

Mathematics Curriculum Review:

Curriculum 2.0 – Middle School

Montgomery County Public Schools, Maryland

Prepared by:

Student Achievement Partners

Table of Contents

Introduction and Methodology.....	Page 1
Summary of Findings and Recommendations: Mathematics (Middle School).....	Page 4
Appendix.....	Page 9
- Grade-Level Evidence and Ratings, Mathematics <i>Investigations in Mathematics</i> Course	

Introduction and Methodology

To ensure that all students in Montgomery County Public Schools (MCPS) are able to meet the expectations of the Maryland College and Career Ready Standards (MCCRS), MCPS educators need access to high-quality standards-aligned instructional and assessment materials. This report presents the results of an alignment review of MCPS's Mathematics middle school curriculum, *Curriculum 2.0*. Because the Maryland College and Career Ready Standards incorporate the [Common Core State Standards](#) for Mathematics (CCSS-M), the review is based on the Instructional Materials Evaluation Tool (IMET), an authoritative rubric for aligning instructional materials with the requirements of the CCSS. In total, there are four IMET rubrics, each one specific to a subject area and grade band: ELA/Literacy grades K–2, ELA/Literacy grades 3–12, Mathematics grades K–8, and Mathematics high school. For the Mathematics middle school review, the Mathematics K-8 IMET served as the foundation for determining alignment. All references to standards in this report will be to the Maryland College and Career Ready Standards, which will be referred to throughout as “MCCRS” or simply “the standards”.

Description of the IMET:

The Mathematics IMET draws directly from the CCSS-M and the [Publishers' Criteria for Common Core State Standards in Mathematics](#). Because of this, the Mathematics IMET is aligned with MCPS's emphasis on the Standards for Mathematical Practice as the critical processes and proficiencies of the curriculum. For example, Alignment Criterion 2 states, “Materials must authentically connect content standards and practice standards,” and guides evaluators to assess whether tasks and assessments of student learning are designed to provide evidence of students' development toward meeting the Standards for Mathematical Practice. In addition, because standards are for all students, evaluating instructional materials requires careful attention be paid to ensure that special populations, including English Language Learners and those with different learning needs, have access to high-quality aligned materials. The IMET, therefore, includes specific guidance ensuring that evaluators assess the availability, alignment, and quality of embedded supports within the instructional materials for English Language Learners and other special populations.

The Mathematics K–8 IMET includes Non-Negotiable Alignment Criteria and Alignment Criteria. Together, the criteria cover critical features of aligned materials including: focus (and avoiding obstacles to focus); coherent progressions of topics; rigor and balance; the Standards for Mathematical Practice; and support for all learners. The *Grade-Level Evidence and Ratings* table (Appendix), which was used to capture detailed evidence of *Curriculum 2.0*, is based on the IMET and is organized as follows:

- Section 1: Focus and Coherence
- Section 2: Rigor and Balance
- Section 3: Standards for Mathematical Practice
- Section 4: Supporting All Students

Review Team:

This review was conducted by mathematics specialists at Student Achievement Partners (SAP). Student Achievement Partners is a nonprofit organization dedicated to helping teachers and school leaders implement high-quality, college- and career-ready standards, with a focus on instructional materials, instructional practice and assessment. Student Achievement Partners developed the IMET, working in concert with organizations and experts who likewise had originally participated in the development of the standards. The mathematics specialists who reviewed *Curriculum 2.0* are well versed in the Common Core State Standards, from the individual standards statements to the overall structure of the standards.

SAP's content specialists are experienced in the design and use of the IMET, and have extensive experience applying the criteria to evaluate instructional materials and training other organizations, state education agencies and local education agencies to use the tool.

Process and Methodology:

The methods for this review consisted of a close reading of existing MCPS curricular documents found on the MCPS Google Drive and an evaluation of them based on the criteria in the Mathematics K-8 IMET. This process was carried out in the following stages:

Project Set-Up and Planning: Once access to *Curriculum 2.0* was provided, the review team met with MCPS staff in the Office of Curriculum and Instructional Programs to understand the scope and background of *Curriculum 2.0* and to become familiar with the online platform. SAP collaborated with MCPS to create and refine a sampling plan that specified which documents from the curriculum the SAP team would review.

Phase 1: The phase 1 review of the written curriculum consisted of a detailed analysis of the middle school curriculum framing documents: the "Instructional Focus Documents", "Marking Period at a Glance", and a selection of formative assessments for all middle school courses (Math 6, Math 7, Math 8, Investigations in Mathematics (IM) and Algebra 1). These were analyzed for their implementation of the Mathematics Instructional Shifts: Focus, Coherence, and Rigor. Particular attention was paid to the coherence across the compacted Investigations in Mathematics and Algebra I pathway. This review was used to identify specific topics or weeks to look at more closely in Phase 2, and it also yielded information about how much time is spent on the Major Work of each grade.

