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SAT® Suite of Assessments: Alignment to Michigan Standards

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Note:

The College Board's redesigned SAT Suite of Assessments was designed to measure knowledge and skills that the best available evidence shows are essential for college and career readiness and success. The College Board has prepared a comparison of the elements measured by the SAT Suite of Assessments to the Michigan standards. The alignment has been reviewed with MDE, however a third-party review has not been completed at this time but is planned for 2016. The conclusion of the College Board and MDE is that the redesigned SAT Suite of Assessments aligns well with the Michigan standards. Both have been designed to promote in a clear and transparent way the goal of college and career readiness and success for all students, and both are grounded in high-quality evidence about essential postsecondary requirements.

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Contents

Executive Summary **1**
Summary of the English Language Arts/Literacy alignment: 2
Summary of the Math alignment: 3
Section 1: Introduction **6**
The SAT Suite of Assessments 6
The Alignment Approach 7
Section 2: Evidentiary Foundation **9**
Evidence-Based Reading and Writing; Essay 9
Math 10
Summary 10
Section 3: Michigan Standards Alignment Summary **12**
English Language Arts/Literacy Alignment Summary 12
Math Alignment Summary 14
Section 4: State Standards Alignment Tables—SAT **16**
English Language Arts/Literacy Alignment: Michigan's Standards to SAT 16
Table 1: College and Career Readiness Anchor Standards for Reading: MI to SAT 16
Table 2: Reading Standards for Literature 11–12: MI to SAT 20
Table 3: Reading Standards for Informational Text 11–12: MI to SAT 23
Table 4: College and Career Readiness Anchor Standards for Writing: MI to SAT 28
Table 5: Writing Standards 11–12: MI to SAT 36
Table 6: College and Career Readiness Anchor Standards for Language: MI to SAT 44
Table 7: Language "Progressive" Standards 11–12: MI to SAT 49
Table 8: Language Standards 11–12: MI to SAT 53
Table 9: Reading Standards for Literacy in History/Social Studies 11–12: MI to SAT 58
Table 10: Reading Standards for Literacy in Science and Technical Subjects 11–12: MI to SAT 61
Table 11: Writing Standards for Literacy in History/Social Studies, Science, and Technical Subjects 11–12: MI to SAT 64
English Language Arts/Literacy Alignment: SAT to Michigan's Standards 71
Table 12: SAT Reading Test: SAT to MI 71
Table 13: SAT Writing and Language Test: SAT to MI 76
Table 14: SAT Essay: SAT to MI 83
Math Alignment: Michigan's Standards and SAT 87
Table 15: Michigan High School Math Standards Alignment: MI to SAT 87

Table 16: SAT Math Test Alignment: SAT to MI 101

Section 5: State Standards Alignment Tables—PSAT/NMSQT and PSAT 10 109

English Language Arts/Literacy Alignment: Michigan's Standards to PSAT/NMSQT and PSAT 10..... 109

Table 17: Reading Standards for Literature 9–10: MI to PSAT/NMSQT and PSAT 10 109

Table 18: Reading Standards for Informational Text 9–10: MI to PSAT/NMSQT and PSAT 10 112

Table 19: Writing Standards 9–10: MI to PSAT/NMSQT and PSAT 10 116

Table 20: Language Standards 9–10: MI to PSAT/NMSQT and PSAT 10..... 124

Table 21: Reading Standards for Literacy in History/Social Studies 9–10: MI to PSAT/NMSQT and PSAT 10 127

Table 22: Reading Standards for Literacy in Science and Technical Subjects 9–10: MI to PSAT/NMSQT and PSAT 10 130

Table 23: Writing Standards for Literacy in History/Social Studies, Science, and Technical Subjects 9–10: MI to PSAT/NMSQT and PSAT 10..... 133

English Language Arts/Literacy Alignment: PSAT/NMSQT and PSAT 10 to Michigan's Standards 140

Table 24: PSAT/NMSQT and PSAT 10 Reading Test: PSAT/NMSQT and PSAT 10 to MI 140

Table 25: PSAT/NMSQT and PSAT 10 Writing and Language Test: PSAT/NMSQT and PSAT 10 to MI 143

Math Alignment: Michigan's Standards and PSAT/NMSQT and PSAT 10..... 148

Table 26: Michigan High School Math Standards Alignment: MI to PSAT/NMSQT and PSAT 10..... 148

Table 27: PSAT/NMSQT and PSAT 10 Math Test Alignment: PSAT/NMSQT and PSAT 10 to MI..... 162

Section 6: State Standards Alignment Tables—PSAT 8/9 170

English Language Arts/Literacy Alignment: Michigan's Standards to PSAT 8/9 170

Table 28: Reading Standards for Literature 8: MI to PSAT 8/9 170

Table 29: Reading Standards for Informational Text 8: MI to PSAT 8/9 173

Table 30: Writing Standards 8: MI to PSAT 8/9 176

Table 31: Language Standards 8: MI to PSAT 8/9 184

Table 32: Reading Standards for Literacy in History/Social Studies 6–8: MI to PSAT 8/9 187

Table 33: Reading Standards for Literacy in Science and Technical Subjects 6–8: MI to PSAT 8/9.. 190

Table 34: Writing Standards for Literacy in History/Social Studies, Science, and Technical Subjects 6–8: MI to PSAT 8/9 192

English Language Arts/Literacy Alignment: PSAT 8/9 to Michigan's Standards 200

Table 35: PSAT 8/9 Reading Test: PSAT 8/9 to MI 200

Table 36: PSAT 8/9 Writing and Language Test: PSAT 8/9 to MI..... 203

Math Alignment: Michigan's Standards and PSAT 8/9 207

Table 37: Michigan Math Standards Alignment: MI to PSAT 8/9 207

Table 38: PSAT 8/9 Math Test Alignment: PSAT 8/9 to MI 240

Executive Summary

While the College Board's redesigned SAT Suite of Assessments was not designed to assess the attainment of any single set of standards, its tests measure knowledge and skills that the best available evidence shows are essential for college and career readiness and success. The SAT Suite, which includes the redesigned SAT®, PSAT/NMSQT® and PSAT™ 10, and PSAT™ 8/9, provides states and schools with a longitudinal, evidence-based assessment system that measures growth in relation to essential college and career readiness and success outcomes from grade 8 through grade 12. The College Board is committed to ensuring that students are ready to make successful transitions to college and career by the time they leave high school. This report demonstrates that the SAT Suite strongly aligns with your state's standards and thereby supports your students' progress toward educational and workplace success.

The key features of the redesigned SAT Suite's English language arts/literacy–related assessments are

- the use of a specified range of text complexity consistent with college and workforce training requirements;
- an emphasis on source analysis and use of evidence;
- the inclusion of data and informational graphics, which students must analyze in conjunction with text;
- a focus on words in context and on word choice for rhetorical effect;
- attention to a core set of important English language conventions and to effective written expression; and
- the requirement that students work with texts across a wide range of disciplines.

The key features of the redesigned SAT Suite's math assessments are

- a strong focus on content that matters most for college and career readiness;
- an emphasis on rich applied problems in real-life settings where the use of mathematical practices is integrated with the content;
- a balance of fluency, conceptual understanding, and application items within and across all content topics;
- an emphasis on problem solving and data analysis; and
- the inclusion of both calculator and no-calculator portions as well as strategic attention to the use of a calculator as a tool.

The heart of the report is a series of tables indicating both the alignment of the Michigan standards to the elements measured by the SAT Suite of Assessments and the alignment of the elements measured by the SAT Suite of Assessments to the Michigan standards. As these tables and the associated documentation demonstrate, the alignment between Michigan's standards and the SAT Suite is robust.

Summary of the English Language Arts/Literacy alignment:

Alignment of Michigan standards to SAT Suite assessments

- **Anchors (aligned to SAT, including Essay):** All of the Michigan Reading and Language Anchor Standards are addressed in whole or in part on the redesigned SAT. Seven of the ten Michigan Writing Anchor Standards are addressed in whole or in part. (Standards regarding technology use [W.CCR.6] and conducting research [W.CCR.7, W.CCR.8] are not aligned to.) Speaking and listening are not addressed on the SAT and are thus not aligned to.
- **Grades 11–12 ELA/Literacy (aligned to SAT, including Essay):** Seven of the nine Reading Standards for Literature 11–12 and all of the Reading Standards for Informational Text 11–12 are addressed in whole or in part on the redesigned SAT. (RL.11–12.7, requiring synthesis of multiple literary texts, was not aligned to, as the SAT Reading Test's paired-passage format is restricted to history/social studies and science texts; RL.11–12.9, which requires demonstration of eighteenth-, nineteenth-, and twentieth-century US literature, is largely outside of the Reading Test domain.) Seven of the ten Writing Standards 11–12 are addressed in whole or in part. (As with the anchor standards, W.11–12.6, W.11–12.7, and W.11–12.8 were not aligned to.) All of the Language "progressive" standards applicable to grades 11–12 are aligned to, as are all of the Language Standards 11–12, in whole or in part.
- **Grades 11–12 Literacy in History/Social Studies, Science, and Technical Subjects (aligned to SAT, not including Essay):** While the SAT Suite assessments are not tests of history/social studies and science content knowledge, they do address aspects of literacy in these subject areas. Nine of the ten Reading Standards for Literacy in History/Social Studies 11–12 are addressed in whole or in part, the lone exception being RH.11–12.8, which requires external validation or critique of an author's argument. Nine out of ten of the Reading Standards for Literacy in Science and Technical Subjects 11–12 are addressed in whole or in part, the lone exception being RST.11–12.3, which is concerned with following a multistep procedure. Four of the nine Writing Standards for Literacy in History/Social Studies, Science, and Technical Subjects 11–12 are addressed in whole or in part. As with the ELA/Literacy counterparts, standards pertaining to technology use (WHST.11–12.6) and research (WHST.11–12.7, WHST.11–12.8) are not addressed; because the Essay task does not involve analyzing a history/social studies, science, or technical source, WHST.11–12.9 and WHST.11–12.10 are not aligned to.
- **Grades 9–10 ELA/Literacy (aligned to PSAT/NMSQT and PSAT 10):** Seven of the nine Reading Standards for Literature 9–10 are addressed in whole or in part. Not aligned to are RL.9–10.7, which focuses on artistic media, and RL.9–10.9, which focuses on a very specific form of intertextuality. Nine of the ten Reading Standards for Informational Text 9–10 are addressed in whole or in part. Not aligned to is RI.9–10.7, which focuses on different mediums for accounts. Five of the ten Writing Standards 9–10 are addressed in whole or in part, the difference from 11–12 accounted for by the fact that the latter was also aligned to the SAT Essay. Five of the six Language Standards 9–10 are aligned to, with L.9–10.3a, concerning use of style manuals, being out of the testing domain.
- **Grades 9–10 Literacy in History/Social Studies, Science, and Technical Subjects (aligned to PSAT/NMSQT and PSAT 10):** All ten of the Reading Standards for Literacy in History/Social Studies 9–10 are addressed in whole or in part. Eight of the ten Reading Standards for Literacy in Science and Technical Subjects 9–10 are aligned to; RST.9–10.3 (following multistep procedures) and RST.9–10.9 (comparing and contrasting findings presented in a text to those from other sources) are not addressed. As with grades 11–12, four of the nine Writing Standards for Literacy in History/Social Studies, Science, and Technical Subjects 9–10 are aligned to, the

exceptions again pertaining to technology (WHST.9–10.6), research (WHST.9–10.7, WHST.9–10.8), source use (WHST.9–10.9), and direct writing (WHST.9–10.10).

- **Grade 8 ELA/Literacy (aligned to PSAT 8/9):** Seven of the nine Reading Standards for Literature 8 are addressed in whole or in part. Not aligned to are RL.8.7, which involves filmed and live productions of stories or dramas, and RL.8.9, which (like RL.9–10.9) focuses on a very specific form of intertextuality. Nine of the ten Reading Standards for Informational Text 8 are aligned to, the exception being RI.8.7, which concerns the use of media. As was true for grades 9–10, five of the ten Writing Standards 8 are addressed in whole or in part, with elements of research, source use, and direct writing not aligned to. All six of the Language Standards 8 are aligned to in whole or in part.
- **Grade 8 Literacy in History/Social Studies, Science, and Technical Subjects (aligned to PSAT 8/9):** All ten of the Reading Standards for Literacy in History/Social Studies 8 are addressed in whole or in part. As was true for grades 9–10, eight of the ten Reading Standards for Literacy in Science and Technical Subjects 8 are aligned to, with the same sorts of exceptions: RST.8.3 (following multistep procedures) and RST.8.9 (comparing and contrasting information from a text to that gained from other sources). In a similar vein, four of the nine Writing Standards for Literacy in History/Social Studies, Science, and Technical Subjects 8, with the omissions again being related to technology (WHST.8.6), research (WHST.8.7, WHST.8.8), source use (WHST.8.9), and direct writing (WHST.8.10).
- Inclusion of the redesigned SAT's Essay improves the alignment in numerous ways, including by addressing Writing standards not directly measured by the selected-response SAT Writing and Language Test.

Alignment of SAT Suite assessments to Michigan standards

- All but two of the elements in the SAT Suite of Assessments are addressed directly by Michigan standards.
- The two exceptions are text complexity in Writing and Language, which is not addressed by Michigan standards, and the SAT Essay's requirement for accuracy in representation of source texts, which is implicit in Michigan's research-related standards (for example, in the provision in W.8.8 to avoid plagiarism).

Summary of the Math alignment:

- The alignment between the redesigned SAT content specifications and the Michigan Standards for High School Mathematics is strong in the Number and Quantity, Algebra, Functions, Modeling, Geometry, and Statistics and Probability conceptual categories. The SAT's domain sampling approach covers standards from 20 of the 22 domains within these conceptual categories. The two domains not covered, Vector and Matrix Quantities (from Number and Quantity) and Using Probability to Make Decisions (from Statistics and Probability), are intentionally excluded as they are composed entirely of (+) standards. The (+) standards throughout the Michigan Standards for High School Mathematics are intended as preparation for advanced courses and are not essential for all students to learn to be college and career ready.
- Ideas from the conceptual category of Modeling are interspersed in problems aligned to the other conceptual categories, as suggested by the standards themselves in the statement,

"Modeling is best interpreted not as a collection of isolated topics, but rather in relation to the other standards." Modeling is emphasized throughout the redesigned SAT Math Test.

- All skills measured in the redesigned SAT appear in the Michigan Standards for High School Mathematics.
- Additionally, an emphasis on the Michigan Standards for Mathematical Practice is apparent throughout the redesigned SAT. In order to do well on the varied item types they will see, students must make sense of problems and persevere in solving them (Math Practice 1). Students have many opportunities to make use of structure (Math Practice 7) in the Heart of Algebra and Passport to Advanced Math domains, while they must evaluate claims (Math Practice 3) in the Problem Solving and Data Analysis domain. They represent quantities in context with mathematical relationships and interpret their results (Math Practice 2) in all three of those domains. Mathematical modeling (Math Practice 4) is especially important in Heart of Algebra and Passport to Advanced Math. Finally, students must solve a carefully selected set of items that rewards strategic, rather than indiscriminant, use of the calculator in the Calculator portion of the Math Test (Math Practice 5).
- The redesigned SAT Math test has a cross-disciplinary focus drawing from topics in Science and Social Studies. Michigan Social Studies process skills, such as P2.2 and P2.5, must be applied in the SAT Math Test to solve math problems about topics drawn from a variety of Social Studies domains, such as history, economics, geography, and political science. Other items will require application of mathematics in science contexts from a variety of life, earth, and physical sciences. The Math components of the redesigned SAT, like the Michigan standards, have been designed to promote in a clear and transparent way the goal of college and career readiness and success for all students and are grounded in evidence about essential postsecondary requirements.
- The alignment between the PSAT/NMSQT and PSAT 10 content specifications and the Michigan Standards for High School Mathematics is strong in Algebra and Functions. PSAT/NMSQT and PSAT 10 content specifications also draw from the conceptual categories of Number and Quantity, Geometry, and Statistics and Probability.
- All skills measured in the PSAT/NMSQT and PSAT 10 appear in the Michigan Standards for High School Mathematics.
- Like the redesigned SAT, the PSAT/NMSQT and PSAT 10 include ideas from the conceptual category of Modeling and aligned to the Michigan Standards for Mathematical Practice interspersed in problems aligned to other conceptual categories.
- Like the redesigned SAT, the PSAT/NMSQT and PSAT 10 have a cross-disciplinary focus, drawing topics from Science and Social Studies.
- The alignment between the PSAT 8/9 content specifications and the Michigan Standards for Grades 6, 7, and 8 is strong in Expressions and Equations and in Statistics and Probability. There is also a strong alignment between the PSAT 8/9 content specifications and the Grade 8 Functions content category, the Grade 6 Ratios and Proportional Relationships content category, and the High School Mathematics Algebra and Functions content categories. PSAT 8/9 content specifications also draw from the conceptual categories of Grade 7 and High School Geometry as well as High School Number and Quantity, Geometry, and Statistics and Probability.
- All skills measured in the PSAT 8/9 appear in the Michigan Standards for grades 6, 7, 8, or High School Mathematics.

