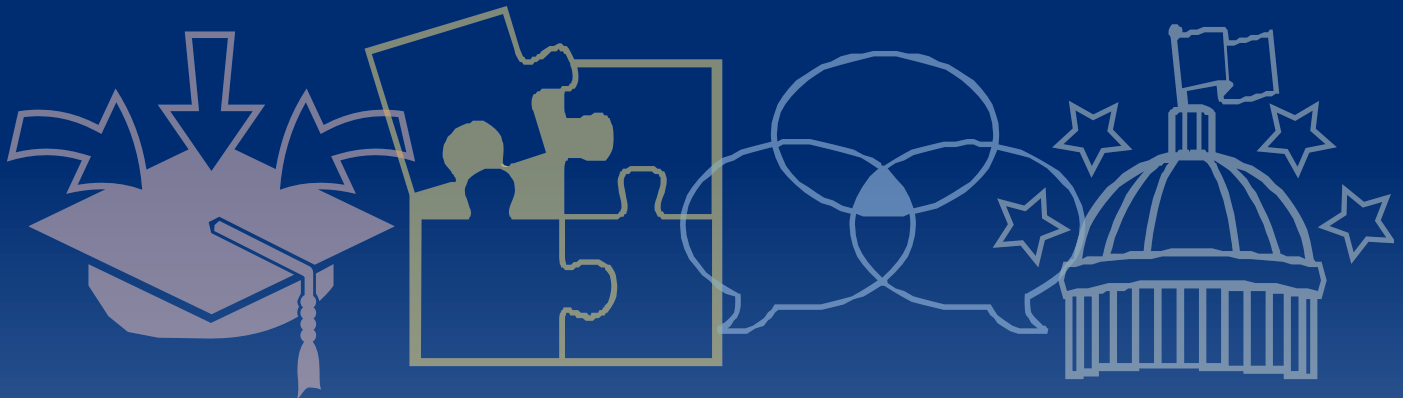# JOHNS HOPKINS

SCHOOL *of* EDUCATION

Institute for Education Policy

ELA Knowledge Map™

CALVERT
EDUCATION

A unique analytic resource enabling policymakers, school leaders, and parents to better understand the strengths and weaknesses of Calvert Education's Grades 3-12 English language arts curriculum.

Winter 2022

The achievement gap is, in large part, a knowledge gap. Compelling research strongly affirms that students' reading levels – particularly from fifth grade onwards – relate deeply to their level of background content knowledge.[i] Students in more affluent systems demonstrate more success in skill-based English language arts (ELA) assessments not only because they are better at "recognizing main ideas," but also because they are far more likely to know more about the subject matter discussed in any given text. Research from around the world shows the same: Most democracies around the world require all schools to teach a standard body of knowledge; and a comprehensive, content-rich curriculum is a signature feature of high-performing education systems. Despite the research record, a large number of the United States' ELA curricula treat texts not as a source of building knowledge, but merely as a site for attempting to hone abstract reading skills.

Determining whether a particular ELA curriculum is "standards aligned" is a helpful step, but it does not tell us about the knowledge-building capacity of that curriculum.[ii] For example: Instructional materials may use publisher-written texts that satisfy the standards-based requirement for "textual complexity," but if the materials fail to offer students a sequenced, knowledge-rich learning experience they miss a critical opportunity to build reading fluency. Merely drilling students on "finding the main idea" will never help them become better readers. Instead, they need to understand what the text is really about - something that can only be achieved by acquiring the background knowledge.

The Johns Hopkins Institute for Education Policy (Institute) has developed the ELA Knowledge Map™, a tool with which to evaluate an ELA curriculum in terms of the knowledge it offers students, both about the world (mainly through nonfiction texts) and about psychology and the human condition (through both nonfiction and fiction texts). The Institute conducts this analysis by "mapping" the knowledge domains implicit in the selection of the documents to be read, while also evaluating each text's quality and the coherence of the unit in which is taught. To measure coherence, we assess the degree to

which supporting materials in a unit amplify and deepen the specific knowledge offered in the anchor text.

Each review generates two visual reports: *Knowledge Heat Maps* and *Unit Coherency Maps*.[1] The maps depict the fields of knowledge opened and those missed, in each grade and cumulatively, and with what quality of texts.

The Knowledge Map™ is a one-of-a-kind analytic resource that enables policymakers, school leaders, and parents to better understand the overall strengths and weaknesses of a given curriculum; instructional leaders to "fill in gaps" that might exist; and publishers to continuously improve the materials they offer the public.

For the present project, the Institute evaluated Calvert Education's ELA curriculum for Grades 3-12 (2018-2019 School Year Edition). Calvert offers a menu of supplementary texts from which to select in each unit. This analysis includes a representative sample and does not cover all possible combinations of texts.

METHODOLOGY

- The Institute maps all items in the evaluated grades on three initial dimensions and at different grain sizes of coverage. For example, a letter by abolitionist Thomas Garrett about Harriet Tubman would be categorized like so:
  - **Domain:** U.S. History to 1865
  - **Topic:** Slavery/Abolition
  - **Subtopics:** Harriet Tubman; Underground Railroad
- The Institute evaluates the quality of every student-facing resource both individually and in the broader context of the unit.
- The Institute constructs a vertical mapping of the knowledge domains at each level, first by grade and then across multiple grades.
- The Institute creates a coverage report that visually illustrates the depth of emphasis a given domain receives across the grades.

HIGH-LEVEL FINDINGS

The Calvert curriculum offers a very strong knowledge-build in American and British Literature; Social and Emotional Knowledge; and Emotions, Being, and Personal Psychology. Calvert's approach to the social sciences is also quite robust, as is its approach to classical literature.

There are omissions in certain arguably key domains and topics: see for example the maps in the visual and performing arts. In addition, some topics within the Diversity and Culturally Relevant domain are unaddressed: few or no texts appear on Native American Experience, Individuals with Disabilities, or the LGBTQIA+ Experience, indicating that the existing texts don't address these domains.

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[1] Unit coherency maps will only be generated if the curriculum materials enable that form of analysis.

Qualitatively, Calvert's high school curriculum shows particularly high average quality scores, with all four achieving ratings of over eighty percent. The higher grades are stronger than the lower grades: 73% for elementary 3-5, and 85% for secondary 6-12. This is significant, as the threshold for high quality is 70%. Some individual units in 6-12 scored above 95%, which is excellent.

A wide variation in proximity scores within units demonstrates an inconsistency in text alignment to the key knowledge-build of specific units. For example, Grade 9's Unit 2 achieved a high-quality score of 93.86%, but the supplemental texts only occasionally support larger knowledge reinforcement. This constitutes a missed opportunity for students to encounter a coherent text set that pulls in the same direction, albeit from different angles.

INSTITUTE RECOMMENDATIONS

Calvert has a long history of providing rich texts and a quality knowledge-build. Our sense is that the pressure to focus upon skill-building in the wake of the Common Core State Standards may have had the unintended consequence of reducing this curriculum's intellectual rigor. We would encourage the publishers, as well as parents and school leaders using Calvert's materials, to:

- Introduce supplemental materials from the visual and performing arts that complement the knowledge build of a given unit;
- Increase the number of texts on Public Institutions in elementary grades;
- Strengthen the knowledge domains in American History & Geography, and World History & Geography; and
- Systematically replace supplemental texts that do not contribute to an overall knowledge build, with high-quality texts that do.

CALVERT QUALITY ASSESSMENT

The quality and coherence of the Calvert curriculum is strong across most evaluated grade levels, but varies within individual grade bands. The chart below demonstrates, by grade level, the percentage difference between the highest unit score and the lowest unit score per grade. In several grade bands – namely, Grades 8, 9, 11, and 12 - this difference is below ten percent, suggesting that these grade levels are consistent in the quality of materials they present to students. In other grade levels, however, the difference reveals more notable discrepancies in quality. Grade 6, for instance, demonstrates a 30.18% difference between the quality scores of its highest and lowest units, indicating that students access resources with a wide variety of quality ratings. In order to improve the overall efficacy of the curriculum, grade bands with high quality differences should be reevaluated to focus on consistent quality and knowledge reinforcement.

Calvert's high school curriculum registers particularly high average quality scores, with all four achieving ratings of over eighty percent. Overall, the curriculum is strong, and many grade levels provide a quality basis for improvement at other levels.

Ten grade levels were evaluated as part of the Calvert curriculum, and eight of them achieved a high-quality rating of over 75%. The highest-rated grade level was Grade 12, with an average quality score of 93.75%, while the lowest was Grade 3, with a score of 70.61%. Grade-specific scores can be seen in more detail below.

Grade	Overall Quality Score	Unit High Score	Unit Low Score	Difference (High-Low)
3	70.61%	83.33%	66.67%	16.66%
4	71.88%	80.25%	62.32%	17.93%
5	76.09%	82.72%	64.29%	18.43%
6	75.96%	87.04%	56.86%	30.18%
7	78.86%	88.10%	73.33%	14.77%
8	89.29%	90.97%	85.96%	5.01%
9	88.58%	93.86%	85.71%	8.51%
10	90.28%	100%	83.81%	16.19%
11	82.68%	85.12%	76.73%	8.39%
12	93.75%	96.67%	90.37%	6.30%

Figure 1. Summary of unit quality scores in Grades 3-12.

CALVERT KNOWLEDGE HEAT MAPS: GRADES 3-5

A critical gateway question covers how much exposure children receive to each important domain of knowledge and topics within them. Each heat map expresses the findings visually using a color-coding scheme, as shown in Figure 2. Lighter blue squares represent fewer knowledge-building texts, such as one or no text; while darker blue squares represent more knowledge-building texts, such as eight or more. The text analysis results for each of the eleven topical domains for Grades K-5 appear in Figures 2-12.

A mere mention of a topic does not necessarily indicate exposure to that topic. The Institute tags a topic only when the text's presentation of it is robust enough for a student to convey specific facts about it. This metric considers the context of age and grade level.

No Text	1 Text	2-4 Texts	5-7 Texts	8+ Texts

Figure 2. Heat map color-coded rating scheme of knowledge building, where lighter blue indicates fewer texts and darker blue indicates a larger number of texts.

Strong Knowledge-Building Domains

The curriculum presents robust knowledge building in several domains and many topics (shown below alphabetically when similarly rated). Strong knowledge-building domains appear in the heat maps as dark blue, indicating many texts address the topic (i.e., the heat map categories of 8+ Texts or 5-7 Texts). Prevalence analysis divides the number of strong heat map ratings on a topic at grade level (i.e., number of darker blue squares) by the entire knowledge domain (i.e., total squares).

Specifically, the knowledge domain of Social-Emotional has the highest prevalence of strong knowledge-building texts, relative to the entire curriculum (n=17 of 27, Figure 3).

Many knowledge domains exhibit patterns of strength in specific topics across grade bands. The first pattern presents large numbers of texts on a topic in 100% of grades (n= 3 of 3) across a band. These include Conflict Resolution, Emotions, and Society (Figure 3). The second pattern presents large numbers of texts across domain topics within an individual grade band. For example, Grade 5 has strong heat map ratings for nearly all topics in the Social-Emotional domain (n=7 of 8, Figure 3). Both patterns demonstrate that students receive regular reinforcement of specific topics throughout their elementary education.
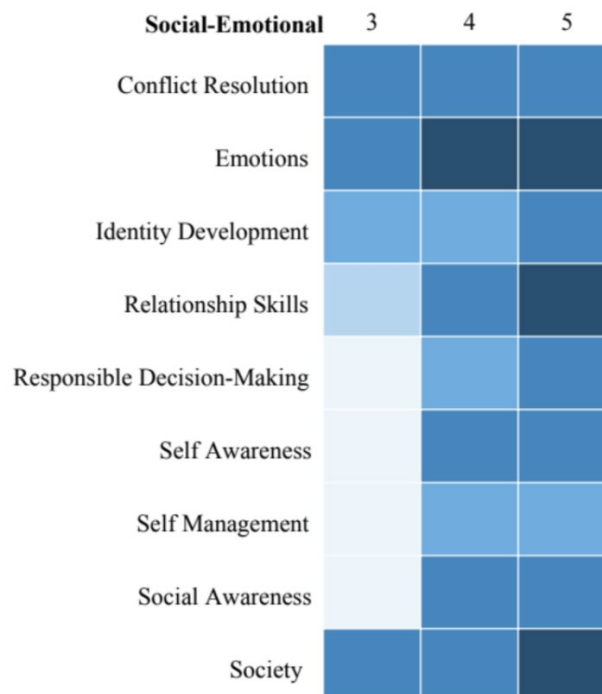
Figure 3. Heat map analysis of the Social-Emotional knowledge domain in Grades 3-5.

Moderate Knowledge-Building Domains

The curriculum presents several moderate knowledge-building domains and topics. Moderate knowledge-building domains appear in the heat maps as mixed blue, indicating few-to-some texts addressing the topic (i.e., the heat map category of 2-4 Texts). Prevalence analysis divides the number of moderate heat map ratings on a subject at grade level (i.e., number of medium blue squares) by the entire knowledge domain (i.e., total squares).

Two knowledge domains present moderate prevalence of knowledge-building texts in all domain topics, relative to the entire curriculum. These domains include: American History & Geography, 13% (n=16 of 126, Figure 6); and Diversity & Culturally Responsive, 57% (n=24 of 42, Figure 13).