Phase 2: The phase 2 review consisted of a detailed examination of the curricular materials from the Investigations in Mathematics (IM) course. This course was selected in conjunction with MCPS. Reviewing this course provides a perspective on the most common student course pathway and allows for the review of both 7th and 8th grade content within the context of a compacted course. The sampling plan focused on Unit 1 (Ratios and Proportional Relationships), Unit 2 (Rational Number Operations), and Unit 6 (Linear Equations) since these are all units that focus on Major Work of the grade. All Sample Learning Tasks (SLTs), including any linked resources, were reviewed, along with the formative assessments for each Topic in the Units.

To conduct the phase 2 review, the curricular materials were examined and evidence was collected corresponding to the criteria; see the *Grade-Level Evidence and Ratings* table (Appendix). The evidence gathered was used to determine the degree to which each individual metric was met.

Format of Results:

The determination of alignment of the Mathematics middle school curriculum, *Curriculum 2.0*, to the Shifts and high-level features of the Maryland College and Career Ready Standards is based on the number of points obtained for both Non-Negotiables and Alignment Criteria. Specifically, the following thresholds were used to determine overall alignment:

Alignment Determination	Component	Conditions	
		Required Non-Negotiable Alignment Criteria to Be Met	Minimum Required Points on Alignment Criteria
ALIGNED to the Shifts and high-level features of the Maryland College and Career Ready Standards when it meets all of the following conditions:	1. Focus and Coherence	NN 1A, NN 2A, NN 2B, NN 2C, NN 2D	---
	2. Rigor and Balance	---	5 out of 6
	3. Standards for Mathematical Practice	---	5 out of 6
	4. Supporting All Students	---	4 out of 6
APPROACHING ALIGNMENT to the Shifts and high-level features of the Maryland College and Career Ready Standards when it doesn't meet all of the conditions stated above for ALIGNED but meets all of the following conditions:	1. Focus and Coherence	NN 2A, NN 2B, NN 2C	
	2. Rigor and Balance	---	4 out of 6
	3. Standards for Mathematical Practice	---	4 out of 6
	4. Supporting All Students	---	3 out of 6
FAR FROM ALIGNED to the Shifts and high-level features of the Maryland College and Career Ready Standards when it does not meet the conditions for "Aligned" or "Approaching Alignment," as stated above.			

Summary of Findings and Recommendations: Mathematics (Middle School)

The MCPS Middle School Mathematics curriculum includes the courses Math 6, Math 7, Math 8, Investigations in Mathematics, and Algebra I. This review is based solely on curricular materials posted on the MCPS Google site as of this review, which includes “Instructional Focus Documents”, “Marking Period at a Glance”, “Sample Learning Tasks” and formative assessments, and any ancillary materials referenced.

Based on the materials reviewed, the curriculum is approaching alignment to the Shifts and high-level features of the Maryland College and Career Ready Standards: 5 of 5 Non-Negotiables were met, and it met the thresholds for approaching alignment in the Alignment Criteria. (A score breakdown is found in the Appendix).

The materials were clearly developed to align with the content expectations of the Maryland College and Career Ready Standards. With a few adjustments, the curriculum will be aligned with the Shifts and major features of the MCCRS.

Among the **strengths**:

- The Curriculum Guides and supporting documents represent a strong commitment and significant investment on the part of MCPS to provide a consistent curriculum for all middle school students and teachers.
- There is significant time in each grade devoted to the content that matters most to students’ future success in college and career (the Major Work), which often times included prioritizing Major Work content toward the beginning of the year.
- The materials are primarily focused on grade-level content; content from previous or future grades does not distract from the grade-level work.
- There is an appropriate balance, based on the expectations of the standards, among conceptual understanding, procedural skill and fluency, and application.
- Conceptual understanding is well-addressed, particularly where it is required by the standards.

In a few ways, the materials examined fall short of meeting the criteria. These **weaknesses** include:

- Grade 7 falls just short of the threshold for large majority of time on Major Work of the Grade.
- Opportunities for students to engage in the Standards for Mathematical Practice are diminished by overly scaffolded questioning techniques.
- Materials lack opportunities for students to engage in modeling at the appropriate level.
- Materials lack content-specific supports for a variety of learners.

Note: In reviewing the scope and sequence across the middle school courses, 8.EE.8, 8.F.2, and 8.F.3 were not included in either the IM course or Algebra I. This presents an issue of focus and coherence as students are missing Major Work of the grade if they take the compacted pathway.

