OREGON MATHEMATICS MATERIALS EVALUATION TOOL (Grades K–8)[1]

The Oregon Mathematics Materials Evaluation Tool (OMET) is a modified version of the instructional materials evaluation tool (IMET) that reflects the adopted criteria by the Oregon State Board in January 2014. The purpose of the IMET is to help educators evaluate the alignment of instructional materials to the Common Core State Standards (CCSS). The IMET is designed for evaluating comprehensive materials only (print and digital); it is not appropriate for evaluating supplemental materials. The IMET draws directly from the *K–8 Publishers' Criteria for the Common Core State Standards for Mathematics*, available at corestandards.org/resources and achievethecore.org/publisherscriteria.

OVERVIEW OF THE EVALUATION TOOL

SECTION I: Non-Negotiable Alignment Criteria
First, each set of materials will be evaluated against two non-negotiable criteria. Materials cannot be CCSS-aligned without fully meeting both non-negotiable criteria. All submissions must meet both non-negotiable criteria at each grade level before passing on to Section II and III.

SECTION II: Alignment Criteria and **SECTION III: Indicators of Quality**
Section II includes additional criteria for alignment to the content and practice standards. Section III includes indicators of quality. These sections are scored differently from the non-negotiable criteria; a higher score in Section II and III indicates that submissions are more closely aligned.

BEFORE YOU BEGIN

Evaluating instructional materials requires both mathematical and pedagogical expertise. It is a time-intensive process. This tool is intended for professionals who will use their expert judgment in a collaborative and collegial environment. Before engaging in the process, leaders should study the Publisher's Criteria and the OMET to develop a protocol for the review. For instance, it will be extremely helpful for reviewers to get a sense of each program overall before beginning the process.

Evaluators of materials must be well versed in the standards for all grade level(s) in which materials are being reviewed, including knowing the major work of each grade vs. the supporting and additional work and understanding how the content progresses across grades in the Standards. For the major work of each grade, see OMET Appendix A and/or achievethecore.org/focus.

To use the OMET, you will need to gather all of the following materials:

- The Common Core State Standards for Mathematics, available at corestandards.org/assets/CCSSI_Math%20Standards.pdf. The IMET must be used in conjunction with the Standards themselves, not as a replacement for them.
- *K–8 Publishers' Criteria for the Common Core State Standards for Mathematics* (Spring 2013), available at corestandards.org/resources and achievethecore.org/publisherscriteria. The Publishers' Criteria add important depth and nuance to the criteria in the IMET.
- Instructional materials being evaluated. Materials for all grades are necessary, as some indicators cannot be rated without having access to multiple grades.

[1] The IMET was developed by Student Achievement Partners in collaboration with state and district partners. For more information on SAP, see achievethecore.org/about-us

SECTION I: NON-NEGOTIABLE ALIGNMENT CRITERIA TO MATHEMATICAL CONTENT

Non-Negotiable 1, Focus in K–8: Materials do not assess certain key topics before the grade level indicated.

Directions

Part 1: Understand K-8 Focus

- Read criterion #2 from the *K–8 Publishers' Criteria for the Common Core State Standards for Mathematics* (Spring 2013, pp. 8 and 9).
- Review **Appendix A** to understand the focus clusters in grades K-8
- Review **Appendix B** to understand key concepts in the algebra progression in K-8
- Review **Appendix C** for common misplaced topics in statistics and geometry in K-8

Part 2: Review K-8 Materials

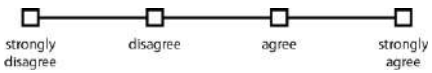
- Review all chapter tests, unit tests, and other such assessment components in the materials, including any associated rubrics.
- Complete the metrics below.

Evaluator: _____ Program:_____ Publisher:_____ Year:_____ Grade(s):_____

SECTION I: NON-NEGOTIABLE ALIGNMENT CRITERIA TO MATHEMATICAL CONTENT

METRICS, Non-Negotiable #1: FOCUS

Rate METRIC 1 as Strongly Agree, Agree, Disagree, or Strongly Disagree based on the questions below.

	Rating for METRIC 1
1. Addresses all grade-level CCSS Mathematics standards by including a clear and explicit purpose for instruction and prioritizing critical concepts for each grade level.	The materials are designed to focus student learning on the major work of each grade 

	Evidence
In each grade K–8, students and teachers using the materials as designed devote the large majority of time to the **major work** of the grade.[2] • Materials give all students extensive work with grade-level problems. • Review of material from previous grades is clearly identified as such to the teacher, and teachers and students can see what their specific responsibility is for the current year.	
Supporting content enhances focus and coherence simultaneously by engaging students in the major work of the grade.[3]	
Materials are designed to limit the amount of content presented **outside of a given grade level**, either from earlier or later grades, to less than 10% of the content presented.	

