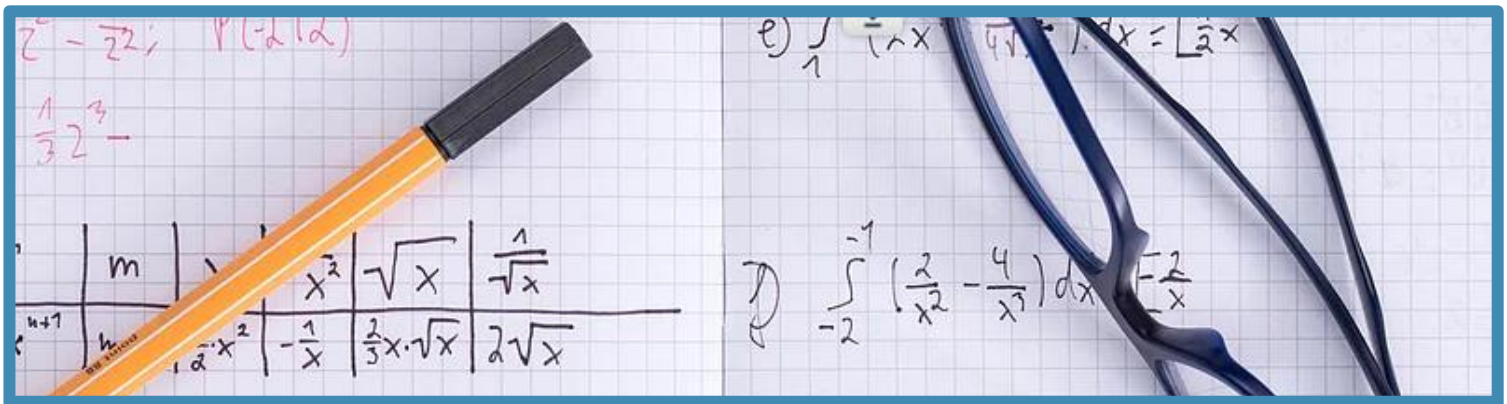
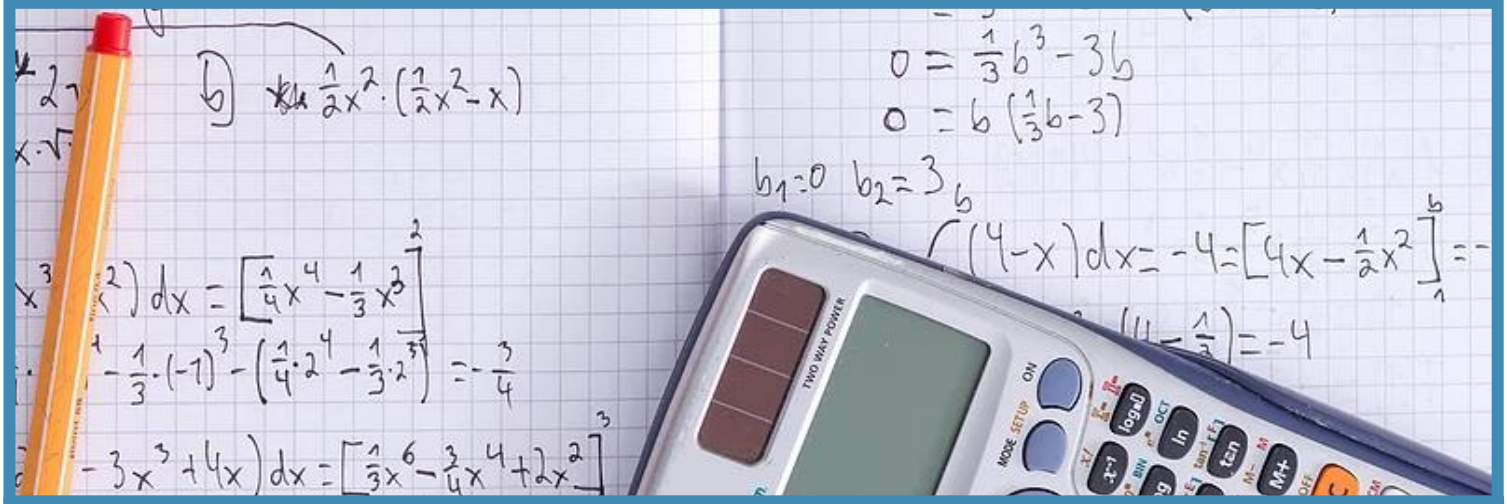


Algebra I Curriculum Vetting Report
Anne Arundel County Public Schools



MARYLAND STATE DEPARTMENT OF EDUCATION
EQUITY AND EXCELLENCE

Division of Career and College Readiness
Office of Leadership Development and School Improvement

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Maryland State Department of Education

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Contents

Overview

High-quality curricula can have a significant impact on student learning outcomes (Steiner, 2017). Curricula defines the essential content to be taught and how deeply to teach it so that each student has access to rigorous academic experiences and instructional supports to meet academic standards. Curriculum is not a textbook or a set of instructional materials. It is the comprehensive academic content and assessments aligned to standards (Casserly, 2017). Curriculum builds instructional coherence within and across grade levels and reflects a clear vision about student learning and achievement. Curriculum includes but is not limited to a scope and sequence; measurable goals and student learning outcomes; instructional scaffolds and benchmarks; supporting instructional materials; and formative and summative assessments.

In August 2019, the Maryland State Board of Education adopted revisions to Code of Maryland Regulations (COMAR) 13A.04.12.02 and 13A.04.14.02 requiring each local school system to demonstrate evidence that curricula for English language arts (ELA) and mathematics align to Maryland College and Career Ready Standards. Acceptable forms of evidence include a vetting report produced by the Maryland State Department of Education (MSDE); a vetting report produced by a nationally recognized external party; or documentation of national ratings to demonstrate alignment to Maryland Career and College Ready Standards and level I or II evidence level as defined by the Every Student Succeeds Act.

The *Maryland Every Student Succeeds Act Consolidated State* (ESSA) plan requires schools that have been identified for comprehensive support and improvement (CSI) to use ELA and mathematics curriculum that has been vetted by the MSDE. CSI schools are the lowest achieving five percent of Title I schools or high schools that do not graduate one third or more of their students based on the four-year adjusted cohort graduation rate. Anne Arundel County had two schools identified for CSI based on graduation rates. Table 1 summarizes the percent of students proficient in Algebra I as measured on state assessment for each high school and the 4-year adjusted cohort graduation rates.

Data Summary for Identification of Comprehensive Support and Improvement Schools

Performance on the Algebra 1 State Assessment:	**Graduation Rate for 4-year adjusted cohort:**
2019 State-wide result for Algebra 1 Percent Proficient: 42.5%	2018 State graduation rate: 87 %
2019 AACPS result for Algebra 1 Percent Proficient: 35%	2018 AACPS graduation rate: 89%
2019 AACPS High School **1** identified: ≤5%	2018 AACPS High School **1** identified: 24%
2019 AACPS High School **2** identified: 13%	2018 AACPS High School **2** identified: 53%
	2019 graduation rate data not available

Table 1. Data Summary for Identification of Comprehensive Support and Improvement Schools

This report identifies the outcome of the curriculum vetting process for the algebra I curriculum for Anne Arundel County Public school describing areas of promise, opportunities for growth, and recommendations for improvement. The MSDE is committed to supporting curricula improvements and associated professional learning experiences for Anne Arundel County Public Schools in alignment with recommendations presented in this report.

The Vetting Process

The vetting process consists of six steps identified in Figure 1. The first steps include selecting curriculum vetters with demonstrated expertise in standards and curriculum analysis. Curriculum vetters participate in multiple face-to-face training workshops and virtual check-in support by the MSDE. Vetters review and evaluate approximately 20-25% of school system curricula. The process culminates with a summary report highlighting areas of promise, opportunities for growth, and recommendations to maintain or improve curriculum based on a criterion-referenced rubric.