Specific patterns of moderate knowledge building arise within specific topics across grade bands. The first pattern presents moderate coverage in topics across grade levels. An example of this pattern includes the African-American Experience (Figure 13). The second pattern presents moderate numbers of texts on a topic within individual grade levels. Examples include Grade 4 in both knowledge domains of American History & Geography (Figure 6) and Diversity & Culturally Responsive (Figure 13). These patterns reveal that moderate knowledge building arises in many topics both within and across grade levels.
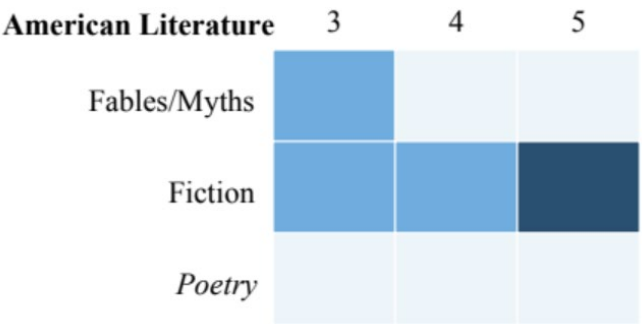
Figure 4. Heat map analysis of the American Literature knowledge domain in Grades 3-5.
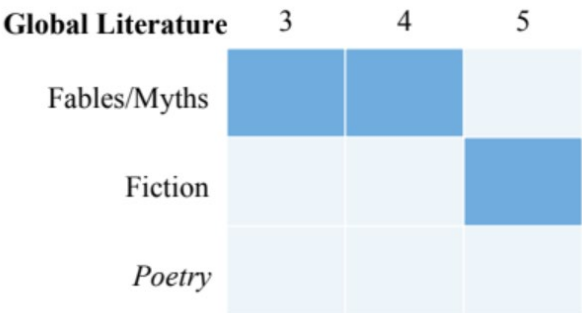

Figure 5. Heat map analysis of the Global Literature knowledge domain in Grades 3-5.

Weak Knowledge-Building Domains

The curriculum presents insufficient or weak knowledge-building in multiple knowledge domains and topics. Weak knowledge-building domains appear in the heat maps as light blue or gray, indicating one or no texts address the topic. The Institute does not perform prevalence analysis on weak domains, because there is not enough data to be meaningful. However, domains with 60% or more of the topics showing no or 1 text are included in the Weak category.

Ten knowledge domains present weak knowledge-building texts in all domain topics. These include American History & Geography (Figure 6); Mathematics (Figure 7); Music & Performing Arts (Figure 8); Public Institutions (Figure 9); Science (Figure 10); Visual Arts (Figure 11); and World History & Geography (Figure 12). Moreover, two knowledge domains - Music & Performing Arts (n=0, Figure 8) and Visual Arts (n=2, Figure 11) - demonstrate an absence of relevant materials at nearly every grade level.

Apart from these overall weak domains, all other knowledge domains have specific weaknesses. One pattern of specific weakness is the absence of texts across grade levels – a pattern that occurs within many domains. For instance, within American Literature, a moderate coverage domain overall, the Poetry

topic contains no texts in any grade (Figure 4). Similarly, many knowledge domains show only a few texts in the entire elementary curriculum, such as Mathematics (Figure 7) and Public Institutions (Figure 9).
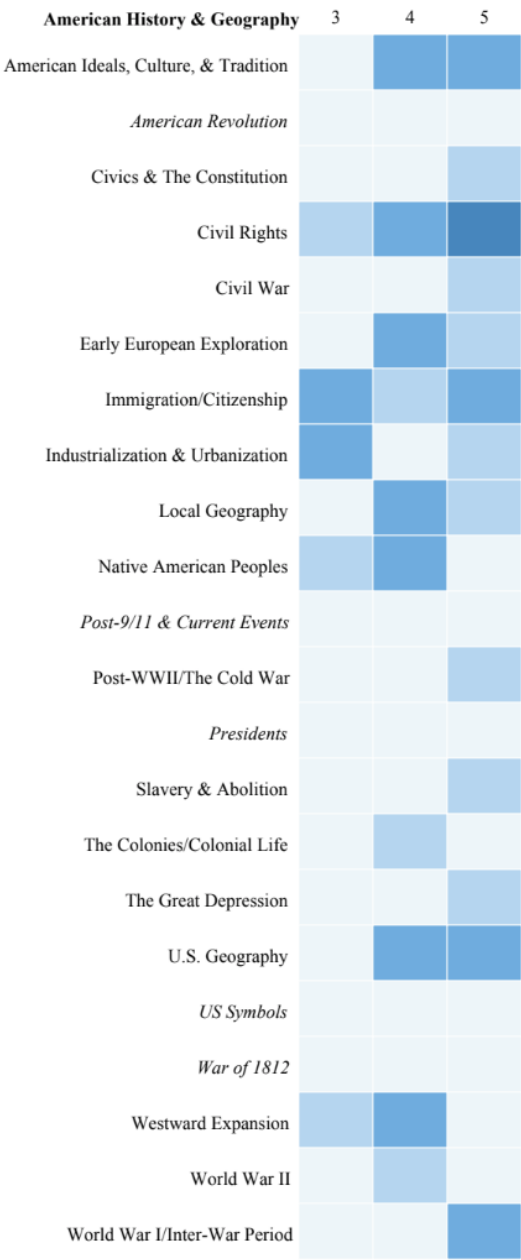

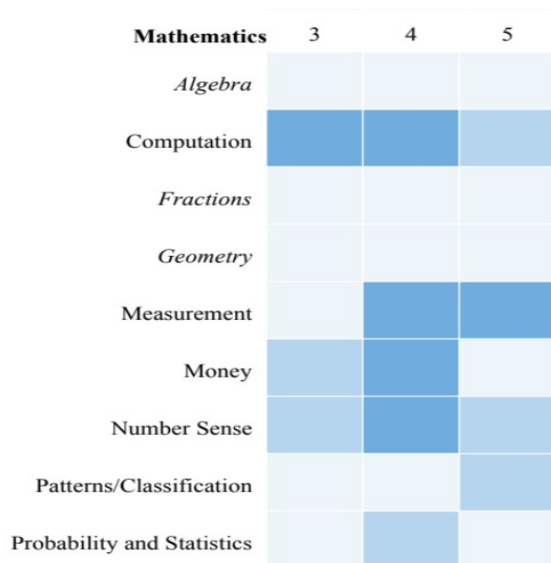*Figure 6. Heat map analysis of the American History & Geography knowledge domain in Grades 3-5.*

Figure 7. Heat map of the Mathematics knowledge domain in Grades 3-5.
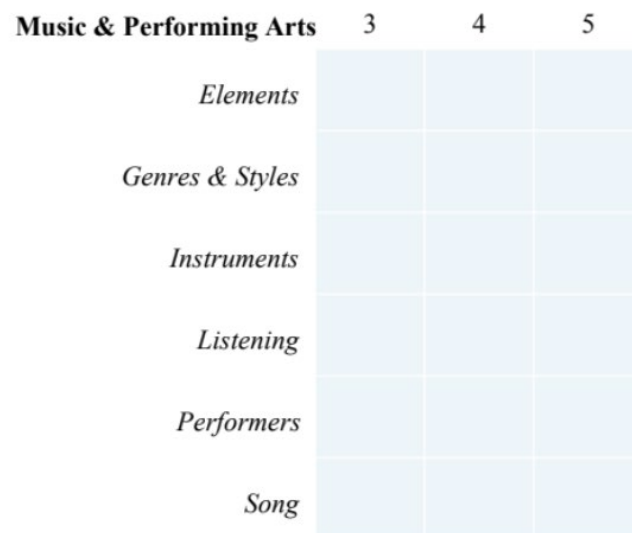

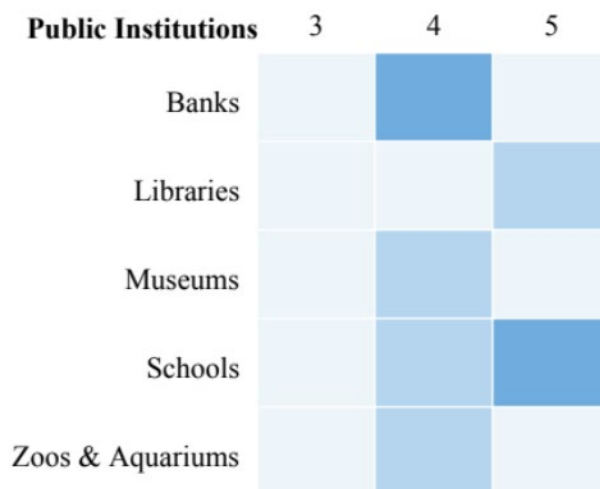Figure 8. Heat map analysis of the Music & Performing Arts knowledge domain in Grades 3-5.

Figure 9. Heat map analysis of the Public Institutions knowledge domain in Grades 3-5.
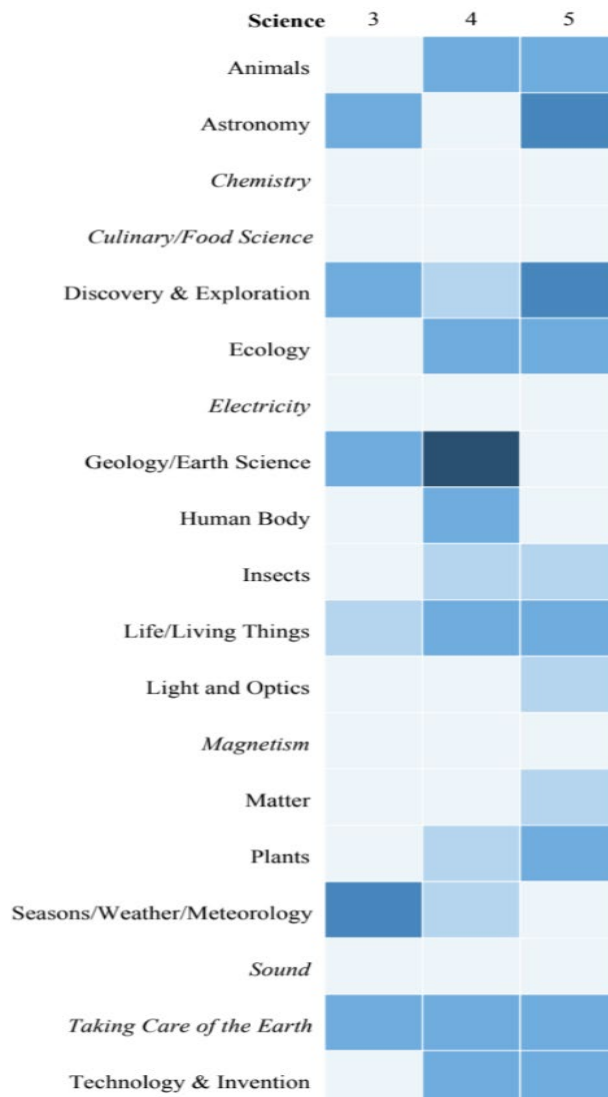
Figure 10. Heat map analysis of the Science knowledge domain in Grades 3-5.
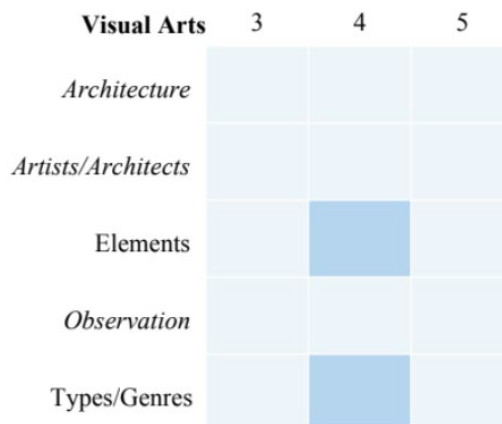
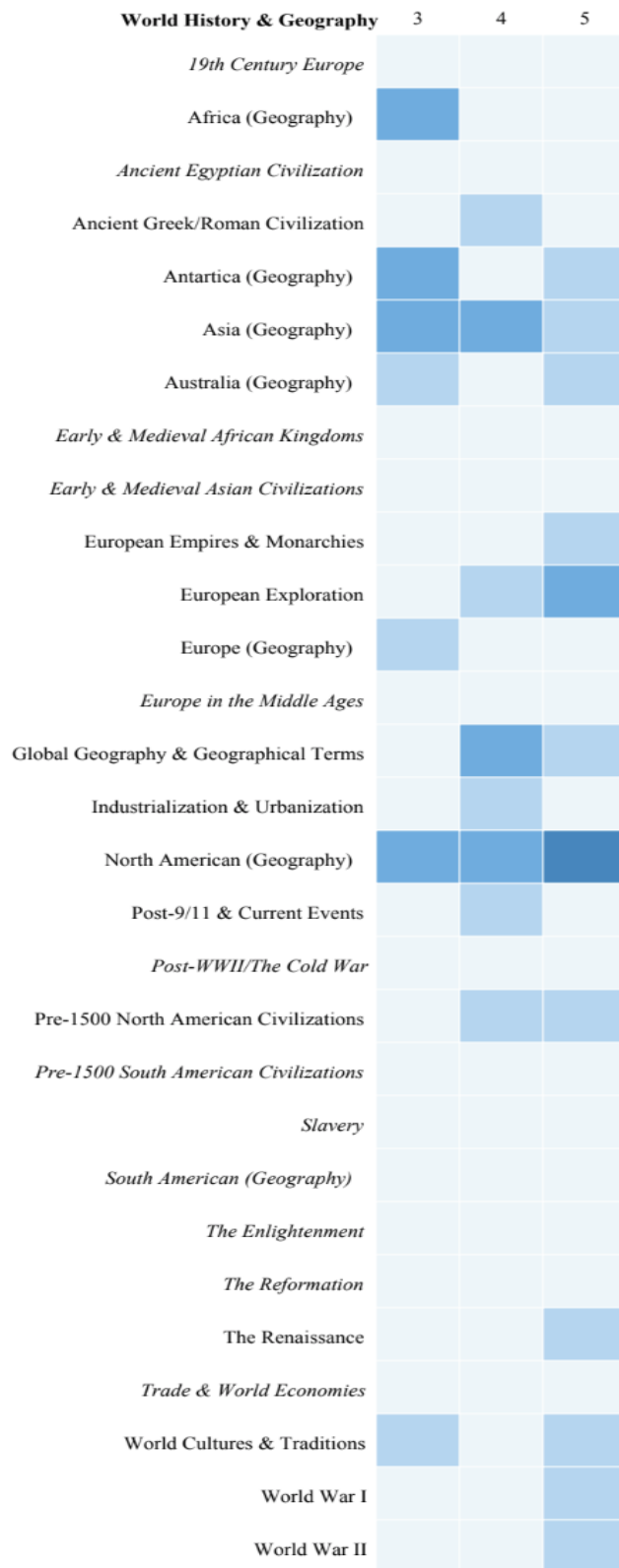*Figure 11. Heat map analysis of the Visual Arts knowledge domain in Grades 3-5.*

Figure 12. Heat map analysis of the World History & Geography knowledge domain in Grades 3-5.