[2] For the major work of each grade K–8, see IMET Appendix A and/or achievethecore.org/focus. For context, read criterion #1 in the *K–8 Publishers' Criteria for the Common Core State Standards for Mathematics* (Spring 2013). The materials should devote at least 65% and up to approximately 85% of class time to the major work of the grade with Grades K–2 nearer the upper end of that range, i.e., 85%. Note that computing numerical percentages is **not** the intent of this criterion.

[3] For the supporting work of each grade K–8, see IMET Appendix A and/or achievethecore.org/focus. For context, read criterion #3 in the *K–8 Publishers' Criteria for the Common Core State Standards for Mathematics* (Spring 2013).

Evaluator: _____ Program:_____ Publisher:_____ Year:_____ Grade(s):_____

SECTION I: NON-NEGOTIABLE ALIGNMENT CRITERIA TO MATHEMATICAL CONTENT

METRICS, Non-Negotiable #2: COHERENCE

Rate METRIC 2 as Strongly Agree, Agree, Disagree, or Strongly Disagree based on the questions below.

Rating for METRIC 2

2. Materials are consistent with the learning progressions in the Standards based on previous understandings.

	Evidence
Materials include learning objectives that are visibly shaped by CCSS cluster headings.	
Materials include problems and activities that serve to connect two or more clusters in a domain, or two or more domains in a grade, in cases where these connections are natural and important.	
Materials are consistent with the progressions in the Standards. • Materials base content progressions on the grade-by-grade progressions in the Standards. • Materials relate grade-level concepts explicitly to prior knowledge from earlier grades.	

Materials foster coherence through connections at a single grade, where appropriate and where required by the Standards.[4]

[4] For context, read criterion #6 in the *K–8 Publishers' Criteria for the Common Core State Standards for Mathematics* (Spring 2013).

Non-Negotiable 3, 4, & 5: Rigor and Balance: Each grade reflects the balances in the Standards and helps students to meet the Standards' rigorous expectations, by helping them develop conceptual understanding, procedural skill and fluency, and the ability mathematics.

Directions

- Read criterion #4 in the *K–8 Publishers' Criteria for the Common Core State Standards for Mathematics* (Spring 2013, pp. 10–12).

- Select one or more **major clusters** or standards from the grade being reviewed that relate to each aspect of rigor (conceptual understanding/procedural skill and fluency/application). **It is most helpful if the same clusters and standards are chosen for all of the programs being evaluated.** For guidance in the selection, note the following from the *K–8 Publishers' Criteria for the Common Core State Standards for Mathematics* (Spring 2013, p. 5):

  > The word "understand" is used in the Standards to set explicit expectations for conceptual understanding, the word "fluently" is used to set explicit expectations for fluency, and the phrase "real-world problems" and the star symbol (★) are used to set expectations and flag opportunities for applications and modeling.

- Identify lessons or units in the materials that address the selected clusters or standards. The materials' table of contents, scope and sequence, and/or alignment documents may be helpful in identifying lessons or units that address the selected clusters or standards. Note: multiple lessons throughout the entire grade level may need to be examined in order to see how a single cluster or standard is addressed.

- Complete the metrics on the following page.

Evaluator: _____ Program:_____ Publisher:_____ Year:_____ Grade(s):_____

SECTION I: NON-NEGOTIABLE ALIGNMENT CRITERIA TO MATHEMATICAL CONTENT

METRICS, Non-Negotiable #3: APPLICATION

Rate METRIC 3 as Strongly Agree, Agree, Disagree, or Strongly Disagree based on the questions below.

	Rating for METRIC 3
3. Provides opportunities for students to independently apply mathematical concepts in real-world situations.	The materials are designed so that teachers and students spend sufficient time working with engaging applications, without losing focus on the major work of each grade. 

	Evidence
Are there ample **single- and multi-step contextual problems** that develop the mathematics of the grade, afford opportunities for practice, and engage students in problem solving?	
Do application problems particularly stress **applying the major work of the grade**?	
Concrete and pictorial representations, such as manipulatives, referenced in the materials are faithful representations of the mathematical objects they represent and are connected to written methods.	
Does **modeling** build slowly across K–8, with applications that are relatively simple in earlier grades and when students are encountering new content? In grades 6–8, do the problems begin to provide opportunities for students to make their own assumptions or simplifications in order to model a situation mathematically?	