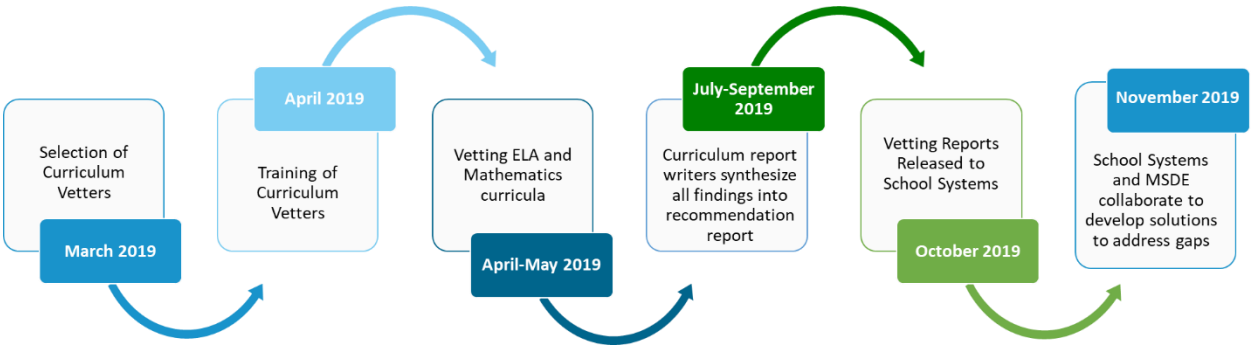

Figure 1. Summarizes the steps involved in vetting a school system curriculum led by the Maryland State Department of Education

Step 1: Selection of Curriculum Vetters

The Office of Leadership Development and School Improvement at the MSDE released an invitation to secure curriculum vetters to evaluate English language arts and mathematics curricula to determine the extent to which each grade level or course is aligned with the Maryland College and Career Ready Standard (MCCRS). The invitation was sent to each local school system's central office leaders who oversee curriculum and instruction, to deans of colleges of education, and the general public. 67 individuals applied for curriculum vetting positions, only 27 were selected.

Criteria for Selecting Vetters

Criteria to select highly qualified individuals began with collaboration between the Office of Leadership Development and School Improvement and the Division of Curriculum, Instructional Improvement, and Professional Learning at the MSDE. A protocol was established to identify curriculum vetters who met essential qualifications and at least one preferred qualification.

Using the protocol, each applicant was required to submit an updated resume, transcripts, teaching certificate, and a sample of a standards-aligned lesson for the content for which they applied. Applicants had to meet all essential qualifications (Level 1) and at least one preferred qualification (Level 2) to be considered for an interview (Table 2). The qualifications listed below were communicated in writing through the invitation to apply and were detailed in the online application.

Criteria for Selecting Highly Qualified Vetters	
Level 1: Met All Essential Qualifications	Level 2: Met at Least One Preferred Qualification
• Hold or be eligible for Advanced Professional Certificate (not applicable to non-school system applicants). • Exhibit experience in identifying and implementing curriculum aligned with the Maryland College- and Career-Ready Standards. • Provide an updated résumé that demonstrated essential qualifications. • Provide at least one reference. • Provide a sample standards-aligned lesson for the content or grade-level for which applicant applied.	• Experience as a curriculum/instructional leader (Specialist, Coordinator, Supervisor, etc.) in one of Maryland's school systems; and/or • Experience in teaching a course(s) in curriculum at a Maryland Institute of Higher Education; and/or • Experience in working with the MSDE in developing or reviewing state assessment items; serving as a Master Teacher; writing example lessons; or leading ELA or mathematics professional learning experiences focused on standards.

Table 2. The essential and preferred qualifications necessary to be invited to interview as a curriculum vetter for the MSDE.

Applicants who met the essential qualifications, matched an open vetting position, and met at least one of the preferred qualifications were invited to interview as potential candidates for a vetting position. Applicants who did not satisfy all essential qualifications and/or did not meet at least one preferred qualification were placed in a pool for consideration of a future opportunity with the MSDE and were not invited to interview.

Interview Scoring Rubric and Selection

Candidates were evaluated and selected by reviewing all parts of the interview process to include: knowledge and experience indicated on the résumé; the quality of the lesson plan sample submission; at least one verifiable reference; and the composite scores from the interview panel questions.

Candidates were rated as *Recommended with Reservation*, *Recommended*, *Highly Recommended*, or *Not Recommended*. In determining key attributes that delineated the *Recommended* category and *Highly Recommended*, the interview panel carefully reviewed résumés and lesson plan samples. For more information on the curriculum vetters, please see Appendix D.

Step 2: Training of Curriculum Vetters

Curriculum vetters participate in continuous in-person and virtual training throughout the vetting process to ensure a reliable and valid evaluation was conducted using the tools developed by the MSDE. The Mathematics 3-10 Grade Level Rubric was developed from research-based practices and exemplars rubrics such as the *Educators Evaluating Quality Instructional Products* (EQUIP), the *Instructional Materials Evaluation Tool* (IMET), and the *Grade-Level Instructional Materials Evaluation Tool/Quality Review* (GIMET-QR).

Four key features of the K-12 Mathematics Curriculum Vetting Rubric (Appendix A) include:

I. Focus and Rigor;
II. Coherence;
III. Instructional Supports; and
IV. Assessment for and of Learning.

Through key features I and II, curriculum is examined to determine the breadth and depth of the MCCRS and integration of the Standards of Mathematical Practices. Key Feature III takes into account necessary scaffolds and supports for English learners, students with disabilities, or those not yet meeting grade-level expectations. With Key Feature IV, curriculum is evaluated for how well performance expectations are communicated, inclusion of variety of task types, and the nature of formative and summative assessments.

To ensure the highest level of consistency and coherence throughout the evaluation process, the MSDE developed a protocol in which to engage each curriculum vetter in several sessions of using the grade level curriculum vetting rubric and the Maryland College- and Career-Ready Vertical Progressions, PreK-12. To view all grade level and course-specific Vertical Progressions documents for Reading PreK-12 mathematics, please visit MCCRS Progression and Framework for Mathematics.

During training sessions with curriculum vetters, the MSDE rubrics and a sample open education curriculum was used to calibrate ratings. Vetters determined the degree to which the sample curriculum was aligned with the MCCRS. This included identifying patterns, trends, strengths, and challenges or concerns across the lessons as it relates to each of the four criteria and indicators as shown on excerpt of the K-12 Mathematics Curriculum Vetting rubric in Table 3. During this time, vetters practiced recording objective and evidence-based comments. It was through this deeper engagement that vetters compared how comments and feedback were written revealing any inconsistencies, assumptions, and possible bias. Consequently, it allowed for clarifications and adjustments with the protocol, before the formal evaluation began (Office of Data, Analysis, Research, and Evaluation, 2016).

Rating Scale for K-12 Mathematics Curriculum

Focus and Rigor	Coherence	Instructional Supports	Assessment for Learning
4- Exceeds expectations for addressing the criteria			
3- Satisfactorily addresses all the criteria.			
2- Addresses only some and/or only inadequately addresses some of the criteria.			
1- Fails to address more than half of the criteria and or/ inaccurately addresses the criteria.			

Table 3. Shows the four key features curriculum vetters used to evaluate for a high-quality mathematics curriculum.

Following the in-person training sessions, curriculum vetters began the work of reviewing and rating (Table 4) their assigned grade level math curriculum based upon the four criteria and respective indicators. Staff from the MSDE were on hand fielding questions, offering guidance as it relates to the calibration protocol established, thus ensuring a smooth transition to the independent review that continued off-site.

Grade K-12 Curriculum Vetting Rubric Criteria and Indicators of a High-Quality Math Curriculum

Criteria	Focus and Rigor	Coherence	Instructional Supports	Assessment For and Of Learning
A high-quality curriculum is evaluated for all of these indicators	• Alignment to MCCRS • Connections between SMPs a nd Content Standards • Instructional Time Frame • Balance Aspects of Rigor	• Communication of Connecting Standards (Major and Additional/ Supporting) • Vertical Progressions	• Resource Guidance on Available Resources • Evidence of Differentiation • Strategies for Identifying Student Errors and Misconceptions	• Clear Performance Expectations • Task Types to Elicit Student Learning/ Thinking • Formative Assessments • Summative assessments

Table 4. Each of the four criteria sections on the rubric conclude with a rating score based on the presence or absence of evidence for each indicator in Table 2.

During the final in-person training session, curriculum vetters synthesized evidence-based findings into a grade band consensus report (Appendix B). The purpose of this important step is to identify the areas of promise, opportunities for growth, and recommendations for improvement to the math curriculum. Discussion around synthesized findings were used to evaluate and ensure consistency among comments and areas for consideration. As a result, vetters used this activity to edit or revise any comments for one grade band consensus.

Step 3: Lesson Selection

The MSDE used well-reputed best practices which suggest selecting some curricular documents undergo an evaluation rather than an entire curriculum. Assessing all curricular documents is not practical due to the amount of time such an evaluation would take and the complexity of the documents. Since this evaluation is not assessing the entire selection of curricular documents, collecting a sample size of documents across both courses is a feasible method as long as the same rubric is used and the evaluation is conducted by someone other than those who wrote the curriculum (Washington State University, 2018). With each quarter having the same or known chance of being selected, it is possible to make generalizations based on the sample size collected (Powell, 1998). From the quarters selected, approximately 20-25% was printed and placed in a binder for each vetter; however, the entire course was available on flash drive. Vetters also received all ancillary and supplemental curricular documents if they were provided by the school system.