DIVERSITY AND CULTURALLY RESPONSIVE DOMAIN: GRADES 3-5

Culturally relevant texts represent a spectrum of positive, neutral, and negative aspects of a cultural group's experience in the United States. Highly rated, cultural materials illustrate both strengths and challenges relevant to the history and experience of each cultural group. Many reading materials rate as Culturally Relevant, ranging from picture books to documentary films. The Institute reviewed 74 texts for cultural relevance across grades 3-5.

The knowledge domain of Cultural Relevance parses into specific topics of cultural experience shown in Figure 13: African American, Asian American, Immigrant, Individuals with Disabilities, Latinx & Hispanic, LGBTQIA+ Experience, Native American Experience, and World Cultures. Of the entire curriculum, the largest share of Culturally Relevant materials relates to African American Experience and World Cultures. The smallest shares of Culturally Relevant materials relate to Individuals with Disabilities and Latinx & Hispanic Experience, each with one text; and LGBTQIA+, with no texts.

The prevalence and distribution of culturally relevant materials vary across the elementary curriculum. Most grades include culturally relevant materials, depicted as a heat map in Figure 13. Again, dark blue indicates a higher number of texts, and light blue indicates a lower number of texts. Grade 5 contains the fewest culturally relevant texts, with six texts marked Culturally Relevant. Similarly, Grades 3 and 4 each present between eight and ten Culturally Relevant texts.
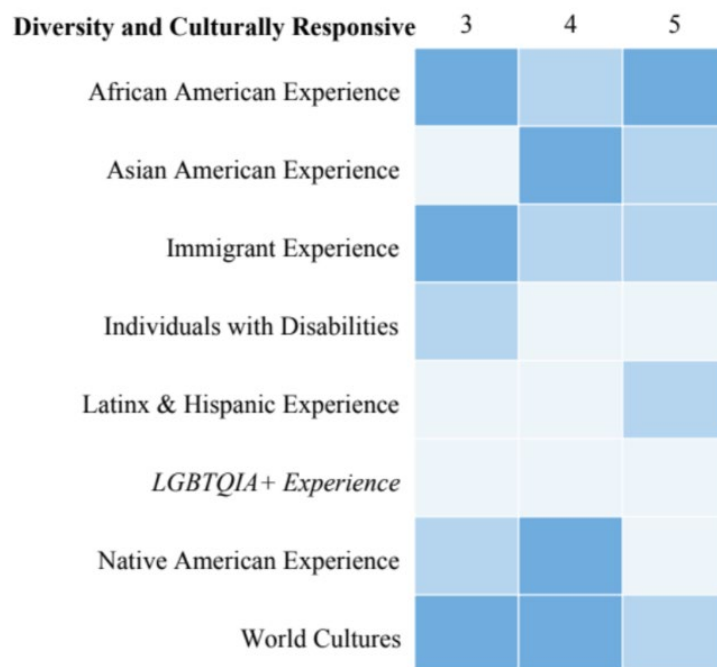

Figure 13. Heat map analysis of the Diversity and Culturally Responsive knowledge domain in Grades 3-5.

Further, the Institute performed a coherence analysis of texts concerning the "Diversity and Culturally Responsive" knowledge domain. The overall unit quality score represents the quality of texts within the units provided by Calvert. The Institute evaluated fiction and nonfiction texts, as well as any additional

materials provided. The text quality score reflects the unit-level review (outlined below in the section entitled "Rubrics for Quality"). Further, the Institute conducted an analysis of the units for coherence using topical tags, shown as proximity graphs for high and low-rated units, respectively, in Figures 13-14.

CALVERT KNOWLEDGE HEAT MAPS: GRADES 6-12

The Institute continued heat map analysis of grades 6-12 using the same criteria and processes as the elementary analysis. Our findings of knowledge-building domains include strong, moderate, and weak ratings. Each heat map expresses the findings visually using a color-coding scheme, as shown in Figure 2 (see page 5). Lighter blue squares represent lesser numbers of knowledge-building texts, and darker blue squares represent greater numbers of knowledge-building texts. The results of text analysis for each of twenty-two topical domains for the 6-12 curriculum appear in Figures 16-56, below. The knowledge domains represent the Institute's interpretation of the Common Core Standards, and therefore, do not include error analysis.

Strong Knowledge-Building Domains

The curriculum presents strong knowledge building in several domains and many topics. Strong knowledge-building domains appear in the heat maps as dark blue, indicating many texts address the topic (i.e., the heat map categories of 8+ Texts or 5-7 Texts). Prevalence analysis divides the number of strong heat map ratings on a topic at grade level (i.e., number of darker blue squares) by the entire knowledge domain (i.e., total squares).

One knowledge domain demonstrates a high prevalence of knowledge-building texts, relative to the entire curriculum: Emotions, Being, & Personal Psychology (n= 87 of 126, or 69%).

Many knowledge domains exhibit patterns of strength in specific topics across grade bands. The first pattern presents large numbers of texts on a topic in 100% of grades (n= 7 of 7) across a band. These include the Human Condition, Relationships, and The Self (Figure 14). The second pattern presents large numbers of texts on domain topics within an individual grade level. For example, Grades 7 and 9 have strong heat map ratings for nearly all topics in Emotion, Being, & Personal Psychology (Figure 14). Both patterns demonstrate that students receive regular reinforcement of specific topics throughout their secondary education.
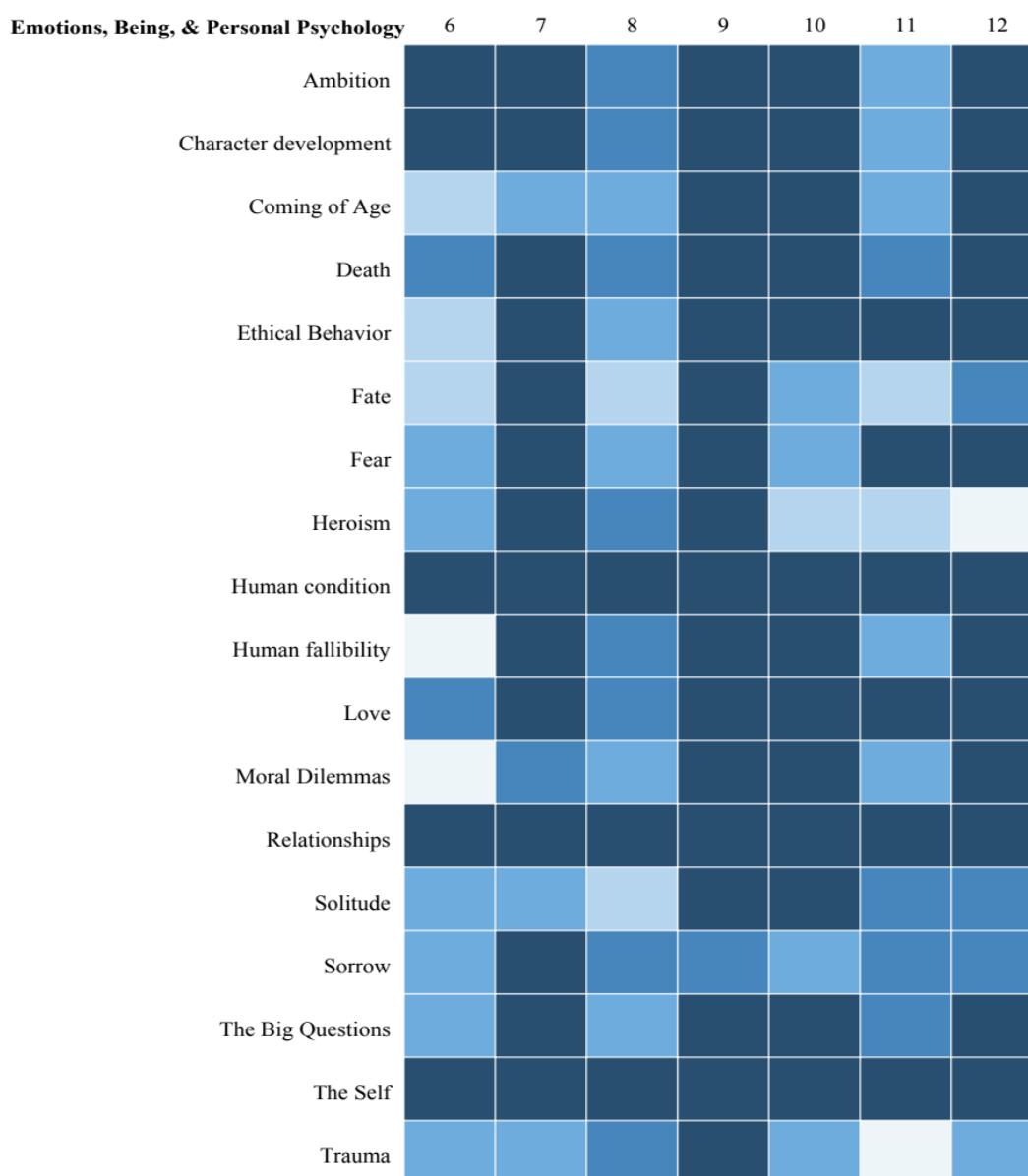
Figure 14. Heat map analysis of the Emotions, Being, & Personal Psychology knowledge domain in Grades 6-12.

Moderate Knowledge-Building Domains

Moderate knowledge-building domains appear in the heat maps as mixed blue, indicating few-to-some texts addressing the topic (i.e., the heat map category of 2-4 Texts). Prevalence analysis divides the number of moderate heat map ratings on a topic at grade level (i.e., number of medium blue squares) by the entire knowledge domain (i.e., total squares).

Analysis presents four knowledge domains notable for moderate prevalence of texts in all domain topics, relative to the entire curriculum. These domains include both American Literature (n=30 of 91 or 33%, Figure 15) and Social Sciences (n=92 of 210 or 44%, Figure 16).

Many domains exhibit specific patterns of moderate knowledge building within specific topics across grade bands. The first pattern presents moderate or vigorous coverage in at least six of the seven secondary grade levels. Examples of this pattern include Post-WWII & Contemporary in American Literature (Figure 15); and Community, Family, and Individual, State, Society in Social Sciences (Figure 16). The second pattern presents as moderate or strong numbers of texts on a specific topic within individual secondary grade levels. Examples include Grade 11 American Literature (Figure 15); and Grades 9, 11, and 12 in Social Sciences (Figure 16). These patterns reveal that moderate knowledge building arises in many topics across several domains.
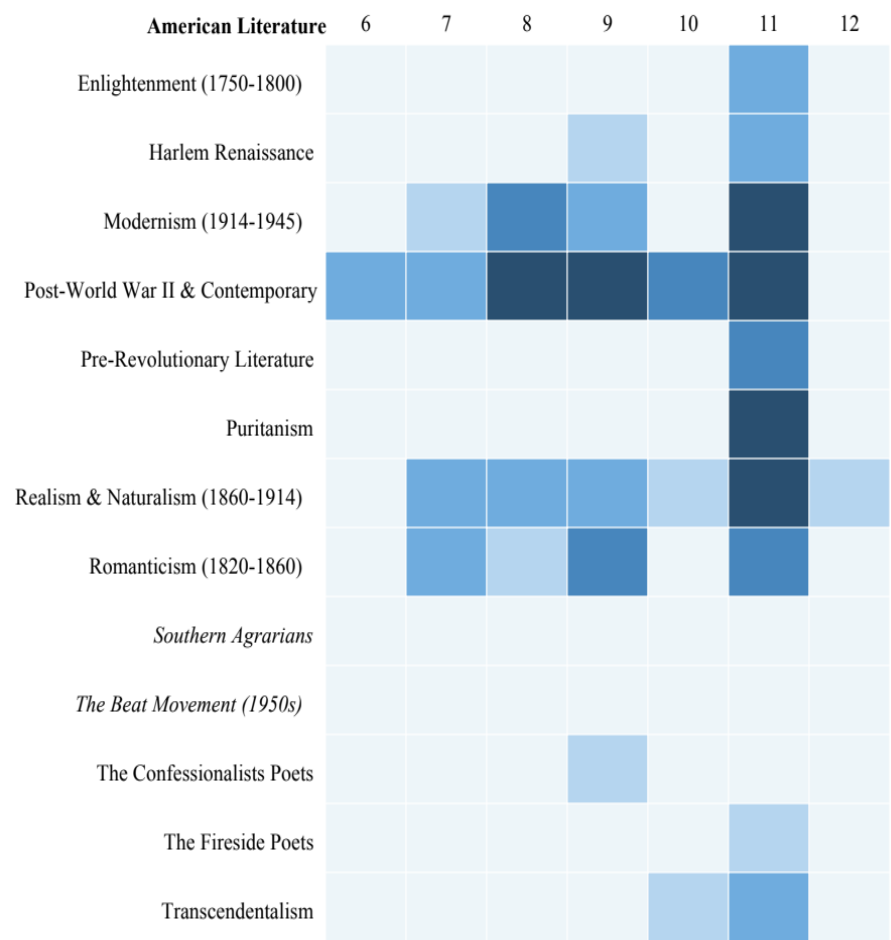
Figure 15. Heat map analysis of the American Literature knowledge domain in Grades 6-12.
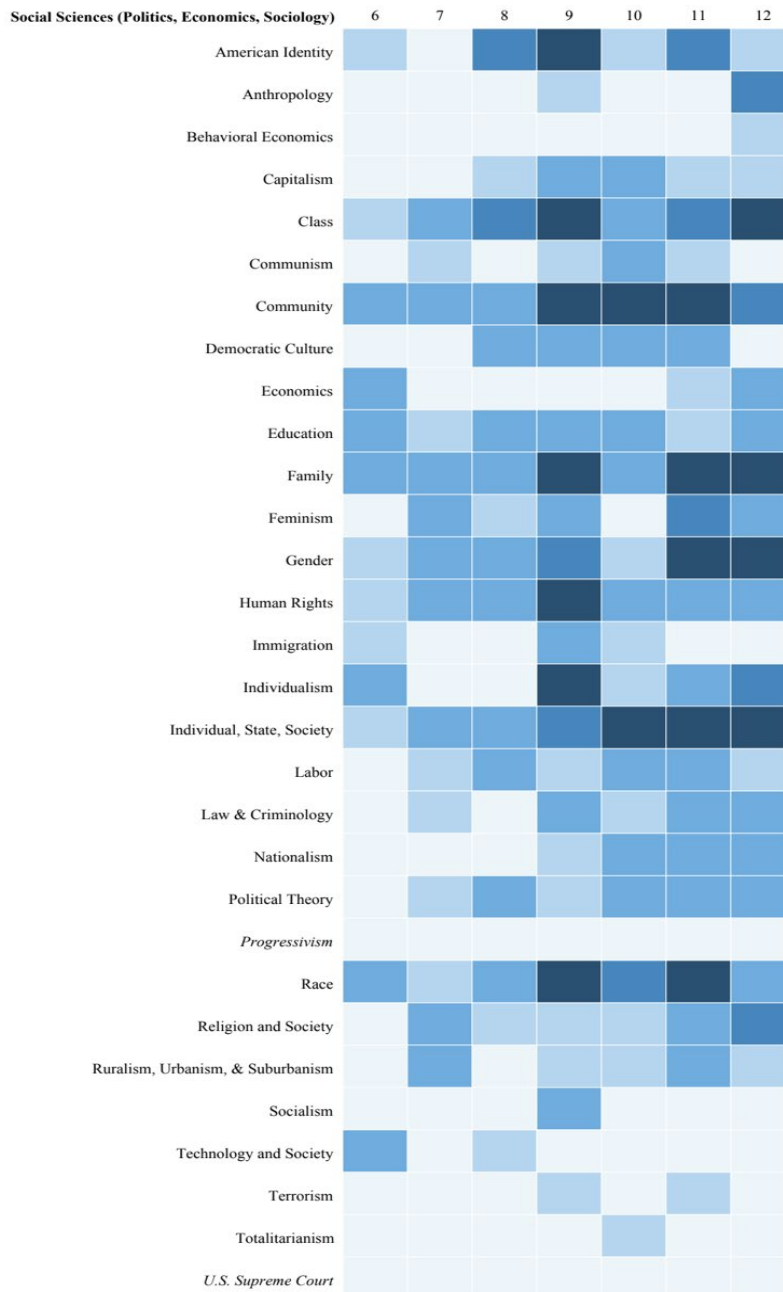
Figure 16. Heat map analysis of the Social Sciences (Politics, Economics, Sociology) knowledge domain in Grades 6-12.