Evaluator: _____ Program:_____ Publisher:_____ Year:_____ Grade(s):_____

SECTION I: NON-NEGOTIABLE ALIGNMENT CRITERIA TO MATHEMATICAL CONTENT

METRICS, Non-Negotiable #4: CONCEPTUAL UNDERSTANDING

Rate METRIC 4 as Strongly Agree, Agree, Disagree, or Strongly Disagree based on the questions below.

4. Develops understanding through conceptual problems and questions, multiple representations and opportunities for students to write and speak mathematically.

	Evidence
Do the materials amply feature high-quality conceptual problems and questions, including: • brief conceptual problems • brief conceptual discussion questions, and • opportunities to identify correspondences across mathematical representations?	
Is conceptual understanding attended to thoroughly where the **Standards set explicit expectations for understanding or interpreting**? (Appendix D) Some important specific cases include: • Are the multi-digit addition and subtraction algorithms carefully explained, on the basis of place value and properties of operations, and without relying on mnemonics? • Are the multi-digit multiplication and division algorithms carefully explained, on the basis of place value and properties of operations, and without relying on mnemonics?	
Concrete and pictorial representations, such as manipulatives, referenced in the materials are faithful representations of the mathematical objects they represent and are connected to written methods.	

Rating for METRIC 4

The materials develop students' conceptual understanding of key mathematical concepts, especially where called for in specific content standards or cluster headings.

Evaluator: _____ Program:_____ Publisher:_____ Year:_____ Grade(s):_____

SECTION I: NON-NEGOTIABLE ALIGNMENT CRITERIA TO MATHEMATICAL CONTENT

METRICS, Non-Negotiable #5: PROCEDURAL SKILL AND FLUENCY

Rate METRIC 5 as Strongly Agree, Agree, Disagree, or Strongly Disagree based on the questions below.

	Rating for METRIC 5
5. Expects, supports and provides guidelines for procedural skill and fluency with core calculations and mathematical procedures (when called for in the standards for the grade) to be performed quickly and accurately	The materials are designed so that students attain the fluencies required by the Standards. 

	Evidence
Do the materials in grades K–6 provide repeated practice toward attainment of fluency standards (K.OA.A.5, 1.OA.C.6, 2.OA.B.2, 2.NBT.B.5, 3.OA.C.7, 3.NBT.A.2, 4.NBT.B.4, 5.NBT.B.5, 6.NS.B.2, and 6.NS.B.3)? (see also Appendix E)	
In grades K–6, is progress toward fluency interwoven with the student's developing conceptual understanding of the operations in question?	
Do the materials present cases in which opportunistic strategies are valuable, in addition to generic cases that require efficient and/or standard algorithms?[5]	

[5] For examples, read criterion #4b in the *K–8 Publishers' Criteria for the Common Core State Standards for Mathematics* (Spring 2013 p 11).

Evaluator: _____ Program:_____ Publisher:_____ Year:_____ Grade(s):_____

SECTION II: ALIGNMENT CRITERIA TO MATHEMATICAL PRACTICES

Only materials that meet both of the non-negotiable criteria in Section I may continue to the evaluation in Section II.

Rate each criterion according to whether it is met, partially met, or not met. Award points for each criterion as indicated. Note that in each of the two subsections II(A) and II(B), there are one or two indicators weighted more heavily, based on their importance.

The minimum passing score for each subsection is blank. Before evaluation, districts should review subsections II(A) and II(B) and decide the minimum passing score according to the needs of your district.

METRICS, Non-Negotiable #6: MATHEMATICAL PRACTICES

Rate METRIC 6 as Strongly Agree, Agree, Disagree, or Strongly Disagree based on the questions below.

	Rating for METRIC 6
6. The mathematical practices are explicit and central to the lessons, handled in a grade-appropriate way and well connected to the content being addressed.	Materials address the practice standards in such a way as to enrich the major work of the grade; practices strengthen the focus on major work instead of detracting from it. 

	Evidence
Over the course of any given year of instruction, each mathematical practice standard is meaningfully present in the form of activities or problems that stimulate students to develop the habits of mind described in the practice standards.[6]	
Alignments to practice standards are accurate. For example, a highly scaffolded problem is not tagged with MP.1; a problem that directs a student to use a calculator is not tagged with MP.5; a problem about merely extending a pattern is not tagged with MP.8.[7]	

[6] For context, read criterion #7 in the *K–8 Publishers' Criteria for the Common Core State Standards for Mathematics* (Spring 2013).
[7] For context, read criterion #9 in the *K–8 Publishers' Criteria for the Common Core State Standards for Mathematics* (Spring 2013).