Curriculum for Anne Arundel County Public Schools

Anne Arundel County Public Schools (AACPS) implements district-developed curricula for English language arts and mathematics in kindergarten through grade twelve. AACPS integrates both standards and performance-based models to inform its approach to curriculum design and development

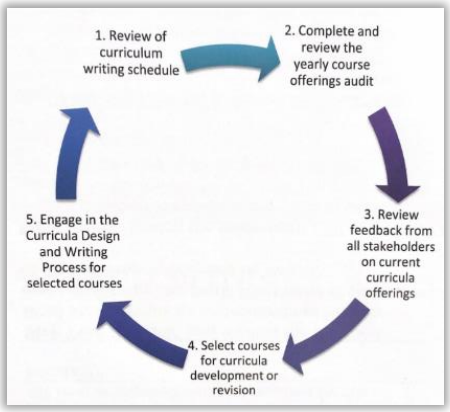

Figure 2. The curriculum development cycle utilized by Anne Arundel County Public Schools.

The process for curriculum development is ongoing throughout the academic year. Figure 2 illustrates the curriculum development cycle used to review, revise, and update curricula. AACPS encourages all teachers to apply to write district assessments and curriculum. Courses selected for updates start by being reviewed by central office staff and selected curriculum writers. Next, teams review assessments and modify as needed before moving on to writing units aligned to standards. Prior to releasing the new or updated curricula to teachers, the Assessment and Curriculum Management Committee (ACMC) works with content offices to vet the documents and make any additional modifications before the content is made available.

Approximately 20-25% of the Algebra 1 course curriculum was vetted representing all or parts of seven of the nine units across the school system's Algebra 1 course:

- Scope and Sequence, and other supporting curricular documents were reviewed
- Unit 1- Relationships between Quantities and Reasoning with Equations: All
- Unit 2- Linear Functions: All
- Unit 3- Application of Linear Equations: Beginning of unit
- Unit 4- Exponential Relationships and Modeling: Middle of unit
- Unit 5- Quadratic Equations: End of unit
- Unit 8- Function Families: Beginning of unit
- Unit 9- Algebraic Geometry: Middle of unit

For the ease of readers, any reference to "lesson" means the same as days of instruction. According to the AACPS *Scope and Sequence* document, a unit title, such as "Relationships between Quantities and Reasoning with Equations," includes clusters of standards identified as 1.1- solving equations and inequalities and 1.2- literal equations and their formulas. All unit titles appear the same way throughout the nine units.

Step 4: Curriculum Vetting Report Development

Curriculum report writers were acquired through a Request for Quotation (RFQ) submitted by the MSDE. All candidates had to submit evidence of technical writing experience with at least one writing sample, a résumé demonstrating knowledge and experience of the MCCRS, a Master's degree, and current Maryland Educator certification. Six RFQs were submitted and staff at the MSDE interviewed the most qualified candidates who met the RFQ requirements. Selected report writers were assigned either English Language Arts or mathematics vetting reports or curricula, depending on their background and expertise.

Three report writers were trained which involved having access to the same materials as vetters, all the K-12 grade level curriculum vetting reports, and the K-12 consensus reports also developed by vetters. Training involved a similar calibration, as described earlier for vetters, in

which writers objectively synthesized all findings against the respective ELA or mathematics curriculum vetting rubrics. As a first step in organizing all the vetting information, writers were required to complete an Evidence Organizer (Appendix C) before beginning a first draft report. This way, the MSDE could ensure a consistent and accurate account of the findings from the curriculum vetters. Throughout a 6-8-week period, report writers were required to submit, for feedback from the MSDE, several drafts which underwent many iterations toward a final report ready for dissemination to local school systems. To see the full list of curriculum vetters and report writers, please see Appendix D.

Curriculum Vetting Results

The next pages present the findings for the Algebra I course for AACPS. The information, evidence, and examples do not represent an exhaustive account of all findings, but act to highlight and reveal common patterns, strengths, and areas for growth. The grade band concludes with the recommendations and overall score. The grade level curriculum vetting rubrics and consensus documents are available for review.

Areas of Promise

I. Disposition of Alignment with Maryland College and Career Ready Standards and Rigor

Evaluating the key feature of **focus and rigor**, a disposition of alignment with the Maryland College and Career Ready Standards (MCCRS) and attention to rigor was identified as areas of promise for the Algebra I curriculum. It was noted that the *Scope and Sequence* document included the MCCRS for Algebra I. In addition, several activities and student tasks showed attention to portions of a given standard, but not to the full intent and language of that standard. This demonstrates a disposition of alignment with the MCCRS. It was difficult to identify lessons that would have completed the full exploration of the given standards. As such, even though some of the activities did not fully align with the demands of the standard, they did align with components of the identified standards.

While full alignment with the standards is of the utmost importance, contemporary research suggests that there is worthiness in implementing a full lesson or activity with the intentional purpose of separating the standards into smaller measurable tasks to ensure the mastery of mathematical objectives. The communication of smaller objectives, derived from the full objective, can help in clarifying or framing the big picture for teachers and students. Likewise, sharing the purpose for an objective and the related individual activities are important components of effective instruction (Saphier, Haley-Speca & Gower, 2018). This approach, by extension, could scaffold teaching and learning toward the fullness of the intended standard. For instance, consider MCCRS A.REI.A.1 in Unit 1.1 (*Explain each step in solving a simple equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. Construct a viable argument to justify a solution method*). It would be acceptable for this lesson to address smaller measurable tasks,

such as an activity that would require students to explain, in their own words, each step involved in solving a simple equation. This was exactly the case with the activity in the You Do, We Do, I Do "Equality and Inequality" lesson.

In Unit 2, the activity "Function Family" was associated with A.CED.A.2 (*Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales*). The activity demonstrated this approach of separating the standard into smaller measurable tasks, as students were required to sketch a graph and identify its characteristics ("Sketch A Graph Gallery Walk" activity). Also, in Unit 2, the 2.4 objective links to F.IF.B.6 (*Calculate and interpret the average rate of change of a function over a specified interval. Estimate the rate of change from a graph*). The embedded "Rate of Change Mad Lib" activity required students to calculate the average rate of change of a function over a specified interval. These examples demonstrate a separation of a given standard into smaller portions.

Additionally, there was some evidence that attention was paid to the aspects of rigor—procedural skills, conceptual understanding, and ability to apply the targeted mathematics (Burris, Wiley, Welner & Murphy, 2008). In an activity in Section 1.2, students were given manipulatives, such as algebra tiles, to support conceptual understanding opportunities. In Unit 8, which focused on piecewise functions, students were required to illustrate an explanation of the effects on the graph that included cases where $f(x)$ is a linear, quadratic, piecewise linear (to include absolute value) or exponential function. This activity provided an opportunity to further develop and demonstrate conceptual understanding.

There were activities which asked students to explain, justify, make sense of problems and to persevere in problem solving (Standards of Mathematical Practice 1 & Standards of Mathematical Practice 3) through various scenarios. For example, in Unit 1, Section 1.2, a differentiated instruction activity for literal equations was presented. The "Four Corners" activity provides students additional practice and an opportunity to move around the room. The activity allowed the teacher to model how to solve a literal equation and then have the students solve a similar problem and participate in "Four Corners." Some of these problems were seen as rigorous, and even suitable practice problems for advanced learners.

II. Vertical Progression of Targeted Mathematics

Coherence is significant to a high-quality curriculum as it illustrates how current learning connects to prior and future learning (Hughes et al., 2013). It is essential to instruction because it promotes retention of information. Educational scholars maintain that when learners "shift from receptive to an active mode with new information, then the retention rate grows an average to 70 to 90 percent" (Saphier, 2018). Therefore, as a criterion of **coherence**, a curriculum is to provide information on the vertical progression of targeted mathematics to illustrate how students' current learning connects to prior and future learning. By establishing a vertical progression, teachers can understand what students were expected to learn, what students are set to learn, and what students will learn in subsequent courses (Hughes, 2013).

The vertical alignment and overview in the curriculum alignment documents adequately address coherence within and across grade levels. To further support that finding, Anne Arundel County Public Schools Office of Secondary Mathematics provides an ancillary resource — Vertical Alignment of MCCRS from Algebra 1 through Pre-Calculus—which not only identifies standards but also stratifies them within mathematics courses. Moreover, a vertical alignment section showed coherence in the vetted units. For instance, in Unit 1 the following was noted:

- By the end of **eighth grade** students have learned to solve linear equations in one variable and have applied graphical and algebraic methods to analyze and solve systems of linear equations in two variables.
- In this unit of **Algebra 1** students will solve equations and inequalities in one variable.
- In **Geometry** students will need to be fluent in solving linear equations in one variable to apply geometry concepts.
- In **Algebra 2** students extend the following concepts:
    - solve polynomial, exponential, logarithmic, radical, rational and trigonometric equations which may require students to solve linear equations in one variable.
    - determine the domain of a rational function which may require a student to solve a linear equation in one variable.
    - graph linear inequalities in two variables.
    - graph the solution set to a system of linear inequalities in two variables (p.5).