Weak Knowledge-Building Domains

The curriculum presents insufficient or weak knowledge-building in multiple knowledge domains and topics. Weak knowledge-building domains appear in the heat maps as light blue, indicating no texts address the topic. We do not perform prevalence analysis on weak domains because there is not enough data to be meaningful.

Nineteen of the curriculum's twenty-one knowledge domains achieved weak overall ratings. Namely, these domains include British Literature (Figure 17); Earth, Life, and Medical Sciences (Figure 18); Global Literature (Figure 19); Literary Genres (Figure 20); Mathematics (Figure 21); Media (Figure 22); Music, Art, Architecture (Figure 23); Philosophy Proper (Figure 24; Physical Sciences (Figure 25); Religion (Figure 26); Technology (Figure 27); U.S. Geography (Figure 28); U.S. History Since 1865 (Figure 29); U.S. History to 1865 (Figure 30); World Geography (Figure 31); World History Since 1600 (Figure 32); and World History to 1600 (Figure 33). Three of these domains present a nearly complete absence of texts at every grade level. These domains include Mathematics (Figure 21), Media (Figure 22), and Music, Art, & Architecture (Figure 23).

Additionally, all knowledge domains have specific weaknesses. One notable pattern is the absence of texts across grade levels – a pattern that appears frequently. Within the moderate coverage domain of Social Sciences, the topics of Behavioral Economics, Progressivism, and Terrorism contain only four texts in all grades (Figure 16). Similarly, many topics present no texts in the entire Secondary curriculum. These include the U.S. Supreme Court topic in the Social Sciences domain (Figure 16) and several topics within the American Literature domain (Figure 15).
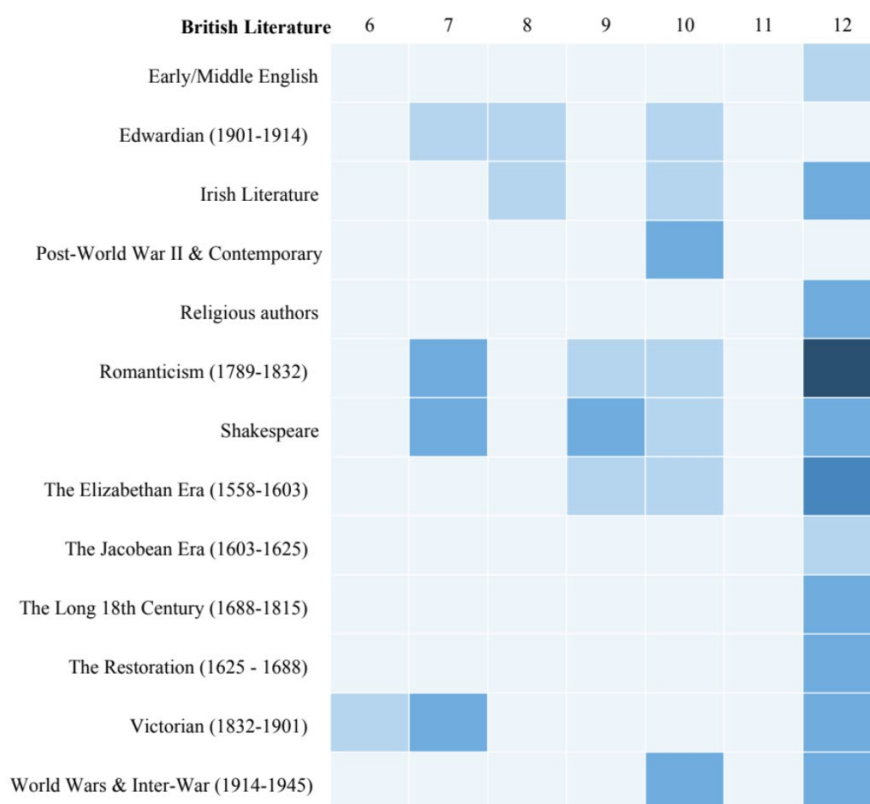

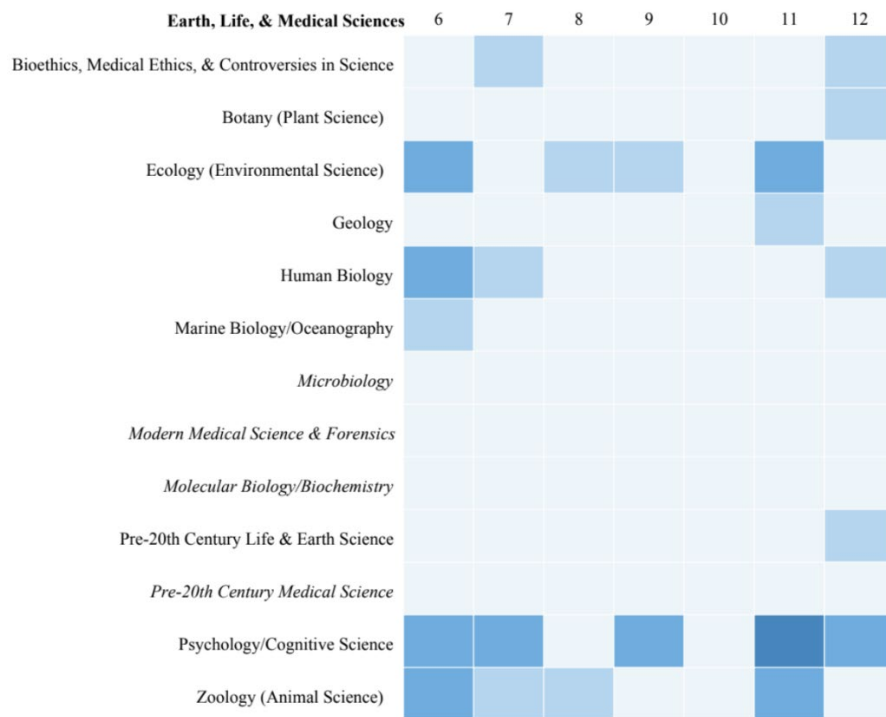*Figure 17. Heat map analysis of the British Literature knowledge domain in Grades 6-12.*

Figure 18. Heat map analysis of the Earth, Life, and Medical Sciences knowledge domain in Grades 6-12.

Figure 19. Heat map analysis of the Global Literature knowledge domain in Grades 6-12.
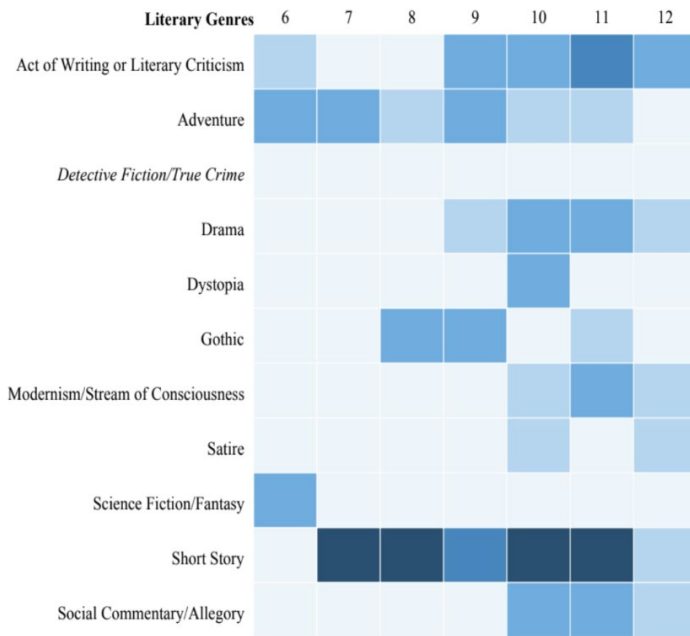
Figure 20. Heat map analysis of the Literary Genres knowledge domain in Grades 6-12.

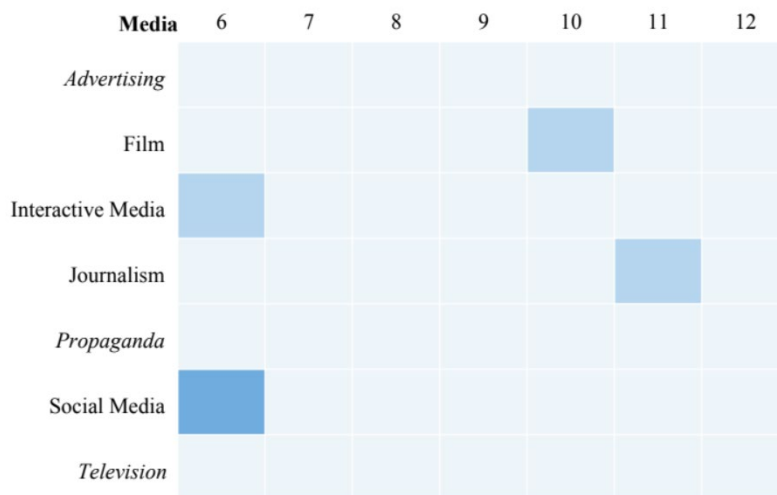Figure 21. Heat map analysis of the Mathematics knowledge domain in grades 6-12.