Evaluator: _____ Program:_____ Publisher:_____ Year:_____ Grade(s):_____

SECTION II: ALIGNMENT CRITERIA

METRICS, Non-Negotiable #7: OVERARCHING HABITS OF MIND OF A PRODUCTIVE MATHEMATICAL THINKER

Rate METRIC 7 as Strongly Agree, Agree, Disagree, or Strongly Disagree based on the questions below.

	Rating for METRIC 7
7. Materials are designed build their perseverance in grade-level-appropriate ways by occasionally solving problems that require them to persevere to a solution beyond the point when students would likely give up.	Materials address **practice standards #1 & #6** in such a way as to strengthen the focus on major work across grade levels. 

	Evidence
Engages students in productive struggle through relevant, thought-provoking questions, problems and tasks that stimulate interest and elicit mathematical thinking. **(Make sense of problems and persevere in solving them - MP.1)**	
Uses and encourages precise and accurate mathematics, academic language, terminology and concrete or abstract representations. **(Attend to precision - MP.6)**	

Evaluator: _____ Program:_____ Publisher:_____ Year:_____ Grade(s):_____

SECTION II: ALIGNMENT CRITERIA

METRICS, Non-Negotiable #8: REASONING AND EXPLAINING

Rate METRIC 8 as Strongly Agree, Agree, Disagree, or Strongly Disagree based on the questions below.

	Rating for METRIC 8
8. Provides sufficient opportunities for students to reason mathematically and express reasoning through classroom discussion, written work and independent thinking.	Materials address **practice standards #2 & #3** in such a way as to strengthen the focus on major work across grade levels. 

	Evidence
Lesson structure frequently calls for students, in a grade-appropriate way, to find solutions, explain their reasoning, and ask and answer questions about their reasoning as it concerns problems, diagrams, mathematical models. **(Reason abstractly and quantitatively - MP.2)**	
Materials prompt students to construct viable arguments and critique the arguments of other concerning key grade-level mathematics that is detailed in the content standards. **(Construct viable arguments and critique the reasoning of others – MP.3)**	

Evaluator: _____ Program:_____ Publisher:_____ Year:_____ Grade(s):_____

SECTION II: ALIGNMENT CRITERIA

METRICS, Non-Negotiable #9: MODELING AND USING TOOLS

Rate METRIC 9 as Strongly Agree, Agree, Disagree, or Strongly Disagree based on the questions below.

	Rating for METRIC 9
9. Materials encourages the strategic use of concrete or abstract representations (e.g. pictures, symbols, expressions, equations, graphics, models, technology based tools) in the discipline.	Materials address **practice standards #4 & #5** in such a way as to strengthen the focus on major work across grade levels. 

	Evidence
Materials prompt students to interpret their results in context of the situation and reflect on whether the results make sense and possibly improve their solutions. **(Modeling with Mathematics –MP.4)**	
Materials include problems that allow students' to make strategic decisions about how to use tools, or about whether to use them at all. **(Use appropriate tools strategically - MP.5)**	

Evaluator: _____ Program:_____ Publisher:_____ Year:_____ Grade(s):_____

SECTION II: ALIGNMENT CRITERIA

METRICS, Non-Negotiable #10: SEEING STRUCTURE AND GENERALIZING

Rate METRIC 10 as Strongly Agree, Agree, Disagree, or Strongly Disagree based on the questions below.

	Rating for METRIC 10
10. Materials connect prior knowledge in order to retell and reflect on patterns and evaluate reasoning.	Materials address **practice standards #7 & #8** in such a way as to strengthen the focus on major work across grade levels. 

	Evidence
Materials include organizational themes emphasized in the standards such as properties of operations, place value decompositions of numbers, numerators and denominators of fractions, numerical and algebraic expressions, etc. **(Look for and make use of structure –MP.7)**	
Materials include content to assist the *development of student insight* into repeated reasoning beyond simply extending patterns and/or perform repeated calculations. **(Look for and express regularity in repeated reasoning - MP.8)**	

Evaluator: _____ Program:_____ Publisher:_____ Year:_____ Grade(s):_____

SECTION III: ADDITIONAL INDICATORS OF QUALITY (OPTIONAL)

Only materials that meet both non-negotiable criteria in Section I and meet or exceed the minimum scores in Sections II(A) and II(B) may continue to the evaluation in Section III.

Rate each indicator in Section III according to whether it is met, partially met, or not met. Award points for each indicator as shown.

The minimum passing score for Section III is blank. Before evaluation, districts should review Section III and decide the minimum passing score according to the needs of your district.