- Like the redesigned SAT, the PSAT 8/9 includes ideas from the conceptual category of Modeling and aligned to the Michigan Standards for Mathematical Practice interspersed in problems aligned to other conceptual categories.
- Like the redesigned SAT, the PSAT 8/9 has a cross-disciplinary focus, drawing topics from Science and Social Studies.

The redesigned SAT Suite of Assessments aligns well with the Michigan standards. Both have been designed to promote in a clear and transparent way the goal of college and career readiness and success for all students, and both are grounded in high-quality evidence about essential postsecondary requirements.

Section 1: Introduction

This report conveys the results of a College Board–conducted alignment study between the SAT Suite of Assessments and state standards.

The SAT Suite of Assessments measures the knowledge and skills that the best available evidence shows are essential for college and career readiness and success. The College Board works in partnership with states, districts, and schools to prepare all students to attain their post–high school educational goals, and our evidence-based assessments align closely with high-quality state standards that focus on essential college and career readiness and success outcomes.

While the revised SAT Suite of Assessments are not specifically aligned to any single set of standards; they measure the skills and knowledge that most current research and evidence shows are essential for college and career success, and are focused on what is familiar to students in their classrooms today regardless of their location. The College Board is committed to ensuring that students are ready to make successful transitions to college and career by the time they leave high school. This report shows that the SAT Suite of Assessments strongly aligns with your state's standards and thereby supports your students' progress toward educational and workplace readiness and success.

The SAT Suite of Assessments

The SAT Suite of Assessments (consisting of the SAT, PSAT/NMSQT and PSAT 10, and PSAT 8/9) focuses on the knowledge and skills that high-quality research shows are essential for college and career readiness and success. The assessments reflect the work students are doing in classrooms across the country.

The SAT Suite makes it easier for students to navigate a path through high school, college, and career by providing unmatched benefits to students, educators, and states/districts, including

- focused, clear, and useful assessments that reflect the knowledge and skills that research shows are essential for college and career readiness and success;
- free, personalized, focused practice resources for all students;
- college opportunities through scholarships, fee waivers, and AP credit; and
- career opportunities through powerful career-planning partnerships and a focus on coding and STEM.

The assessments in the SAT Suite are scored on the same underlying scale, which provides a powerful tool for measuring growth. Taken together, these assessments provide benchmarks and consistent feedback, showing student progress over time and allowing teachers to accelerate students who are either ahead or behind.

PSAT 8/9. Taken in the fall or spring of eighth or ninth grade, the PSAT 8/9 serves as a foundation for student progress in high school and helps ensure students are on target for being college and career ready by the time they leave high school.

PSAT/NMSQT and PSAT 10. Students take the PSAT/NMSQT in the fall of tenth or eleventh grade (though only eleventh graders are eligible for the National Merit Scholarship Program); some schools may instead deliver the PSAT™ 10 in the spring of students' tenth-grade year. Both assessments cover the same content domain and serve as a "check-in" on student progress and to pinpoint areas for development.

SAT. The SAT is offered throughout the school year and provides a powerful connection to college. Most students take the SAT for the first time during the spring of their junior year and a second time during the fall of their senior year.

The Alignment Approach

Point-by-point technical alignments between a test's or program's domain and a state's standards have been the centerpiece of traditional alignment study reports. Such alignments are valuable in that they illustrate in detail how and to what extent specific elements of a state's standards are assessed by an assessment program. They also identify any content in the assessments that is not included in the state's standards. Point-by-point alignments, however, tell only part of the story. While it is critical to know how well the elements of assessments and standards align, these types of studies often miss how well the broader aims and emphases of the assessment and standards mesh. Even extensive overlap between the elements of assessment and standards is not a guarantee that the two programs are well aligned at a broad, conceptual level.

As section 2 of this report outlines, several dominant themes emerge from in-depth study of educational standards and research literature on what knowledge and skills are most valuable in both postsecondary education and workforce training. For instance, a principal theme is that students are generally better served by learning core knowledge and skills in depth rather than undertaking a surface-level exploration of a wider range of topics. Therefore, it makes sense to identify the evidence-based core knowledge and skills on which college and career readiness and success rely and then to develop tests of that core. This has been the College Board's approach in redesigning its SAT Suite of Assessments.

Another important theme is that, even for assessments (such as the College Board's) concentrated on measuring attainment of core knowledge and skills, it is a practical impossibility to assess every possible element in depth in a reasonable time frame. However, when each element belongs to a cohesive knowledge and skill domain, as is the case with the SAT Suite's assessments, careful, strategic sampling of that domain permits valid and reliable inferences about an examinee's level of learning. Careful domain sampling enables tests of reasonable length and time to render technically sound educational measurements.

This report includes both conceptual and point-by-point alignments in a way that we believe is open, clear, transparent, and reader friendly. Section 2 outlines the evidentiary foundation for key elements of the redesigned SAT Suite's Reading Tests, Writing and Language Tests, Essay (SAT only), and Math Tests. For a detailed account of the test specifications for the redesigned SAT (which also applies to the PSAT/NMSQT, PSAT 10, and PSAT 8/9), please refer to *Test Specifications for the Redesigned SAT* at https://www.collegeboard.org/pdf/sat/delivering-opportunity/test_specifications_for_the_redesigned_sat_102414.pdf.

Sections 3 through 6 detail the technical alignment between the redesigned assessments and the state standards. Section 3 provides a summary of the match between the key features of the redesigned SAT Suite assessments and the state standards. Sections 4, 5, and 6 offer point-by-point comparisons of assessment domains to standards, presented first with the state's standards as the organizing principle and second with the elements of the redesigned assessments as the principle.

Section 2: Evidentiary Foundation

This section outlines the evidence base supporting the redesigned SAT Suite of Assessments. The discussion focuses first on Evidence-Based Reading and Writing (Reading; Writing and Language) and the optional Essay (SAT only) and then on Math. The section offers a global description of the key evidence undergirding the major choices guiding the redesign of the SAT Suite. As new evidence about the essential requirements for college and career readiness and success emerges from our ongoing research, we will incorporate it in our evidence base and document the results.

For a detailed account of the evidence base, see "The Redesigned SAT: Evidentiary Foundation," section II of the *Test Specifications for the Redesigned SAT* at https://www.collegeboard.org/pdf/sat/delivering-opportunity/test_specifications_for_the_redesigned_sat_102414.pdf.

Evidence-Based Reading and Writing; Essay

The Evidence-Based Reading and Writing (ERW) section of each assessment in the SAT Suite is composed of two required multiple-choice tests:

- a **Reading Test** focused on the assessment of students' comprehension and reasoning skills in relation to appropriately challenging prose passages (sometimes paired, or associated with one or more informational graphics) across a range of content areas; and
- a **Writing and Language Test** focused on the assessment of students' revising and editing skills in the context of extended prose passages (sometimes associated with one or more informational graphics) across a range of content areas.

The optional **Essay (SAT only)** is focused on the assessment of students' skill in developing a cogent and clear written analysis of a provided source text.

The scores on the Reading Test and the Writing and Language Test are multiplied by ten and combined to yield an Evidence-Based Reading and Writing section score. The three scores yielded by the SAT Essay (Reading, Analysis, Writing) complement those from the multiple-choice English language arts/literacy assessments but are not combined with them or with each other.

A number of key design elements strongly supported by evidence are interwoven throughout the Evidence-Based Reading and Writing and the Essay sections of the assessments. These include

- the use of a specified range of text complexity aligned to college and career readiness levels of reading, based on extensive research on requirements for reading and comprehension in college, career, and life;
- an emphasis on source analysis and use of evidence, based on current curricular and career emphases;
- the inclusion of data and informational graphics, which students must analyze in conjunction with text, based on studies showing the ever-increasing importance of visual displays of information;

- a focus on relevant words in context and on word choice for rhetorical effect, based on studies going back nearly a century;
- attention to a core set of important English language conventions and to effective written expression, based on recent research in metalinguistic understanding; and
- the requirement that students work with texts across a wide range of disciplines, based on extensive research showing the importance of developing discipline-specific literacy skills.

Math

The overall aim of the Math section in each of the SAT Suite's assessments is to assess students' fluency with, understanding of, and ability to apply the mathematical concepts, skills, and practices that are most strongly prerequisite and useful for a range of college majors and careers. The Math Test rewards a much stronger command of fewer, more important topics than has traditionally been assessed. To succeed on the Math Test, students need to exhibit command of mathematical practices, fluency with mathematical procedures, and conceptual understanding of mathematical ideas. In keeping with the best available evidence on essential college and career readiness and success outcomes, the assessment also provides opportunities for students to engage with rich applied problems.

Among the key evidence-based design elements that shape the Math Test are

- a focus on content that matters most for college and career readiness and success, based on extensive research and on national surveys of teachers of mathematics;
- an emphasis on problem solving and data analysis in real-world settings where the use of mathematical practices is integrated with content, based on recent studies and on recent results of the Programme for International Student Assessment (PISA);
- a balance of fluency, conceptual understanding, and application items within and across all content topics; and
- the inclusion of both calculator and no-calculator portions as well as attention to the use of a calculator as a tool, based on clear data reflecting the expectations of postsecondary instructors of mathematics.

Summary

All of the tests that are part of the redesigned SAT Suite of Assessments are informed by evidence about essential requirements for college and career readiness and success and are designed to measure robustly students' attainment of those key requirements. The Reading, Writing and Language, and (optional; SAT only) Essay sections of the assessments share a focus on text—its complexity, its use of evidence, its relationship to data, its disciplinary roots—and on language, particularly its use in communicating information and ideas clearly and purposefully. The redesigned SAT Suite also supports sustained attention on a core of math concepts, skills, and understandings rather than encouraging a race through a vast array of math soon forgotten. An important element of math is that knowing a few things very well gives students a wide-ranging readiness. The math in the SAT Suite reflects what

students can expect to see and use throughout a range of college courses, workforce training programs, and career opportunities.

The College Board's commitment to focus across all the sections in the SAT Suite can be summed up as follows: The redesigned assessments are not mysterious or tricky. They are completely transparent. They focus on the knowledge and skills that are worthy of practice. They are designed to offer clear signals to instruction and to resemble the best of classroom work and work outside of the classroom. The redesigned assessments are reliable, measuring durable knowledge and skills needed in all levels of postsecondary education, work, and life. Rather than covering a great number of topics and concepts that most examinees will never see again, the assessments focus on study of a deep core that students can draw upon again and again in college and career.

Section 3: Michigan Standards Alignment Summary

Section 3 outlines the alignment of the SAT Suite of Assessments to Michigan's standards conducted by the College Board and provides a high-level summary of the results.

English Language Arts/Literacy Alignment Summary

The College Board's Assessment Design and Development English Language Arts/Literacy team conducted the following alignments between the SAT Suite of Assessments and the Michigan Standard Course of Study for English Language Arts:

(1) Michigan's English Language Arts/Literacy standards (including college and career readiness anchor standards; grades 11–12, grades 9–10, and grade 8 English Language Arts standards [including SAT-applicable Language "progressive" standards]; and grades 11–12, grades 9–10, and grades 6–8 Literacy in History/Social Studies, Science, and Technical Subjects standards) to the redesigned SAT Suite Reading, Writing and Language, and Essay testing domains; and the redesigned SAT Suite Reading, Writing and Language, and (optional; SAT only) Essay testing domains to Michigan's English Language Arts/Literacy standards (anchors and grades 11–12, 9–10, and 8).

The overall alignment is clear and robust, as summarized below.

- **Anchors (aligned to SAT, including Essay):** All of the Michigan Reading and Language Anchor Standards are addressed in whole or in part on the redesigned SAT. Seven of the ten Michigan Writing Anchor Standards are addressed in whole or in part. (Standards regarding technology use [W.CCR.6] and conducting research [W.CCR.7, W.CCR.8] are not aligned to.) Speaking and listening are not addressed on the SAT and are thus not aligned to.
- **Grades 11–12 ELA/Literacy (aligned to SAT, including Essay):** Seven of the nine Reading Standards for Literature 11–12 and all of the Reading Standards for Informational Text 11–12 are addressed in whole or in part on the redesigned SAT. (RL.11–12.7, requiring synthesis of multiple literary texts, was not aligned to, as the SAT Reading Test's paired-passage format is restricted to history/social studies and science texts; RL.11–12.9, which requires demonstration of eighteenth-, nineteenth-, and twentieth-century US literature, is largely outside of the Reading Test domain.) Seven of the ten Writing Standards 11–12 are addressed in whole or in part. (As with the anchor standards, W.11–12.6, W.11–12.7, and W.11–12.8 were not aligned to.) All of the Language "progressive" standards applicable to grades 11–12 are aligned to, as are all of the Language Standards 11–12, in whole or in part.
- **Grades 11–12 Literacy in History/Social Studies, Science, and Technical Subjects (aligned to SAT, not including Essay):** While the SAT Suite assessments are not tests of history/social studies and science content knowledge, they do address aspects of literacy in these subject areas. Nine of the ten Reading Standards for Literacy in History/Social Studies 11–12 are addressed in whole or in part, the lone exception being RH.11–12.8, which requires external validation or critique of an author's argument. Nine out of ten of the Reading Standards for Literacy in Science and Technical Subjects 11–12 are addressed in whole or in part, the lone exception being RST.11–12.3, which is concerned with following a multistep procedure. Four of the nine Writing Standards for Literacy in History/Social Studies, Science, and Technical Subjects 11–12 are addressed in whole or in part. As with the ELA/Literacy counterparts, standards

pertaining to technology use (WHST.11–12.6) and research (WHST.11–12.7, WHST.11–12.8) are not addressed; because the Essay task does not involve analyzing a history/social studies, science, or technical source, WHST.11–12.9 and WHST.11–12.10 are not aligned to.

- **Grades 9–10 ELA/Literacy (aligned to PSAT/NMSQT and PSAT 10):** Seven of the nine Reading Standards for Literature 9–10 are addressed in whole or in part. Not aligned to are RL.9–10.7, which focuses on artistic media, and RL.9–10.9, which focuses on a very specific form of intertextuality. Nine of the ten Reading Standards for Informational Text 9–10 are addressed in whole or in part. Not aligned to is RI.9–10.7, which focuses on different mediums for accounts. Five of the ten Writing Standards 9–10 are addressed in whole or in part, the difference from 11–12 accounted for by the fact that the latter was also aligned to the SAT Essay. Five of the six Language Standards 9–10 are aligned to, with L.9–10.3a, concerning use of style manuals, being out of the testing domain.
- **Grades 9–10 Literacy in History/Social Studies, Science, and Technical Subjects (aligned to PSAT/NMSQT and PSAT 10):** All ten of the Reading Standards for Literacy in History/Social Studies 9–10 are addressed in whole or in part. Eight of the ten Reading Standards for Literacy in Science and Technical Subjects 9–10 are aligned to; RST.9–10.3 (following multistep procedures) and RST.9–10.9 (comparing and contrasting findings presented in a text to those from other sources) are not addressed. As with grades 11–12, four of the nine Writing Standards for Literacy in History/Social Studies, Science, and Technical Subjects 9–10 are aligned to, the exceptions again pertaining to technology (WHST.9–10.6), research (WHST.9–10.7, WHST.9–10.8), source use (WHST.9–10.9), and direct writing (WHST.9–10.10).
- **Grade 8 ELA/Literacy (aligned to PSAT 8/9):** Seven of the nine Reading Standards for Literature 8 are addressed in whole or in part. Not aligned to are RL.8.7, which involves filmed and live productions of stories or dramas, and RL.8.9, which (like RL.9–10.9) focuses on a very specific form of intertextuality. Nine of the ten Reading Standards for Informational Text 8 are aligned to, the exception being RI.8.7, which concerns the use of media. As was true for grades 9–10, five of the ten Writing Standards 8 are addressed in whole or in part, with elements of research, source use, and direct writing not aligned to. All six of the Language Standards 8 are aligned to in whole or in part.
- **Grade 8 Literacy in History/Social Studies, Science, and Technical Subjects (aligned to PSAT 8/9):** All ten of the Reading Standards for Literacy in History/Social Studies 8 are addressed in whole or in part. As was true for grades 9–10, eight of the ten Reading Standards for Literacy in Science and Technical Subjects 8 are aligned to, with the same sorts of exceptions: RST.8.3 (following multistep procedures) and RST.8.9 (comparing and contrasting information from a text to that gained from other sources). In a similar vein, four of the nine Writing Standards for Literacy in History/Social Studies, Science, and Technical Subjects 8, with the omissions again being related to technology (WHST.8.6), research (WHST.8.7, WHST.8.8), source use (WHST.8.9), and direct writing (WHST.8.10).
- Inclusion of the redesigned SAT's Essay improves the alignment in numerous ways, including by addressing Writing standards not directly measured by the selected-response SAT Writing and Language Test.