Figure 22. Heat map analysis of the Media knowledge domain in Grades 6-12.
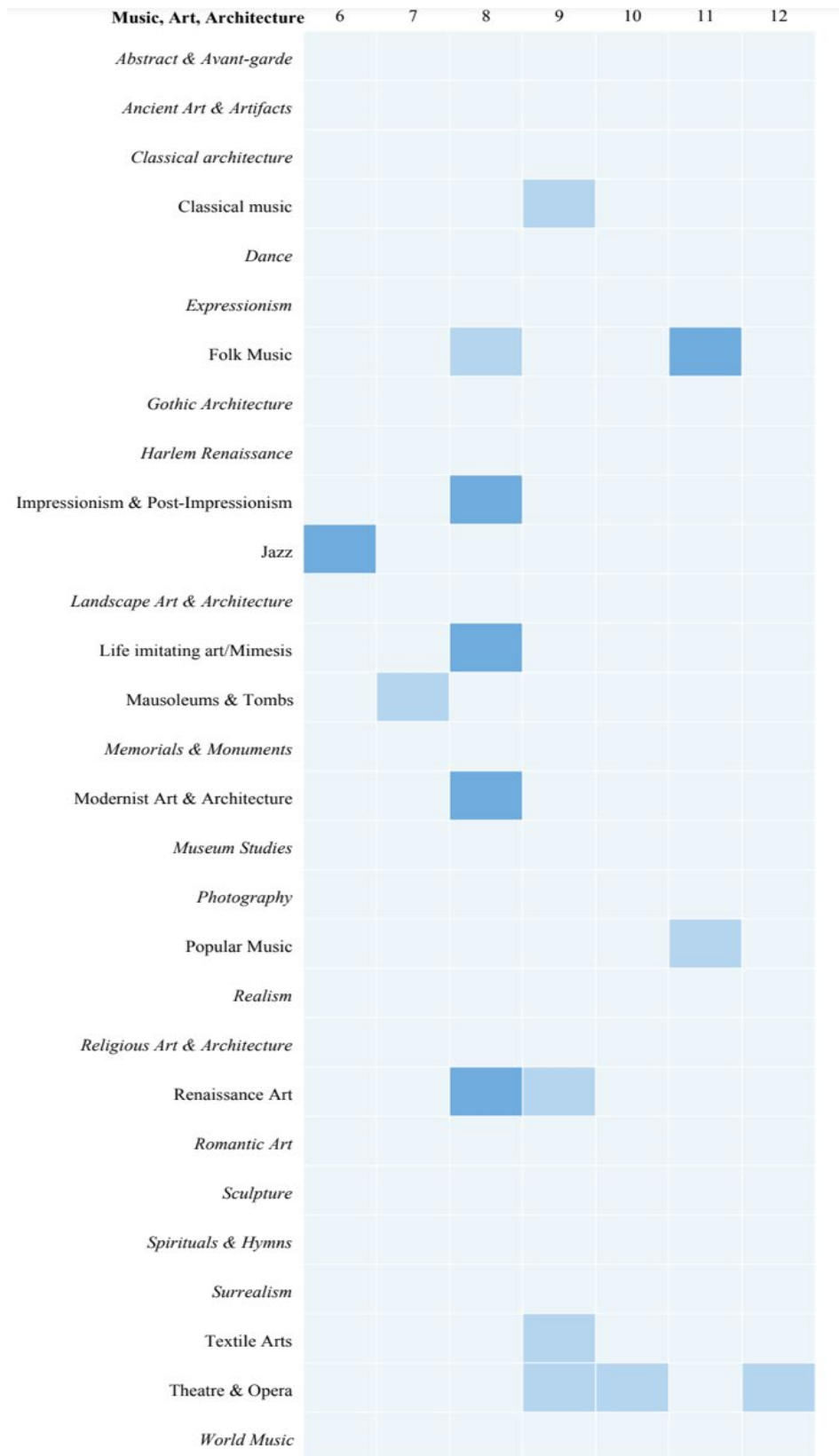
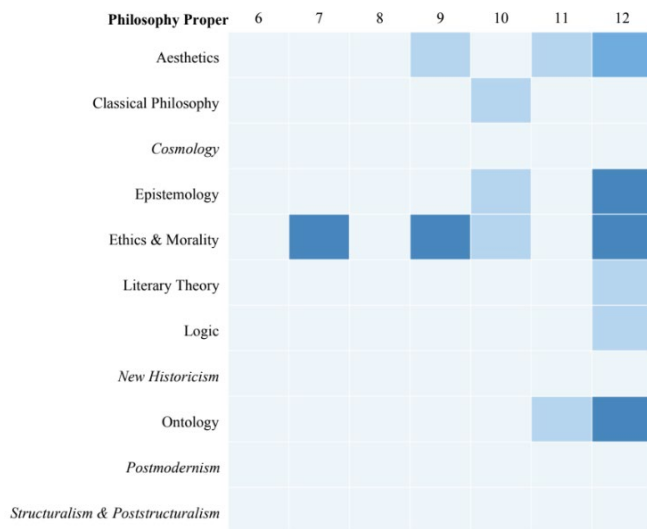Figure 23. Heat map analysis of the Music, Art, Architecture knowledge domain in Grades 6-12.

Figure 24. Heat map analysis of the Philosophy Proper knowledge domain in Grades 6-12.
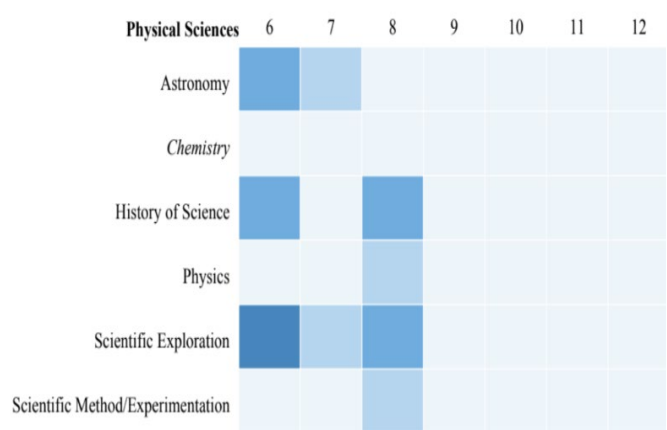

Figure 25. Heat map analysis of the Physical Sciences knowledge domain in Grades 6-12.
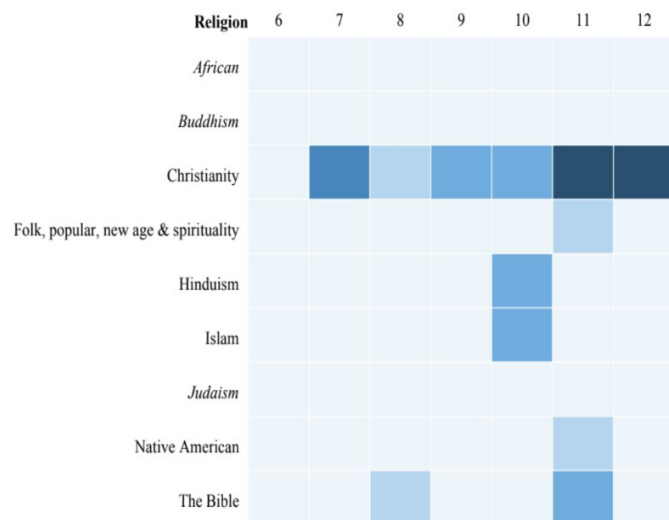

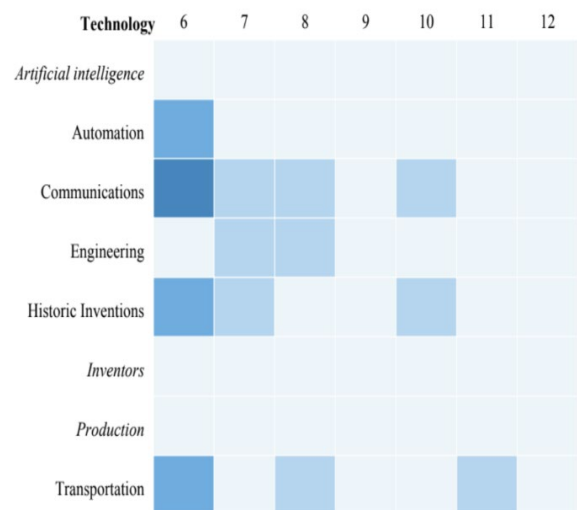Figure 26. Heat map analysis of the Religion knowledge domain in Grades 6-12.

Figure 27. Heat map analysis of the Technology knowledge domain in Grades 6-12.
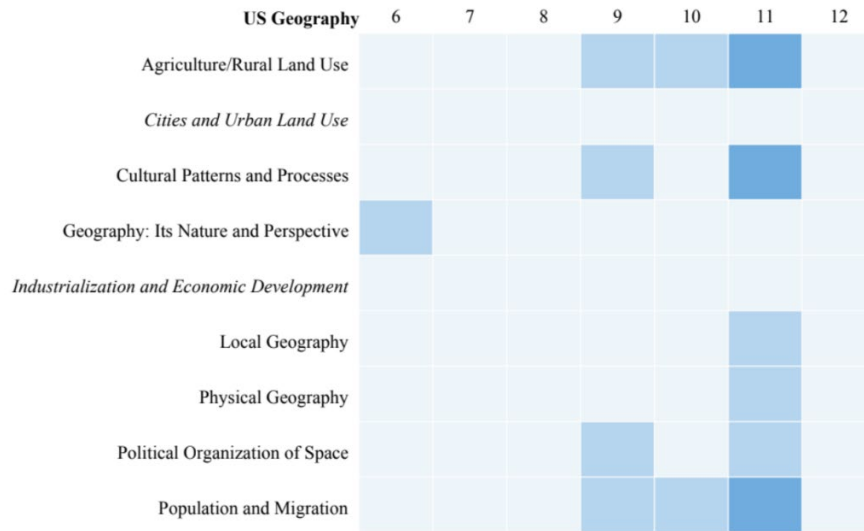
Figure 28. Heat map analysis of the US Geography knowledge domain in Grades 6-12.
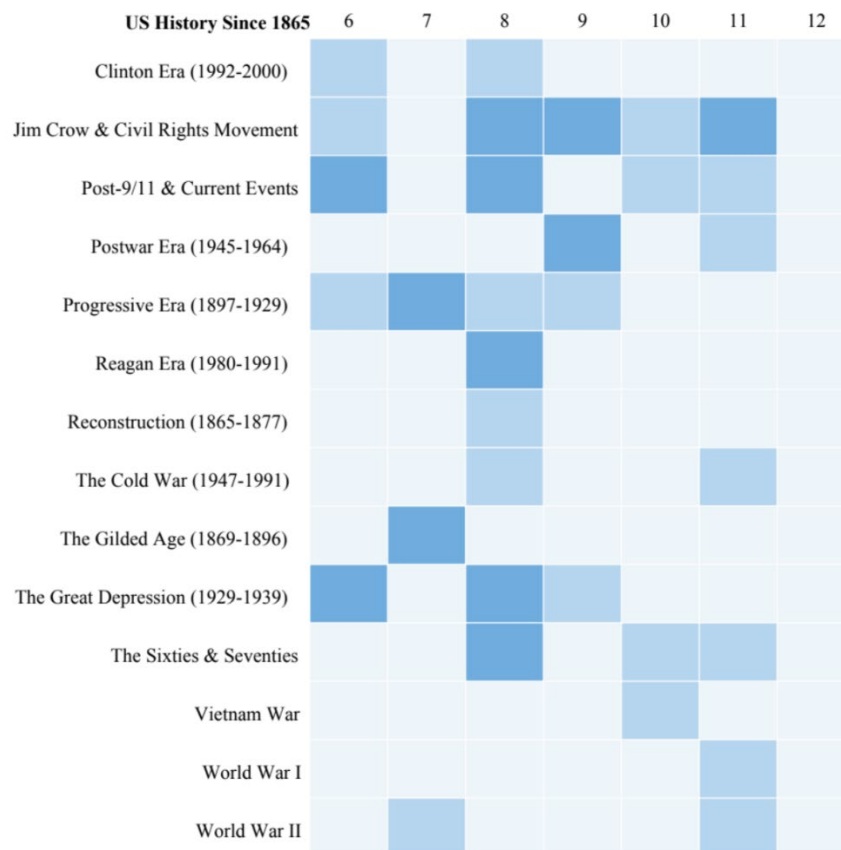

Figure 29. Heat map analysis of the US History Since 1865 knowledge domain in Grades 6-12.
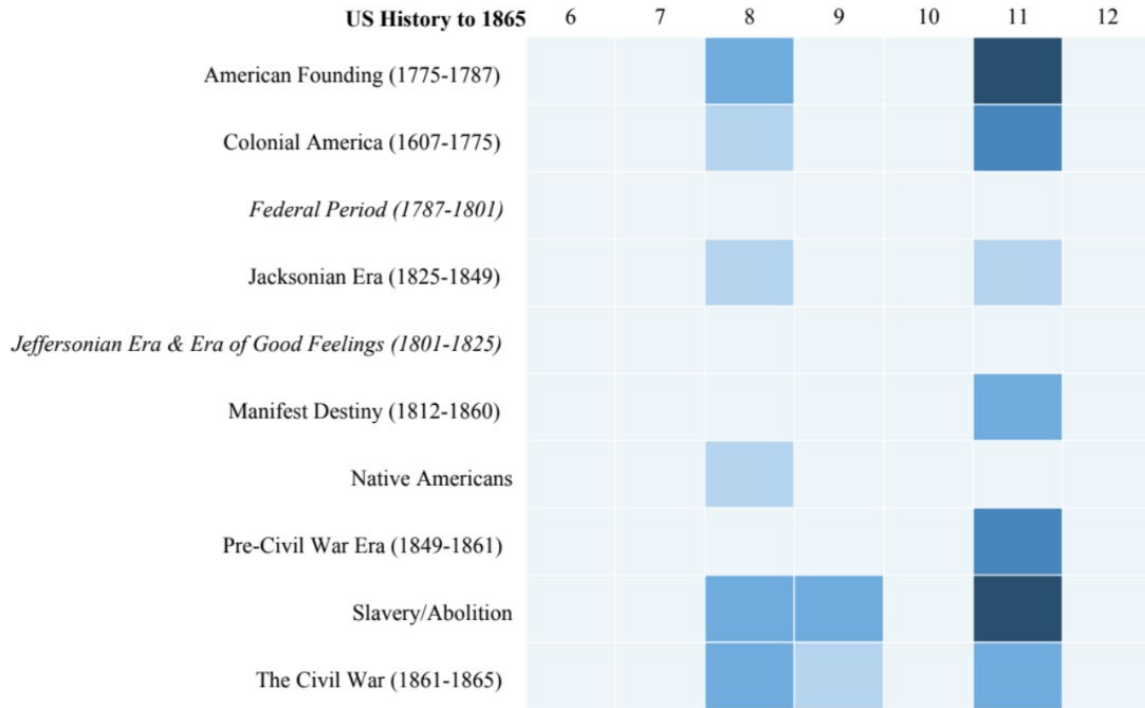
Figure 30. Heat map analysis of the US History to 1865 knowledge domain in Grades 6-12.
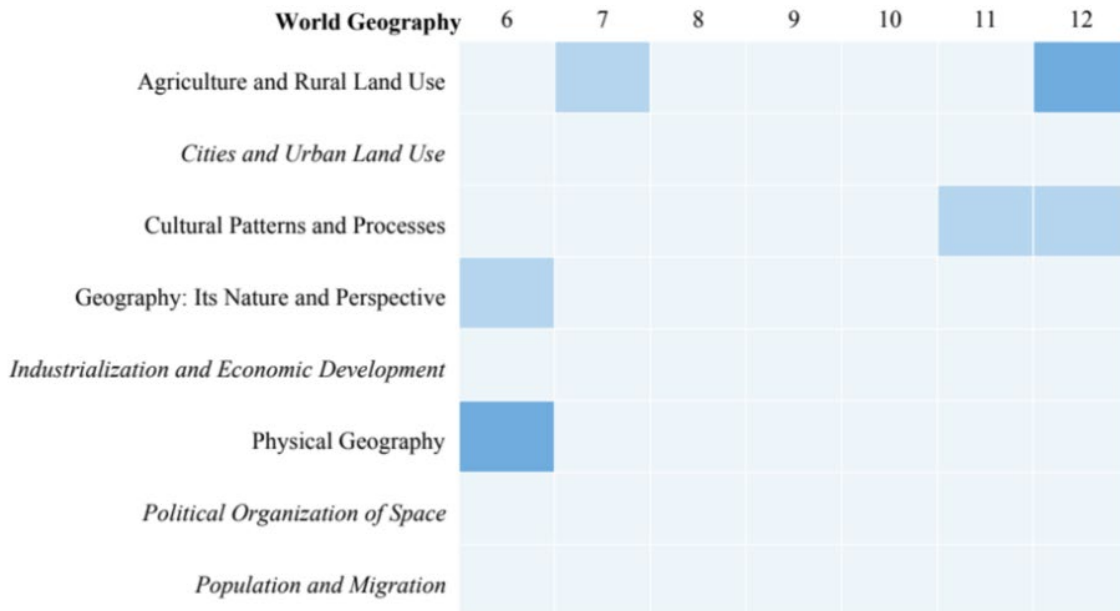