III. Evidence of Differentiation

For evaluation of **instructional supports**, evidence of differentiation was sought. Differentiated instruction—a critical element of a quality curriculum— is an instructional approach in which a variety of student-centered strategies are designed to ensure effective instruction of learners who have different learning needs and levels of scaffolding (Gaitas, 2017). Evidence of differentiation in a curriculum includes guidance for scaffolds and other supports that address the needs of special populations, such as English learners, students with gaps in learning, and students with disabilities. Within the vetted curriculum, there was acceptable evidence of options for differentiated instruction processes. Likewise, there was evidence of Universal Design for Learning (UDL) engagement. Moreover, both differentiated instruction and UDL approaches were present in both enrichment and remediation activities. Educational scholars who promote UDL contend that curricula designed in UDL has the promise to minimize the distinction of differences among learners and learning styles (Al-Azawei, Serenelli & Lundqvist, 2016).

Also, it must be noted that general instructional guidance specific to English Learners was present in the *Curriculum Alignment Guide*. As stated, English learners (ELs):

> *benefit from reading the problem/scenario more than once. The first reading they are looking to understand the overall meaning (comprehension); in other words, what is it asking them to do. The second reading is for drawing a representation/understanding of what they should do to solve the problem. The third reading helps them determine how*

to solve the problem posed in the context. Make sure you add verbal interactions with your ELL students during this lesson. Have students identify what the problem is asking and have them explain what they think they should do to answer the problem. Consider helping them create a flow map so they understand how they are using the order of operations in reverse (p.10).

Further, the following included resources had been noted:

- Sorting from Verbal to Symbolic: This is a third sorting activity involving translating more complex verbal expressions into algebraic equations.
- Pearson, Algebra 1 T.E, p. 53: This concept byte is about solving linear equations with variables on both sides with algebra tiles and is designed for struggling learners (p.10).

IV. Communication of Performance Expectations

According to Saphier, Haley-Speca and Gower (2018) the foundation of any curriculum is the learning expectations or outcomes—the list of exactly what we expect students to learn or be able to do. Communication of these performance expectations at the grade/course level was an area of promise aligned with **assessment for and of learning**. The *I can* statements that were included in each unit was acknowledged as evidence of this alignment. In Unit 1, for instance, the following *I can* statements were noted:

I can:

- Use inverse operations to solve and graph multi-step equations and inequalities in one variable.
- Identify equations that are identities or have no solution.
- Solve and graph compound inequalities.
- Rewrite and use literal equations and formulas (p.1)

Further, each of the units included an anchor board practice activity, which consisted of a checklist and a suggested point-value criterion for students' recording of work and grade earned. Further, the ongoing sample of assessments in the units reviewed represented an extension of an implicit communication of expectations. In addition to a mention of a quarter benchmark, formative assessment questions and drills were evidenced in each unit.

Opportunities for Growth

I. Incomplete Alignment between Maryland College and Career Ready Mathematics Standards, Standards for Mathematical Practice, and Student Activities

The subsections that follow serve to clarify the growth opportunities within alignment into six distinct, yet related categories.

A. Language of the Standards

Within the vetted curriculum, some objectives and activities reflect partial alignment with the language of the MCCRS for Algebra I. Some of the written objectives are not aligned with the MCCRS for Algebra I, as the objectives do not use the specific language of the standards. For example, in Unit 1, Section 1.2, the objective states the "[s]tudents will be able to develop literal equations to model real world situations and use them to solve problems and *rewrite* the formulas to highlight a quantity of interest using correct reasoning." Explicitly using the language of the MCCRS, the objective would read: "students will create equations and use them to solve problems and *rearrange* the formulas to highlight a quantity of interest using correct reasoning" (cf. CED.A.1 and CED.A.4).

In other instances, the vetted curriculum includes non-mathematical language in the lesson activities not aligned to the MCCRS. In Unit 1, Section 1.2, for instance, the literal equations Differentiated Instruction (DI) Activity included non-mathematical language such as: "flip", "flip the sign", and "move to the other side". The importance of academic language learning within the content areas has been underlined in many educational studies (Hajer, 2017). The use of mathematical language when writing or communicating the learning objectives is vital to high-quality curriculum. Educational scholars argue that teachers should realize that students' oral and written communication is essential for learning mathematics (Hajer, 2017). To facilitate learning, teachers can divide the learning objectives of the state standard into smaller fragments to ensure mastery, while en route to the bigger objective (Hajer, 2018). Nevertheless, the use of mathematical language when writing or communicating the learning objectives should be maintained (Hajer, 2017).

B. Demands of the Standards

There were several instances in which the standards identified in the *Scope and Sequence* were not addressed to the full depth and breadth of the content standards in the *Curriculum Alignment Guide*. Select examples from the vetted lessons have been provided.

In Section 1.1, an identified standard was A.REI.B.3 (*Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters*). For this standard, three learning objectives had also been identified:

- *Objective 1:* Solving Equations and Inequalities — Students will model real world quantities using algebraic expressions, relate the quantities with linear equations, and solve a variety of multi-step equations.
- *Objective 2:* Understanding types of solutions — As students solve equations and inequalities, build an understanding of rational and irrational numbers.
- *Objective 3:* Compound Inequalities —Solve and graph compound inequalities.

When evaluating the corresponding student activities, many of the activities did not fully align to the demands of the standard, nor fully to Objective 2 and 3. In the activity wherein students were modeling equations with algebra tiles, they were being asked to simplify expressions. Simplifying expressions does not completely address standard A.REI.B.3.

Again in Section 1.1, a second identified standard was A.CED.A.3 (*Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or non-viable options in a modeling context*). In this section, two student activities involving modeling were evident. The activities, however, did not provide a well-rounded opportunity to engage with the elements of the modeling in mathematics described as the process of using mathematics and statistics to better analyze everyday problems in the real world. (Maryland State Department of Education, 2016). The intent is to engage students to create and/or interpret models independently.

C. Standards for Mathematical Practice (SMPs)

There was no explicit evidence of intentionality in alignment between the Standards for Mathematical Practice and math content standards. The textbook identified in the curriculum referenced the Standards for Mathematical Practice, but they were not evident in the lessons. Moreover, there were no clear expectation or guidance on how the textbook can be integrated in preparing a taught curriculum. For instance, the lesson outcomes from the textbook do not align to the outcomes in the *Curriculum Alignment Guide*; therefore, there is a misalignment in the Standards of Mathematical Practice that are noted in the textbook.

The Maryland State Department of Education embraces the Standards of Mathematical Practices (SMP) as the essential processes and proficiencies that mathematics educators at all levels must seek to develop in their students (Maryland State Department of Education, 2019). Since each of the eight mathematical practice standards has a specialized focus, it is necessary to interlace with other standards to ensure a robust mathematics curriculum. The Standards of Mathematical Practice inform the implementation of content standards in the learning environment, in ways that engender college and career readiness for students.

D. Student Learning Activities

There was evidence of misalignment between several identified standards and their associated student activities. Recall the three learning objectives for Section 1.1:

- *Objective 1:* Solving Equations and Inequalities — Students will model real world quantities using algebraic expressions, relate the quantities with linear equations, and solve a variety of multi-step equations.
- *Objective 2:* Understanding types of solutions — As students solve equations and inequalities, build an understanding of rational and irrational number
- *Objective 3:* Compound Inequalities —Solve and graph compound inequalities.

In this section, the student activity "Writing, Modeling, and Solving Problems" asked students to create verbal scenarios and translate them into algebraic equations. The activity also provided further practice on solving two-step equations. Unfortunately, the activity did not align with the standard that had been identified for the lesson— A.REI.B.3 (*Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters*). Whereas the standard and objective asked students to solve linear equations, the activity requires students to create equations. As such, the activity was better aligned with standard A.CED.A.1 (*Create equations and inequalities in one variable and use them to solve*

problems. Include equations arising from linear and quadratic functions, and simple rational and exponential functions).