Alignment of SAT Suite assessments to Michigan standards

- All but two of the elements in the SAT Suite of Assessments are addressed directly by Michigan standards.

- The two exceptions are text complexity in Writing and Language, which is not addressed by Michigan standards, and the SAT Essay's requirement for accuracy in representation of source texts, which is implicit in Michigan's research-related standards (for example, in the provision in W.8.8 to avoid plagiarism).

Math Alignment Summary

The College Board's Assessment Design and Development Math team conducted the following alignments between the SAT Suite of Assessments and Michigan's standards:

(1) the Michigan Standards for Mathematics, Grades 6, 7, 8, and High School (including Number and Quantity, Algebra, Functions, Modeling, Geometry, and Statistics and Probability) to the redesigned SAT Suite Math testing domains; and

(2) the redesigned SAT Suite Math testing domains to the Michigan Standards for Mathematics, Grades 6, 7, 8, and High School.

The overall alignment is again clear and robust, as summarized below.

- The alignment between the redesigned SAT content specifications and the Michigan Standards for High School Mathematics is strong in the Number and Quantity, Algebra, Functions, Modeling, Geometry, and Statistics and Probability conceptual categories. The SAT's domain sampling approach covers standards from 20 of the 22 domains within these conceptual categories. The two domains not covered, Vector and Matrix Quantities (from Number and Quantity) and Using Probability to Make Decisions (from Statistics and Probability), are intentionally excluded as they are composed entirely of (+) standards. The (+) standards throughout the Michigan Standards for High School Mathematics are intended as preparation for advanced courses and are not essential for all students to learn to be college and career ready.
- Ideas from the conceptual category of Modeling are interspersed in problems aligned to the other conceptual categories, as suggested by the standards themselves in the statement, "Modeling is best interpreted not as a collection of isolated topics, but rather in relation to the other standards." Modeling is emphasized throughout the redesigned SAT Math Test.
- All skills measured in the redesigned SAT appear in the Michigan Standards for High School Mathematics.
- Additionally, an emphasis on the Michigan Standards for Mathematical Practice is apparent throughout the redesigned SAT. In order to do well on the varied item types they will see, students must make sense of problems and persevere in solving them (Math Practice 1). Students have many opportunities to make use of structure (Math Practice 7) in the Heart of Algebra and Passport to Advanced Math domains, while they must evaluate claims (Math Practice 3) in the Problem Solving and Data Analysis domain. They represent quantities in context with mathematical relationships and interpret their results (Math Practice 2) in all three of those domains. Mathematical modeling (Math Practice 4) is especially important in Heart of Algebra and Passport to Advanced Math. Finally, students must solve a carefully selected set of items that rewards strategic, rather than indiscriminant, use of the calculator in the Calculator portion of the Math Test (Math Practice 5).

- The redesigned SAT Math test has a cross-disciplinary focus drawing from topics in Science and Social Studies. Michigan Social Studies process skills, such as P2.2 and P2.5, must be applied in the SAT Math Test to solve math problems about topics drawn from a variety of Social Studies domains, such as history, economics, geography, and political science. Other items will require application of mathematics in science contexts from a variety of life, earth, and physical sciences. The Math components of the redesigned SAT, like the Michigan standards, have been designed to promote in a clear and transparent way the goal of college and career readiness and success for all students and are grounded in evidence about essential postsecondary requirements.
- The alignment between the PSAT/NMSQT and PSAT 10 content specifications and the Michigan Standards for High School Mathematics is strong in Algebra and Functions. PSAT/NMSQT and PSAT 10 content specifications also draw from the conceptual categories of Number and Quantity, Geometry, and Statistics and Probability.
- All skills measured in the PSAT/NMSQT and PSAT 10 appear in the Michigan Standards for High School Mathematics.
- Like the redesigned SAT, the PSAT/NMSQT and PSAT 10 include ideas from the conceptual category of Modeling and aligned to the Michigan Standards for Mathematical Practice interspersed in problems aligned to other conceptual categories.
- Like the redesigned SAT, the PSAT/NMSQT and PSAT 10 have a cross-disciplinary focus, drawing topics from Science and Social Studies.
- The alignment between the PSAT 8/9 content specifications and the Michigan Standards for Grades 6, 7, and 8 is strong in Expressions and Equations and in Statistics and Probability. There is also a strong alignment between the PSAT 8/9 content specifications and the Grade 8 Functions content category, the Grade 6 Ratios and Proportional Relationships content category, and the High School Mathematics Algebra and Functions content categories. PSAT 8/9 content specifications also draw from the conceptual categories of Grade 7 and High School Geometry as well as High School Number and Quantity, Geometry, and Statistics and Probability.
- All skills measured in the PSAT 8/9 appear in the Michigan Standards for grades 6, 7, 8, or High School Mathematics.
- Like the redesigned SAT, the PSAT 8/9 includes ideas from the conceptual category of Modeling and aligned to the Michigan Standards for Mathematical Practice interspersed in problems aligned to other conceptual categories.
- Like the redesigned SAT, the PSAT 8/9 has a cross-disciplinary focus, drawing topics from Science and Social Studies.

Section 4: State Standards Alignment Tables—SAT

The detailed results of the alignments between Michigan's standards and the knowledge and skills assessed by the redesigned SAT are presented in this section. The English Language Arts/Literacy alignment results are presented in tables 1 through 14 and are followed by the Math alignment results in tables 15 and 16. Tables 1 through 11 (English Language Arts/Literacy) and table 15 (Math) show Michigan's standards in the left-hand column and aligned SAT content specifications in the right-hand column. Tables 12 through 14 (English Language Arts/Literacy) and table 16 (Math) present the SAT content specifications in the left-hand column and aligned Michigan standards in the right-hand column.

English Language Arts/Literacy Alignment: Michigan's Standards to SAT
Tables 1 through 11 detail the SAT-Michigan alignment using Michigan's standards as the organizing principle. In selected cases, a partial or otherwise qualified alignment was noted through the use of red text. A partial or qualified alignment was indicated only when College Board staff felt that doing so identified an essential agreement that respected the spirit of the element being incompletely aligned to. Additional explanatory notes (also in red, in the right-hand column) are included to help illuminate College Board's methodology.

Table 1: College and Career Readiness Anchor Standards for Reading: MI to SAT

Michigan Anchor Standards for Reading	SAT Reading Test and SAT Essay
1. Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.	Determining explicit meanings: The student will identify information and ideas explicitly stated in text. Determining implicit meanings: The student will draw reasonable inferences and logical conclusions from text. Using analogical reasoning: The student will extrapolate in a reasonable way from the information and ideas in a text or apply information and ideas in a text to a new, analogous situation. Citing textual evidence: The student will cite the textual evidence that best supports a given claim or point. Essay—Reading *Speaking is not assessed.*

Michigan Anchor Standards for Reading	SAT Reading Test and SAT Essay
2. Determine central ideas or themes of a text and analyze their development; summarize the key supporting details and ideas.	Determining central ideas and themes: The student will identify explicitly stated central ideas or themes in text and determine implicit central ideas or themes from text. Summarizing: The student will identify a reasonable summary of a text or of key information and ideas in text. Essay—Reading
3. Analyze how and why individuals, events, and ideas develop and interact over the course of a text.	Understanding relationships: The student will identify explicitly stated relationships or determine implicit relationships between and among individuals, events, or ideas (e.g., cause-effect, comparison-contrast, sequence). Essay—Reading
4. Interpret words and phrases as they are used in a text, including determining technical, connotative, and figurative meanings, and analyze how specific word choices shape meaning or tone.	Determining explicit meanings: The student will identify information and ideas explicitly stated in text. Determining implicit meanings: The student will draw reasonable inferences and logical conclusions from text. Interpreting words and phrases in context: The student will determine the meaning of words and phrases in context. Analyzing word choice: The student will determine how the selection of specific words and phrases or the use of patterns of words and phrases shapes meaning and tone in text. Essay—Reading Essay—Analysis

Michigan Anchor Standards for Reading	SAT Reading Test and SAT Essay
5. Analyze the structure of texts, including how specific sentences, paragraphs, and larger portions of the text (e.g., a section, chapter, scene, or stanza) relate to each other and the whole.	Analyzing overall text structure: The student will describe the overall structure of a text. Analyzing part-whole relationships: The student will analyze the relationship between a particular part of a text (e.g., a sentence) and the whole text. Essay—Analysis *Reading Test and Essay passages are generally too short to allow for "larger portions" to be meaningfully present.*
6. Assess how point of view or purpose shapes the content and style of a text.	Analyzing point of view: The student will determine the point of view or perspective from which a text is related or the influence this point of view or perspective has on content and style. Analyzing purpose: The student will determine the main or most likely purpose of a text or of a particular part of a text (typically, one or more paragraphs). Essay—Analysis
7. Integrate and evaluate content presented in diverse media and formats, including visually and quantitatively, as well as in words.	Analyzing quantitative information: The student will analyze information presented quantitatively in such forms as graphs, tables, and charts and/or relate that information to information presented in text. *Media and purely visual information are not included, although informational graphics, such as tables, graphs, and charts, are included on the Reading Test.*
8. Delineate and evaluate the argument and specific claims in a text, including the validity of the reasoning as well as the relevance and sufficiency of the evidence.	Analyzing claims and counterclaims: The student will identify claims and counterclaims explicitly stated in text or determine implicit claims and counterclaims from text. Assessing reasoning: The student will assess an author's reasoning for soundness. Analyzing evidence: The student will assess how an author uses or fails to use evidence to support a claim or counterclaim. Essay—Analysis

Michigan Anchor Standards for Reading	SAT Reading Test and SAT Essay
9. Analyze how two or more texts address similar themes or topics in order to build knowledge or to compare the approaches the authors take.	Analyzing multiple texts: The student will synthesize information and ideas from paired texts.
10. Read and comprehend complex literary and informational texts independently and proficiently.	Text complexity: The passages/pair on the SAT Reading Test represent a specified range of text complexities from grades 9–10 to postsecondary entry. Essay—Reading *Passages on the Essay are "informational texts" and "literary nonfiction" per Michigan's standards and fall within the range of high school–level reading difficulty.*

Table 2: Reading Standards for Literature 11–12: MI to SAT

Michigan Reading Standards for Literature 11–12	SAT Reading Test
1. Cite strong and thorough textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text, including determining where the text leaves matters uncertain.	Determining explicit meanings: The student will identify information and ideas explicitly stated in text. Determining implicit meanings: The student will draw reasonable inferences and logical conclusions from text. Using analogical reasoning: The student will extrapolate in a reasonable way from the information and ideas in a text or apply information and ideas in a text to a new, analogous situation. Citing textual evidence: The student will cite the textual evidence that best supports a given claim or point. *Students are asked on the Reading Test to cite the best evidence for the answer to a particular question or in support of a given point or conclusion.*
2. Determine two or more themes or central ideas of a text and analyze their development over the course of the text, including how they interact and build on one another to produce a complex account; provide an objective summary of the text.	Determining central ideas and themes: The student will identify explicitly stated central ideas or themes in text and determine implicit central ideas or themes from text. Summarizing: The student will identify a reasonable summary of a text or of key information and ideas in text. *Reading Test passages may or may not have multiple themes or central ideas.*

Michigan Reading Standards for Literature 11–12	SAT Reading Test
3. Analyze the impact of the author's choices regarding how to develop and relate elements of a story or drama (e.g., where a story is set, how the action is ordered, how the characters are introduced and developed).	Analyzing overall text structure: The student will describe the overall structure of a text. Analyzing part-whole relationships: The student will analyze the relationship between a particular part of a text (e.g., a sentence) and the whole text. Analyzing point of view: The student will determine the point of view or perspective from which a text is related or the influence this point of view or perspective has on content and style. Analyzing purpose: The student will determine the main or most likely purpose of a text or of a particular part of a text (typically, one or more paragraphs). *Drama is not included on the Reading Test.*
4. Determine the meaning of words and phrases as they are used in the text, including figurative and connotative meanings; analyze the impact of specific word choices on meaning and tone, including words with multiple meanings or language that is particularly fresh, engaging, or beautiful.	Determining explicit meanings: The student will identify information and ideas explicitly stated in text. Determining implicit meanings: The student will draw reasonable inferences and logical conclusions from text. Interpreting words and phrases in context: The student will determine the meaning of words and phrases in context. Analyzing word choice: The student will determine how the selection of specific words and phrases or the use of patterns of words and phrases shapes meaning and tone in text.
5. Analyze how an author's choices concerning how to structure specific parts of a text (e.g., the choice of where to begin or end a story, the choice to provide a comedic or tragic resolution) contribute to its overall structure and meaning as well as its aesthetic impact.	Analyzing part-whole relationships: The student will analyze the relationship between a particular part of a text (e.g., a sentence) and the whole text.

Michigan Reading Standards for Literature 11–12	SAT Reading Test
6. Analyze a case in which grasping point of view requires distinguishing what is directly stated in a text from what is really meant (e.g., satire, sarcasm, irony, or understatement).	Analyzing point of view: The student will determine the point of view or perspective from which a text is related or the influence this point of view or perspective has on content and style. *Such texts are within the Reading Test domain but are not guaranteed to appear on any given test form.*
7. Analyze multiple interpretations of a story, drama, or poem (e.g., recorded or live production of a play or recorded novel or poetry), evaluating how each version interprets the source text.	
8. (Not applicable to literature)	
9. Demonstrate knowledge of eighteenth-, nineteenth- and early-twentieth-century foundational works of American literature, including how two or more texts from the same period treat similar themes or topics.	*A given Reading Test form may include a work of classic US literature. Multiple literature texts are not included.*
10. By the end of grade 11, read and comprehend literature, including stories, dramas, and poems, in the grades 11-CCR text complexity band proficiently, with scaffolding as needed at the high end of the range. By the end of grade 12, read and comprehend literature, including stories, dramas, and poems, at the high end of the grades 11–CCR text complexity band independently and proficiently.	Text complexity: The passages/pair on the SAT Reading Test represent a specified range of text complexities from grades 9–10 to postsecondary entry. *Scaffolding is not available during the summative Reading Test. Drama and poetry are not included on the Reading Test.*

Table 3: Reading Standards for Informational Text 11–12: MI to SAT

Michigan Reading Standards for Informational Text 11–12	SAT Reading Test and SAT Essay
1. Cite strong and thorough textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text, including determining where the text leaves matters uncertain.	Determining explicit meanings: The student will identify information and ideas explicitly stated in text. Determining implicit meanings: The student will draw reasonable inferences and logical conclusions from text. Using analogical reasoning: The student will extrapolate in a reasonable way from the information and ideas in a text or apply information and ideas in a text to a new, analogous situation. Citing textual evidence: The student will cite the textual evidence that best supports a given claim or point. Essay—Reading
2. Determine two or more central ideas of a text and analyze their development over the course of the text, including how they interact and build on one another to provide a complex analysis; provide an objective summary of the text.	Determining central ideas and themes: The student will identify explicitly stated central ideas or themes in text and determine implicit central ideas or themes from text. Summarizing: The student will identify a reasonable summary of a text or of key information and ideas in text. Essay—Reading *Reading Test and Essay passages may or may not have multiple central ideas.*

Michigan Reading Standards for Informational Text 11–12	SAT Reading Test and SAT Essay
3. Analyze a complex set of ideas or sequence of events and explain how specific individuals, ideas, or events interact and develop over the course of the text.	Determining explicit meanings: The student will identify information and ideas explicitly stated in text. Determining implicit meanings: The student will draw reasonable inferences and logical conclusions from text. Using analogical reasoning: The student will extrapolate in a reasonable way from the information and ideas in a text or apply information and ideas in a text to a new, analogous situation. Understanding relationships: The student will identify explicitly stated relationships or determine implicit relationships between and among individuals, events, or ideas (e.g., cause-effect, comparison-contrast, sequence). Essay—Reading
4. Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings; analyze how an author uses and refines the meaning of a key term or terms over the course of a text (e.g., how Madison defines *faction* in *Federalist* No. 10).	Determining explicit meanings: The student will identify information and ideas explicitly stated in text. Determining implicit meanings: The student will draw reasonable inferences and logical conclusions from text. Interpreting words and phrases in context: The student will determine the meaning of words and phrases in context. Analyzing word choice: The student will determine how the selection of specific words and phrases or the use of patterns of words and phrases shapes meaning and tone in text. Essay—Reading Essay—Analysis *The passages in any given Reading or Essay administration may or may not include extended study of a particular term.*