Figure 31. Heat map analysis of the World Geography knowledge domain in Grades 6-12.
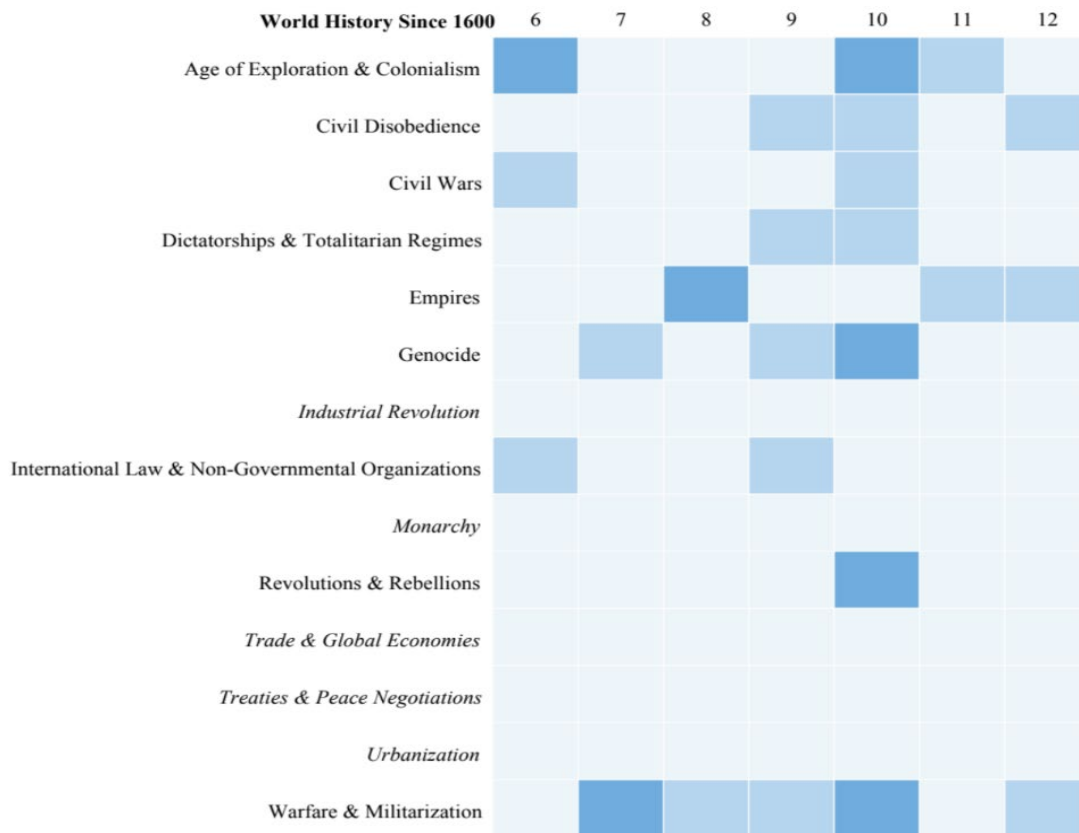
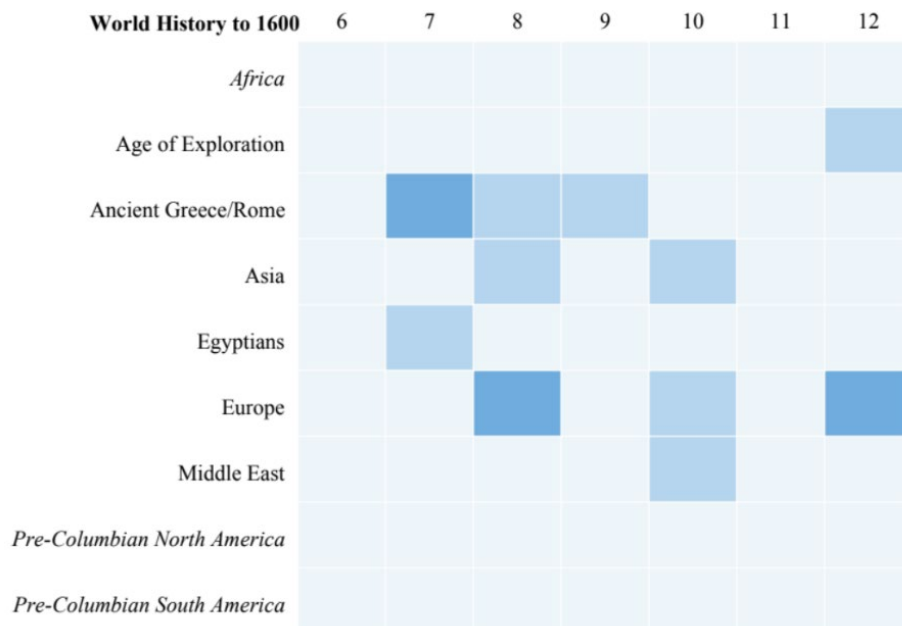*Figure 32. Heat map analysis of the World History Since 1600 knowledge domain in Grades 6-12.*

Figure 33. Heat map analysis of the World History to 1600 knowledge domain in Grades 6-12.

DIVERSITY AND CULTURALLY RESPONSIVE DOMAIN: GRADES 6-12

Culturally Responsive texts represent a spectrum of positive, neutral, and negative aspects of a cultural group's experience in the United States. Highly rated, cultural materials illustrate both strengths and challenges relevant to the history and experience of each cultural group. The types of reading materials that rate as Culturally Responsive range from picture books to documentary films. The Institute reviewed 38 texts for diversity and cultural responsiveness across grades 6-12.

The knowledge domain of Culturally Responsive parses into specific topics of cultural experience shown in Figure 34 and includes African American, Asian American, Immigrant, Individuals with Disabilities, Latinx & Hispanic Experience, LGBTQIA+ Experience, Native American Experience, and World Cultures.

Overall, this is a weak knowledge-building domain in the Calvert curriculum. Of the entire curriculum, the largest share of Culturally Responsive materials relates to World Cultures (n=29 of X, followed closely by African American Experience (n=24 of X); then Asian American Experience (n=12 of x); Immigrant Experience, (n=11 of X); Native American Experience (n=3 of X); Latinx & Hispanic Experience, (n=3 of X); and Individuals with Disabilities (n=3 of X). The curriculum presents no texts related to the LGBTQIA+ Experience topic.

The prevalence and distribution of culturally responsive materials vary across the secondary curriculum. Most grades include relevant materials, depicted as a heat map in Figure 34. Again, dark blue indicates a higher number of texts, and light blue indicates a lower number of texts. Grade 8 contains the fewest culturally relevant texts, with only one text marked Culturally Responsive. Of grades with relevant texts, Grade 9 possesses the highest number of Culturally Responsive materials, touching on five of the knowledge domain's eight topics.
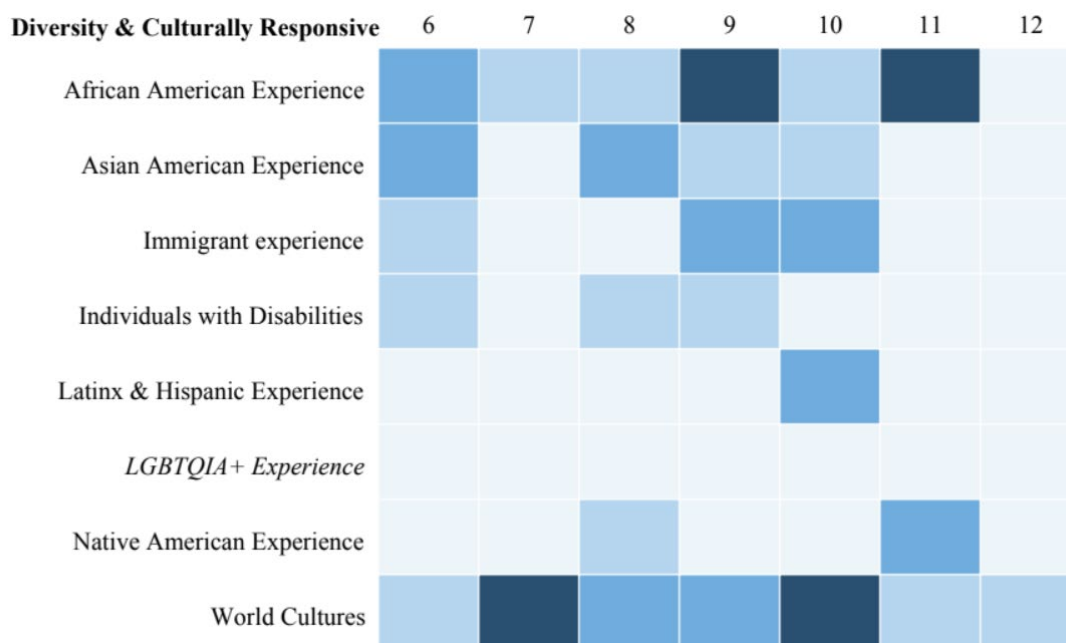

Figure 34. Heat map analysis of the Diversity and Culturally Responsive knowledge domain in Grades 6-12.

CALVERT QUALITY AND COHERENCE

As mentioned previously, the Institute's analysis includes tagging each text for the knowledge domains, topic, and subtopics that it reinforces. The Institute expanded upon the Heat Map analysis and evaluated each text for quality, according to the rubrics below. In addition, the Institute also applies a coherency score that rates how well the materials within a unit reinforce the overall knowledge build, as described in more detail below.

The findings of quality and coherence vary and are not linked. For instance, a unit may score high in overall quality, shown as a percentage, but may still have a low coherence score in terms of how well the texts reinforce the knowledge introduced in the unit. In other words, units with high overall quality scores may only weakly reinforce central themes through additional materials. The converse is also possible, where a unit scores low for overall quality but presents moderate or strong reinforcement of the unit's topics.

Rubrics for Quality

The Institute applied three rubrics for analysis of text quality: a fiction rubric, a nonfiction rubric, and a literary nonfiction rubric. All three rubrics consider content knowledge and language. Fiction and literary nonfiction (nonfiction material presented in a book-length format) include additional factors relevant to the genres, such as emotion, prominence of the work, and eternal questions. Nonfiction does not consider these factors, instead focusing on the accuracy and quality of the source. Within the literary nonfiction rubric, these factors reside within the 'prominence' category.

Fiction and Literary Nonfiction (Total of 15 possible Points)

Emotion: Emotion is the degree to which the text is memorable due to its impact upon the reader's affect (e.g., Shakespeare's *Romeo and Juliet*, and Morrison's *The Bluest Eye*).

Language: The degree to which the text contains outstanding language and derives from several factors, including:

- Clarity (Baldwin's *The Fire Next Time*, and Austen's *Emma*)
- Appeal to the imagination (Tolkien's *The Lord of the Rings*)
- Sophisticated capacity at multiple levels, including: cultural, social, metaphorical, and/or theological (Achebe's *Things Fall Apart*, Dante's *Divine Comedy,* de Cervantes' *Don Quixote,* and Morrison's *The Bluest Eye).*

Eternal questions: Eternal questions form a category about which the text addresses perpetual issues of the human condition, such as: private and public ethics, obedience to the State, family allegiance, meaning and purpose (e.g., Sophocles' *Antigone,* and Camus's *The Stranger*).

Content knowledge: Content knowledge is the degree to which text builds students' background knowledge about the world (e.g., Erdrich's *Birchbark House* in elementary school, and Austen's *Pride and Prejudice* in secondary school).

Prominence: Prominence represents the degree to which a text is widely known. Several factors determine a text's prominence, including:

- Longevity: Degree to which the text has entered the American literary canon, meaning that the

text remains widely read after at least 50 years since first publication (e.g., Steinbeck's The Grapes *of Wrath* or Thoreau's *Walden*)
- Current prominence: Degree to which the text is a contemporary classic, meaning that American schools widely read the text (e.g., Cisneros's *Last House on Mango Street* or Satrapi's *Persepolis*)
- Awards: Degree to which critics recognize the text as outstanding, such as the Nobel Prize in Literature, Booker Prize, John Newberry, Man Booker Award, PEN/Faulkner Award for Fiction, Pulitzer Prize, the Coretta Scott King awards, or Pura Belpre Awards. More examples of critical literary acclaim linked here.
- Accuracy & Source: For literary nonfiction, accuracy and source quality concern the verifiable factual basis for the information and the bias profile of the source.

Nonfiction (Total of 12 Possible Points)

Accuracy: Accuracy is the degree to which the text is empirically accurate.

Source quality: Source quality is the degree to which text comes from a high-caliber source. The Institute assigned an initial numerical value to news sources and added quality scores upon encountering new sources. (For relevant links, click here.)

Language: Language as a category represents the degree to which the text is well written and presents its subject matter.

Content knowledge: Content knowledge as a category is the degree to which the text effectively builds background knowledge of the topic or subtopic at hand.

Coherence Analysis

Finally, the Institute generates *Unit Coherence Maps* that illustrate the extent to which the materials reinforce the knowledge built within that unit, measured through shared topical tags.

The Unit Coherence map utilizes a hub and spoke visual, where the unit name appears in the central square and the surrounding squares represent the unit's additional materials. The percentage shown on each outer square represents the percentage of shared topics weighted against the total number of shared topics within a unit. The more often a topic is shared within a unit, the higher the percentage for each text including that topic; similarly, less frequent topics will result in a lower percentage for each text. The proximity of each spoke to the central unit square visually represents this relationship. Additionally, the upper right corner of the graphic presents the overall unit coherence score. This score averages the coherency percentages of all texts within a given unit, but also includes a .5% penalty for each domain that is not shared by any supporting materials.