The following **recommendations** are offered (and elaborated upon in the Detailed Findings below) as steps to bring the curricular materials into alignment with the Shifts and high-level features of the Maryland College and Career Ready Standards:

1. Reallocate time in Grade 7 so that more time will be spent on Major Work of the grade. While the other middle school courses meet the expectation for Focus on Major Work, the 7th grade course falls just short of the minimum expectation (approximately 65 percent of instructional days should be spent on Major Work of the grade in grade 7). Solutions could include extending the time spent on Units 1 and 2 and adding more resources into these units.
2. Revise the IM and Algebra I course materials to ensure that students learn all of the standards required in grade 8.
3. Enhance opportunities for teachers to develop and students to engage in the Standards for Mathematical Practice, particularly SMP.1. Teacher-facing materials should include instructional practices that help students develop and engage in the SMPs. This could include suggestions for pacing (e.g., increased work time for students on problems without teacher support) or more open-ended questions.
4. Include application problems that call for the level of modeling required for algebra-readiness. While students have the opportunity to encounter many application problems, they are not required to engage in multiple steps of the modeling process. More performance tasks would allow for this work.
5. Include recommendations for working with a variety of learners that are content-specific and embedded in the materials. While the curriculum clearly sends the message that all students should be engaging in grade- or course-level work, it would benefit from intentional supports for a variety of learners that are specific to the math content of the Topics and Lessons.

By making the changes listed above, the Middle School Math *Curriculum 2.0* materials would become aligned to the Shifts and major features of the standards, as defined by the IMET. In addition to the above recommendations, it is strongly recommended that MCPS engage with mathematicians to do an audit of all of the instructional materials for mathematical precision. Some inaccuracies were found in the materials reviewed. Given the investment of MCPS in the development of the materials, a review for mathematical accuracy is essential.

Detailed Findings and Recommendations

On the pages that follow, please find a narrative discussion of the findings and recommendations based on the review of the provided MCPS curricular materials for the Investigations in Mathematics course. The discussion is organized according to each of the sections of the review tool. Each section header appears in a box, followed by a summary of findings and corresponding recommendations. More detailed information is included in the *Grade-Level Evidence and Ratings* (Appendix).

Section 1: Focus and Coherence

High-Level Summary: Focus and Coherence

The materials generally align with the expectations for Focus and Coherence emphasized in the design of the standards. The majority of time is expected to be spent on the content that matters most to students' future success in college and career over the course of the middle school program. The Investigations in Mathematics course spends sufficient time on the Major Work of the grade. The content of the IM course builds from previous grade-level work and follows the progressions outlined in the Standards. However, the materials' focus and coherence can be strengthened by fully capitalizing on the use of Supporting Work to enhance the Major Work of the grade.

Findings:

- *Strength:* The progression of content is consistent with the progression of topics with the standards. Off-grade-level topics do not interfere with the work of the grade.
- *Strength:* Using the materials as designed, students and teachers will spend the majority of time on Major Work of the Grade over the course of the middle school curriculum.
- *Strength:* Supporting Work is connected to and used to enhance Major Work topics.
- *Strength:* Materials do not include full lessons related to review of previous grade-level content.

Section 2: Rigor and Balance

High-Level Summary: Rigor and Balance

Curriculum 2.0 generally aligns with the balance of conceptual understanding, procedural skill, and fluency and application. The materials are most aligned in addressing standards that target conceptual understanding but need more time on the development of procedural skill and fluency and on the application of mathematics to robust applications in order to fully meet the expectations of each aspect of rigor as called for in the MCCRS.

Findings:

- *Strength:* Materials generally attend to the aspect of Rigor called for in specific standards.
- *Strength:* Conceptual understanding is well attended to where it is required by the standards.
- *Strength:* Development of procedural skill is based on conceptual understanding.
- *Strength:* There are many opportunities for students to consider mathematics in real-world contexts.
- *Area for Improvement:* Procedural skill and fluency are not sufficiently attended to. For example, sometimes the transition from conceptual to procedural happens too rapidly, and

sometimes the materials do not fully build to the fluency and procedural skill expectation of the grade.

- *Area for Improvement:* Application problems do not reach the level of modeling required by the middle school grades.

Recommendations:

1. ***Ensure enough time is spent on the connection between conceptual understanding and procedural skill.*** For standards that require both conceptual and procedural skill in a single grade, build time and additional lesson content into the SLT sequence to allow a base of strong conceptual understanding, which builds to sufficient practice with procedural skill and fluency. This might also include providing pacing suggestions within the Topics and SLTs to indicate when teachers and students should be spending adequate time on activities or SLTs that interweave conceptual understanding and procedural skill.
2. ***Supplement the current materials with problems that allow students to engage more with the whole modeling cycle.*** Students need opportunities to engage with application problems that require them to make assumptions and/or simplifications in order to model a situation mathematically. This could include removing scaffolding from some of the more complex problems already included in the materials.