Michigan Reading Standards for Informational Text 11–12	SAT Reading Test and SAT Essay
5. Analyze and evaluate the effectiveness of the structure an author uses in his or her exposition or argument, including whether the structure makes points clear, convincing, and engaging.	Analyzing overall text structure: The student will describe the overall structure of a text. Analyzing part-whole relationships: The student will analyze the relationship between a particular part of a text (e.g., a sentence) and the whole text. Essay—Analysis
6. Determine an author's point of view or purpose in a text in which the rhetoric is particularly effective, analyzing how style and content contribute to the power, persuasiveness, or beauty of the text.	Analyzing point of view: The student will determine the point of view or perspective from which a text is related or the influence this point of view or perspective has on content and style. Analyzing purpose: The student will determine the main or most likely purpose of a text or of a particular part of a text (typically, one or more paragraphs). Essay—Analysis
7. Integrate and evaluate multiple sources of information presented in different media or formats (e.g., visually, quantitatively) as well as in words in order to address a question or solve a problem.	Analyzing quantitative information: The student will analyze information presented quantitatively in such forms as graphs, tables, and charts and/or relate that information to information presented in text. *Media and purely visual information are not included, although informational graphics, such as tables, graphs, and charts, are included on the Reading Test. Students are not asked to solve problems.*

Michigan Reading Standards for Informational Text 11–12	SAT Reading Test and SAT Essay
8. Delineate and evaluate the reasoning in seminal U.S. texts, including the application of constitutional principles and use of legal reasoning (e.g., in U.S. Supreme Court majority opinions and dissents) and the premises, purposes, and arguments in works of public advocacy (e.g., *The Federalist*, presidential addresses).	Analyzing purpose: The student will determine the main or most likely purpose of a text or of a particular part of a text (typically, one or more paragraphs). Analyzing claims and counterclaims: The student will identify claims and counterclaims explicitly stated in text or determine implicit claims and counterclaims from text. Assessing reasoning: The student will assess an author's reasoning for soundness. Analyzing evidence: The student will assess how an author uses or fails to use evidence to support a claim or counterclaim. *The Reading Test includes either a selection from a US founding document or a selection from a text in the Great Global Conversation; Essay includes an argument written for a broad audience. Reading Test passages may or may not assess the application of constitutional principles and use of legal reasoning.*

Michigan Reading Standards for Informational Text 11–12	SAT Reading Test and SAT Essay
9. Analyze seventeenth-, eighteenth-, and nineteenth-century foundational U.S. documents of historical and literary significance (including The Declaration of Independence, the Preamble to the Constitution, the Bill of Rights, and Lincoln's Second Inaugural Address) for their themes, purposes, and rhetorical features.	Determining central ideas and themes: The student will identify explicitly stated central ideas or themes in text and determine implicit central ideas or themes from text. Analyzing word choice: The student will determine how the selection of specific words and phrases or the use of patterns of words and phrases shapes meaning and tone in text. Analyzing part-whole relationships: The student will analyze the relationship between a particular part of a text (e.g., a sentence) and the whole text. Analyzing purpose: The student will determine the main or most likely purpose of a text or of a particular part of a text (typically, one or more paragraphs). Analyzing claims and counterclaims: The student will identify claims and counterclaims explicitly stated in text or determine implicit claims and counterclaims from text. Assessing reasoning: The student will assess an author's reasoning for soundness. Analyzing evidence: The student will assess how an author uses or fails to use evidence to support a claim or counterclaim. *The Reading Test includes either a selection from a US founding document or a selection from a text in the Great Global Conversation.*
10. By the end of grade 11, read and comprehend literary nonfiction in the grades 11-CCR text complexity band proficiently, with scaffolding as needed at the high end of the range. By the end of grade 12, read and comprehend literary nonfiction at the high end of the grades 11–CCR text complexity band independently and proficiently.	Text complexity: The passages/pair on the SAT Reading Test represent a specified range of text complexities from grades 9–10 to postsecondary entry. Essay—Reading *Passages on the Essay are "informational texts" and "literary nonfiction" per Michigan's standards and fall within the range of high school–level reading difficulty. Scaffolding is not available during the summative Reading Test.*

Table 4: College and Career Readiness Anchor Standards for Writing: MI to SAT

Michigan Anchor Standards for Writing	SAT Writing and Language Test and SAT Essay
1. Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence.	Proposition: The student will add, revise, or retain central ideas, main claims, counterclaims, topic sentences, and the like to structure text and convey arguments, information, and ideas clearly and effectively. Support: The student will add, revise, or retain information and ideas (e.g., details, facts, statistics) intended to support claims or points in text. Focus: The student will add, revise, retain, or delete information and ideas in text for the sake of relevance to topic and purpose. Quantitative information: The student will relate information presented quantitatively in such forms as graphs, charts, and tables to information presented in text. Logical sequence: The student will revise text as needed to ensure that information and ideas are presented in the most logical order. Introductions, conclusions, and transitions: The student will revise text as needed to improve the beginning or ending of a text or paragraph to ensure that transition words, phrases, or sentences are used effectively to connect information and ideas. Precision: The student will revise text as needed to improve the exactness or content appropriateness of word choice. Concision: The student will revise text as needed to improve the economy of word choice (i.e., to eliminate wordiness and redundancy). Style and tone: The student will revise text as necessary to ensure consistency of style and tone within a text or to improve the match of style and tone to purpose. Syntax: The student will use various sentence

Michigan Anchor Standards for Writing	SAT Writing and Language Test and SAT Essay
	structures to accomplish needed rhetorical purposes. Essay—Analysis Essay—Writing
2. Write informative/explanatory texts to examine and convey complex ideas and information clearly and accurately through the effective selection, organization, and analysis of content.	Proposition: The student will add, revise, or retain central ideas, main claims, counterclaims, topic sentences, and the like to structure text and convey arguments, information, and ideas clearly and effectively. Support: The student will add, revise, or retain information and ideas (e.g., details, facts, statistics) intended to support claims or points in text. Focus: The student will add, revise, retain, or delete information and ideas in text for the sake of relevance to topic and purpose. Quantitative information: The student will relate information presented quantitatively in such forms as graphs, charts, and tables to information presented in text. Logical sequence: The student will revise text as needed to ensure that information and ideas are presented in the most logical order. Introductions, conclusions, and transitions: The student will revise text as needed to improve the beginning or ending of a text or paragraph to ensure that transition words, phrases, or sentences are used effectively to connect information and ideas. Precision: The student will revise text as needed to improve the exactness or content appropriateness of word choice. Concision: The student will revise text as needed to improve the economy of word choice (i.e., to eliminate wordiness and redundancy). Style and tone: The student will revise text as necessary to ensure consistency of style and tone within a text or to improve the match of style and

Michigan Anchor Standards for Writing	SAT Writing and Language Test and SAT Essay
	tone to purpose. Syntax: The student will use various sentence structures to accomplish needed rhetorical purposes. Essay—Analysis Essay—Writing
3. Write narratives to develop real or imagined experiences or events using effective technique, well-chosen details, and well-structured event sequences.	Proposition: The student will add, revise, or retain central ideas, main claims, counterclaims, topic sentences, and the like to structure text and convey arguments, information, and ideas clearly and effectively. Support: The student will add, revise, or retain information and ideas (e.g., details, facts, statistics) intended to support claims or points in text. Focus: The student will add, revise, retain, or delete information and ideas in text for the sake of relevance to topic and purpose. Quantitative information: The student will relate information presented quantitatively in such forms as graphs, charts, and tables to information presented in text. Logical sequence: The student will revise text as needed to ensure that information and ideas are presented in the most logical order. Introductions, conclusions, and transitions: The student will revise text as needed to improve the beginning or ending of a text or paragraph to ensure that transition words, phrases, or sentences are used effectively to connect information and ideas. Precision: The student will revise text as needed to improve the exactness or content appropriateness of word choice. Concision: The student will revise text as needed to improve the economy of word choice (i.e., to eliminate wordiness and redundancy).

Michigan Anchor Standards for Writing	SAT Writing and Language Test and SAT Essay
	Style and tone: The student will revise text as necessary to ensure consistency of style and tone within a text or to improve the match of style and tone to purpose. Syntax: The student will use various sentence structures to accomplish needed rhetorical purposes. *Fictional narratives are not included on the Writing and Language Test.*
4. Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.	Proposition: The student will add, revise, or retain central ideas, main claims, counterclaims, topic sentences, and the like to structure text and convey arguments, information, and ideas clearly and effectively. Support: The student will add, revise, or retain information and ideas (e.g., details, facts, statistics) intended to support claims or points in text. Focus: The student will add, revise, retain, or delete information and ideas in text for the sake of relevance to topic and purpose. Quantitative information: The student will relate information presented quantitatively in such forms as graphs, charts, and tables to information presented in text. Logical sequence: The student will revise text as needed to ensure that information and ideas are presented in the most logical order. Introductions, conclusions, and transitions: The student will revise text as needed to improve the beginning or ending of a text or paragraph to ensure that transition words, phrases, or sentences are used effectively to connect information and ideas. Style and tone: The student will revise text as necessary to ensure consistency of style and tone within a text or to improve the match of style and tone to purpose.

Michigan Anchor Standards for Writing	SAT Writing and Language Test and SAT Essay
	Essay—Analysis Essay—Writing
5. Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach.	Proposition: The student will add, revise, or retain central ideas, main claims, counterclaims, topic sentences, and the like to structure text and convey arguments, information, and ideas clearly and effectively. Support: The student will add, revise, or retain information and ideas (e.g., details, facts, statistics) intended to support claims or points in text. Focus: The student will add, revise, retain, or delete information and ideas in text for the sake of relevance to topic and purpose. Quantitative information: The student will relate information presented quantitatively in such forms as graphs, charts, and tables to information presented in text. Logical sequence: The student will revise text as needed to ensure that information and ideas are presented in the most logical order. Introductions, conclusions, and transitions: The student will revise text as needed to improve the beginning or ending of a text or paragraph to ensure that transition words, phrases, or sentences are used effectively to connect information and ideas. Precision: The student will revise text as needed to improve the exactness or content appropriateness of word choice. Concision: The student will revise text as needed to improve the economy of word choice (i.e., to eliminate wordiness and redundancy). Style and tone: The student will revise text as necessary to ensure consistency of style and tone within a text or to improve the match of style and tone to purpose. Syntax: The student will use various sentence

Michigan Anchor Standards for Writing	SAT Writing and Language Test and SAT Essay
	structures to accomplish needed rhetorical purposes. Sentence boundaries: The student will recognize and correct grammatically incomplete sentences (e.g., rhetorically inappropriate fragments and run-ons). Subordination and coordination: The student will recognize and correct problems in coordination and subordination in sentences. Parallel structure: The student will recognize and correct problems in parallel structure in sentences. Modifier placement: The student will recognize and correct problems in modifier placement (e.g., misplaced or dangling modifiers). Verb tense, mood, and voice: The student will recognize and correct inappropriate shifts in verb tense, voice, and mood within and between sentences. Pronoun person and number: The student will recognize and correct inappropriate shifts in pronoun person and number within and between sentences. Pronoun clarity: The student will recognize and correct pronouns with unclear or ambiguous antecedents. Possessive determiners: The student will recognize and correct cases in which possessive determiners (*its*, *your*, *their*), contractions (*it's*, *you're*, *they're*), and adverbs (*there*) are confused with each other. Pronoun-antecedent agreement: The student will recognize and correct lack of agreement between pronoun and antecedent. Subject-verb agreement: The student will recognize and correct lack of agreement between subject and verb. Noun agreement: The student will recognize and

Michigan Anchor Standards for Writing	SAT Writing and Language Test and SAT Essay
	correct lack of agreement between nouns. Frequently confused words: The student will recognize and correct instances in which a word or phrase is confused with another (e.g., *accept*/*except*, *allusion*/*illusion*). Logical comparison: The student will recognize and correct cases in which unlike terms are compared. Conventional expression: The student will recognize and correct cases in which a given expression is inconsistent with standard written English. End-of-sentence punctuation: The student will recognize and correct inappropriate uses of ending punctuation in cases in which the context makes the intent clear. Within-sentence punctuation: The student will correctly use and recognize and correct inappropriate uses of colons, semicolons, and dashes to indicate sharp breaks in thought within sentences. Possessive nouns and pronouns: The student will recognize and correct inappropriate uses of possessive nouns and pronouns as well as differentiate between possessive and plural forms. Items in a series: The student will correctly use and recognize and correct inappropriate uses of punctuation (commas and sometimes semicolons) to separate items in a series. Nonrestrictive and parenthetical elements: The student will correctly use punctuation (commas, parentheses, dashes) to set off nonrestrictive and parenthetical sentence elements as well as recognize and correct cases in which restrictive or essential sentence elements are inappropriately set off with punctuation. Unnecessary punctuation: The student will recognize and correct cases in which unnecessary punctuation appears in a sentence.

Michigan Anchor Standards for Writing	SAT Writing and Language Test and SAT Essay
	Essay—Writing *The Writing and Language Test is a test of revision and editing. Time does not typically permit students taking the Essay to rewrite or try a new approach. Students taking the Essay may plan, but their planning is not scored.*
6. Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others.	
7. Conduct short as well as more sustained research projects based on focused questions, demonstrating understanding of the subject under investigation.	
8. Gather relevant information from multiple print and digital sources, assess the credibility and accuracy of each source, and integrate the information while avoiding plagiarism.	
9. Draw evidence from literary or informational texts to support analysis, reflection, and research.	Essay—Reading Essay—Analysis *Passages on the Essay are "informational texts" and "literary nonfiction" per Michigan's standards. On the Essay, students are required to draw evidence from an argument written for a broad audience.*
10. Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of tasks, purposes, and audiences.	Essay—Analysis Essay—Writing *The Essay is a timed, single-sitting assessment. The Essay task is consistent from administration to administration.*

Table 5: Writing Standards 11–12: MI to SAT

Michigan Writing Standards 11–12	SAT Writing and Language and SAT Essay
1. Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence. a. Introduce precise, knowledgeable claim(s), establish the significance of the claim(s), distinguish the claim(s) from alternate or opposing claims, and create an organization that logically sequences claim(s), counterclaims, reasons, and evidence. b. Develop claim(s) and counterclaims fairly and thoroughly, supplying the most relevant evidence for each while pointing out the strengths and limitations of both in a manner that anticipates the audience's knowledge level, concerns, values, and possible biases. c. Use words, phrases, and clauses as well as varied syntax to link the major sections of the text, create cohesion, and clarify the relationships between claim(s) and reasons, between reasons and evidence, and between claim(s) and counterclaims. d. Establish and maintain a formal style and objective tone while attending to the norms and conventions of the discipline in which they are writing. e. Provide a concluding statement or section that follows from and supports the argument presented.	Proposition: The student will add, revise, or retain central ideas, main claims, counterclaims, topic sentences, and the like to structure text and convey arguments, information, and ideas clearly and effectively. Support: The student will add, revise, or retain information and ideas (e.g., details, facts, statistics) intended to support claims or points in text. Focus: The student will add, revise, retain, or delete information and ideas in text for the sake of relevance to topic and purpose. Quantitative information: The student will relate information presented quantitatively in such forms as graphs, charts, and tables to information presented in text. Logical sequence: The student will revise text as needed to ensure that information and ideas are presented in the most logical order. Introductions, conclusions, and transitions: The student will revise text as needed to improve the beginning or ending of a text or paragraph to ensure that transition words, phrases, or sentences are used effectively to connect information and ideas. Precision: The student will revise text as needed to improve the exactness or content appropriateness of word choice. Style and tone: The student will revise text as necessary to ensure consistency of style and tone within a text or to improve the match of style and tone to purpose. Syntax: The student will use various sentence structures to accomplish needed rhetorical purposes. Essay—Analysis