III (A) - INDICATORS OF QUALITY: INSTRUCTIONAL SUPPORTS	SCORE Does not meet	Partially meets/ Not sure	Meets	EVIDENCE
The teacher materials are responsive to varied teacher needs:				
11. Includes clear, sufficient and easy to use guidance to support teaching, learning of the targeted standards and vocabulary, including, when appropriate, the use of supported technology, web and media.	0	1	2	
12. Provides a discussion of the mathematics of the units and the mathematical point of each lesson as it relates to the organizing concepts of the unit.	0	1	2	
13. Recommend and facilitate a mix of instructional approaches, such as using multiple representations (e.g., including models, using a range of questions, checking for understanding, flexible grouping, pair-share, etc.).	0	1	2	
14. Gradually remove supports, requiring students to demonstrate their mathematical understanding independently.	0	1	2	
15. Teacher materials are organized and easy to use.	0	1	2	
The materials are responsive to varied student learning needs:				
16. Differentiation for ELD, SPED, students below or above and other special populations is evident. The language in which problems are posed is carefully considered.	0	1	2	
17. Uses technology and media to deepen learning.	0	1	2	
18. Cultivates student interest and engagement in math.	0	1	2	
19. Provides extensions and extra support for students above and below grade level.	0	1	2	
Total (18 points possible)				

Evaluator: _____ Program:_____ Publisher:_____ Year:_____ Grade(s):_____

SECTION IV: ADDITIOAL INDICATORS OF QUALITY (OPTIONAL)

Only materials that meet both non-negotiable criteria in Section I and meet or exceed the minimum scores in Sections II(A) and II(B) may continue to the evaluation in Section III.

Rate each indicator in Section III according to whether it is met, partially met, or not met. Award points for each indicator as shown.

The minimum passing score for Section III is blank. Before evaluation, districts should review Section III and decide the minimum passing score according to the needs of your district.

IV - INDICATORS OF QUALITY: ASSESSMENT	**SCORE** Does not meet	Partially meets/ Not sure	Meets	**EVIDENCE**
The instructional materials regularly assesses whether students are mastering standards-based content and skills:				
20. Demonstrate grade-level CCSS (content and Mathematical Practices) and are rigorous.	0	1	2	
21. Available in digital/non-digital formats and are accessible to all students.	0	1	2	
22. Includes rubrics and proficiency criteria.	0	1	2	
23. Uses varied modes which must include selected, constructed, extended response items, self-assessments and performances tasks to provide teachers with a range of formative and summative data to inform instruction.	0	1	2	
Total (8 points possible)				
Minimum passing score:[8] _____ *Continue to FINAL EVALUATION on page XX.*				

[8] To be determined by the district

Evaluator: _____ Program:_____ Publisher:_____ Year:_____
Grade(s):_____

FINAL EVALUATION		
In this section, list the results for Section I, Section II(A), Section II(B), and Section III to make a final decision for the materials under review.		
SECTION	**RESULT**	**MINIMUM REQUIRED TO PASS**
I—Non-Negotiable Alignment Criteria: Alignment to the CCSS Mathematical Content	**Score** (write N/A if either non-negotiable was not met):	**Must have at least _____ points.**[9]
I—Non-Negotiable Alignment Criteria: Alignment to the CCSS Mathematical Practices	**Score** (write N/A if either non-negotiable was not met):	**Must have at least _____ points.**[10]
III(A)— Indicators of Quality (Optional): Instructional Supports	**Score** (write N/A if either non-negotiable was not met):	**Must have at least _____ points.**[11]
III (B) – Indicators of Quality (Optional): Assessment	**Score** (write N/A if either non-negotiable was not met):	**Must have at least _____ points.**[12]
	DECISION:	**PURCHASE (Y/N)?**

[9] To be determined by the district
[10] To be determined by the district
[11] To be determined by the district
[12] To be determined by the district

APPENDIX A: FOCUS CLUSTERS, GRADES K-8

(See also achievethecore.org/focus)

Grade	High-Level Summary of Major Work in Grades K–8
K–2	Addition and subtraction - concepts, skills, and problem solving; and place value
3–5	Multiplication and division of whole numbers and fractions - concepts, skills, and problem solving
6	Ratios and proportional relationships; early expressions and equations
7	Ratios and proportional relationships; arithmetic of rational numbers
8	Linear algebra and linear functions

Appendix A: Focus in K–8 (continued)