Section 3: Standards for Mathematical Practice

High-Level Summary: Standards for Mathematical Practice

The design of *Curriculum 2.0* takes into consideration the Standards for Mathematical Practice (SMPs) and provides problems and tasks that would allow students to engage with the SMPs in a way that enhances their understanding of the content. This includes opportunities for reasoning. However, the teacher-facing materials suggest a pathway for teachers that would limit students' opportunity to authentically engage in the full expectations of all eight SMPs.

Findings:

- *Strength:* Problems and activities in the materials provide opportunities for students to engage in the Standards for Mathematical Practice (SMPs).
- *Strength:* Tasks and assessments provide evidence of students' proficiency with the SMPs.
- *Area of Improvement:* The structure of questions in the lessons takes away opportunity for students to fully engage in the SMPs.
- *Area of Improvement:* Problems that lend themselves to engagement with particular SMPs are not called out in teacher-facing materials.

Recommendations:

1. ***The teacher-facing materials should reflect the intent of the Standards for Mathematical Practice.*** Directions to the teachers should be clearer in how specific problems and activities will allow students to engage in the Standards for Mathematical Practice. This could include less scaffolding and/or more explicit mentions of how instruction can support student development of specific MPs. This could also involve including pacing within the lesson to indicate how much time students should be given to engage in tasks.

Section 4: Supporting All Students

High-Level Summary: Supporting All Students

Curriculum 2.0 has instructional strategies and representations built into the lessons that will be supportive of a broad range of learners reaching the expectations of the standards. However, the materials are lacking consistent and content-specific supports to ensure that all students achieve the expectations of the standards.

Findings:

- *Strength:* A variety of instructional strategies and groupings are suggested throughout the materials.
- *Strength:* There is no indication in the materials that any subgroups should be doing work that is off grade-level.
- *Area for Improvement:* There is no clearly articulated system, protocol, or supports provided specifically for English Language Learners.
- *Area for Improvement:* There is no clearly articulated system, protocol, or supports provided specifically for students who are below or above grade-level.

Recommendations:

1. ***Integrate a systematic structure to provide the resources, time, and supports for students above and below grade-level and English Language Learners. This structure should provide teachers and students with content- and lesson-specific opportunities for strategic and appropriate support.*** Incorporating structures and supports into the instructional materials will ensure all students have access to grade-level mathematics.

Appendix: Grade-Level Evidence and Ratings

Grade-Level Evidence and Ratings (Investigations in Mathematics (IM) – Grade 7/8 Compacted)

Section	# of Non-Negotiables Met	Does This Section Meet All Non-Negotiables?	Alignment Criteria Points
1. Focus and Coherence	<u>5/5</u>	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	
2. Rigor and Balance			<u>4/6</u>
3. Standards for Mathematical Practice			<u>4/6</u>
4. Supporting All Students			<u>3/6</u>

1. Focus and Coherence

IMET Metric	Evidence	Score
<p>NN 1A: Materials reflect the basic architecture of the Standards by not assessing the topics listed below before the grade level indicated.</p> <ul style="list-style-type: none"> · Probability, including chance, likely outcomes, probability models. · 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. · Coordinate transformations or formal definition of congruence or similarity. · Symmetry of shapes, including line/reflection symmetry, rotational symmetry. 	<p>The assessments in the IM course do not assess any listed topics before they are required by the Standards.</p> <p>Note: In Unit 1, Topic 2, SLT 9, a definition of similarity is introduced (“two shapes that have congruent angles and corresponding parts that share a constant of proportionality”) in relation to work with 7.G.1. However, there are no questions on the Unit 1, Topic 2 Formative Assessment that evaluate student understanding of the definition of similarity. Therefore, this metric is met, as the topic of similarity is not assessed in a 7th grade unit.</p>	<input checked="" type="checkbox"/> Meets <input type="checkbox"/> Does Not Meet
<p>NN 2A: Students and teachers using the materials as designed devote the large majority of time to the Major Work of the grade.</p>	<p>Approximately 65% of instructional time in the IM course is spent on Major Work of grade 7 or 8. Units 1, 2, and 6 address only Major Work clusters. Additionally, Unit 5, Topic 1 and Unit 7, Topic 1 also focus on Major Work. Collectively, this content represents 70 Sample Learning Tasks out of a total of 106 in the course, which is 66%. The “Instructional Focus Documents” call for 108 out of 168 instructional days to be spent on this content, which is 64%.</p> <p>Sixty-five percent is at the lower end of the acceptable range for time spent on Major Work, but is still sufficient given the content of grades 7 and 8 and the fact that it is a compacted course, therefore this metric is met.</p>	<input checked="" type="checkbox"/> Meets <input type="checkbox"/> Does Not Meet