The standard A.REI.A.1 (*Explain each step in solving a simple equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. Construct a viable argument to justify a solution method*) was also present in Section 1.1. However, there was no evidence that any of the activities for this section asked students to construct a viable argument. Though, students were required to justify a solution in an activity presented in Section 1.2. Therefore, the standard would be best aligned to Section 1.2 instead of Section 1.1. Furthermore, Objective 2 (Understanding Types of Solutions) and Objective 3 (Compound Inequalities) appear to be better aligned with Sections 1.3 (Solving and Graphing Inequalities) and 1.4 (Compound Inequalities), which are not included in the *Scope and Sequence* document, nor on the table of contents on the *Curriculum Alignment Guide*.

In the *Curriculum Alignment Guide*, Section 2.3 *Arithmetic Sequences* referenced chapter 2.8 of the textbook associated with the Algebra I course. The referenced chapter, unfortunately, focused on proportions and similar figures. This also appeared to be a misalignment with the learning objectives, as *proportions and similar figures* are not the same content as *arithmetic sequences*. Similarly, in Section 2.4 *Rate of Change and Slope*, the curriculum referenced a chapter from the textbook associated with the Algebra I course. The textbook Chapter 3.1 appeared to focus on inequalities and their graphs, which represents a misalignment with the topic of Section 2.4. Further, there appeared to be a misalignment with the topic referenced in the *Curriculum Alignment Guide* for Section 2.5 and the chapter referenced in the textbook associated with the Algebra I course. In the *Curriculum Alignment Guide*, Section 2.5 *Forms of Linear Functions* was linked with the textbook chapter sections 3.3 through 3.5, which were aligned with inequalities and their graphs and thus, not reflective of the same content.

E. Inconsistencies between the *Scope and Sequence* and *Curriculum Alignment Guide Documents*

The *Scope and Sequence* did an excellent job of identifying the standards, although not the Maryland College and Career Ready Standards, associated with each unit. The *Curriculum Alignment Guide* identified standards associated with student learning outcomes. Unfortunately, multiple discrepancies existed between both documents and resulted in them not being aligned to each other. As an example, the *Scope and Sequence* document listed the following standards for Unit 1: HSA.SSE.A.1, HSA.REI.A.1, HSA.REI.B.3, HSN.Q.A.2, HSN.Q.A.3, HSA.CED.A.4, HSA.CED.A.1, and HSA.CED.A.3. The *Curriculum Alignment Guide*, however, addressed 62.5% of these standards listed in the *Scope and Sequence* for Unit 1, namely: HSA.REI.B.3, HSA.CED.A.1, HSA.REI.A.1, HSN.Q.A.2, and HSA.CED.A.4.

Similarly, the *Scope and Sequence* document listed the following standards for Unit 2: HSN.Q.A.1, HSF.LE.A.1, HSF.LE.A.1.B, HSF.LE.A.2, HSF.IF.B.4, HSF.IF.B.5, HSS.ID.C.7, HSF.BF.A.1.A, and HSA.CED.A.2. The *Curriculum Alignment Guide*, however, addressed 77.8% of these standards listed in the *Scope and Sequence* for Unit 2, namely: HSA.CED.A.2, HSF.IF.B.4,

HSF.IF.B.5, HSN.Q.A.1, HSF.BF.A.1.A, HSF.LE.A.2, and HSF.LE.A.1.B. Seven additional standards (HSA.REI.D.10, HSF.IF.A.3, HSA.SSE.A.1.a, HSF.IF.B.6, HSF.IF.C.7.a, HSA.SSE.A.1, and HSF.LE.B.5) appeared in the *Curriculum Alignment Guide* for Unit 2.

These discrepancies between the *Scope and Sequence* and the *Curriculum Alignment Guide* could be a source of confusion for teachers as well as for school leaders who are charged with providing opportunities for growth and development to their faculty.

F. Standards Outside of the Algebra I MCCRS Framework

Another source of confusion for teachers and school leadership could be the implementation of learning activities that are aligned to other grade level mathematics standards. This, by extension, could lead to performance gaps in preparation for state and local Algebra I assessments. The preponderance of student learning activities in Unit 2 were aligned with grade 8 standards. Section 2.2 Activity "Linear Relations Cut and Paste", which required students to cut out graphs, equations, tables, and scenarios and match them together on an answer sheet, was partially aligned with 8th grade standard 8.F.B.4[1]. Likewise, in Section 2.2, the student activity "Practice Function vs. Not a Function" asked students to determine if each problem was a function and to justify their response. This activity was more aligned with standards 8.F.A.1[2] and 8.F.A.2[3]. Similarly, in Section 2.4 *Rate of Change and Slope*, the proposed student activity is related to writing and interpreting real world slope, which is better aligned with standards 8.F.4[4] and 8.F.5[5].

In Section 2.5, the following student learning objectives are presented:

- *Objective 1*: Write linear equations using slope-intercept form and graph the equations.
- *Objective 2*: Write and graph linear equations using point-slope form.
- *Objective 3*: Write and graph linear equations using standard form.

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[1] 8.F.B.4: *Construct a function to model a linear relationship between two quantities. Determine the rate of change and initial value of the function from a description of a relationship or from two (x, y) values, including reading these from a table or from a graph. Interpret the rate of change and initial value of a linear function in terms of the situation.*

[2] 8.F.A.1: *Understand that a function is a rule that assigns to each input exactly one output. The graph of a function is the set of ordered pairs consisting of an input and the corresponding output.*

[3] 8.F.A.2: *Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). For example, given a linear function represented by a table of values and a linear function represented by an algebraic expression, determine which function has the greater rate of change.*

[4] 8.F.4: *Construct a function to model a linear relationship between two quantities. Determine the rate of change and initial value of the function from a description of a relationship or from two (x, y) values, including reading these from a table or from a graph. Interpret the rate of change and initial value of a linear function in terms of the situation.*

[5] 8.F.5: *Describe qualitatively the functional relationship between two quantities by analyzing a graph (e.g., where the function is increasing or decreasing, linear or nonlinear). Sketch a graph that exhibits the qualitative features of a function that has been described verbally.*

The student activities associated with the three learning objectives appear to be aligned with MCCRS for grade 8. For example, the activities associated with Objective 1 are aligned with 8.EE.B.6[6], 8.F.B4[7], and 8.F.B.5[8]. It should also be noted that Section 3.1 includes the geometry standard G.GPE.B.5[9]. This geometry standard is not aligned to the Algebra I standards framework, and it is not provided in the context of future learning.

II. Deliberate Communication of Connection Between Standards

While the vertical alignment and overview in the curriculum alignment documents represented a promising feature of the curriculum, little evidence was found that it supported the deliberate communication of connections between major standards and additional and supporting standards within a course or grade. Vertical alignment was emphasized in the overview document, with little evidence represented within the objectives and activities provided for teachers.

Additionally, the connections among standards, clusters, domains, and conceptual categories called for in the standards were not identified for teachers. As such, the content was disconnected. From the perspective of vertical progression (see **Area of Promise** above), there was a clear connection to the standards for grade 6 through grade 8, including guidance regarding how the high school work builds upon the work from the middle school grades. Nevertheless, many student activities which aligned to prior learning were included in the vetted curriculum without guidance on how to implement the activities in such a way to ensure coherent delivery of instruction aligned with the MCCRS for Algebra I.

III. Guidance Regarding Support for Teaching and Learning

As mentioned as an **Area of Promise**, there was significant evidence of Universal Design for Learning (UDL) and Differentiated Instruction (DI) incorporated in the curriculum. The curriculum included a wealth of activities to be used as resources when teaching an objective aligned to the standards. Nevertheless, of the lessons vetted, there was relatively no guidance regarding which of the available student activities best support teaching and learning of targeted standards. Furthermore, there are many instances in which the expectation or connection between the stated objective and the design of the student learning activities are not clear and appear to be misaligned. Throughout the units evaluated, there was no evidence

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[6] 8.EE.B.6: *Use similar triangles to explain why the slope m is the same between any two distinct points on a non-vertical line in the coordinate plane; derive the equation y = mx for a line through the origin and the equation y = mx+ b for a line intercepting the vertical axis at b*.

[7] 8.F.B.4: *Construct a function to model a linear relationship between two quantities. Determine the rate of change and initial value of the function from a description of a relationship or from two (x, y) values, including reading these from a table or from a graph. Interpret the rate of change and initial value of a linear function in terms of the situation.*

[8] 8.F.B.5: *Describe qualitatively the functional relationship between two quantities by analyzing a graph (e.g., where the function is increasing or decreasing, linear or nonlinear). Sketch a graph that exhibits the qualitative features of a function that has been described verbally.*

[9] G.GPE.B.5: *Prove the slope criteria for parallel and perpendicular lines and use them to solve geometric problems (e.g., find the equation of a line parallel or perpendicular to a given line that passes through a given point)*.

that suggests the intentional sequences to support scaffolds or other instructional supports that more robustly and consistently address the needs of multiple special populations (struggling learners, Gifted and Talented, English learners, students with gaps in learning, and students with disabilities). For effectiveness, scaffolding should reflect intentional instructional supports during the initial phase of learning, prior to gradually shifting the level of support most appropriate for the specific learner (Jumaat, 2014).