Michigan Writing Standards 11–12	SAT Writing and Language and SAT Essay
	Essay—Writing
2. Write informative/explanatory texts to examine and convey complex ideas, concepts, and information clearly and accurately through the effective selection, organization, and analysis of content. a. Introduce a topic; organize complex ideas, concepts, and information so that each new element builds on that which precedes it to create a unified whole; include formatting (e.g., headings), graphics (e.g., figures, tables), and multimedia when useful to aiding comprehension. b. Develop the topic thoroughly by selecting the most significant and relevant facts, extended definitions, concrete details, quotations, or other information and examples appropriate to the audience's knowledge of the topic. c. Use appropriate and varied transitions and syntax to link the major sections of the text, create cohesion, and clarify the relationships among complex ideas and concepts. d. Use precise language, domain-specific vocabulary, and techniques such as metaphor, simile, and analogy to manage the complexity of the topic. e. Establish and maintain a formal style and objective tone while attending to the norms and conventions of the discipline in which they are writing. f. Provide a concluding statement or section that follows from and supports the information or explanation presented (e.g., articulating implications or the significance of the topic).	Proposition: The student will add, revise, or retain central ideas, main claims, counterclaims, topic sentences, and the like to structure text and convey arguments, information, and ideas clearly and effectively. Support: The student will add, revise, or retain information and ideas (e.g., details, facts, statistics) intended to support claims or points in text. Focus: The student will add, revise, retain, or delete information and ideas in text for the sake of relevance to topic and purpose. Quantitative information: The student will relate information presented quantitatively in such forms as graphs, charts, and tables to information presented in text. Logical sequence: The student will revise text as needed to ensure that information and ideas are presented in the most logical order. Introductions, conclusions, and transitions: The student will revise text as needed to improve the beginning or ending of a text or paragraph to ensure that transition words, phrases, or sentences are used effectively to connect information and ideas. Precision: The student will revise text as needed to improve the exactness or content appropriateness of word choice. Style and tone: The student will revise text as necessary to ensure consistency of style and tone within a text or to improve the match of style and tone to purpose. Syntax: The student will use various sentence structures to accomplish needed rhetorical purposes. Essay—Analysis Essay—Writing

Michigan Writing Standards 11–12	SAT Writing and Language and SAT Essay
	Formatting and multimedia are not used in the Writing and Language Test or Essay.
3. Write narratives to develop real or imagined experiences or events using effective technique, well-chosen details, and well-structured event sequences. a. Engage and orient the reader by setting out a problem, situation, or observation and its significance, establishing one or multiple point(s) of view, and introducing a narrator and/or characters; create a smooth progression of experiences or events. b. Use narrative techniques, such as dialogue, pacing, description, reflection, and multiple plot lines, to develop experiences, events, and/or characters. c. Use a variety of techniques to sequence events so that they build on one another to create a coherent whole and build toward a particular tone and outcome (e.g., a sense of mystery, suspense, growth, or resolution). d. Use precise words and phrases, telling details, and sensory language to convey a vivid picture of the experiences, events, setting, and/or characters. e. Provide a conclusion that follows from and reflects on what is experienced, observed, or resolved over the course of the narrative.	Proposition: The student will add, revise, or retain central ideas, main claims, counterclaims, topic sentences, and the like to structure text and convey arguments, information, and ideas clearly and effectively. Support: The student will add, revise, or retain information and ideas (e.g., details, facts, statistics) intended to support claims or points in text. Focus: The student will add, revise, retain, or delete information and ideas in text for the sake of relevance to topic and purpose. Logical sequence: The student will revise text as needed to ensure that information and ideas are presented in the most logical order. Introductions, conclusions, and transitions: The student will revise text as needed to improve the beginning or ending of a text or paragraph to ensure that transition words, phrases, or sentences are used effectively to connect information and ideas. Precision: The student will revise text as needed to improve the exactness or content appropriateness of word choice. Style and tone: The student will revise text as necessary to ensure consistency of style and tone within a text or to improve the match of style and tone to purpose. *Fictional narratives are not included on the Writing and Language Test.*
4. Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.	Proposition: The student will add, revise, or retain central ideas, main claims, counterclaims, topic sentences, and the like to structure text and convey arguments, information, and ideas clearly and effectively. Support: The student will add, revise, or retain

Michigan Writing Standards 11–12	SAT Writing and Language and SAT Essay
	information and ideas (e.g., details, facts, statistics) intended to support claims or points in text. Focus: The student will add, revise, retain, or delete information and ideas in text for the sake of relevance to topic and purpose. Quantitative information: The student will relate information presented quantitatively in such forms as graphs, charts, and tables to information presented in text. Logical sequence: The student will revise text as needed to ensure that information and ideas are presented in the most logical order. Introductions, conclusions, and transitions: The student will revise text as needed to improve the beginning or ending of a text or paragraph to ensure that transition words, phrases, or sentences are used effectively to connect information and ideas. Style and tone: The student will revise text as necessary to ensure consistency of style and tone within a text or to improve the match of style and tone to purpose. Essay—Analysis Essay—Writing
5. Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience.	Proposition: The student will add, revise, or retain central ideas, main claims, counterclaims, topic sentences, and the like to structure text and convey arguments, information, and ideas clearly and effectively. Support: The student will add, revise, or retain information and ideas (e.g., details, facts, statistics) intended to support claims or points in text. Focus: The student will add, revise, retain, or delete information and ideas in text for the sake of relevance to topic and purpose. Quantitative information: The student will relate

Michigan Writing Standards 11–12	SAT Writing and Language and SAT Essay
	information presented quantitatively in such forms as graphs, charts, and tables to information presented in text. Logical sequence: The student will revise text as needed to ensure that information and ideas are presented in the most logical order. Introductions, conclusions, and transitions: The student will revise text as needed to improve the beginning or ending of a text or paragraph to ensure that transition words, phrases, or sentences are used effectively to connect information and ideas. Precision: The student will revise text as needed to improve the exactness or content appropriateness of word choice. Concision: The student will revise text as needed to improve the economy of word choice (i.e., to eliminate wordiness and redundancy). Style and tone: The student will revise text as necessary to ensure consistency of style and tone within a text or to improve the match of style and tone to purpose. Syntax: The student will use various sentence structures to accomplish needed rhetorical purposes. Sentence boundaries: The student will recognize and correct grammatically incomplete sentences (e.g., rhetorically inappropriate fragments and run-ons). Subordination and coordination: The student will recognize and correct problems in coordination and subordination in sentences. Parallel structure: The student will recognize and correct problems in parallel structure in sentences. Modifier placement: The student will recognize and correct problems in modifier placement (e.g., misplaced or dangling modifiers).

Michigan Writing Standards 11–12	SAT Writing and Language and SAT Essay
	Verb tense, mood, and voice: The student will recognize and correct inappropriate shifts in verb tense, voice, and mood within and between sentences. Pronoun person and number: The student will recognize and correct inappropriate shifts in pronoun person and number within and between sentences. Pronoun clarity: The student will recognize and correct pronouns with unclear or ambiguous antecedents. Possessive determiners: The student will recognize and correct cases in which possessive determiners (*its*, *your*, *their*), contractions (*it's*, *you're*, *they're*), and adverbs (*there*) are confused with each other. Pronoun-antecedent agreement: The student will recognize and correct lack of agreement between pronoun and antecedent. Subject-verb agreement: The student will recognize and correct lack of agreement between subject and verb. Noun agreement: The student will recognize and correct lack of agreement between nouns. Frequently confused words: The student will recognize and correct instances in which a word or phrase is confused with another (e.g., *accept*/*except*, *allusion*/*illusion*). Logical comparison: The student will recognize and correct cases in which unlike terms are compared. Conventional expression: The student will recognize and correct cases in which a given expression is inconsistent with standard written English. End-of-sentence punctuation: The student will recognize and correct inappropriate uses of ending punctuation in cases in which the context makes

Michigan Writing Standards 11–12	SAT Writing and Language and SAT Essay
	the intent clear. Within-sentence punctuation: The student will correctly use and recognize and correct inappropriate uses of colons, semicolons, and dashes to indicate sharp breaks in thought within sentences. Possessive nouns and pronouns: The student will recognize and correct inappropriate uses of possessive nouns and pronouns as well as differentiate between possessive and plural forms. Items in a series: The student will correctly use and recognize and correct inappropriate uses of punctuation (commas and sometimes semicolons) to separate items in a series. Nonrestrictive and parenthetical elements: The student will correctly use punctuation (commas, parentheses, dashes) to set off nonrestrictive and parenthetical sentence elements as well as recognize and correct cases in which restrictive or essential sentence elements are inappropriately set off with punctuation. Unnecessary punctuation: The student will recognize and correct cases in which unnecessary punctuation appears in a sentence. Essay—Writing *The Writing and Language Test is a test of revision and editing. Time does not typically permit students taking the Essay to rewrite or try a new approach. Students taking the Essay may plan, but their planning is not scored.*
6. Use technology, including the Internet, to produce, publish, and update individual or shared writing products in response to ongoing feedback, including new arguments or information.	
7. Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under	

Michigan Writing Standards 11–12	SAT Writing and Language and SAT Essay
investigation.	
8. Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the strengths and limitations of each source in terms of the task, purpose, and audience; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and over reliance on any one source and following a standard format for citation.	
9. Draw evidence from literary or informational texts to support analysis, reflection, and research. a. Apply grades 11–12 Reading standards to literature (e.g., "Demonstrate knowledge of eighteenth-, nineteenth- and early-twentieth-century foundational works of American literature, including how two or more texts from the same period treat similar themes or topics"). b. Apply grades 11–12 Reading standards to literary nonfiction (e.g., "Delineate and evaluate the reasoning in seminal U.S. texts, including the application of constitutional principles and use of legal reasoning [e.g., in U.S. Supreme Court Case majority opinions and dissents] and the premises, purposes, and arguments in works of public advocacy [e.g., *The Federalist*, presidential addresses]").	Essay—Reading Essay—Analysis *Passages on the Essay are "informational texts" and "literary nonfiction" per Michigan's standards. On the Essay, students are required to draw evidence from an argument written for a broad audience. See the relevant Reading standards for alignment details.*
10. Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of tasks, purposes, and audiences.	Essay—Analysis Essay—Writing *The Essay is a timed, single-sitting assessment. The Essay task is consistent from administration to administration.*

Note: The College and Career Readiness Anchor Standards for Speaking and Listening and the Speaking and Listening standards 11–12 are not included here as the SAT does not measure speaking and listening and therefore does not align with any of these standards.

Table 6: College and Career Readiness Anchor Standards for Language: MI to SAT

Michigan Anchor Standards for Language	SAT Reading Test, SAT Writing and Language Test, and SAT Essay
1. Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.	Sentence boundaries: The student will recognize and correct grammatically incomplete sentences (e.g., rhetorically inappropriate fragments and run-ons). Subordination and coordination: The student will recognize and correct problems in coordination and subordination in sentences. Parallel structure: The student will recognize and correct problems in parallel structure in sentences. Modifier placement: The student will recognize and correct problems in modifier placement (e.g., misplaced or dangling modifiers). Verb tense, mood, and voice: The student will recognize and correct inappropriate shifts in verb tense, voice, and mood within and between sentences. Pronoun person and number: The student will recognize and correct inappropriate shifts in pronoun person and number within and between sentences. Pronoun clarity: The student will recognize and correct pronouns with unclear or ambiguous antecedents. Possessive determiners: The student will recognize and correct cases in which possessive determiners (*its*, *your*, *their*), contractions (*it's*, *you're*, *they're*), and adverbs (*there*) are confused with each other. Pronoun-antecedent agreement: The student will recognize and correct lack of agreement between pronoun and antecedent. Subject-verb agreement: The student will recognize and correct lack of agreement between subject and verb. Noun agreement: The student will recognize and

Michigan Anchor Standards for Language	SAT Reading Test, SAT Writing and Language Test, and SAT Essay
	correct lack of agreement between nouns. Frequently confused words: The student will recognize and correct instances in which a word or phrase is confused with another (e.g., *accept*/*except*, *allusion*/*illusion*). Logical comparison: The student will recognize and correct cases in which unlike terms are compared. Conventional expression: The student will recognize and correct cases in which a given expression is inconsistent with standard written English. Essay—Writing *Speaking is not assessed.*
2. Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.	End-of-sentence punctuation: The student will recognize and correct inappropriate uses of ending punctuation in cases in which the context makes the intent clear. Within-sentence punctuation: The student will correctly use and recognize and correct inappropriate uses of colons, semicolons, and dashes to indicate sharp breaks in thought within sentences. Possessive nouns and pronouns: The student will recognize and correct inappropriate uses of possessive nouns and pronouns as well as differentiate between possessive and plural forms. Items in a series: The student will correctly use and recognize and correct inappropriate uses of punctuation (commas and sometimes semicolons) to separate items in a series. Nonrestrictive and parenthetical elements: The student will correctly use punctuation (commas, parentheses, dashes) to set off nonrestrictive and parenthetical sentence elements as well as recognize and correct cases in which restrictive or essential sentence elements are inappropriately set off with punctuation.

Michigan Anchor Standards for Language	SAT Reading Test, SAT Writing and Language Test, and SAT Essay
	Unnecessary punctuation: The student will recognize and correct cases in which unnecessary punctuation appears in a sentence. Essay—Writing
3. Apply knowledge of language to understand how language functions in different contexts, to make effective choices for meaning or style, and to comprehend more fully when reading or listening.	Determining explicit meanings: The student will identify information and ideas explicitly stated in text. Determining implicit meanings: The student will draw reasonable inferences and logical conclusions from text. Interpreting words and phrases in context: The student will determine the meaning of words and phrases in context. Analyzing word choice: The student will determine how the selection of specific words and phrases or the use of patterns of words and phrases shapes meaning and tone in text. Precision: The student will revise text as needed to improve the exactness or content appropriateness of word choice. Concision: The student will revise text as needed to improve the economy of word choice (i.e., to eliminate wordiness and redundancy). Style and tone: The student will revise text as necessary to ensure consistency of style and tone within a text or to improve the match of style and tone to purpose. Syntax: The student will use various sentence structures to accomplish needed rhetorical purposes. Essay—Reading Essay—Analysis Essay—Writing *Listening is not assessed.*
4. Determine or clarify the meaning of unknown	Determining explicit meanings: The student will

Michigan Anchor Standards for Language	SAT Reading Test, SAT Writing and Language Test, and SAT Essay
and multiple-meaning words and phrases by using context clues, analyzing meaningful word parts, and consulting general and specialized reference materials, as appropriate.	identify information and ideas explicitly stated in text. Determining implicit meanings: The student will draw reasonable inferences and logical conclusions from text. Interpreting words and phrases in context: The student will determine the meaning of words and phrases in context. Essay—Reading *Vocabulary strategies are not directly assessed. Students do not have access to reference materials.*
5. Demonstrate understanding of figurative language, word relationships, and nuances in word meanings.	Determining explicit meanings: The student will identify information and ideas explicitly stated in text. Determining implicit meanings: The student will draw reasonable inferences and logical conclusions from text. Interpreting words and phrases in context: The student will determine the meaning of words and phrases in context. Analyzing word choice: The student will determine how the selection of specific words and phrases or the use of patterns of words and phrases shapes meaning and tone in text. Analyzing part-whole relationships: The student will analyze the relationship between a particular part of a text (e.g., a sentence) and the whole text. Precision: The student will revise text as needed to improve the exactness or content appropriateness of word choice. Essay—Reading Essay—Analysis Essay—Writing
6. Acquire and use accurately a range of general academic and domain-specific words and phrases	Determining explicit meanings: The student will identify information and ideas explicitly stated in

Michigan Anchor Standards for Language	SAT Reading Test, SAT Writing and Language Test, and SAT Essay
sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when encountering an unknown term important to comprehension or expression.	text. Determining implicit meanings: The student will draw reasonable inferences and logical conclusions from text. Interpreting words and phrases in context: The student will determine the meaning of words and phrases in context. Analyzing word choice: The student will determine how the selection of specific words and phrases or the use of patterns of words and phrases shapes meaning and tone in text. Analyzing part-whole relationships: The student will analyze the relationship between a particular part of a text (e.g., a sentence) and the whole text. Precision: The student will revise text as needed to improve the exactness or content appropriateness of word choice. Essay—Reading Essay—Analysis Essay—Writing *Speaking and listening are not assessed.* *Acquisition of vocabulary knowledge is not directly assessed.*

Table 7: Language "Progressive" Standards 11–12: MI to SAT

Note: Only those "progressive" standards applicable to grades 11–12 are included in this table. The various PSAT/NMSQT and PSAT 10 as well as PSAT 8/9 alignments to Michigan standards indicate the minor alignment variations for those programs. "Items in a series" and "parallel structure" are treated as distinct testing points in the SAT, PSAT/NMSQT and PSAT 10, and PSAT 8/9 domains, as indicated throughout this document.