1. Focus and Coherence

IMET Metric	Evidence	Score
<p>NN 2B: Supporting Work enhances focus and coherence simultaneously by also engaging students in the Major Work of the grade.</p>	<p>Overall the materials make effective connections between Major and supporting work, for example:</p> <ul style="list-style-type: none"> - Unit 1: The work of scale drawings (7.G.A) is integrated into the work of ratio and proportion (7.RP.A), allowing students to apply understanding of ratios and proportions to the geometric context. - Unit 4: Statistics and Probability (7.SP.A and 7.SP.C) connects to work in 7.RP.A by having students use proportionality to understand sampling and probability. - Unit 5: The work of radicals and integer exponents (8.EE.A), is connected to the work of classifying rational and irrational numbers (8.NS.A) in Topic 2. <p>Because there are many supporting clusters, there are additional opportunities for supporting work to engage students in Major Work, for example:</p> <ul style="list-style-type: none"> - Unit 4: The work in the SP domain can be used to reinforce the work of the RP domain. - 8.G.C could more strongly support the work of 8.EE.A and 8.NS. 	<p><input checked="" type="checkbox"/> Meets <input type="checkbox"/> Does Not Meet</p>
<p>NN 2C: Materials follow the grade-by-grade progressions in the Standards. Content from previous or future grades does not unduly interfere with on-grade-level content.</p>	<p>Materials follow the grade-by-grade progressions in the standards; there was little content from previous grades present and no content from future grades. Review material was typically only present at the beginning of an SLT to prepare students for grade-level content. A few examples:</p> <ul style="list-style-type: none"> - Unit 1: SLT 1 directly builds upon grade 6; there is a teacher’s note in that lesson that states: “The terms used in this Sample Learning Task are a review of terms learned in C2.0 Mathematics 6, Marking Period 1, Topic 1. Refer to the Terminology Resource prior to teaching this SLT to become familiar with the lesson terminology.” This SLT moves from the work of grade 6 to grade 7 in the RP domain. The lessons progress by SLT 4 to develop an understanding of proportionality and then apply that concept in subsequent lessons in the topic. - Unit 2: SLT 1 is a direct connection to grade 6 work of locating rational numbers on a number line and considering absolute value. This content is 	<p><input checked="" type="checkbox"/> Meets <input type="checkbox"/> Does Not Meet</p>


1. Focus and Coherence

<u>IMET Metric</u>	<u>Evidence</u>	<u>Score</u>
	<p>leveraged to launch work on 7.NS.A.1</p> <ul style="list-style-type: none"> - Unit 2: Throughout this unit, students are given work that includes the entire rational number system. (See the second activity in SLT 1 “Unknown Rules Card Sort” where examples include negative fractions and decimals.) This aligns with the expectation that once operations with all rational numbers are introduced in grade 7, they should be present in work across domains going forward. - Unit 2: Topic 2 builds directly on students’ prior work with the EE domain in grade 6 and extends that work to complex expressions. On occasion, as visible at the end of SLT 16, notes are provided to indicate connection to work in prior grades. - Unit 6: The work of 8.EE.5 and 8.EE.6 in Topic 1 builds explicitly on grade 7 work with proportionality and scale drawings. - Unit 6: The work of 8.EE.7 in SLT 7 is explicitly tied to work in grade 7 with equivalent expressions. 	
NN 2D: Lessons that only include mathematics from previous grades are clearly identified as such to the teacher.	There were no lessons identified that only included mathematics from previous grade-levels. However, there was one SLT that mostly related to previous grade-level work. (Unit 1, SLT 13 was used to review working with percent as a part-whole relationship in support of students’ work with the 7.RP domain but was not tagged as grade 6 content.)	<input checked="" type="checkbox"/> Meets <input type="checkbox"/> Does Not Meet
Rating (Focus and Coherence):	<u>Non-Negotiables</u>	
	<i>Are All NNs Met?</i> <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	

2. Rigor and Balance

IMET Metric	<u>Guiding Questions</u>	<u>Evidence</u>	<u>Score</u>
<p>AC 1A: The materials support the development of students' conceptual understanding of key mathematical concepts, especially where called for in specific content standards or cluster headings.</p>	<ul style="list-style-type: none"> - Where the standards explicitly require students to understand concepts, do the assignments that students work on build that understanding, and do assessment tasks reveal whether students understand the mathematics in question? - Do the materials feature high-quality conceptual problems and conceptual discussion questions? - Do the materials feature opportunities to identify correspondences across mathematical representations? When manipulatives are used, are they faithful representations of the mathematical objects they represent? Are manipulatives connected to written methods? 	<p>Students are afforded multiple opportunities to engage in rich problems to develop conceptual understanding.</p> <ul style="list-style-type: none"> - Work with proportionality attends to the full conceptual understanding required by the standards. For example, Unit 1, SLT 6: Students are required to solve proportional relationship with unknowns in different positions. - Questions in the materials prompt students to generalize and think about the conceptual understanding required by the standards. For example, Unit 1, SLT 8 "What two points will always be on the graph of any proportional relationship?" - The number line is used as a tool to help students generalize ideas and strategies for the operations. In Unit 2, Topic 1, work with 7.NS.A.1 utilizes a number line model to help students connect work with addition and subtraction in earlier grades to operations with rational numbers. - In learning about equivalent expressions, students have the opportunity to connect mathematical scenarios to both visual models and algebraic expressions as visible in Unit 2, SLT 14, in the "Matching Activity: Modeling Expressions Placemat." This activity also connects back to work students did in the MD domain in grades 3 and 4 with perimeter and area. 	<ul style="list-style-type: none"> <input checked="" type="checkbox"/> 2 <input type="checkbox"/> 1 <input type="checkbox"/> 0