Secondly, there was minimal evidence of strategies for identifying and correcting common student errors and misconceptions. School system leaders should consider including a rationale for activities, along with strategies or guidance for correcting common student errors and misconceptions. Overall, the resources provided do not appear to sufficiently support teachers in planning or providing effective learning experiences to help guide the comprehensible development of mathematical concepts.

IV. Communication of the Performance Expectations and Variety of Tasks Types

Recall that in an instructional approach proven to be effective, educators now begin instructional planning by identifying what students are expected to learn or to be able to do (Saphier, 2018). The development of clear and concise performance expectations is considered the foundation of any curriculum, especially one of quality. Key Features IV, **Assessment for and of Learning,** requires curricular documents that provide guidance on how to measure whether students have met specific learning expectations. To elicit evidence of student learning and thinking, generally Maryland educators reference the following tasks types:

- Type I- tasks assessing concepts, skills and procedures;
- Type II- tasks assessing expressing mathematical reasoning; and
- Type III- tasks assessing modeling and applications (cf. Maryland State Department of Education, *MCAP Algebra I Evidence Statements*, August 2019).

Within the vetted curriculum, there was no evidence of clear examples of these types of tasks. Though the curriculum includes multiple activities for which teachers may choose, it was unclear how teachers would identify what tasks to complete with students to demonstrate the fullest alignment with the MCCRS and various task types.

Overall Rating

The Maryland College and Career Ready Standards (MCCRS) Curriculum Framework for Algebra I provides an overview of the standards, which have been assembled to form the units of study for Algebra I (Maryland State Department of Education, 2018). The framework identifies five critical content units:

- Unit 1 - Relationships between Quantities and Reasoning with Equations;
- Unit 2 - Linear and Exponential Relationships;
- Unit 3 - Descriptive Statistics;
- Unit 4 - Expressions and Equations; and
- Unit 5 - Quadratic Functions and Modeling.

The standards in each unit are grouped conceptually by clusters. Ideally, a curriculum is aligned with the MCCRS so that by the end of the year, students have had rich and multiple exposures to and experiences with each of the content standards.

Using the MSDE-developed K-12 curriculum vetting rubric, curriculum vetters assessed lessons using the criteria as shown in Table 5. During the review, the curriculum vetters reached a consensus (Appendix B) regarding the findings, arranged by areas of promise, opportunities for growth, and recommendations for improvement. The curriculum vetters used the following rating scale to rate the curriculum on a scale ranging from 1 to 4, for each of the four key features. A rating of *4* indicates that the vetted curriculum was considered *Exemplary*, thus exceeding expectations for addressing the criteria of each key feature. In contrast, a rating of *1* indicates that the vetted curriculum was deemed *Unsatisfactory*, failing to address more than half the criteria and/or inaccurately addressing the key features.

Overall, the curriculum vetters rated the Algebra I curriculum as a ***2 (Needs Improvement)***, as it addresses ***only some and/or only inadequately addresses some of the criteria for each key feature***. Nevertheless, there were promising aspects of the curriculum drawing from one or more key features.

Rating Scale:

4- Exemplary - Exceeds expectations for addressing the criteria for each key feature

3- Satisfactory - Satisfactorily addresses all criteria for each key feature

2- Needs Improvement - Addresses only some and/or only inadequately addresses some of the criteria for each key feature

1- Unsatisfactory - Fails to address more than half the criteria and/or inaccurately address the key feature

Criteria on the Mathematics K-12 Curriculum Vetting Rubric

Key Features	Focus and Rigor	Coherence	Instructional Supports	Assessment for Learning
A high-quality curriculum is evaluated for all of these indicators	• Alignment to MCCRS • Connections between SMPs and Content Standards • Instructional Time Frame • Balance Aspects of Rigor	• Communication of Connecting Standards (Major and Additional/ Supporting) • Vertical Progressions	• Resource Guidance on Available Resources • Evidence of Differentiation • Strategies for Identifying Student Errors and Misconceptions	• Clear Performance Expectations • Task Types to Elicit Student Learning/ Thinking • Formative Assessments • Summative assessments
Overall Rating	**1**	**1**	**2**	**2**

Table 5. Grades K-12 Mathematics Curriculum Vetting Rubric

Recommendations for improvement to the Anne Arundel County Public Schools Algebra I curriculum are presented in the next section of this report.

Recommendations for Improvements

I. Consistently Align the Standards Mathematical Practices, Objectives, and Student Activities with the Maryland College and Career Ready Standards.

Evidence of partial alignment with the standards was cited throughout the curriculum. Therefore, it is recommended that an alignment of the Standards of Mathematical Practices (SMP), learning objectives, and student activities with the MCCRS for Algebra I be addressed throughout the Algebra I course curriculum. Intentionally listing the Standards of Mathematical Practices along with identified content standards in the curriculum alignment guide could result in a consistent and accurate account of what students should know and be able to do. This kind of clarity may reduce or eliminate the instances in which a standard is referenced as a learning outcome on the *Curriculum Alignment Guide* but is not included in the scope and sequence document.

In the process of revisiting the curriculum to better align the Standards of Mathematical Practice, learning objectives, and student activities, the school system can engage in deliberate planning activities. Contemporary educational research posits that the planning and development of a high-quality curriculum must include acknowledged standards, learning objectives, and the purpose and essential elements of the task (Festus, 2015; Steiner, 2017; Saphier, 2018). Moreover, the planning should entail an inclusive review of the standards, with a focus on enduring understanding, to be certain that student activities explicitly connect to the standard (Saphier, 2018). This will serve to improve the focus and coherence within and across the Algebra I curriculum.

II. Identify, with specific language, the major and additional/supporting MCCRS.

Anne Arundel County Public Schools is encouraged to identify, with specific language, the major and additional or supporting standards for each unit. Within the vetted curriculum, the identification of and connections between major and additional standards are not consistently communicated. According to educational experts, content standards outline the expectations for students' learning, expounding upon what students will know and be able to do by the end of each course, while curriculum is the means to get there (Pearson, 2019). As such, it is imperative that a high-quality curriculum include the major standards aligned to units as well as the additional or supporting standards for each unit. In this light, the curriculum highlights the learning expectations that are essential and those that are an extension of learning (Saphier, 2018). Accounting for the major and additional or supporting standards should also prove beneficial in improving coherence within the curriculum. By differentiating the major standards from those that are additional or supporting, the curriculum could offer clarity on how current learning connects to foundational or future learning, within and across units.

III. Ensure a Balanced Approach to Addressing Rigor.

Given that a high-quality curriculum can be a critical lever for the academic success of all students, it is essential that the curriculum be rigorous (Steiner, 2017). In the case of mathematics curricula, the definition of rigor takes on a different meaning than in other contexts. While the concept of rigor is often thought of making something difficult or challenging or introducing topics earlier, this is not necessarily the same idea with respect to mathematics curriculum. Rigor, in mathematics, is defined as a deep, authentic command of mathematical concepts (Standards Institute, 2017). Specifically, a high-quality mathematics curriculum must have an equal balance of conceptual understanding often referred to as making sense of the math; procedural and fluency skills (doing the math; formulas, algorithms); and real-world application, or the point at which concepts and procedures are applied to new, other subject areas, or real-world situations (Standards Institute, 2017).

A concern noted throughout the vetted curriculum is related to the consistent and thorough approach to the aspects of rigor. Some standards were not fully developed throughout the units due to more weight given to one or two aspects of rigor. There was a lack of evidence found to support the intentional development of conceptual understanding and application when addressing a component of the standard. Many lessons were scaffolded in such a way that students were guided through a specific path or given specific properties and formulas to use. This approach, by extension, may impair the integration of the Standards of Mathematical Practices with instruction. Therefore, they do not afford students an opportunity to apply skills learned throughout the course, as discussed in the opportunity for growth section. This step-by-step process, which is found throughout the student activities, may reduce the chances of students engaging in productive struggle, as is expected in an Algebra I course.

As such, it is recommended that the aspects of rigor are examined within and across the nine unit titles and the course, as a whole. To be clear, the written curriculum must demonstrate equal emphasis on conceptual understanding, procedural fluency and skills, and application of standards. School system leaders may consider identifying which activities align to each aspect of rigor within the standards, thus identifying gaps.