CALVERT UNIT COHERENCE FINDINGS: GRADES 3-12

The quality and coherence findings for each grade level follow in the sections below. This report highlights the highest- and lowest-quality units for each grade and provides a discussion of knowledge reinforcement within those units. The caption below each graphic provides an average quality score for all texts contained in the unit. The Institute considers a unit or text high quality if it achieves a score of 70% or above. A unit or text rated below 60% is poor quality, and one between 60% and 69% is acceptable. The caption also includes a unit's Coherency Score. Because the score depends on the number of shared topics within a unit, what constitutes a strong Coherency Score will vary from unit to unit.

Grade 3

Grade 3 receives an overall quality score of 70.61%, placing it in the high-quality band.

Highest-Rated Unit

5 Qualitative Score: 83.33 %

5 Coherence Score: 98.8 %

Potential Total Score: 101.3% / Isolated Domain Penalty: -2.5% / 98.8% Final Coherence Score

Figure 35. Proximity map of grade 3, Unit 5. The average unit score for text quality is 83.33%. The final coherence score is 98.8%.

Lowest-Rated Unit

Unit 3 is the lowest-rated unit at this grade level, with an average text quality score of 66.67%. Coherence analysis indicates strong knowledge reinforcement, as shown in the figure below. The unit achieves an overall coherence score of 77.5%, suggesting that the materials within it contribute to

broader topical coverage. Though the presence of isolated knowledge domains levied a penalty against the unit score, the similarities between texts still contribute to a strong instructional build overall.
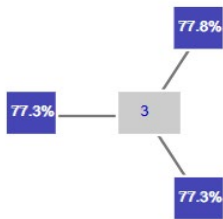
3 Qualitative Score: 66.67 %

3 Coherence Score: 77.5 %

Potential Total Score: 78.5% / Isolated Domain Penalty: -1% / 77.5% Final Coherence Score

Figure 36. Proximity map of Grade 3, Unit 3. The average unit score for text quality is 66.67%. The final coherence score is 77.5%

Grade 4

Grade 4 receives an overall quality score of 71.88%, placing it in the high-quality band.

Unit 3 is the highest-quality unit at this level, with an overall average text quality score of 80.25%. Coherence analysis suggests weak-to-moderate knowledge reinforcement (Figure 37). Though the individual texts generally boast high quality scores, the unit as a whole achieves a final coherence score of 55%. This indicates that while students are accessing strong materials in their own right, they may not have the tools to build upon the knowledge established in the unit.
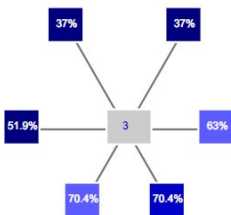
3 Qualitative Score: 80.25 %

3 Coherence Score: 55 %

Potential Total Score: 55% / Isolated Domain Penalty: -0% / 55% Final Coherence Score

Figure 37. Proximity map of Grade 4, Unit 3. The average unit score for text quality is 80.25%. The final coherence score is 55%.

Unit 2 is the lowest-quality unit at this grade level, with an average text quality score of 62.32%. Coherence results demonstrate weak-to-moderate knowledge reinforcement at this level, as indicated in Figure 38 below. Texts vary in their coherence scores and, as a result, their topical connections to the rest of the unit. In places, this variance is significant; the lowest-scored text earned a 25% for coherence, while the highest scored a 75%. This also hints at a level of inconsistency in the unit's knowledge build, which may be worth evaluating further.
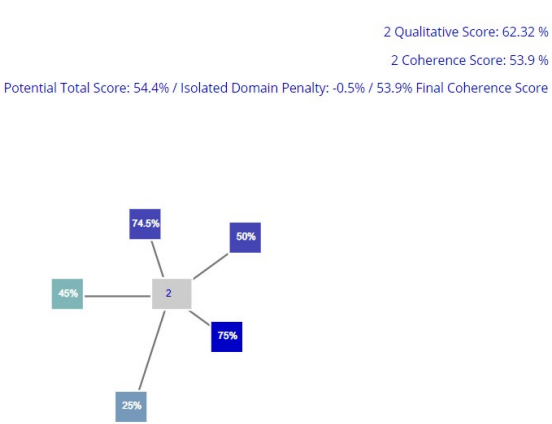
2 Qualitative Score: 62.32 %

2 Coherence Score: 53.9 %

Potential Total Score: 54.4% / Isolated Domain Penalty: -0.5% / 53.9% Final Coherence Score

Figure 38. Proximity map of Grade 4, Unit 2. The average unit score for text quality is 62.32%. The final coherence score is 53.9%.

Grade 5

Grade 5 receives an overall quality score of 76.09%, placing it in the high-quality band.

Unit 2 is the highest-quality unit at this grade level, with an average text quality score of 82.72%. Coherence analysis shows weak-to-moderate levels of knowledge reinforcement, as demonstrated in Figure 39 below. Texts again vary in their individual coherence scores, with percentages ranging from 40 to 91 percent for coherence. However, texts appear in the unit with high scores on both metrics, and the basis for further improvements is present.
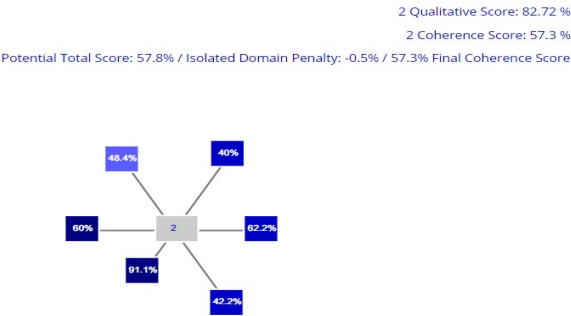
2 Qualitative Score: 82.72 %

2 Coherence Score: 57.3 %

Potential Total Score: 57.8% / Isolated Domain Penalty: -0.5% / 57.3% Final Coherence Score

Figure 39. Proximity map of Grade 5, Unit 2. The average unit score for text quality is 82.72%. The final coherence score is 57.3%.

Unit 4 is the lowest-quality unit at this grade level, with an average quality score of 64.29%. Coherence analysis indicates moderate levels of knowledge reinforcement. Though two of the three texts in the unit achieve solid coherence scores, the unit as a whole earned a 1.5% penalty for isolated knowledge domains. This implies the presence of particular gaps in knowledge reinforcement, as certain domains are only briefly covered.
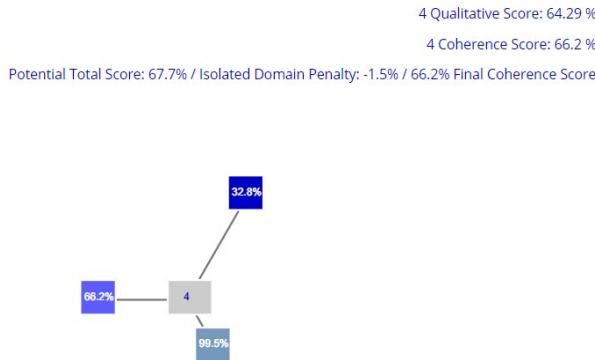
4 Qualitative Score: 64.29 %

4 Coherence Score: 66.2 %

Potential Total Score: 67.7% / Isolated Domain Penalty: -1.5% / 66.2% Final Coherence Score

Figure 40. Proximity map of Grade 5, Unit 4. The average unit score for text quality is 64.29%. The final coherence score is 66.2%.

Grade 6

Grade 6 receives an overall quality score of 75.96%, placing it in the high-quality band.

Unit 1 achieved the highest overall quality rating for Grade 6, with an average text quality score of 82.05%. Coherence analysis indicates that moderate topical reinforcement occurs through the unit. The overall coherence score of 64.3% suggests that texts adequately build upon each other. However, this score is brought down by the presence of a text with a 23.1% coherence rating. When evaluated in the context of the rest of the unit, this text should be reevaluated to ensure that it is best suited for the main themes of instruction here.
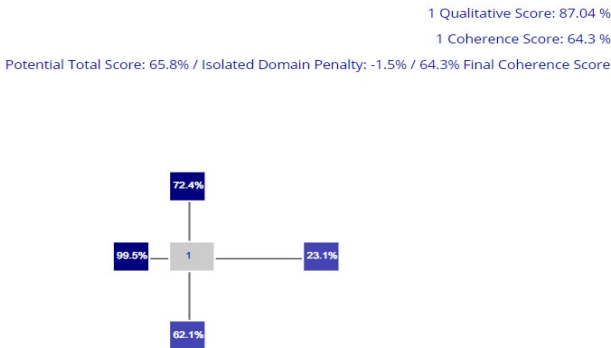
1 Qualitative Score: 87.04 %

1 Coherence Score: 64.3 %

Potential Total Score: 65.8% / Isolated Domain Penalty: -1.5% / 64.3% Final Coherence Score

Figure 41. Proximity map of Grade 6, Unit 1. The average unit score for text quality is 82.05%. The final coherence score is 64.3%.

Unit 2 is the lowest-rated unit at this grade level, with an average text quality score of 58.86%. Coherence analysis reveals strong levels of knowledge reinforcement. Individual texts score highly on their ability to expand upon each other and establish main themes and ideas, and the unit as a whole achieves a coherence score of 89.1%. Though coherence is generally quite strong within the unit, the inclusion of additional high-quality texts would contribute to a more effective unit overall.

3 Qualitative Score: 56.86 %

3 Coherence Score: 89.1 %

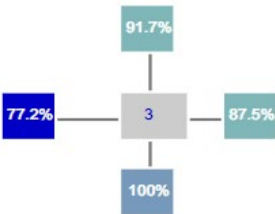Potential Total Score: 91.1% / Isolated Domain Penalty: -2% / 89.1% Final Coherence Score

Figure 42. Proximity map of Grade 6, Unit 3. The average unit score for text quality is 56.86%. The final coherence score is 89.1%.
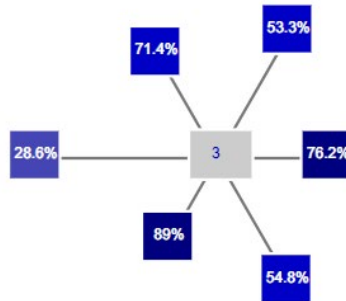
Grade 7

Grade 7 receives an overall quality score of 78.86%, placing it in the high-quality band.

Highest-Rated Unit

Unit 7 achieves the highest-quality rating at this grade level, with an average text quality score of 88.10%. This unit contains several high-quality texts, demonstrating that students access strong and well-evaluated information at this level. Coherence analysis indicates that moderate knowledge reinforcement occurs throughout the unit. With a 62.2% final coherence score and an isolated domain penalty of 3%, texts do not always connect to each other and to the broader context of the unit. However, several texts with high ratings on both metrics can be found, revealing the presence of a good basis for future development.

3 Qualitative Score: 88.10 %

3 Coherence Score: 62.2 %

Potential Total Score: 65.2% / Isolated Domain Penalty: -3% / 62.2% Final Coherence Score

Figure 43. Proximity map of Grade 7, Unit 3. The average unit score for text quality is 88.10%.
The final coherence score is 62.2%.

Unit 5 presents as the lowest-quality unit at this grade level, with an average text quality score of 73.33%. The Institute's coherence analysis reveals high levels of knowledge reinforcement across the unit. Both texts build upon each other in a meaningful way, contributing to an overall coherence score of 98%. Though the inclusion of additional high-quality texts would likely benefit the overall efficacy of the unit, it already performs well on both of the Institute's metrics.

5 Qualitative Score: 73.33 %

5 Coherence Score: 98 %

Potential Total Score: 102% / Isolated Domain Penalty: -4% / 98% Final Coherence Score

Figure 44. Proximity map of Grade 7, Unit 5. The average unit score for text quality is 73.33%.
The final coherence score is 98%.

Grade 8

Grade 8 receives an overall quality score of 89.29%, placing it firmly in the high-quality band.

Unit 5 achieves the highest quality rating at this level, with an average text quality score of 90.97%. Most texts in this unit achieved moderate or high-quality scores. Despite this high-quality score, the unit performs poorly on overall knowledge reinforcement. It achieves a final coherence score of 30.2%, with individual materials ranging in scores from 8 to 44%. Though the materials student access at this level are strong on their own, greater care should be taken to ensure they contribute to a larger knowledge build.
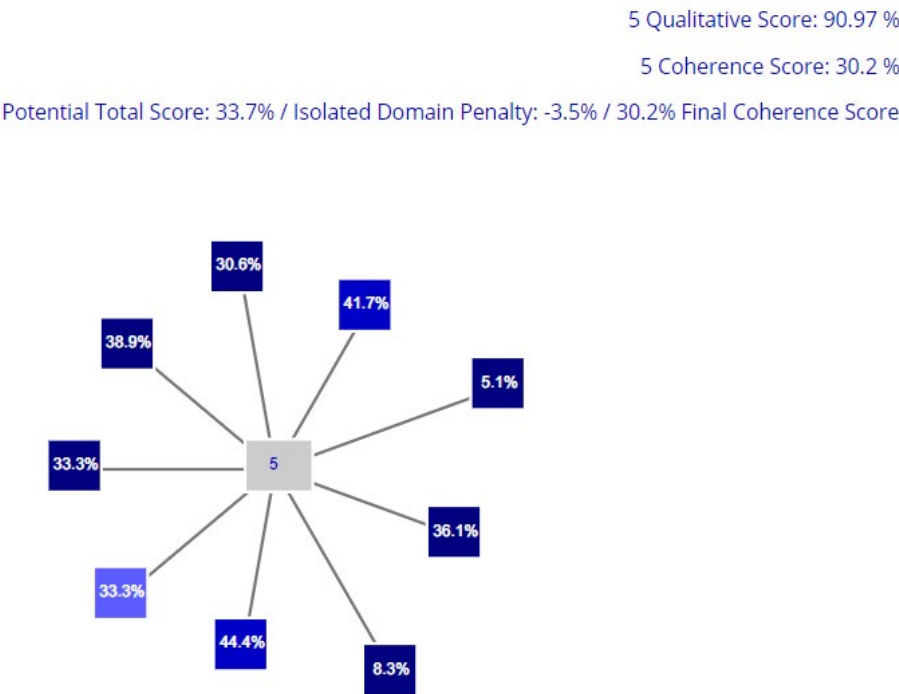
5 Qualitative Score: 90.97 %

5 Coherence Score: 30.2 %

Potential Total Score: 33.7% / Isolated Domain Penalty: -3.5% / 30.2% Final Coherence Score

Figure 45. Proximity map of Grade 8, Unit 5. The average unit score for text quality is 90.97%. The final coherence score is 30.2%.