Michigan "Progressive" Standards for Language 11–12	SAT Reading Test, SAT Writing and Language Test, and SAT Essay
Ensure subject-verb and pronoun-antecedent agreement	Subject-verb agreement: The student will recognize and correct lack of agreement between subject and verb. Pronoun-antecedent agreement: The student will recognize and correct lack of agreement between pronoun and antecedent. Essay—Writing
Choose words and phrases for effect	Precision: The student will revise text as needed to improve the exactness or content appropriateness of word choice. Essay—Writing
Produce complete sentences, recognizing and correcting inappropriate fragments and run-ons.	Sentence boundaries: The student will recognize and correct grammatically incomplete sentences (e.g., rhetorically inappropriate fragments and run-ons). Essay—Writing
Correctly use frequently confused words (e.g., *to*/*too*/*two*; *there*/*their*).	Frequently confused words: The student will recognize and correct instances in which a word or phrase is confused with another (e.g., *accept*/*except*, *allusion*/*illusion*). Possessive determiners: The student will recognize and correct cases in which possessive determiners (*its*, *your*, *their*), contractions (*it's*, *you're*, *they're*), and adverbs (*there*) are confused with each other. Essay—Writing
Choose punctuation for effect.	End-of-sentence punctuation: The student will recognize and correct inappropriate uses of ending punctuation in cases in which the context makes the intent clear. Within-sentence punctuation: The student will

Michigan "Progressive" Standards for Language 11–12	SAT Reading Test, SAT Writing and Language Test, and SAT Essay
	correctly use and recognize and correct inappropriate uses of colons, semicolons, and dashes to indicate sharp breaks in thought within sentences. Essay—Writing
Recognize and correct inappropriate shifts in verb tense.	Verb tense, mood, and voice: The student will recognize and correct inappropriate shifts in verb tense, voice, and mood within and between sentences. Essay—Writing
Recognize and correct inappropriate shifts in pronoun number and person.	Pronoun person and number: The student will recognize and correct inappropriate shifts in pronoun person and number within and between sentences. Essay—Writing
Recognize and correct vague pronouns (i.e., ones with unclear or ambiguous antecedents).	Pronoun clarity: The student will recognize and correct pronouns with unclear or ambiguous antecedents. Essay—Writing
Recognize variations from standard English in their own and others' writing and speaking, and identify and use strategies to improve expression in conventional language.	Sentence boundaries: The student will recognize and correct grammatically incomplete sentences (e.g., rhetorically inappropriate fragments and run-ons). Subordination and coordination: The student will recognize and correct problems in coordination and subordination in sentences. Parallel structure: The student will recognize and correct problems in parallel structure in sentences. Modifier placement: The student will recognize and correct problems in modifier placement (e.g., misplaced or dangling modifiers). Verb tense, mood, and voice: The student will recognize and correct inappropriate shifts in verb tense, voice, and mood within and between sentences. Pronoun person and number: The student will

Michigan "Progressive" Standards for Language 11–12	SAT Reading Test, SAT Writing and Language Test, and SAT Essay
	recognize and correct inappropriate shifts in pronoun person and number within and between sentences. Pronoun clarity: The student will recognize and correct pronouns with unclear or ambiguous antecedents. Possessive determiners: The student will recognize and correct cases in which possessive determiners (*its*, *your*, *their*), contractions (*it's*, *you're*, *they're*), and adverbs (*there*) are confused with each other. Pronoun-antecedent agreement: The student will recognize and correct lack of agreement between pronoun and antecedent. Subject-verb agreement: The student will recognize and correct lack of agreement between subject and verb. Noun agreement: The student will recognize and correct lack of agreement between nouns. Frequently confused words: The student will recognize and correct instances in which a word or phrase is confused with another (e.g., *accept*/*except*, *allusion*/*illusion*). Logical comparison: The student will recognize and correct cases in which unlike terms are compared. Conventional expression: The student will recognize and correct cases in which a given expression is inconsistent with standard written English. End-of-sentence punctuation: The student will recognize and correct inappropriate uses of ending punctuation in cases in which the context makes the intent clear. Within-sentence punctuation: The student will correctly use and recognize and correct inappropriate uses of colons, semicolons, and dashes to indicate sharp breaks in thought within

Michigan "Progressive" Standards for Language 11–12	SAT Reading Test, SAT Writing and Language Test, and SAT Essay
	sentences. Possessive nouns and pronouns: The student will recognize and correct inappropriate uses of possessive nouns and pronouns as well as differentiate between possessive and plural forms. Items in a series: The student will correctly use and recognize and correct inappropriate uses of punctuation (commas and sometimes semicolons) to separate items in a series. Nonrestrictive and parenthetical elements: The student will correctly use punctuation (commas, parentheses, dashes) to set off nonrestrictive and parenthetical sentence elements as well as recognize and correct cases in which restrictive or essential sentence elements are inappropriately set off with punctuation. Unnecessary punctuation: The student will recognize and correct cases in which unnecessary punctuation appears in a sentence. Essay—Writing *Speaking is not assessed.*
Use punctuation (commas, parentheses, dashes) to set off nonrestrictive/parenthetical elements.	Nonrestrictive and parenthetical elements: The student will correctly use punctuation (commas, parentheses, dashes) to set off nonrestrictive and parenthetical sentence elements as well as recognize and correct cases in which restrictive or essential sentence elements are inappropriately set off with punctuation. Essay—Writing
Maintain consistency in style and tone.	Style and tone: The student will revise text as necessary to ensure consistency of style and tone within a text or to improve the match of style and tone to purpose. Essay—Writing
Place phrases and clauses within a sentence, recognizing and correcting misplaced and dangling modifiers.	Modifier placement: The student will recognize and correct problems in modifier placement (e.g., misplaced or dangling modifiers).

Michigan "Progressive" Standards for Language 11–12	SAT Reading Test, SAT Writing and Language Test, and SAT Essay
	Essay—Writing
Choose language that expresses ideas precisely and concisely, recognizing and eliminating wordiness and redundancy.	Precision: The student will revise text as needed to improve the exactness or content appropriateness of word choice. Concision: The student will revise text as needed to improve the economy of word choice (i.e., to eliminate wordiness and redundancy). Essay—Writing
Recognize and correct inappropriate shifts in verb voice and mood.	Verb tense, mood, and voice: The student will recognize and correct inappropriate shifts in verb tense, voice, and mood within and between sentences. Essay—Writing
Use parallel structure.	Parallel structure: The student will recognize and correct problems in parallel structure in sentences. Essay—Writing

Table 8: Language Standards 11–12: MI to SAT

Michigan Language Standards 11–12	SAT Reading Test, SAT Writing and Language Test, and SAT Essay
1. Demonstrate command of the conventions of standard English grammar and usage when writing or speaking. a. Apply the understanding that usage is a matter of convention, can change over time, and is sometimes contested. b. Resolve issues of complex or contested usage, consulting references (e.g., Merriam-Webster's *Dictionary of English Usage*, Garner's *Modern American Usage*) as needed.	Sentence boundaries: The student will recognize and correct grammatically incomplete sentences (e.g., rhetorically inappropriate fragments and run-ons). Subordination and coordination: The student will recognize and correct problems in coordination and subordination in sentences. Parallel structure: The student will recognize and correct problems in parallel structure in sentences. Modifier placement: The student will recognize and correct problems in modifier placement (e.g., misplaced or dangling modifiers). Verb tense, mood, and voice: The student will recognize and correct inappropriate shifts in verb tense, voice, and mood within and between sentences.

Michigan Language Standards 11–12	SAT Reading Test, SAT Writing and Language Test, and SAT Essay
	Pronoun person and number: The student will recognize and correct inappropriate shifts in pronoun person and number within and between sentences. Pronoun clarity: The student will recognize and correct pronouns with unclear or ambiguous antecedents. Possessive determiners: The student will recognize and correct cases in which possessive determiners (*its*, *your*, *their*), contractions (*it's*, *you're*, *they're*), and adverbs (*there*) are confused with each other. Pronoun-antecedent agreement: The student will recognize and correct lack of agreement between pronoun and antecedent. Subject-verb agreement: The student will recognize and correct lack of agreement between subject and verb. Noun agreement: The student will recognize and correct lack of agreement between nouns. Frequently confused words: The student will recognize and correct instances in which a word or phrase is confused with another (e.g., *accept*/*except*, *allusion*/*illusion*). Logical comparison: The student will recognize and correct cases in which unlike terms are compared. Conventional expression: The student will recognize and correct cases in which a given expression is inconsistent with standard written English. Essay—Writing *Speaking is not assessed. Students do not have access to reference materials.*
2. Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.	Essay—Writing

Michigan Language Standards 11–12	SAT Reading Test, SAT Writing and Language Test, and SAT Essay
a. Observe hyphenation conventions. b. Spell correctly.	
3. Apply knowledge of language to understand how language functions in different contexts, to make effective choices for meaning or style, and to comprehend more fully when reading or listening. a. Vary syntax for effect, consulting references (e.g., Tufte's *Artful Sentences*) for guidance as needed; apply an understanding of syntax to the study of complex texts when reading.	Determining explicit meanings: The student will identify information and ideas explicitly stated in text. Determining implicit meanings: The student will draw reasonable inferences and logical conclusions from text. Syntax: The student will use various sentence structures to accomplish needed rhetorical purposes. Essay—Reading Essay—Writing *Listening is not assessed. Students do not have access to reference materials.*
4. Determine or clarify the meaning of unknown and multiple-meaning words and phrases based on grades 11–12 reading and content, choosing flexibly from a range of strategies. a. Use context (e.g., the overall meaning of a sentence, paragraph, or text; a word's position or function in a sentence) as a clue to the meaning of a word or phrase. b. Identify and correctly use patterns of word changes that indicate different meanings or parts of speech (e.g., conceive, conception, conceivable). c. Consult general and specialized reference materials (e.g., dictionaries, glossaries, thesauruses), both print and digital, to find the pronunciation of a word or determine or clarify its precise meaning, its part of speech, its etymology, or its standard usage. d. Verify the preliminary determination of the meaning of a word or phrase (e.g., by checking the inferred meaning in context or in a dictionary).	Determining explicit meanings: The student will identify information and ideas explicitly stated in text. Determining implicit meanings: The student will draw reasonable inferences and logical conclusions from text. Interpreting words and phrases in context: The student will determine the meaning of words and phrases in context. Essay—Reading *Students are assessed on passages, not directly on "content." Students' flexible use of strategies is not directly assessed. Reference materials are not available to students.*
5. Demonstrate understanding of figurative language, word relationships, and nuances in word meanings. a. Interpret figures of speech (e.g., hyperbole, paradox) in context and analyze their role in the text.	Determining explicit meanings: The student will identify information and ideas explicitly stated in text. Determining implicit meanings: The student will draw reasonable inferences and logical conclusions

Michigan Language Standards 11–12	SAT Reading Test, SAT Writing and Language Test, and SAT Essay
b. Analyze nuances in the meaning of words with similar denotations.	from text. Interpreting words and phrases in context: The student will determine the meaning of words and phrases in context. Analyzing word choice: The student will determine how the selection of specific words and phrases or the use of patterns of words and phrases shapes meaning and tone in text. Analyzing part-whole relationships: The student will analyze the relationship between a particular part of a text (e.g., a sentence) and the whole text. Precision: The student will revise text as needed to improve the exactness or content appropriateness of word choice. Essay—Reading Essay—Analysis Essay—Writing
6. Acquire and use accurately general academic and domain-specific words and phrases, sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression.	Determining explicit meanings: The student will identify information and ideas explicitly stated in text. Determining implicit meanings: The student will draw reasonable inferences and logical conclusions from text. Interpreting words and phrases in context: The student will determine the meaning of words and phrases in context. Analyzing word choice: The student will determine how the selection of specific words and phrases or the use of patterns of words and phrases shapes meaning and tone in text. Analyzing part-whole relationships: The student will analyze the relationship between a particular part of a text (e.g., a sentence) and the whole text. Precision: The student will revise text as needed to improve the exactness or content appropriateness of word choice.

Michigan Language Standards 11–12	SAT Reading Test, SAT Writing and Language Test, and SAT Essay
	Essay—Reading Essay—Analysis Essay—Writing *Speaking and listening are not assessed.* *Acquisition of vocabulary knowledge is not directly assessed.*

Table 9: Reading Standards for Literacy in History/Social Studies 11–12: MI to SAT

Michigan Reading Standards for Literacy in History/Social Studies 11–12	SAT Reading Test
1. Cite specific textual evidence to support analysis of primary and secondary sources, connecting insights gained from specific details to an understanding of the text as a whole	Determining explicit meanings: The student will identify information and ideas explicitly stated in text. Determining implicit meanings: The student will draw reasonable inferences and logical conclusions from text. Using analogical reasoning: The student will extrapolate in a reasonable way from the information and ideas in a text or apply information and ideas in a text to a new, analogous situation. Citing textual evidence: The student will cite the textual evidence that best supports a given claim or point. Analyzing part-whole relationships: The student will analyze the relationship between a particular part of a text (e.g., a sentence) and the whole text.
2. Determine the central ideas or information of a primary or secondary source; provide an accurate summary that makes clear the relationships among the key details and ideas.	Determining central ideas and themes: The student will identify explicitly stated central ideas or themes in text and determine implicit central ideas or themes from text. Summarizing: The student will identify a reasonable summary of a text or of key information and ideas in text.
3. Evaluate various explanations for actions or events and determine which explanation best accords with textual evidence, acknowledging where the text leaves matters uncertain.	Citing textual evidence: The student will cite the textual evidence that best supports a given claim or point. Understanding relationships: The student will identify explicitly stated relationships or determine implicit relationships between and among individuals, events, or ideas (e.g., cause-effect, comparison-contrast, sequence).

Michigan Reading Standards for Literacy in History/Social Studies 11–12	SAT Reading Test
4. Determine the meaning of words and phrases as they are used in a text, including analyzing how an author uses and refines the meaning of a key term over the course of a text (e.g., how Madison defines faction in *Federalist* No. 10).	Determining explicit meanings: The student will identify information and ideas explicitly stated in text. Determining implicit meanings: The student will draw reasonable inferences and logical conclusions from text. Interpreting words and phrases in context: The student will determine the meaning of words and phrases in context. Analyzing word choice: The student will determine how the selection of specific words and phrases or the use of patterns of words and phrases shapes meaning and tone in text. *The passages in any given Reading administration may or may not include extended study of a particular term.*
5. Analyze in detail how a complex primary source is structured, including how key sentences, paragraphs, and larger portions of the text contribute to the whole.	Analyzing overall text structure: The student will describe the overall structure of a text. Analyzing part-whole relationships: The student will analyze the relationship between a particular part of a text (e.g., a sentence) and the whole text. *Primary sources (in the form of US founding documents and texts in the Great Global Conversation) are included but are not always "complex."*
6. Evaluate authors' differing points of view on the same historical event or issue by assessing the authors' claims, reasoning, and evidence.	Analyzing point of view: The student will determine the point of view or perspective from which a text is related or the influence this point of view or perspective has on content and style. Analyzing claims and counterclaims: The student will identify claims and counterclaims explicitly stated in text or determine implicit claims and counterclaims from text. Assessing reasoning: The student will assess an author's reasoning for soundness. Analyzing evidence: The student will assess how an author uses or fails to use evidence to support

Michigan Reading Standards for Literacy in History/Social Studies 11–12	SAT Reading Test
	a claim or counterclaim. Analyzing multiple texts: The student will synthesize information and ideas from paired texts. *Passages from US founding documents and texts in the Great Global Conversation may be (but are not necessarily) paired. Social science passages are not paired.*
7. Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., visually, quantitatively, as well as in words) in order to address a question or solve a problem.	Analyzing quantitative information: The student will analyze information presented quantitatively in such forms as graphs, tables, and charts and/or relate that information to information presented in text. *Media and purely visual information are not included, although informational graphics, such as tables, graphs, and charts, are included on the Reading Test. Students are not asked to solve problems.*
8. Evaluate an author's premises, claims, and evidence by corroborating or challenging them with other information.	
9. Integrate information from diverse sources, both primary and secondary, into a coherent understanding of an idea or event, noting discrepancies among sources.	Analyzing multiple texts: The student will synthesize information and ideas from paired texts. *The Reading Test includes one passage pair as well as a number of items requiring cross-text "bridging." Pairing may involve either primary and secondary sources or both, depending on test administration.*
10. By the end of grade 12, read and comprehend history/social studies texts in the grades 11–CCR text complexity band independently and proficiently.	Text complexity: The passages/pair on the SAT Reading Test represent a specified range of text complexities from grades 9–10 to postsecondary entry.