A second concern related to the rigor of the curriculum stems from the claim that many standards were partially addressed. In many instances, the standards aligned with the modeling process were listed throughout the *Curriculum Alignment Guide*. Yet, there was no evidence that the curriculum fully addressed the modeling process for mastery of the standards. The student activities provided did not appear to afford students an opportunity to authentically engage in the modeling process. In other words, they did not gather their own data, organize it, create multiple representations of it, or interpret the representations.

IV. Establish Performance Expectations and Formative and Summative Assessments

The foundation of any curriculum is the documentation of exactly what students will learn or be able to do (Saphier, 2018). Both teacher and student should have a clear understanding of what is to be learned, and how mastery of the learning will be evident. The evaluation of the curriculum yields no evidence of the explicit communication of performance expectations related to targeted standards for the unit. Hence, it is recommended that the curriculum explicitly communicate the performance expectations of an identified standard, in its entirety or in portions, for which students should master by the end of each unit. In conjunction with identifying the performance expectations, it would be useful to include a rationale for identifying the types of tasks that should be assigned to elicit evidence of student learning and thinking.

Finally, throughout the learning process, formative assessments provide insight on what students have demonstrated mastery and the extent to which they are prepared to learn moving forward (Boaler,2015). As such, establishing performance expectations in conjunction with assessments for and of learning is another essential element of a high-quality curriculum**.**

Discussion and Conclusion

Curriculum grounded in standards is the foundation for improved student outcomes. It is a priority of the MSDE that all students engage in curriculum, instruction, and assessments that prepares them for postsecondary success. As a result, the Maryland State Board of Education adopted Maryland College and Career Ready Standards. These standards identify what knowledge is measured through state assessments.

It is essential that students in the Anne Arundel County Public School system have access to high-quality curriculum that will prepare them for future success. Anne Arundel Public Schools must revise its current Algebra I curriculum to more clearly align with the fullness of the MCCRS for Algebra I. In doing so, further alignment with the Standards of Mathematical Practice, strategic placement of prior and future learning standards and robust student learning activities will fall into place. Rectifying the alignment concerns identified in this report will produce a more coherent curriculum that will emblematize a commitment to rigor in Algebra I. The MSDE is committed to supporting Anne Arundel County Public Schools in identifying and implementing curriculum and professional learning experiences that is in alignment with state standards and effective practices for curriculum and instruction.

Next Steps

Recent studies have shown that a high-quality curriculum can have a more noticeable impact than other commonly used interventions such as decreasing class size or merit pay for teachers (Steiner, 2018). Beginning with meeting the **Recommendations for Improvement**, such as tighter alignment between all facets of the curriculum (standards, content, objective, assessment, and all ancillary documents and hyperlinks) or ensuring a clear and balanced approach to all aspects of rigor, can make a difference. However, making the necessary revisions toward stronger curricula is only part of the shift necessary to make the greatest impact on student achievement (Steiner, 2018).

What follows must be a coordinated and collaborative partnership between the MSDE and Anne Arundel County Public School leaders throughout the process of making improvement to the Algebra 1 curriculum. The MSDE is committed to supporting Anne Arundel County Public Schools in finding and implementing solutions in a reasonable timeframe. The MSDE will provide resources, tools, and training that supports the improvement and implementation of a high-quality Algebra 1 curriculum.

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Appendix A: K-12 Mathematics Curriculum Vetting Rubric

Key Feature #1: Focus and Rigor Curricular documents explicitly articulate the content and performance expectations for a grade level or course.		
Criteria ***The mathematics curriculum:***	Strengths *Provide specific evidence/examples of commendations*	Challenges or Concerns *Provide specific evidence/examples of areas for improvement*
demonstrates full alignment to the Maryland College and Career Ready Mathematics Standards.		
makes explicit connections between the Standards for Mathematical Practice and the grade-level/ course-level mathematics content standards.		
provides instructional time frames that are appropriate for addressing the expectations for addressing major, supporting, and additional content.		
includes clear evidence that attention is paid to the aspects of rigor (procedural skills, conceptual understandings and ability to apply the targeted mathematics).		

Rating Scale for Key Feature #1 – **Focus and Rigor** (Select a **single** rating that is reflective of the degree to which the criteria are met.)	
4	Exceeds expectations for addressing the criteria for Key Feature #1 (**Exemplary**)
3	Satisfactorily addresses all of the criteria for Key Feature #1 (**Satisfactory**)
2	Addresses only some and/or only inadequately addresses some of the criteria for Key Feature #1. (**Needs Improvement**)
1	Fails to address more than half of the criteria and or/ inaccurately addresses the criteria for Key Feature #1. (**Unsatisfactory**)
Qualitative Summary of Evidence	

Key Feature #2: Coherence The curriculum builds coherence within and across grade levels/courses.		
Criteria ***The mathematics curriculum:***	Strengths *Provide specific evidence/examples of commendations*	Challenges or Concerns *Provide specific evidence/examples of areas for improvement*
deliberately communicates connections between major standards and additional and supporting standards within a course/grade.		
provides information on the vertical progression of targeted mathematics to illustrate how current learning connects to prior and future learning. See: http://mdk12.msde.maryland.gov/instruction/curriculum/mathematics/index.html		

Rating Scale for Key Feature #2 – **Coherence** (Select a **single** rating that is reflective of degree to which the criteria are met.)	
4	Exceeds expectations for addressing the criteria for Key Feature #2. (**Exemplary**)
3	Satisfactorily addresses all of the criteria for Key Feature #2. (**Satisfactory**)
2	Addresses only some and/or inadequately addresses some of the criteria for Key Feature #2. (**Needs Improvement**)
1	Fails to address more than half of the criteria and or/ inaccurately addresses the criteria for Key Feature #2. (**Unsatisfactory**)

Qualitative Summary of Evidence

Key Feature #3: Instructional Supports Curricular documents include instructional support for teachers of mathematics.		
Criteria ***The mathematics curricular documents provide:***	Strengths *Provide specific evidence/examples of commendations*	Challenges or Concerns *Provide specific evidence/examples of areas for improvement*
guidance on which of the available resources best support the teaching and learning of targeted standards, including, when appropriate, the use of technology and media.		
scaffolds and/or other supports (differentiation) that address the needs of special populations (struggling learners, Gifted and Talented, English learner, students with gaps in learning, and students with disabilities).		
strategies for identifying and guidance on correcting common student errors and misconceptions.		

Rating Scale for Key Feature #3 – **Instructional Supports** (Select a **single** rating that is reflective of the degree to which the criteria are met.)	
4	Exceeds expectations for addressing the criteria for Key Feature #3 (**Exemplary**)
3	Satisfactorily addresses all of the criteria for Key Feature #3 (**Satisfactory**)
2	Addresses only some and/or inadequately addresses some of the criteria for Key Feature #3. (**Needs Improvement**)
1	Fails to address more than half of the criteria and or/ inaccurately addresses the criteria for Key Feature #3. (**Unsatisfactory**)
Qualitative Summary of Evidence	

Key Feature #4 Assessment for and of learning Curricular documents provide guidance on how to measure whether students have met specific learning expectations.		
Criteria ***The mathematics curriculum:***	Strengths *Provide specific evidence/examples of commendations*	Challenges or Concerns *Provide specific evidence/examples of areas for improvement*
communicates the performance expectations at the grade/course level related to targeted standards for the unit.		
includes examples of the types of tasks that should be assigned to elicit evidence of student learning/thinking.		
provides guidance for common expectations for formative assessments.		
provides guidance for common expectations for summative assessments.		

Rating Scale for Key Feature #4 – **Assessment for learning and of learning.** (Select a **single** rating that is reflective of the degree to which the criteria are met.)	
4	Exceeds expectations for addressing the criteria for Key Feature #4 (**Exemplary**)
3	Satisfactorily addresses all of the criteria for Key Feature #4 (**Satisfactory**)
2	Addresses only some and/or inadequately addresses some of the criteria for Key Feature #4. (**Needs Improvement**)
1	Fails to address more than half of the criteria and or/ inaccurately addresses the criteria for Key Feature #4. (**Unsatisfactory**)
Qualitative Summary of Evidence	

Appendix B: Mathematics Consensus Report

Directions: Using the Evaluation Rubric, indicate the criteria evidenced across the grade band curriculum.