Grade	Major Clusters[13]	Supporting or Additional Clusters
K	***K.CC.A** Know number names and the count sequence. ***K.CC.B** Count to tell the number of objects. ***K.CC.C** Compare numbers. ***K.OA.A** Understand addition as putting together and adding to, and understand subtraction as taking apart and taking from. ***K.NBT.A** Work with numbers 11–19 to gain foundations for place value.	**K.MD.A** Describe and compare measureable attributes. **K.MD.B** Classify objects and count the number of objects in categories. **K.G.A** Identify and describe shapes. **K.G.B** Analyze, compare, create, and compose shapes.
1	***1.OA.A** Represent and solve problems involving addition and subtraction. ***1.OA.B** Understand and apply properties of operations and the relationship between addition and subtraction. ***1.OA.C** Add and subtract within 20. ***1.OA.D** Work with addition and subtraction equations. ***1.NBT.A** Extending the counting sequence. ***1.NBT.B** Understand place value. ***1.NBT.C** Use place value understanding and properties of operations to add and subtract. ***1.MD.A** Measure lengths indirectly and by iterating length units.	**1.MD.B** Tell and write time. **1.MD.C** Represent and interpret data. **1.G.A** Reason with shapes and their attributes.
2	***2.OA.A** Represent and solve problems involving addition and subtraction. ***2.OA.B** Add and subtract within 20. ***2.NBT.A** Understand place value. ***2.NBT.B** Use place value understanding and properties of operations to add and subtract. ***2.MD.A** Measure and estimate lengths in standard units. ***2.MD.B** Relate addition and subtraction to length.	**2.OA.C** Work with equal groups of objects to gain foundations for multiplication. **2.MD.C** Work with time and money. **2.MD.D** Represent and interpret data. **2.G.A** Reason with shapes and their attributes.
3	***3.OA.A** Represent and solve problems involving multiplication and division. ***3.OA.B** Understand properties of multiplication and the relationship between multiplication and division. ***3.OA.C** Multiply and divide within 100. ***3.OA.D** Solve problems involving the four operations, and identify and explain patterns in arithmetic. ***3.NF.A** Develop understanding of fractions as numbers. ***3.MD.A** Solve problems involving measurement and estimation of intervals of time, liquid volumes, and masses of objects. ***3.MD.C** Geometric measurement: understand concepts of area and relate area to multiplication and to addition.	**3.NBT.A** Use place value understanding and properties of operations to perform multi-digit arithmetic. **3.MD.B** Represent and interpret data. **3.MD.D** Geometric measurement: recognize perimeter as an attribute of plane figures and distinguish between linear and area measures. **3.G.A** Reason with shapes and their attributes.
4	***4.OA.A** Use the four operations with whole numbers to solve problems. ***4.NBT.A** Generalize place value understanding for multi-digit whole numbers. ***4.NBT.B** Use place value understanding and properties of operations to perform multi-digit arithmetic. ***4.NF.A** Extend understanding of fraction equivalence and ordering. ***4.NF.B** Build fractions from unit fractions by applying and extending previous understandings of operations on whole numbers. ***4.NF.C** Understand decimal notation for fractions and compare decimal fractions.	**4.OA.B** Gain familiarity with factors and multiples. **4.OA.C** Generate and analyze patterns. **4.MD.A** Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit. **4.MD.B** Represent and interpret data. **4.MD.C** Geometric measurement: understand concepts of angle and measure angles **4.G.A** Draw and identify lines and angles, and classify shapes by properties of their lines and angles.

[13] * indicate standards that comprise the subset of the major work in grades K–8 is the progression that leads toward middle school algebra

Appendix A: Focus in K–8 (continued)