2. Rigor and Balance

IMET Metric 	<u>Guiding Questions</u>	<u>Evidence</u>	<u>Score</u>
<p>AC 1B: The materials are designed so that students attain the fluencies and procedural skills required by the Standards.</p>	<ul style="list-style-type: none"> - Do the materials in grades K-6 provide repeated practice toward attainment of fluency standards? Do assessment tasks reveal whether students have the fluencies the standards require? - Is progress toward fluency and procedural skill interwoven with students' developing conceptual understanding of the operations in question? 	<p>The design of the materials does not make it clear that students will attain the fluencies and procedural skills required by the standards. Sometimes, the learning jumps from conceptual to procedural skill too rapidly. Sometimes, particularly in the 8.EE work, the materials do not build to the fluency and procedural skill expectations of the standards. For example:</p> <ul style="list-style-type: none"> - Unit 2: Topic 1 provides a sequence of 13 lessons that start with conceptual understanding of working with rational numbers that builds on students' understanding of operations with whole numbers. By the end of the Topic, students are expected to demonstrate the procedural skills required by 7.NS.A as evidenced by the corresponding formative assessment, which contains a mix of conceptual and procedural items. The progression from conceptual to procedural sometimes occurs in the course of a single lesson (e.g., SLT 3 on subtracting rational numbers), which makes it unlikely that students will develop procedural skill grounded in conceptual understanding. - Unit 6: The majority of the lessons in Topic 2 require students to use Algebra Tiles. The focus of SLT 8 is almost entirely on the models, with the culminating question at the end of the lesson being "How do models help support your understanding of a linear equations and its transformations?" Since students have simplified and solved equations without Algebra Tiles in grade 7, the requirement for students to use them detracts from developing the procedural expectations of the 8.EE domain. 	<p><input type="checkbox"/> 2 <input checked="" type="checkbox"/> 1 <input type="checkbox"/> 0</p>


2. Rigor and Balance

<u>IMET Metric</u>	<u>Guiding Questions</u>	<u>Evidence</u>	<u>Score</u>
<p>AC 1C: The materials are designed so that teachers and students spend sufficient time working with applications, without losing focus on the Major Work of each grade.</p>	<ul style="list-style-type: none"> - Are there single- and multi-step contextual problems that develop the mathematics of the grade, afford opportunities for practice, and engage students in problem solving? Where the standards require students to solve multistep and real-world problems, do the assignments that students work on allow them to do that, and do assessment tasks reveal whether students can do that? - Do application problems particularly stress applying the Major Work of the grade? - 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? 	<p>Although the materials are generally designed to spend time on Application, there are not enough opportunities for Application work at the complexity level that is required by the 6-8 band.</p> <p>Time was spent on Application, where required by the standards. For example:</p> <ul style="list-style-type: none"> - Unit 1: Expectations of 7.RP.A. are attended to in this unit. For example, students apply their understanding of proportional relationships to a variety of contexts in the “Relationship Poster” activity in Unit 1, SLT 5 and “Proportions Four Square” in Unit 1, SLT 7. - Unit 2: Topic 1 allows students to work with rational number operations in context. <p>However, there was no evidence of students solving more complex modeling problems without scaffolding within the materials. When complex problems are presented, they are often presented with a series of questions that guide students to the solution pathway (for example, see “Amy and Penny” in Unit 1, SLT 13). Although several lessons are marked for engagement of SMP 4, no problems were found that require students to independently make assumptions or simplifications in order to solve the problem, which is expected of application work at the complexity level that is necessary to prepare students for the full modeling cycle they will encounter in high school courses.</p>	<p><input type="checkbox"/> 2</p> <p><input checked="" type="checkbox"/> 1</p> <p><input type="checkbox"/> 0</p>
<u>Rating (Rigor and Balance):</u>		Alignment Criteria	
		Section Points: <u>4/6</u>	

