.				

4.OA.A.3 Solve multi-step contextual problems (posed with whole numbers and having whole-number answers using the four operations) including problems in which remainders must be interpreted. ***Represent these problems using equations with a letter standing for the unknown quantity.***			
4.OA.B.4 Find factor pairs for whole numbers in the range 1–100 using models. ***Recognize that a whole number is a multiple of each of its factors. Determine whether a given whole number is prime or composite and whether the given number is a multiple of a given one-digit number.***			
4.OA.C.5 Generate a number or shape pattern that follows a given rule. ***Identify apparent features of the pattern that were not explicit in the rule itself.***			
4.NBT.A.1 Recognize that in a multi-digit whole number (less than or equal to 1,000,000), a digit in one place represents 10 times as much as it represents in the place to its right.			
4.NBT.A.2 Read and write multi-digit whole numbers (less than or equal to 1,000,000) using standard form, word form, and expanded. ***Compare two multi-digit numbers based on meanings of the digits in each place and use the symbols >, =, and < to show the relationship.***			
4.NBT.A.3 Round multi-digit whole numbers to any place (up to and including the hundred-thousand place) ***using understanding of place value and use a number line to explain how the number was rounded.***			
4.NBT.B.5 Multiply a whole number of up to four digits by a one-digit whole number and multiply two two-digit numbers, using strategies based on place value and the properties of operations. ***Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.***			
4.NBT.B.6 Find whole-number quotients and remainders with up to four-digit dividends and one-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. ***Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.***			
4.NF.A.1 *Explain why a fraction a/b is equivalent to a fraction (a x n)/(b x n) or (a ÷ n)/(b ÷ n) using visual fraction models, with attention to how the number and size of the parts differ even though the two fractions themselves are the same size.* Use this principle to recognize and generate equivalent fractions.			
4.NF.A.2 *Compare two fractions with different numerators and different denominators by creating common denominators or common numerators or by comparing to a benchmark such as 0 or 1/2 or 1. Recognize that comparisons are*			

valid only when the two fractions refer to the same whole. Use the symbols >, =, or < to show the relationship and justify the conclusions.				
4.NF.B.3 Understand a fraction *a/b* with *a* > 1 as a sum of fractions 1/*b*.				
4.NF.B.3a Understand addition and subtraction of fractions as joining and separating parts referring to the same whole.				
4.NF.B.3b Decompose a fraction into a sum of fractions with the same denominator in more than one recording each decomposition by an equation. ***Justify decompositions using a visual fraction model.***				
4.NF.B.4 Apply and extend understanding of multiplication as repeated addition to multiply a whole number by a fraction.				
4.NF.B.4a Understand a fraction *a/b* as a multiple of 1/*b*.				
4.NF.B.4b ***Understand a multiple of a/b as a multiple of 1/b*** and use this understanding to multiply a whole number by a fraction.				
4.NF.C.7 ***Compare two decimals to hundredths by reasoning about their size. Recognize that comparisons are valid only when the two decimals refer to the same whole.*** Use the symbols >, =, or < to show the relationship and justify the conclusions.				
4.MD.A.1 Measure and estimate to determine relative sizes of measurement units within a single system of measurement involving length, liquid volume, and mass/weight of objects using customary and metric units.				
4.MD.C.5 Recognize angles as geometric shapes that are formed wherever two rays share a common endpoint; and understand concepts of angle measurement.				
4.MD.C.5a Understand that an angle is measured with reference to a circle with its center at the common endpoint of the rays, by considering the fraction of the circular arc between the points where the two rays intersect the circle.				
4.MD.C.5b Understand that an angle that turns through 1/360 of a circle is called a "one-degree angle," and can be used to measure angles. An angle that turns through *n* one-degree angles is said to have an angle measure of *n* degrees and represents a fractional portion of the circle.				
4.MD.C.7 ***Recognize angle measure as additive. When an angle is decomposed into non-overlapping parts, the angle measure of the whole is the sum of the angle measures of the parts.*** Solve addition and subtraction problems to find unknown angles on a diagram in real-world and mathematical problems.				
4.G.A.3 ***Recognize*** and draw ***lines of symmetry for two-dimensional figures.***				