Key Feature 1- Focus and Rigor for a grade level or course (Check ☑ all that apply.)	**Key Feature 2-** Coherence within and across grade levels/courses (Check ☑ all that apply.)	**Key Feature 3-** Instructional Supports (Check ☑ all that apply.)	**Key Feature 4-** Assessment/Measurability (Check ☑ all that apply.)
☐ **Measurable Alignment:** Curriculum demonstrates full alignment to the Maryland College-and Career-Ready Mathematics Standards.	☐ **Communication of Connecting Standards**: Curriculum deliberately communicates connections between major standards and additional and supporting standards within a course/grade. http://mdk12.msde.maryland.gov/instruction/curriculum/mathematics/index.html	☐ **Resource Guidance:** Curriculum offers guidance on which of the available resources best support the teaching and learning of targeted standards, including, when appropriate, the use of technology and media.	☐ **Clear Performance Expectations**: Curriculum communicates the performance expectations at the grade/course level related to targeted standards for the unit.
☐ **Focus and Connections with standards and practices:** Curriculum makes explicit connections between the Standards of Mathematical Practice and grade level/course mathematics content standards.	☐ **Vertical Progressions:** Curriculum provides information on the vertical progression of targeted mathematics to illustrate how current learning connects to prior and future learning. http://mdk12.msde.maryland.gov/instruction/curriculum/mathematics/index.html	☐ **Evidence of Differentiation:** Curriculum includes guidance for scaffolds and/or other supports that address the needs of special populations (struggling learners, Gifted and Talented, English learner, students with gaps in learning, and students with disabilities).	☐ **Task Types:** Curriculum includes examples of the types of tasks that should be assigned to elicit evidence of student learning and thinking.
☐ **Instructional Time Frame:** Curriculum provides time frames that are appropriate for addressing major, supporting, and additional content.		☐ **Student Errors and Misconceptions:** Curriculum includes strategies for identifying for and guidance on correcting common student errors and misconceptions.	☐ **Formative Assessments:** Curriculum provides guidance for common expectations for formative assessments.
☐ **Aspects of Rigor:** Curriculum includes clear evidence that major topics receive equal attention to conceptual understanding, procedural skills and fluency, and application in problem-solving contexts.			☐ **Summative Assessments:** Curriculum provides guidance for common expectations for summative assessments.

Directions: Using the criteria evidenced above and the Evaluation Rubric notes, provide a synthesis of the strengths and challenges across the curriculum. Be sure to cite specific objective examples for each of the criteria.

Key Feature 1- Focus and Rigor for a grade level or course	**Key Feature 2-** Coherence within and across grade levels/courses	**Key Feature 3-** Instructional Supports	**Key Feature 4-** Assessment/Measurability
Synthesis of Strengths Synthesis of Challenges/Concerns	Synthesis of Strengths Synthesis of Challenges/Concerns	Synthesis of Strengths Synthesis of Challenges/Concerns	Synthesis of Strengths Synthesis of Challenges/Concerns
Select an overall rating for all lessons evaluated for the grade level. ☐ **4-Exemplary** Exceeds expectations for addressing the criteria for each indicator ☐**3- Satisfactory** Satisfactorily addresses all criteria for each indicator ☐**2- Needs Improvement** Addresses only some or all the indicators ☐**1- Unsatisfactory** Fails to address more than half the criteria and/or inaccurately address the indicators	*Select an overall rating for all lessons evaluated for the grade level.* ☐ **4-Exemplary** Exceeds expectations for addressing the criteria for each indicator ☐**3- Satisfactory** Satisfactorily addresses all criteria for each indicator ☐**2- Needs Improvement** Addresses only some or all the indicators ☐**1- Unsatisfactory** Fails to address more than half the criteria and/or inaccurately address the indicators	*Select an overall rating for all lessons evaluated for the grade level.* ☐ **4-Exemplary** Exceeds expectations for addressing the criteria for each indicator ☐**3- Satisfactory** Satisfactorily addresses all criteria for each indicator ☐**2- Needs Improvement** Addresses only some or all the indicators ☐**1- Unsatisfactory** Fails to address more than half the criteria and/or inaccurately address the indicators	*Select an overall rating for all lessons evaluated for the grade level.* ☐ **4-Exemplary** Exceeds expectations for addressing the criteria for each indicator ☐**3- Satisfactory** Satisfactorily addresses all criteria for each indicator ☐**2- Needs Improvement** Addresses only some or all the indicators ☐**1- Unsatisfactory** Fails to address more than half the criteria and/or inaccurately address the indicators

Directions: Synthesizing all of the information collected throughout the evaluation process, list key recommendations for the grade band impacting teaching and learning to be shared with the school system.

Key Feature 1- Focus and Rigor for a grade level or course	**Key Feature 2-** Coherence within and across grade levels/courses	**Key Feature 3-** Instructional Supports	**Key Feature 4-** Assessment/Measurability
Recommendations	Recommendations	Recommendations	Recommendations

This tool has been adapted by the MSDE from the Quality Rubric created by the Tri-State Collaborative (Massachusetts, New York, Rhode Island) – facilitated by Achieve.

Appendix C: Evidence Organizer

Curriculum Vetted:
Grade Level/Grade Band:
Check-in Due Date: MSDE Approved: ☐Yes ☐ Needs revision, resubmit by:
Check-in Due Date: MSDE Approved: ☐Yes ☐ Needs revision, resubmit by:

Key Feature #1: Focus and Rigor *Curricular documents explicitly articulate the content (the MCCRS) and performance expectations (what students should know and be able to do) for a grade level or course.* Overall Rating Assigned by Vetter(s): ☐4 ☐3 ☐2 ☐1	
Summary of Recommendation(s) = Opportunities for Growth from Consensus Report	
Grade Band Claim from Consensus Report (Challenges/Concerns)	**Evidence and/or Examples** from Consensus and Grade-level Findings as a Challenge/Concern
Research-Based Rationale for Opportunities for Growth aligned to each Recommendation	
Summary of Strengths = Areas of Promise from Consensus Report	
Research-Based Rationale for Areas of Promise	

Key Feature #2: Coherence *The curriculum builds coherence within and across grade levels or courses.* Overall Rating Assigned by Vetter(s): ☐4 ☐3 ☐2 ☐1	
Summary of Recommendation(s) = Opportunities for Growth from Consensus Report	
Grade Band Claim from Consensus Report (Challenges/Concerns)	**Evidence and/or Examples** from Consensus and Grade-level Findings as a Challenge/Concern
Research-Based Rationale for Opportunities for Growth aligned to each Recommendation	
Summary of Strengths = Areas of Promise from Consensus Report	
Research-Based Rationale for Areas of Promise	

Key Feature #3: Instructional Supports

Curricular documents include instructional supports for teachers and students of mathematics.

Overall Rating Assigned by Vetter(s): ☐4 ☐3 ☐2 ☐1

Summary of Recommendation(s) = Opportunities for Growth from Consensus Report	
Grade Band Claim from Consensus Report (Challenges/Concerns)	**Evidence and/or Examples** from Consensus and Grade-level Findings as a Challenge/Concern
Research-Based Rationale for Opportunities for Growth aligned to each Recommendation	
Summary of Strengths = Areas of Promise from Consensus Report	
Research-Based Rationale for Areas of Promise	

Key Feature #4: Assessment for and of Learning Curricular documents provide guidance on how to measure whether students have met specific performance expectations. Overall Rating Assigned by Vetter(s): ☐4 ☐3 ☐2 ☐1	
Summary of Recommendation(s) = Opportunities for Growth from Consensus Report	
Grade Band Claim from Consensus Report (Challenges/Concerns)	**Evidence and/or Examples** from Consensus and Grade-level Findings as a Challenge/Concern
Research-Based Rationale for Opportunities for Growth aligned to each Recommendation	
Summary of Strengths = Areas of Promise from Consensus Report	
Research-Based Rationale for Areas of Promise	

Appendix D: Curriculum Vetter and Report Writer Information

Curriculum Vetting Leadership Team

- Tiara Booker-Dwyer, Assistant State Superintendent
- Ed Mitzel, Executive Director of Leadership Development and School Improvement
- Laura Liccione, Coordinator of Academic Improvement
- Tara Corona, Continuous Improvement Specialist
- Anders Alicea, Instructional Transformation Specialist

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- **Susan Corby**

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Cecil County Public Schools

- **Richetta Coelho-Tooley**

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- **Dr. Rachel McGann**

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- **Donna Beeman**

Allegany County Public Schools

- **Amy Siracusano**

Calvert County Public Schools

- **Lisa Sauerwald**

Baltimore County Public Schools

- **Shannon Fuller**

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- **Julie Heltsley**

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- **Tricia Blackman**

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- **Linda Gent**

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Mathematics Curriculum Vetters

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  Baltimore City Public Schools
- **Deborah Mateer**
  Harford County Public Schools
- **Brenda Hommel**
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- **Sherri Stevens**
  Montgomery County Public Schools
- **Theresa Gloyd**
  Retired - Queen Anne's County Public Schools
- **Nicole Paris**
  Frederick County Public Schools
- **Carolyn Thomas**
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- **Brett Parker**
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- **Asha Johnson**
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Curriculum Report Writers

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- Thomas Porter