3. Standards for Mathematical Practice

IMET Metric	<u>Guiding Questions</u>	<u>Evidence</u>	<u>Score</u>
<p>AC 2A: Materials address the practice standards in such a way as to enrich the Major Work of the grade; practice standards strengthen the focus on Major Work instead of detracting from it, in both teacher and student materials.</p>		<p>Teacher and student materials unevenly address the Standards for Mathematical Practice (SMPs) in connection with the Major Work. While there are opportunities built into lessons for students to engage with the SMPs within the Major Work clusters and domains, the materials (e.g., the text of the SLT) often diminish opportunities for students to engage in the SMPs by providing suggestions for heavily scaffolding student work.</p> <p>There are instances where the intent of the SMPs attended to, for example:</p> <ul style="list-style-type: none"> - SMP 3 is developed with many prompts for students’ discussion throughout the lessons. In Unit 1, SLT 7, “Sentence Stems for Student Discourse” are provided and are specific to the mathematical content. - SMP 5 is addressed through the introduction of various tools and models throughout the lessons. In Unit 1, SLT 12, students complete an activity “Percents and Proportional Reasoning” that asks them to consider the benefits and limitations of different models for representing percents (tape diagram, double number line or equation). - SMP 5 is addressed in Unit 2, SLT 14, where Algebra Tiles are introduced, and within the same lesson students are presented with an expression with rational number coefficients and constants and discuss how the Algebra Tiles won’t be helpful in that situation. - SMP 7 is addressed in the approach to rational number operations in Unit 2, Topic 1. Specifically in SLTs 7–9, students are asked to look for patterns in multiplication and division in order to make 	<input type="checkbox"/> 2 <input checked="" type="checkbox"/> 1 <input type="checkbox"/> 0


3. Standards for Mathematical Practice

IMET Metric 	<u>Guiding Questions</u>	<u>Evidence</u>	<u>Score</u>
		<p>generalizations about those operations with rational numbers.</p> <p>However, there are some instances where the intent of the SMPs is diminished by heavy scaffolding. For example:</p> <ul style="list-style-type: none"> - Some SLTs include over-scaffolded, heavily guided experiences that remove the students' opportunity to engage in SMP 7. Specific instances include: Unit 1, SLTs 14, 15, 17; Unit 2, SLTs 3, 7, 15; and Unit 6, SLTs 2, 3, 8. - Unit 1: In SLT 14, students are guided through the process of determining percentages using questions that lead them to a way of computing the results without encouraging engagement in SMP2 or SMP3. Another example of this can be seen in SLT 15, where students are asked to identify keywords to determine processes for calculating markups and markdowns, without engaging in making sense of the problem as required by SMP1. - Unit 2: In SLT 14, teacher materials provide a series of questions to develop a representation using Algebra Tiles as well as a tape diagram to illustrate the scenarios in the "Simplifying Expressions." The sequencing and model responses to the questions do not signal to teachers that this activity is an opportunity for students to engage in SMP5. Similar experiences can be seen in SLT 15, in the guided discussion of "Factoring Expressions Models" Activity, as well as in SLT 16 in the "Equivalent Expressions" Activity. - Unit 6: In SLT 3, students are led to writing equations via questions without opportunity to independently engage in SMP 7. 	

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<p>AC 2B: Tasks and assessments of student learning are designed to provide evidence of students' proficiency in the Standards for Mathematical Practice.</p>		<p>There are opportunities for students to show evidence of proficiency with the SMPs — in both tasks and formative assessments. Some examples include:</p> <ul style="list-style-type: none"> - Unit 1: In the Topic 1 Formative Assessment, students engage in SMP 2 by considering what the point (1,r) represents in the given context and solving for r. - Unit 1: In SLT 11, students engage in SMP 3 by analyzing the strategies others are using to calculate measurements using scale factor. - Unit 2: In SLT 19, students engage in SMP 8 as they are asked to consider the difference in solving inequalities with negative coefficients, compared to inequalities with positive coefficients. - Unit 6: In the Topic 1 Assessment, students engage in SMP 2 by considering the meaning of the slope and y-intercept in the context of the problem. - Unit 6: In the Topic 1 Assessment, students engage in SMP 7 by examining the graph of a linear function and identifying the correct equation. 	<input checked="" type="checkbox"/> 2 <input type="checkbox"/> 1 <input type="checkbox"/> 0
<p>AC 2C: Materials support the Standards' emphasis on mathematical reasoning.</p>	<ul style="list-style-type: none"> - Do the materials support students in constructing viable arguments and critiquing the arguments of others concerning grade-level mathematics that is detailed in the content standards? - Do the materials support students in producing not only answers and solutions but also, in a grade-appropriate way, arguments, explanations, diagrams, 	<p>There are opportunities for students to develop and communicate mathematical reasoning through the tasks and assignments in the materials. However, many of these opportunities are undercut by heavy scaffolding and/or lack of time for students to engage in the mathematics within the teacher-facing materials.</p> <p>For example:</p> <ul style="list-style-type: none"> - Unit 1: In SLT 6, students are given an opportunity to define unit rate prior to looking at the formal definition. - Unit 1: In SLT 15, students are asked to construct viable arguments centered on scenarios involving various discounts. 	<input type="checkbox"/> 2 <input checked="" type="checkbox"/> 1 <input type="checkbox"/> 0