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
4.OA.B.4 *Find factor pairs for whole numbers in the range 1–100 using models.* Recognize that a whole number is a multiple of each of its factors. *Determine whether a given whole number is prime or composite and whether the given number is a multiple of a given one-digit number.*				
4.OA.C.5 *Generate a number or shape pattern that follows a given rule*. Identify apparent features of the pattern that were not explicit in the rule itself.				
4.NBT.A.2 *Read and write multi-digit whole numbers (less than or equal to 1,000,000) using standard form, word form, and expanded.* Compare two multi-digit numbers based on meanings of the digits in each place and use the symbols >, =, and < to show the relationship.				
4.NBT.A.3 *Round multi-digit whole numbers to any place (up to and including the hundred-thousand place)* using understanding of place value and use a number line to explain how the number was rounded.				
4.NBT.B.4 Fluently add and subtract within 1,000,000 using efficient strategies and algorithms.				
4.NBT.B.5 *Multiply a whole number of up to four digits by a one-digit whole number and multiply two two-digit numbers, using strategies based on place value and the properties of operations.* Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.				
4.NBT.B.6 *Find whole-number quotients and remainders with up to four-digit dividends and one-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division.* Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.				
4.NF.A.1 Explain why a fraction a/b is equivalent to a fraction (a x n)/(b x n) or (a ÷ n)/(b ÷ n) using visual fraction models, with attention to how the number and size of the parts differ even though the two fractions themselves are the same size. *Use this principle to recognize and generate equivalent fractions.*				
4.NF.A.2 Compare two fractions with different numerators and different denominators by creating common denominators or common numerators or by comparing to a benchmark such as 0 or 1/2 or 1. *Recognize that comparisons are valid only when the two fractions refer to the same whole. Use the symbols >, =, or < to show the relationship and justify the conclusions.*				

4.NF.B.3b *Decompose a fraction into a sum of fractions with the same denominator in more than one way (e.g., 3/8 = 1/8 + 1/8 + 1/8; 3/8 = 1/8 + 2/8; 2 1/8 = 1 + 1 + 1/8 = 8/8 + 8/8 + 1/8) recording each decomposition by an equation.* Justify decompositions using a visual fraction model.				
4.NF.B.3c Add and subtract mixed numbers with like denominators by replacing each mixed number with an equivalent fraction and/or by using properties of operations and the relationship between addition and subtraction.				
4.NF.B.4b Understand a multiple of a/b as a multiple of $1/b$ and *use this understanding to multiply a whole number by a fraction.*				
4.NF.C.5 Express a fraction with denominator 10 as an equivalent fraction with denominator 100, and use this technique to add two fractions with respective denominators 10 and 100.				
4.NF.C.6 Read and write decimal notation for fractions with denominators 10 or 100. Locate these decimals on a number line.				
4.NF.C.7 *Compare two decimals to hundredths* by reasoning about their size. Recognize that comparisons are valid only when the two decimals refer to the same whole. *Use the symbols >, =, or < to show the relationship and justify the conclusions.*				
4.MD.A.1 Measure and estimate to determine relative sizes of measurement units within a single system of measurement involving length, liquid volume, and mass/weight of objects using customary and metric units.				
4.MD.B.4 *Make a line plot to display a data set of measurements in fractions of the same unit (1/2 or 1/4 or 1/8).* Use operations on fractions for this grade to solve problems involving information presented in line plots.				
4.MD.C.6 Measure angles in whole-number degrees using a protractor. Sketch angles of specified measure.				
4.MD.C.7 Recognize angle measure as additive. When an angle is decomposed into non-overlapping parts, the angle measure of the whole is the sum of the angle measures of the parts. *Solve addition and subtraction problems to find unknown angles on a diagram in real-world and mathematical problems.*				
4.G.A.1 Draw points, lines, line segments, rays, angles (right, acute, obtuse, straight, reflex), and perpendicular and parallel lines. Identify these in two-dimensional figures.				
4.G.A.2 Classify two-dimensional figures based on the presence or absence of parallel or perpendicular lines or the presence or absence of angles of a specified				

	0	1	2	Evidence
size. Classify triangles based on the measure of the angles as right, acute, or obtuse.				
4.G.A.3 Recognize and ***draw lines of symmetry for two-dimensional 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**
4.OA.A.2 Multiply or divide to solve contextual problems involving multiplicative comparison, and distinguish multiplicative comparison from additive comparison.				
4.OA.A.3 ***Solve multi-step contextual problems (posed with whole numbers and having whole-number answers using the four operations) including problems in which remainders must be interpreted.*** Represent these problems using equations with a letter standing for the unknown quantity.				
4.NF.B.3d Solve contextual problems involving addition and subtraction of fractions referring to the same whole and having like denominators.				
4.NF.4c Solve contextual problems involving multiplication of a whole number by a fraction.				
4.MD.A.2 Solve one- or two-step real-world problems involving whole number measurements (including length, liquid volume, mass/weight, time, and money) with all four operations within a single system of measurement. (Contexts need not include conversions.)				
4.MD.A.3 Know and apply the area and perimeter formulas for rectangles in real-world and mathematical contexts.				
4.MD.B.4 Make a line plot to display a data set of measurements in fractions of the same unit (1/2 or 1/4 or 1/8). ***Use operations on fractions for this grade to solve problems involving information presented in line plots.***				
4.MD.C.7 Recognize angle measure as additive. When an angle is decomposed into non-overlapping parts, the angle measure of the whole is the sum of the angle measures of the parts*. **Solve addition and subtraction problems to find unknown angles on a diagram in real-world and mathematical problems.***				
			Total	