Grade	Major Clusters	Supporting or Additional Clusters
5	***5.NBT.A** Understand the place value system. ***5.NBT.B** Perform operations with multi-digit whole numbers and with decimals to hundredths. ***5.NF.A** Use equivalent fractions as a strategy to add and subtract fractions. ***5.NF.B** Apply and extend previous understandings of multiplication and division to multiply and divide fractions. ***5.MD.C** Geometric measurement: understand concepts of volume and relate volume to multiplication and to addition.	**5.OA.A** Write and interpret numerical expressions. **5.OA.B** Analyze patterns and relationships. **5.MD.A** Convert like measurement units within a given measurement system. **5.MD.B** Represent and interpret data. ***5.G.A** Graph points on the coordinate plane to solve real-world and mathematical problems. **5.G.B** Classify two-dimensional figures into categories based on their properties.
6	***6.RP.A** Understand ratio concepts and use ratio reasoning to solve problems. ***6.NS.A** Apply and extend previous understandings of multiplication and division to divide fractions by fractions. ***6.NS.C** Apply and extend previous understandings of numbers to the system of rational numbers. ***6.EE.A** Apply and extend previous understandings of arithmetic to algebraic expressions. ***6.EE.B** Reason about and solve one-variable equations and inequalities. ***6.EE.C** Represent and analyze quantitative relationships between dependent and independent variables.	**6.NS.B** Compute fluently with multi-digit numbers and find common factors and multiples. **6.G.A** Solve real-world and mathematical problems involving area, surface area, and volume. **6.SP.A** Develop understanding of statistical variability. **6.SP.B** Summarize and describe distributions.
7	***7.RP.A** Analyze proportional relationships and use them to solve real-world and mathematical problems. ***7.NS.A** Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers. ***7.EE.A** Use properties of operations to generate equivalent expressions. ***7.EE.B** Solve real-life and mathematical problems using numerical and algebraic expressions and equations.	**7.G.A** Draw, construct, and describe geometrical figures and describe the relationships between them. **7.G.B** Solve real-life and mathematical problems involving angle measure, area, surface area, and volume. **7.SP.A** Use random sampling to draw inferences about a population. **7.SP.B** Draw informal comparative inferences about two populations. **7.SP.C** Investigate chance processes and develop, use, and evaluate probability models.
8	***8.EE.A** Work with radicals and integer exponents. ***8.EE.B** Understand the connection between proportional relationships, lines, and linear equations. ***8.EE.C** Analyze and solve linear equations and pairs of simultaneous linear equations. ***8.F.A** Define, evaluate, and compare functions. ***8.F.B** Use functions to model relationships between quantities. **8.G.A** Understand congruence and similarity using physical models, transparencies, or geometry software. **8.G.B** Understand and apply the Pythagorean Theorem.	**8.NS.A** Know that there are numbers that are not rational, and approximate them by rational numbers. **8.G.C** Solve real-world and mathematical problems involving volume of cylinders, cones and spheres. **8.SP.A** Investigate patterns of association in bivariate data.

APPENDIX B: PROGRESS TO ALGEBRA GRADES K-8 (FOCUS)

Table 1. Progress to Algebra in Grades K–8

K	1	2	3	4	5	6	7	8
Know number names and the count sequence Count to tell the number of objects Compare numbers Understand addition as putting together and adding to, and understand subtraction as taking apart and taking from Work with numbers 11-19 to gain foundations for place value	Represent and solve problems involving addition and subtraction Understand and apply properties of operations and the relationship between addition and subtraction Add and subtract within 20 Work with addition and subtraction equations Extend the counting sequence Understand place value Use place value understanding and properties of operations to add and subtract Measure lengths indirectly and by iterating length units	Represent and solve problems involving addition and subtraction Add and subtract within 20 Understand place value Use place value understanding and properties of operations to add and subtract Measure and estimate lengths in standard units Relate addition and subtraction to length	Represent & solve problems involving multiplication and division Understand properties of multiplication and the relationship between multiplication and division Multiply & divide within 100 Solve problems involving the four operations, and identify & explain patterns in arithmetic Develop understanding of fractions as numbers Solve problems involving measurement and estimation of intervals of time, liquid volumes, & masses of objects Geometric measurement: understand concepts of area and relate area to multiplication and to addition	Use the four operations with whole numbers to solve problems Generalize place value understanding for multi-digit whole numbers Use place value understanding and properties of operations to perform multi-digit arithmetic Extend understanding of fraction equivalence and ordering Build fractions from unit fractions by applying and extending previous understandings of operations Understand decimal notation for fractions, and compare decimal fractions	Understand the place value system Perform operations with multi-digit whole numbers and decimals to hundredths Use equivalent fractions as a strategy to add and subtract fractions Apply and extend previous understandings of multiplication and division to multiply and divide fractions Geometric measurement: understand concepts of volume and relate volume to multiplication and to addition Graph points in the coordinate plane to solve real-world and mathematical problems*	Apply and extend previous understandings of multiplication and division to divide fractions by fractions Apply and extend previous understandings of numbers to the system of rational numbers Understand ratio concepts and use ratio reasoning to solve problems Apply and extend previous understandings of arithmetic to algebraic expressions Reason about and solve one-variable equations and inequalities Represent and analyze quantitative relationships between dependent and independent variables	Apply and extend previous understanding of operations with fractions to add, subtract, multiply, and divide rational numbers Analyze proportional relationship and use them to solve real-world and mathematical problems Use properties of operations to generate equivalent expressions Solve real-life and mathematical problems using numerical and algebraic expressions and equations	Work with radical and integer exponents Understand the connections between proportional relationships, lines, and linear equations** Analyze and solve linear equations and pairs of simultaneous linear equations Define, evaluate, and compare functions Use functions to model relationships between quantities

*Indicates a cluster that is well thought of as part of a student's progress to algebra, but that is currently not designated as Major by one or both of the assessment consortia in their draft materials. Apart from the asterisked exception, the clusters listed here are a subset of those designated as Major in both of the assessment consortia's draft documents. ** Depends on similarity ideas from geometry to show that slope can be defined and then used to show that a linear equation has a graph which is a straight line and conversely.