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	<p>mathematical models, etc., especially in the Major Work of the grade?</p> <ul style="list-style-type: none"> - Do materials explicitly attend to the specialized language of mathematics? Is the language of argument, problem solving, and mathematical explanations taught rather than assumed? 	<ul style="list-style-type: none"> - Unit 2: In SLT 2, students are asked to justify their reasoning as they make generalizations about adding rational numbers. - Unit 2: In SLT 16, students need to identify equivalent expressions and justify the equivalence of the expressions. - Unit 6: In SLT 7, students work to justify their responses and use mathematical language to describe the difference between expressions and equations. - Unit 6: In SLT 10, students sort given equations into categories based on the number of solutions by applying their understanding of the structure of the equations or by solving them. 	
<u>Rating (Standards for Mathematical Practice):</u>		Alignment Criteria	
		<i>Section Points: <u>4/6</u></i>	

4. Supporting All Students

IMET Metric	Evidence	Score
<p>AC 3A: Support for English Language Learners and other special populations is thoughtful and helps those students meet the same Standards as all other students. The language in which problems are posed is carefully considered.</p>	<p>No specific support was offered throughout the materials for English Language Learners or other special populations. A few examples of supports were found, but there was no consistent support for language development. For example:</p> <ul style="list-style-type: none"> - Unit 1, SLT 11, includes the teacher-facing direction “While students are working, focus your attention on any student that struggled to begin the task, to identify the scale or make sense of the plan view” (page 7, Unit 1, SLT 11). - Unit 2, SLT 17, offers a modified “Three Reads” structure for students to solve word problems, which supports English Language Learners in making sense of the context. 	<p> <input type="checkbox"/> 2 <input type="checkbox"/> 1 <input checked="" type="checkbox"/> 0 </p>
<p>AC 3B: Materials provide appropriate level and type of scaffolding, differentiation, intervention, and support for a broad range of learners with gradual removal of supports, when needed, to allow students to demonstrate their mathematical understanding independently.</p>	<p>Materials provide some embedded structures that could be supportive to a broad range of learners, but support is not consistently provided throughout the materials. For example:</p> <ul style="list-style-type: none"> - In Unit 1, SLT 4, students engage in an activity that allows them to compare their solutions and methods to a partner and discuss their responses and get feedback from their partner. - In Unit 1, SLT 14, alternate card sets are provided for the activity that allow students to engage with the objective at different levels of complexity. - In Unit 6, SLT 7, there is a note to the teacher that advises on the use of calculators for scaffolding student work: “A calculator may be used for instructional purposes, but it is important to note, the standard, which includes complex equations with rational number constants and coefficients, is assessed without the use of a calculator. Consider how the calculator may be utilized effectively as an instructional tool.” <p>Some Topics and Lessons provide examples of structures that support student understanding; however, the suggestions provided are general, so they are of limited use for supporting a broad range of learners. For example:</p> <ul style="list-style-type: none"> - Unit 2, SLT 4: “Encourage the use of different strategies while students are working independently.” 	<p> <input type="checkbox"/> 2 <input checked="" type="checkbox"/> 1 <input type="checkbox"/> 0 </p>

4. Supporting All Students

IMET Metric	Evidence	Score
<p>AC 3C: Design of lessons attends to the needs of a variety of learners (e.g., using multiple representations, deconstructing/reconstructing the language of problems, providing suggestions for addressing common student difficulties).</p>	<p>A variety of lesson structures, activity structures, and representations are included throughout the materials to support a variety of learners. For example:</p> <ul style="list-style-type: none"> - Unit 2: In SLT 19, an interactive discussion strategy is suggested for the “Making a Change” activity. - Unit 2: In SLT 20, a “Think Pair Share Cooperative Learning Strategy” is provided. - Unit 6: In SLT 10, a “Gallery Walk” structure is used to engage students in making sense of the number of solutions a given linear equation has. <p>There are a few notes that specifically address common student difficulties, but this is not consistent throughout the materials. Unit 2 has 21 SLTs; there are notes included that address potential student misconceptions in only 5 of the SLTs. For example:</p> <ul style="list-style-type: none"> - SLT 2 includes a note to the teacher about a common misinterpretation of negative mixed numbers. - SLT 14 includes a note to the teacher regarding students needing experience with visual models before they move to the abstract work of symbolic notation. 	<p><input checked="" type="checkbox"/> 2 <input type="checkbox"/> 1 <input type="checkbox"/> 0</p>
Rating (Supporting All Students):	Alignment Criteria	
	Section Points: <u>3/6</u>	