Table 10: Reading Standards for Literacy in Science and Technical Subjects 11–12: MI to SAT

Michigan Reading Standards for Literacy in Science and Technical Subjects 11–12	SAT Reading
1. Cite specific textual evidence to support analysis of science and technical texts, attending to important distinctions the author makes and to any gaps or inconsistencies in the account.	Determining explicit meanings: The student will identify information and ideas explicitly stated in text. Determining implicit meanings: The student will draw reasonable inferences and logical conclusions from text. Using analogical reasoning: The student will extrapolate in a reasonable way from the information and ideas in a text or apply information and ideas in a text to a new, analogous situation. Citing textual evidence: The student will cite the textual evidence that best supports a given claim or point. Assessing reasoning: The student will assess an author's reasoning for soundness. *While Reading Test passages often do include technical elements, they are better understood as being narrative, informative/explanatory, or argumentative in genre.*
2. Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms	Determining central ideas and themes: The student will identify explicitly stated central ideas or themes in text and determine implicit central ideas or themes from text. Summarizing: The student will identify a reasonable summary of a text or of key information and ideas in text.
3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text	
4. Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to *grades 11–12 texts and topics*.	Determining explicit meanings: The student will identify information and ideas explicitly stated in text. Determining implicit meanings: The student will draw reasonable inferences and logical conclusions

Michigan Reading Standards for Literacy in Science and Technical Subjects 11–12	SAT Reading
	from text. *Students are assessed on passages, not directly on topics.*
5. Analyze how the text structures information or ideas into categories or hierarchies, demonstrating understanding of the information or ideas.	Understanding relationships: The student will identify explicitly stated relationships or determine implicit relationships between and among individuals, events, or ideas (e.g., cause-effect, comparison-contrast, sequence). Analyzing overall text structure: The student will describe the overall structure of a text. Analyzing part-whole relationships: The student will analyze the relationship between a particular part of a text (e.g., a sentence) and the whole text.
6. Analyze the author's purpose in providing an explanation, describing a procedure, or discussing an experiment in a text, identifying important issues that remain unresolved.	Analyzing part-whole relationships: The student will analyze the relationship between a particular part of a text (e.g., a sentence) and the whole text. Analyzing purpose: The student will determine the main or most likely purpose of a text or of a particular part of a text (typically, one or more paragraphs).
7. Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem.	Analyzing quantitative information: The student will analyze information presented quantitatively in such forms as graphs, tables, and charts and/or relate that information to information presented in text. *Media and purely visual information are not included, although informational graphics, such as tables, graphs, and charts, are included on the Reading Test. Students are not asked to solve problems.*
8. Evaluate the hypotheses, data, analysis, and conclusions in a science or technical text, verifying the data when possible and corroborating or challenging conclusions with other sources of information.	Determining explicit meanings: The student will identify information and ideas explicitly stated in text. Determining implicit meanings: The student will draw reasonable inferences and logical conclusions from text. Using analogical reasoning: The student will extrapolate in a reasonable way from the

Michigan Reading Standards for Literacy in Science and Technical Subjects 11–12	SAT Reading
	information and ideas in a text or apply information and ideas in a text to a new, analogous situation. Analyzing part-whole relationships: The student will analyze the relationship between a particular part of a text (e.g., a sentence) and the whole text. Analyzing claims and counterclaims: The student will identify claims and counterclaims explicitly stated in text or determine implicit claims and counterclaims from text. Assessing reasoning: The student will assess an author's reasoning for soundness. Analyzing evidence: The student will assess how an author uses or fails to use evidence to support a claim or counterclaim. *While Reading Test passages often do include technical elements, they are better understood as being narrative, informative/explanatory, or argumentative in genre. Students have no direct means of externally validating or critiquing passages.*
9. Synthesize information from a range of sources (e.g., texts, experiments, simulations) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible.	Analyzing multiple texts: The student will synthesize information and ideas from paired texts. *The Reading Test includes one passage pair as well as a number of items requiring cross-text "bridging." Pairing may or may not involve science, depending on test administration. Conflicting information may be noted and analyzed but cannot be resolved through external validation.*
10. By the end of grade 12, read and comprehend science/technical texts in the grades 11–CCR text complexity band independently and proficiently.	Text complexity: The passages/pair on the SAT Reading Test represent a specified range of text complexities from grades 9–10 to postsecondary entry. *While Reading Test passages often do include technical elements, they are better understood as being narrative, informative/explanatory, or argumentative in genre.*

Table 11: Writing Standards for Literacy in History/Social Studies, Science, and Technical Subjects 11–12: MI to SAT

Michigan Writing Standards for Literacy in History/Social Studies, Science, and Technical Subjects 11–12	SAT Writing and Language
1. Write arguments focused on *discipline-specific content*. a. Introduce precise, knowledgeable claim(s), establish the significance of the claim(s), distinguish the claim(s) from alternate or opposing claims, and create an organization that logically sequences the claim(s), counterclaims, reasons, and evidence b. Develop claim(s) and counterclaims fairly and thoroughly, supplying the most relevant data and evidence for each while pointing out the strengths and limitations of both claim(s) and counterclaims in a discipline-appropriate form that anticipates the audience's knowledge level, concerns, values, and possible biases. c. Use words, phrases, and clauses as well as varied syntax to link the major sections of the text, create cohesion, and clarify the relationships between claim(s) and reasons, between reasons and evidence, and between claim(s) and counterclaims. d. Establish and maintain a formal style and objective tone while attending to the norms and conventions of the discipline in which they are writing. e. Provide a concluding statement or section that follows from or supports the argument presented.	Proposition: The student will add, revise, or retain central ideas, main claims, counterclaims, topic sentences, and the like to structure text and convey arguments, information, and ideas clearly and effectively. Support: The student will add, revise, or retain information and ideas (e.g., details, facts, statistics) intended to support claims or points in text. Focus: The student will add, revise, retain, or delete information and ideas in text for the sake of relevance to topic and purpose. Quantitative information: The student will relate information presented quantitatively in such forms as graphs, charts, and tables to information presented in text. Logical sequence: The student will revise text as needed to ensure that information and ideas are presented in the most logical order. Introductions, conclusions, and transitions: The student will revise text as needed to improve the beginning or ending of a text or paragraph to ensure that transition words, phrases, or sentences are used effectively to connect information and ideas. Precision: The student will revise text as needed to improve the exactness or content appropriateness of word choice. Style and tone: The student will revise text as necessary to ensure consistency of style and tone within a text or to improve the match of style and tone to purpose. Syntax: The student will use various sentence structures to accomplish needed rhetorical

Michigan Writing Standards for Literacy in History/Social Studies, Science, and Technical Subjects 11–12	SAT Writing and Language
	purposes. *The Writing and Language Test does not directly address precise concerns about audience. Writing and Language passages are too short to have distinct sections.*
2. Write informative/explanatory texts, including the narration of historical events, scientific procedures/experiments, or technical processes. a. Introduce a topic and organize complex ideas, concepts, and information so that each new element builds on that which precedes it to create a unified whole; include formatting (e.g., headings), graphics (e.g., figures, tables), and multimedia when useful to aiding comprehension b. Develop the topic thoroughly by selecting the most significant and relevant facts, extended definitions, concrete details, quotations, or other information and examples appropriate to the audience's knowledge of the topic. c. Use varied transitions and sentence structures to link the major sections of the text, create cohesion, and clarify the relationships among complex ideas and concepts. d. Use precise language, domain-specific vocabulary and techniques such as metaphor, simile, and analogy to manage the complexity of the topic; convey a knowledgeable stance in a style that responds to the discipline and context as well as to the expertise of likely readers. e. Provide a concluding statement or section that follows from and supports the information or explanation provided (e.g., articulating implications or the significance of the topic).	Proposition: The student will add, revise, or retain central ideas, main claims, counterclaims, topic sentences, and the like to structure text and convey arguments, information, and ideas clearly and effectively. Support: The student will add, revise, or retain information and ideas (e.g., details, facts, statistics) intended to support claims or points in text. Focus: The student will add, revise, retain, or delete information and ideas in text for the sake of relevance to topic and purpose. Quantitative information: The student will relate information presented quantitatively in such forms as graphs, charts, and tables to information presented in text. Logical sequence: The student will revise text as needed to ensure that information and ideas are presented in the most logical order. Introductions, conclusions, and transitions: The student will revise text as needed to improve the beginning or ending of a text or paragraph to ensure that transition words, phrases, or sentences are used effectively to connect information and ideas. Precision: The student will revise text as needed to improve the exactness or content appropriateness of word choice. Style and tone: The student will revise text as necessary to ensure consistency of style and tone within a text or to improve the match of style and tone to purpose.

Michigan Writing Standards for Literacy in History/Social Studies, Science, and Technical Subjects 11–12	SAT Writing and Language
	Syntax: The student will use various sentence structures to accomplish needed rhetorical purposes. *Formatting and multimedia are not used in the Writing and Language Test. The Writing and Language Test does not directly address such audience concerns as identified in (b) and (d), above. Writing and Language passages are too short to have distinct sections.*
3. (Not applicable as a separate requirement)	
4. Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.	Proposition: The student will add, revise, or retain central ideas, main claims, counterclaims, topic sentences, and the like to structure text and convey arguments, information, and ideas clearly and effectively. Support: The student will add, revise, or retain information and ideas (e.g., details, facts, statistics) intended to support claims or points in text. Focus: The student will add, revise, retain, or delete information and ideas in text for the sake of relevance to topic and purpose. Quantitative information: The student will relate information presented quantitatively in such forms as graphs, charts, and tables to information presented in text. Logical sequence: The student will revise text as needed to ensure that information and ideas are presented in the most logical order. Introductions, conclusions, and transitions: The student will revise text as needed to improve the beginning or ending of a text or paragraph to ensure that transition words, phrases, or sentences are used effectively to connect information and ideas. Style and tone: The student will revise text as

Michigan Writing Standards for Literacy in History/Social Studies, Science, and Technical Subjects 11–12	SAT Writing and Language
	necessary to ensure consistency of style and tone within a text or to improve the match of style and tone to purpose.
5. Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience.	Proposition: The student will add, revise, or retain central ideas, main claims, counterclaims, topic sentences, and the like to structure text and convey arguments, information, and ideas clearly and effectively. Support: The student will add, revise, or retain information and ideas (e.g., details, facts, statistics) intended to support claims or points in text. Focus: The student will add, revise, retain, or delete information and ideas in text for the sake of relevance to topic and purpose. Quantitative information: The student will relate information presented quantitatively in such forms as graphs, charts, and tables to information presented in text. Logical sequence: The student will revise text as needed to ensure that information and ideas are presented in the most logical order. Introductions, conclusions, and transitions: The student will revise text as needed to improve the beginning or ending of a text or paragraph to ensure that transition words, phrases, or sentences are used effectively to connect information and ideas. Precision: The student will revise text as needed to improve the exactness or content appropriateness of word choice. Concision: The student will revise text as needed to improve the economy of word choice (i.e., to eliminate wordiness and redundancy). Style and tone: The student will revise text as necessary to ensure consistency of style and tone within a text or to improve the match of style and

Michigan Writing Standards for Literacy in History/Social Studies, Science, and Technical Subjects 11–12	SAT Writing and Language
	tone to purpose. Syntax: The student will use various sentence structures to accomplish needed rhetorical purposes. Sentence boundaries: The student will recognize and correct grammatically incomplete sentences (e.g., rhetorically inappropriate fragments and run-ons). Subordination and coordination: The student will recognize and correct problems in coordination and subordination in sentences. Parallel structure: The student will recognize and correct problems in parallel structure in sentences. Modifier placement: The student will recognize and correct problems in modifier placement (e.g., misplaced or dangling modifiers). Verb tense, mood, and voice: The student will recognize and correct inappropriate shifts in verb tense, voice, and mood within and between sentences. Pronoun person and number: The student will recognize and correct inappropriate shifts in pronoun person and number within and between sentences. Pronoun clarity: The student will recognize and correct pronouns with unclear or ambiguous antecedents. Possessive determiners: The student will recognize and correct cases in which possessive determiners (*its*, *your*, *their*), contractions (*it's*, *you're*, *they're*), and adverbs (*there*) are confused with each other. Pronoun-antecedent agreement: The student will recognize and correct lack of agreement between pronoun and antecedent.

Michigan Writing Standards for Literacy in History/Social Studies, Science, and Technical Subjects 11–12	SAT Writing and Language
	Subject-verb agreement: The student will recognize and correct lack of agreement between subject and verb. Noun agreement: The student will recognize and correct lack of agreement between nouns. Frequently confused words: The student will recognize and correct instances in which a word or phrase is confused with another (e.g., *accept*/*except*, *allusion*/*illusion*). Logical comparison: The student will recognize and correct cases in which unlike terms are compared. Conventional expression: The student will recognize and correct cases in which a given expression is inconsistent with standard written English. End-of-sentence punctuation: The student will recognize and correct inappropriate uses of ending punctuation in cases in which the context makes the intent clear. Within-sentence punctuation: The student will correctly use and recognize and correct inappropriate uses of colons, semicolons, and dashes to indicate sharp breaks in thought within sentences. Possessive nouns and pronouns: The student will recognize and correct inappropriate uses of possessive nouns and pronouns as well as differentiate between possessive and plural forms. Items in a series: The student will correctly use and recognize and correct inappropriate uses of punctuation (commas and sometimes semicolons) to separate items in a series. Nonrestrictive and parenthetical elements: The student will correctly use punctuation (commas, parentheses, dashes) to set off nonrestrictive and parenthetical sentence elements as well as

Michigan Writing Standards for Literacy in History/Social Studies, Science, and Technical Subjects 11–12	SAT Writing and Language
	recognize and correct cases in which restrictive or essential sentence elements are inappropriately set off with punctuation. Unnecessary punctuation: The student will recognize and correct cases in which unnecessary punctuation appears in a sentence. *The Writing and Language Test is a test of revision and editing.*
6. Use technology, including the Internet, to produce, publish, and update individual or shared writing products in response to ongoing feedback, including new arguments or information.	
7. Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.	
8. Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the strengths and limitations of each source in terms of the specific task, purpose, and audience; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and overreliance on any one source and following a standard format for citation.	
9. Draw evidence from informational texts to support analysis, reflection, and research.	
10. Write routinely over extended time frames (time for reflection and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences	

English Language Arts/Literacy Alignment: SAT to Michigan's Standards
Tables 12 through 14 detail the SAT-Michigan alignment using SAT content specifications as the organizing principle. In the interest of brevity, the Michigan standards in the right-hand column are presented in their abbreviated form (consistent with how they are numbered and lettered in Michigan standards documents).

Table 12: SAT Reading Test: SAT to MI

SAT Reading Test	Michigan Standards
Text Complexity The passages/pair on the SAT Reading Test represent a specified range of text complexities from grades 9–10 to postsecondary entry.	R.CCR.10 RL.11–12.10 RI.11–12.10 RH.11–12.10 RST.11–12.10 P1.1
Information and Ideas	
The student will identify information and ideas explicitly stated in text.	R.CCR.1 R.CCR.4 RL.11–12.1 RL.11–12.4 RI.11–12.1 R1.11–12.3 RI.11–12.4 L.CCR.3 L.CCR.4 L.CCR.5 L.CCR.6 L.11–12.3a L.11–12.4a L.11–12.5a L.11–12.6 RH.11–12.1 RH.11–12.4 RST.11–12.1 RST.11–12.4 RST.11–12.8 P1.1 P1.2

SAT Reading Test	Michigan Standards
The student will draw reasonable inferences and logical conclusions from text.	R.CCR.1 R.CCR.4 RL.11–12.1 RL.11–12.4 RI.11–12.1 RI.11–12.3 RI.11–12.4 L.CCR.3 L.CCR.4 L.CCR.5 L.CCR.6 L.11–12.3a L.11–12.4a L.11–12.5a L.11–12.6 RH.11–12.1 RH.11–12.4 RST.11–12.1 RST.11–12.4 RST.11–12.8 P1.1 P1.2
The student will extrapolate in a reasonable way from the information and ideas in a text or apply information and ideas in a text to a new, analogous situation.	R.CCR.1 RL.11–12.1 RI.11–12.1 RI.11–12.3 RH.11–12.1 RST.11–12.1 RST.11–12.8 P1.1
The student will cite the textual evidence that best supports a given claim or point.	R.CCR.1 RL.11–12.1 RI.11–12.1 RH.11–12.1 RH.11–12.3 RST.11–12.1 P1.1
The student will identify explicitly stated central ideas or themes in text and determine implicit central ideas or themes from text.	R.CCR.2 RL.11–12.2 RI.11–12.2 RI.11–12.9 RH.11–12.2 RST.11–12.2 P1.1

SAT Reading Test	Michigan Standards
The student will identify a reasonable summary of a text or of key information and ideas in text.	R.CCR.2 RL.11–12.2 RI.11–12.2 RH.11–12.2 RST.11–12.2 P1.1
The student will identify explicitly stated relationships or determine implicit relationships between and among individuals, events, or ideas (e.g., cause-effect, comparison-contrast, sequence).	R.CCR.3 RI.11–12.3 RH.11–12.3 RST.11–12.5 P1.1
The student will determine the meaning of words and phrases in context.	R.CCR.4 RL.11–12.4 RI.11–12.4 L.CCR.3 L.CCR.4 L.CCR.5 L.CCR.6 L.11–12.4a L.11–12.5a L.11–12.5b L.11–12.6 RH.11–12.4 P1.1
Rhetoric	
The student will determine how the selection of specific words and phrases or the use of patterns of words and phrases shapes meaning and tone in text.	R.CCR.4 RL.11–12.4 RI.11–12.4 RI.11–12.9 L.CCR.3 L.CCR.5 L.CCR.6 L.11–12.5a L.11–12.6 RH.11–12.4 P1.1
The student will describe the overall structure of a text.	R.CCR.5 RL.11–12.3 RI.11–12.5 RH.11–12.5 RST.11–12.5 P1.1