APPENDIX C: ADDITIONAL AREAS OF FOCUS, K-8

Additional areas of Focus in K–8: Materials do not assess certain key topics before the grade level indicated.

Directions

- Read criterion #2 from the *K–8 Publishers' Criteria for the Common Core State Standards for Mathematics* (Spring 2013, pp. 8 and 9).
- Review all chapter tests, unit tests, and other such assessment components in the materials, including any associated rubrics.
- Complete the metrics below.

METRICS, Additional areas of Focus K-8

Topic	Grade introduced in CCSSM	Topic is assessed only at, or after, the grade introduced in CCSS	Evidence
Probability, including chance, likely outcomes, probability models.	**7**	T F	
Statistical distributions, including center, variation, clumping, outliers, mean, median, mode, range, quartiles; and **statistical association or trends**, including two-way tables, bivariate measurement data, scatter plots, trend line, line of best fit, correlation.	**6**	T F	
Similarity, congruence, or geometric transformations.	**8**	T F	
Symmetry of shapes, including line/reflection symmetry, rotational symmetry.	**4**	T F	

Additional Notes

Have the materials met all four area of additional focus in K-8?	**Meet? (Y/N)**

APPENDIX D: CLUSTERS IDENTIFYING UNDERSTANDING, GRADES K-8

Grade	Clusters identifying understanding		Clusters identifying interpretation	
K	**K.OA.A**	Understand addition, and understand subtraction.		
1	**1.OA.B**	Understand and apply properties of operations and the relationship between addition and subtraction.	**1.MD.C**	Represent and interpret data.
	1.NBT.B	Understand place value.		
	1.NBT.C	Use place value understanding and properties of operations to add and subtract.		
2	**2.NBT.A**	Understand place value.	**2.MD.D**	Represent and interpret data.
	2.NBT.B	Use place value understanding and properties of operations to add and subtract.		
3	**3.OA.B**	Understand properties of multiplication and the relationship between multiplication and division.	**3.MD.B**	Represent and interpret data.
	3.NBT.A	Use place value understanding and properties of operations to perform multi-digit arithmetic.		
	3.MD.C	Understand concepts of area and relate area to multiplication and to addition.		
4	**4.NBT.A**	Generalize place value understanding for multi-digit whole numbers.	**4.MD.B**	Represent and interpret data.
	4.NBT.B	Use place value understanding and properties of operations to perform multi-digit arithmetic.		
	4.NF.A	Extend understanding of fraction equivalence and ordering.		
	4.NF.C	Understand decimal notation for fractions, and compare decimal fractions.		
	4.MD.C	Understand concepts of angle and measure angles.		
5	**5.NBT.A**	Understand the place value system.	**5.OA.A**	Write and interpret numerical expressions.
	5.NF.B	Apply and extend previous understandings of multiplication and division.	**5.MD.B**	Represent and interpret data**.**
	5.MD.C	Understand concepts of volume.		
6	**6.RP.A**	Understand ratio concepts and use ratio reasoning to solve problems.		
	6.NS.A	Apply and extend previous understandings of multiplication and division to divide fractions by fractions.		
	6.NS.C	Apply and extend previous understandings of numbers to the system of rational numbers.		
	6.EE.A	Apply and extend previous understandings of arithmetic to algebraic expressions.		
	6.SP.A	Develop understanding of statistical variability.		
7	**7.NS.A**	Apply and extend previous understandings of operations with fractions.		
8	**8.EE.B**	Understand the connections between proportional relationships, lines, and linear equations.		
	8.G.A	Understand congruence and similarity using physical models, transparencies, or geometry software.		
	8.G.B	Understand and apply the Pythagorean Theorem.		

APPENDIX E: REQUIRED FLUENCIES IN GRADES K-6

Grade	Standard	Required Fluency
K	K.OA.5	Add/subtract within 5
1	1.OA.6	Add/subtract within 10
2	2.OA.2 2.NBT.5	Single-digit sums and differences (sums by memory by end of grade) Add/subtract within 100
3	3.OA.7 3.NBT.2	Single-digit products and quotients (products by memory by end of grade) Add/subtract within 1000
4	4.NBT.4	Add/subtract within 1,000,000
5	5.NBT.5	Multi-digit multiplication
6	6.NS.2,3	Multi-digit division Multi-digit decimal operations