Lowest-Rated Unit

Unit 6 is the lowest-quality unit at this grade level, with an average text quality rating of 85.96%. Coherence analysis reveals moderate levels of knowledge reinforcement. Individual texts range in their individual coherence scores, indicating that some may contribute more than others to the greater knowledge build. The figure below reveals major discrepancies in texts' coherence scores and addressing those discrepancies would allow for a more effective establishment of the unit's core ideas.

6 Qualitative Score: 85.96 %

6 Coherence Score: 55.6 %

Potential Total Score: 60.6% / Isolated Domain Penalty: -5% / 55.6% Final Coherence Score
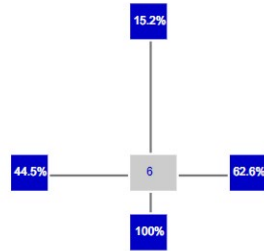

Figure 46. Proximity map of Grade 8, Unit 6. The average unit score for text quality is 85.96%. The final coherence score is 55.6%.

Grade 9

Grade 9 receives an overall quality score of 74.89%, placing it in the high-quality band.

Unit 2 is the highest-quality unit at this grade level, with an average text quality score of 93.86%. The individual texts are mostly high-quality. The Institute's coherence analysis indicates moderate reinforcement of knowledge built by the unit's texts, suggesting that it presents a good basis for further improvement. Notably, however, the unit earned a 6% penalty, indicating the presence of significant isolated knowledge domains. Though meaningful connections between texts do exist, the unit should be evaluated further to find ways to ensure that gaps in knowledge building are addressed.

2 Qualitative Score: 93.86 %

2 Coherence Score: 54.1 %

Potential Total Score: 60.1% / Isolated Domain Penalty: -6% / 54.1% Final Coherence Score
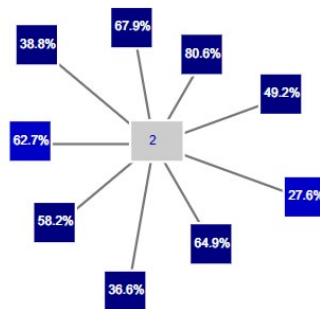

Figure 47. Proximity Map of Grade 9, Unit 2. The average unit score for text quality is 93.86%. The final coherence score is 54.1%.

Unit 1 receives the lowest quality rating at this grade level, with an average text quality score of 85.71%. Coherence analysis reveals moderate coherence between texts. Though the quality of individual texts within the unit is quite strong, greater variance appears in specific coherence scores, revealing that certain topics are more meaningfully addressed than others. These results should be measured against the broader context of the unit to ensure that coverage exists where it should.

1 Qualitative Score: 85.71 %

1 Coherence Score: 54.6 %

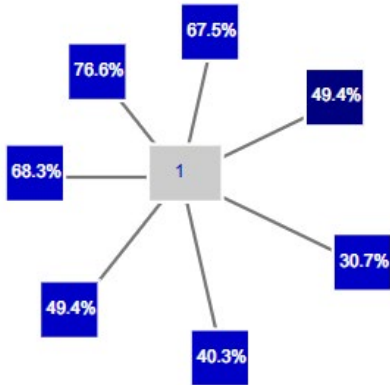Potential Total Score: 55.6% / Isolated Domain Penalty: -1% / 54.6% Final Coherence Score

Figure 48. Proximity map of Grade 9, Unit 1. The average unit score for text quality is 85.71%. The final coherence score is 54.6%.

Grade 10

Grade 10 receives an overall quality score of 93.75%, placing it firmly in the high-quality band.

Highest-Rated Unit

Unit 3 in the highest-quality unit at this grade level, with an average text quality score of 94.79% - one of the highest quality scores in the curriculum. Most of the texts are high or very high quality, indicating that student-facing materials are strong and well-researched. Coherence analysis shows weak-to-moderate knowledge reinforcement across the unit, as demonstrated by the figure below. The lowest individual coherence score in the unit is 2.9%, and the unit accrues an isolated domain penalty of 4%. Introducing relevant materials of a similar quality would contribute to stronger knowledge-building on these topics.
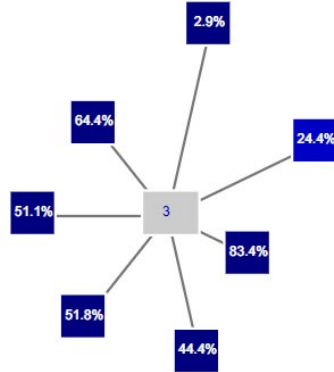
Figure 49. Proximity map of Grade 10, Unit 3. The average unit score for text quality is 94.79%. The final coherence score is 46.1%

Unit 6 is the lowest-quality unit at this grade level, with an average text quality score of 83.81% - a reasonable score for the lowest-quality unit, compared to other grade levels. Most texts present here are high or moderate quality, but their contributions to the unit's coherence varies. Coherence analysis demonstrates low coherence across the entire unit, indicating that though the sources are high quality, they do not necessarily always connect to the ideas of each other. Individual materials skew on the lower side in terms of their coherence scores, as seen below. Further reinforcement of poorly represented topics in the supplementary materials would improve the overall scope of the unit.

6 Qualitative Score: 83.81 %

6 Coherence Score: 44.1 %

Potential Total Score: 45.6% / Isolated Domain Penalty: -1.5% / 44.1% Final Coherence Score
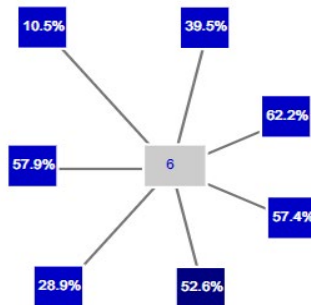

Figure 50. Proximity map of Grade 10, Unit 6. The average unit score for text quality is 83.81%. The final coherence score is 44.1%.

Grade 11

Grade 11 receives an overall quality score of 82.68%, placing it in the high-quality band.

Unit 1 is the highest-quality unit at this grade level, with an average text quality score of 85.12%. Most of the texts present here demonstrate high quality, indicating that students have access to strong materials at this level. Coherence analysis demonstrates low knowledge reinforcement, suggesting variance in the unit's ability to effectively build knowledge.
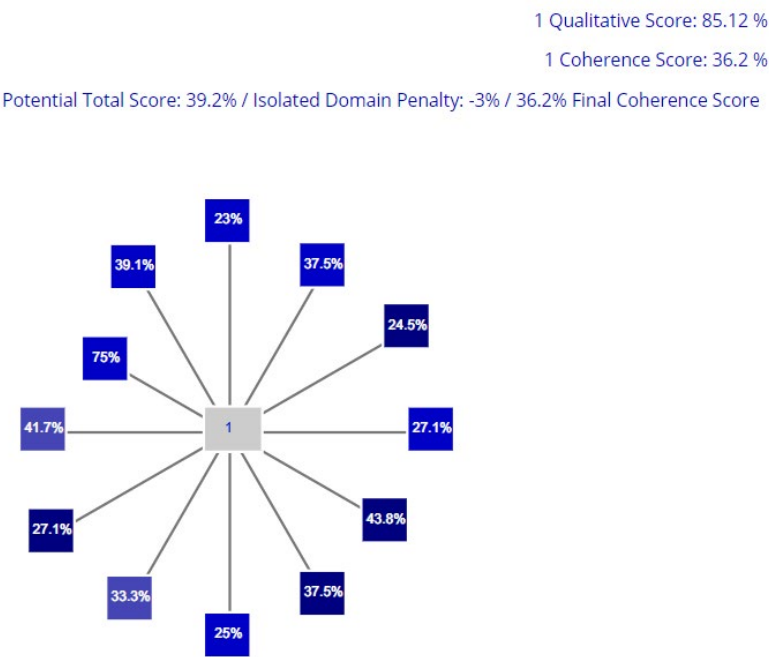
1 Qualitative Score: 85.12 %

1 Coherence Score: 36.2 %

Potential Total Score: 39.2% / Isolated Domain Penalty: -3% / 36.2% Final Coherence Score

Figure 51. Proximity map of Grade 11, Unit 1. The average unit score for text quality is 85.12%.
The final coherence score is 36.2%.

Lowest-Rated Unit

Unit 7 is the lowest quality unit at this grade level, with an average quality score of 76.73%. Most of the texts at this level achieve moderate quality scores, but overall coherence is weak. Coherence analysis indicates that students at this level are not exposed to information that reinforces knowledge. The generally low individual coherence scores and the notable isolated domain penalty present here reveal that texts often exist separately from each other, as opposed to contributing to a larger knowledge build. In order to reinforce information and ideas throughout the unit, a focus on aligning texts to each other would produce benefits.
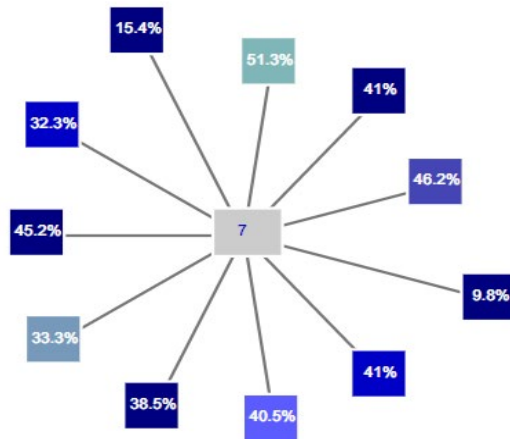
Figure 52. Proximity map of Grade 11, Unit 7. The average unit score for text quality is 76.73%. The final coherence score is 35.9%.

Grade 12

Grade 12 receives an overall quality score of 93.75%, placing it firmly in the high-quality band.

Highest-Rated Unit

Unit 1 is the highest-quality unit at this grade level, with an exemplary average text quality score of 96.19%. Across the board, texts at this level demonstrate very high quality. Coherence analysis presents moderate knowledge reinforcement, which slightly lowers the overall efficacy of the unit. Two texts achieve high scores for their ability to connect topically to the unit, while two appear to struggle on that metric. Overall, however, this is an excellent example of a high-quality unit, and a greater focus on knowledge building would make it even stronger.
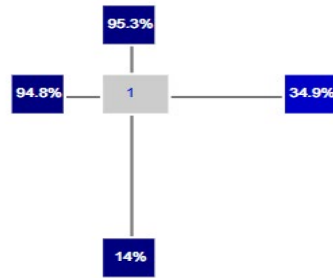
*Figure 53. Proximity map of Grade 12, Unit 1. The average unit score for text quality is 96.67%.
The final coherence score is 59.8%.*

Unit 5 is the lowest-quality rated unit at this grade level, with an average quality score of 90.37% - still a high-quality score, even if it is the lowest at this band. Individual texts achieve high or moderate quality ratings, but their contributions to the overall knowledge build vary. Coherence analysis indicates low-to-moderate rates of connection from text to text, which hinders the unit's overall effectiveness. The isolated domain penalty of 4% reveals that several areas of knowledge exist within the unit, but do not expand across texts. Alignment between sources and a more coherent knowledge build both represent areas for improvement.

5 Qualitative Score: 90.37 %

5 Coherence Score: 49.2 %

Potential Total Score: 53.2% / Isolated Domain Penalty: -4% / 49.2% Final Coherence Score
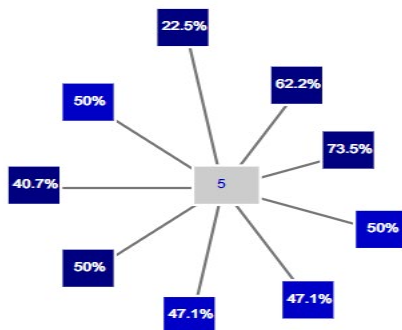

*Figure 54. Proximity map of Grade 12, Unit 5. The average unit score for text quality is 90.37%.
The final coherence score is 49.2%.*

LEARN MORE

This report is one of twelve ELA Knowledge Map™ reports released in Winter 2022 by the Johns Hopkins Institute for Education Policy. The release of these reports was accompanied by a Findings Summary, outlining the overarching themes across all ELA curricula analyzed. View the other ELA Knowledge Map™ reports and learn more about the importance of high-quality curriculum at edpolicy.education.jhu.edu.

About the Institute

The Johns Hopkins University Institute for Education Policy is dedicated to integrating research, policy, and practice to achieve educational excellence for all of America's students. Specifically, we connect research to the policies and practices that will ensure all children have access to intellectually challenging curricula, highly-effective educators, and school models that meet students' diverse needs. By delivering the strongest evidence to the policymakers who set the course and the practitioners who teach and lead, we hope to serve the American children who enter our classrooms every day.

About Calvert Education

Calvert invented modern homeschooling 110 years ago, and we've been perfecting it ever since. We have helped parents educate more than 600,000 students in all 50 states and in more than 90 countries around the world.

[i] Reid Smith et al., "The Role of Background Knowledge in Reading Comprehension: A Critical Review," *Reading Psychology* 42, no. 3 (April 3, 2021): 214–40). Sonia Q. Cabell and Hyejin Hwang, "Building Content Knowledge to Boost Comprehension in the Primary Grades," *Reading Research Quarterly* 55, no. S1 (2020): S99–107, https://ila.onlinelibrary.wiley.com/doi/full/10.1002/rrq.338 and also Kathryn S. McCarthy and Danielle S. McNamara, "The Multidimensional Knowledge in Text Comprehension Framework," *Educational Psychologist* 56, no. 3 (July 3, 2021): 196–214, https://doi.org/10.1080/00461520.2021.1872379).

[ii] "Standards aligned" generally refers to the Common Core State Standards.