SAT Reading Test	Michigan Standards
The student will analyze the relationship between a particular part of a text (e.g., a sentence) and the whole text.	R.CCR.5 RL.11–12.3 RL.11–12.5 RI.11–12.5 RI.11–12.9 L.CCR.5 L.CCR.6 L.11–12.5a L.11–12.6 RH.11–12.1 RH.11–12.5 RST.11–12.5 RST.11–12.6 RST.11–12.8 P1.1
The student will determine the point of view or perspective from which a text is related or the influence this point of view or perspective has on content and style.	R.CCR.6 RL.11–12.3 RL.11–12.6 RI.11–12.6 RH.11–12.6 P1.1 P1.2
The student will determine the main or most likely purpose of a text or of a particular part of a text (typically, one or more paragraphs).	R.CCR.6 RL.11–12.3 RI.11–12.6 RI.11–12.8 RI.11–12.9 RST.11–12.6 P1.1
The student will identify claims and counterclaims explicitly stated in text or determine implicit claims and counterclaims from text.	R.CCR.8 RI.11–12.8 RI.11–12.9 RH.11–12.6 RST.11–12.8 P1.1
The student will assess an author's reasoning for soundness.	R.CCR.8 RI.11–12.8 RI.11–12.9 RH.11–12.6 RST.11–12.1 RST.11–12.8 P1.1

SAT Reading Test	Michigan Standards
The student will assess how an author uses or fails to use evidence to support a claim or counterclaim.	R.CCR.8 RI.11–12.8 RI.11–12.9 RH.11–12.6 RST.11–12.8 P1.1
Synthesis	
The student will synthesize information and ideas from paired texts.	R.CCR.9 RH.11–12.6 RH.11–12.9 RST.11–12.9 P1.1
The student will analyze information presented quantitatively in such forms as graphs, tables, and charts and/or relate that information to information presented in text.	R.CCR.7 RI.11–12.7 RH.11–12.7 RST.11–12.7 P1.1 P1.2

Table 13: SAT Writing and Language Test: SAT to MI

SAT Writing and Language Test	Michigan Standards
Text Complexity The passages on the SAT Writing and Language Test represent a specified range of text complexities from grades 9–10 to postsecondary entry.	
Expression of Ideas	
The student will add, revise, or retain central ideas, main claims, counterclaims, topic sentences, and the like to structure text and convey arguments, information, and ideas clearly and effectively.	W.CCR.1 W.CCR.2 W.CCR.3 W.CCR.4 W.CCR.5 W.11–12.1a W.11–12.2a W.11–12.3a W.11–12.4 W.11–12.5 WHST.11–12.1a WHST.11–12.2a WHST.11–12.4 WHST.11–12.5 P1.5
The student will add, revise, or retain information and ideas (e.g., details, facts, statistics) intended to support claims or points in text.	W.CCR.1 W.CCR.2 W.CCR.3 W.CCR.4 W.CCR.5 W.11–12.1b W.11–12.2b W.11–12.2d W.11–12.3b W.11–12.3d W.11–12.4 W.11–12.5 WHST.11–12.1b WHST.11–12.2b WHST.11–12.2d WHST.11–12.4 WHST.11–12.5 P1.5

SAT Writing and Language Test	Michigan Standards
The student will add, revise, retain, or delete information and ideas in text for the sake of relevance to topic and purpose.	W.CCR.1 W.CCR.2 W.CCR.3 W.CCR.4 W.CCR.5 W.11–12.1b W.11–12.2b W.11–12.2d W.11–12.3b W.11–12.3d W.11–12.4 W.11–12.5 WHST.11–12.1b WHST.11–12.2b WHST.11–12.2d WHST.11–12.4 WHST.11–12.5
The student will relate information presented quantitatively in such forms as graphs, charts, and tables to information presented in text.	W.CCR.1 W.CCR.2 W.CCR.3 W.CCR.4 W.CCR.5 W.11–12.1b W.11–12.2b W.11–12.4 W.11–12.5 WHST.11–12.1b WHST.11–12.2b WHST.11–12.4 WHST.11–12.5 P1.5 P2.2
The student will revise text as needed to ensure that information and ideas are presented in the most logical order.	W.CCR.1 W.CCR.2 W.CCR.3 W.CCR.4 W.CCR.5 W.11–12.1a W.11–12.2a W.11–12.3a W.11–12.3c W.11–12.4 W.11–12.5 WHST.11–12.1a WHST.11–12.2a WHST.11–12.4 WHST.11–12.5

SAT Writing and Language Test	Michigan Standards
The student will revise text as needed to improve the beginning or ending of a text or paragraph to ensure that transition words, phrases, or sentences are used effectively to connect information and ideas.	W.CCR.1 W.CCR.2 W.CCR.3 W.CCR.4 W.CCR.5 W.11–12.1a W.11–12.1c W.11–12.1e W.11–12.2a W.11–12.2c W.11–12.2f W.11–12.3a W.11–12.3c W.11–12.3e W.11–12.4 W.11–12.5 WHST.11–12.1a WHST.11–12.1c WHST.11–12.1e WHST.11–12.2a WHST.11–12.2c WHST.11–12.2e WHST.11–12.4 WHST.11–12.5 P1.5
The student will revise text as needed to improve the exactness or content appropriateness of word choice.	W.CCR.1 W.CCR.2 W.CCR.3 W.CCR.5 W.11–12.1c W.11–12.2d W.11–12.3d W.11–12.5 L.CCR.3 L.CCR.5 L.CCR.6 L.3.3a—progressive L.7.3a—progressive L.11–12.5b L.11–12.6 WHST.11–12.1c WHST.11–12.2d WHST.11–12.5

SAT Writing and Language Test	Michigan Standards
The student will revise text as needed to improve the economy of word choice (i.e., to eliminate wordiness and redundancy).	W.CCR.1 W.CCR.2 W.CCR.3 W.CCR.5 W.11–12.5 L.CCR.3 L.7.3a—progressive WHST.11–12.5
The student will revise text as necessary to ensure consistency of style and tone within a text or to improve the match of style and tone to purpose.	W.CCR.1 W.CCR.2 W.CCR.3 W.CCR.4 W.CCR.5 W.11–12.1d W.11–12.2d W.11–12.2e W.11–12.3d W.11–12.4 W.11–12.5 L.CCR.3 L.6.3b—progressive WHST.11–12.1d WHST.11–12.2d WHST.11–12.4 WHST.11–12.5
The student will use various sentence structures to accomplish needed rhetorical purposes.	W.CCR.1 W.CCR.2 W.CCR.3 W.CCR.5 W.11–12.1c W.11–12.2c W.11–12.5 L.CCR.3 L.11–12.3a WHST.11–12.1c WHST.11–12.2c WHST.11–12.5
Standard English Conventions	
The student will recognize and correct grammatically incomplete sentences (e.g., rhetorically inappropriate fragments and run-ons).	W.CCR.5 W.11–12.5 L.CCR.1 L.4.1f—progressive L.6.1e—progressive L.11–12.1a WHST.11–12.5

SAT Writing and Language Test	Michigan Standards
The student will recognize and correct problems in coordination and subordination in sentences.	W.CCR.5 W.11–12.5 L.CCR.1 L.6.1e—progressive L.11–12.1a WHST.11–12.5
The student will recognize and correct problems in parallel structure in sentences.	W.CCR.5 W.11–12.5 L.CCR.1 L.6.1e—progressive L.9–10.1a—progressive L.11–12.1a WHST.11–12.5
The student will recognize and correct problems in modifier placement (e.g., misplaced or dangling modifiers).	W.CCR.5 W.11–12.5 L.CCR.1 L.6.1e—progressive L.7.1c—progressive L.11–12.1a WHST.11–12.5
The student will recognize and correct inappropriate shifts in verb tense, voice, and mood within and between sentences.	W.CCR.5 W.11–12.5 L.CCR.1 L.5.1d—progressive L.6.1e—progressive L.8.1d—progressive L.11–12.1a WHST.11–12.5
The student will recognize and correct inappropriate shifts in pronoun person and number within and between sentences.	W.CCR.5 W.11–12.5 L.CCR.1 L.6.1c—progressive L.6.1e—progressive L.11–12.1a WHST.11–12.5
The student will recognize and correct pronouns with unclear or ambiguous antecedents.	W.CCR.5 W.11–12.5 L.CCR.1 L.6.1d—progressive L.6.1e—progressive L.11–12.1a WHST.11–12.5

SAT Writing and Language Test	Michigan Standards
The student will recognize and correct cases in which possessive determiners (*its, your, their*), contractions (*it's, you're, they're*), and adverbs (*there*) are confused with each other.	W.CCR.5 W.11–12.5 L.CCR.1 L.4.1g—progressive L.6.1e—progressive L.11–12.1a WHST.11–12.5
The student will recognize and correct lack of agreement between pronoun and antecedent.	W.CCR.5 W.11–12.5 L.CCR.1 L.3.1f—progressive L.6.1e—progressive L.11–12.1a WHST.11–12.5
The student will recognize and correct lack of agreement between subject and verb.	W.CCR.5 W.11–12.5 L.CCR.1 L.3.1f—progressive L.6.1e—progressive L.11–12.1a WHST.11–12.5
The student will recognize and correct lack of agreement between nouns.	W.CCR.5 W.11–12.5 L.CCR.1 L.6.1e—progressive L.11–12.1a WHST.11–12.5
The student will recognize and correct instances in which a word or phrase is confused with another (e.g., *accept/except*, *allusion/illusion*).	W.CCR.5 W.11–12.5 L.CCR.1 L.4.1g—progressive L.6.1e—progressive L.11–12.1a WHST.11–12.5
The student will recognize and correct cases in which unlike terms are compared.	W.CCR.5 W.11–12.5 L.CCR.1 L.6.1e—progressive L.11–12.1a WHST.11–12.5
The student will recognize and correct cases in which a given expression is inconsistent with standard written English.	W.CCR.5 W.11–12.5 L.CCR.1 L.6.1e—progressive L.11–12.1a WHST.11–12.5

SAT Writing and Language Test	Michigan Standards
The student will recognize and correct inappropriate uses of ending punctuation in cases in which the content makes the intent clear.	W.CCR.5 W.11–12.5 L.CCR.2 L.4.3b—progressive L.6.1e—progressive WHST.11–12.5
The student will correctly use and recognize and correct inappropriate uses of colons, semicolons, and dashes to indicate sharp breaks in thought within sentences.	W.CCR.5 W.11–12.5 L.CCR.2 L.4.3b—progressive L.6.1e—progressive WHST.11–12.5
The student will recognize and correct inappropriate uses of possessive nouns and pronouns as well as differentiate between possessive and plural forms.	W.CCR.5 W.11–12.5 L.CCR.2 L.6.1e—progressive WHST.11–12.5
The student will correctly use and recognize and correct inappropriate uses of punctuation (commas and sometimes semicolons) to separate items in a series.	W.CCR.5 W.11–12.5 L.CCR.2 L.6.1e—progressive L.9–10.1a—progressive WHST.11–12.5
The student will correctly use punctuation (commas, parentheses, dashes) to set off nonrestrictive and parenthetical sentence elements as well as recognize and correct cases in which restrictive or essential sentence elements are inappropriately set off with punctuation.	W.CCR.5 W.11–12.5 L.CCR.2 L.6.1e—progressive L.6.2a—progressive WHST.11–12.5
The student will recognize and correct cases in which unnecessary punctuation appears in a sentence.	W.CCR.5 W.11–12.5 L.CCR.2 L.6.1e—progressive WHST.11–12.5

Table 14: SAT Essay: SAT to MI

SAT Essay	Michigan Standards
Reading	
Comprehension of the source text	R.CCR.1 R.CCR.2 R.CCR.3 R.CCR.4 RI.11–12.1 RI.11–12.2 RI.11–12.3 RI.11–12.4 L.CCR.3 L.CCR.4 L.CCR.5 L.CCR.6 L.11–12.3a L.11–12.4a L.11–12.5a L.11–12.5b L.11–12.6
Understanding of central ideas, important details, and their interrelationship	R.CCR.1 R.CCR.2 R.CCR.3 R.CCR.4 RI.11–12.1 RI.11–12.2 RI.11–12.3 RI.11–12.4 L.CCR.3 L.CCR.4 L.CCR.5 L.CCR.6 L.11–12.3a L.11–12.4a L.11–12.5a L.11–12.5b L.11–12.6
Accuracy in representation of the source text (i.e., no errors of fact or interpretation introduced)	Implicit in Michigan's research-related standards
Use of textual evidence (quotations, paraphrases, or both) to demonstrate understanding of the source text	R.CCR.1 RI.11–12.1 W.CCR.9 W.11–12.9

SAT Essay	Michigan Standards
Analysis	
Analysis of the source text and understanding of the analytical task	R.CCR.4 R.CCR.5 R.CCR.6 R.CCR.8 RI.11–12.4 RI.11–12.5 RI.11–12.6 W.CCR.1 W.CCR.2 W.CCR.4 W.CCR.9 W.11–12.1a W.11–12.1b W.11–12.2a W.11–12.2b W.11–12.4 W.11–12.9 L.CCR.3 L.CCR.5 L.CCR.6 L.11–12.3a L.11–12.5a L.11–12.6
Evaluation of the author's use of evidence, reasoning, and/or stylistic and persuasive elements, and/or features chosen by the student	R.CCR.4 R.CCR.5 R.CCR.6 R.CCR.8 RI.11–12.4 RI.11–12.5 RI.11–12.6 W.CCR.1 W.CCR.2 W.CCR.4 W.CCR.9 W.11–12.1a W.11–12.1b W.11–12.2a W.11–12.2b W.11–12.4 W.11–12.9 L.CCR.3 L.CCR.5 L.CCR.6 L.11–12.3a L.11–12.5a L.11–12.6

SAT Essay	Michigan Standards
Support for claims or points made in the response	W.CCR.1 W.CCR.2 W.CCR.4 W.11–12.1b W.11–12.2b W.11–12.2d W.11–12.4
Focus on features of the text most relevant to addressing the task	W.CCR.1 W.CCR.2 W.CCR.4 W.11–12.1b W.11–12.2b W.11–12.2d W.11–12.4
Writing	
Use of a central claim	W.CCR.1 W.CCR.2 W.CCR.4 W.CCR.5 W.11–12.1a W.11–12.2a W.11–12.4 W.11–12.5
Use of effective organization and progression of ideas	W.CCR.1 W.CCR.2 W.CCR.4 W.CCR.5 W.11–12.1a W.11–12.1c W.11–12.1e W.11–12.2a W.11–12.2c W.11–12.2f W.11–12.4 W.11–12.5
Use of varied sentence structures	W.CCR.1 W.CCR.2 W.CCR.5 W.11–12.1c W.11–12.2c W.11–12.5 L.CCR.3 L.11–12.3a

SAT Essay	Michigan Standards
Employment of precise word choice	W.CCR.1 W.CCR.2 W.CCR.5 W.11–12.1c W.11–12.2d W.11–12.5 L.CCR.3 L.CCR.5 L.CCR.6 L.3.3a—progressive L.7.3a—progressive L.11–12.5b L.11–12.6
Maintenance of a consistent, appropriate style and tone	W.CCR.1 W.CCR.2 W.CCR.4 W.CCR.5 W.11–12.1d W.11–12.2d W.11–12.2e W.11–12.4 W.11–12.5 L.CCR.3 L.6.3b—progressive
Command of the conventions of standard written English	W.CCR.5 W.11–12.5 L.CCR.1 L.CCR.2 L.3.1f—progressive L.4.1f—progressive L.4.1g—progressive L.4.3b—progressive L.5.1d—progressive L.6.1c—progressive L.6.1d—progressive L.6.1e—progressive L.6.2a—progressive L.7.1c—progressive L.8.1d—progressive L.9–10.1a—progressive L.11-12.1a L.11–12.2a L.11–12.2b
Overall task	
Timed, on-demand writing task	W.CCR.10 W.11–12.10

Math Alignment: Michigan's Standards and SAT

The alignment between the Michigan Standards for High School Mathematics and the SAT Math Test is shown in tables 15 and 16. Table 15, Michigan High School Math Standards Alignment: MI to SAT, details the Michigan-SAT alignment using Michigan's standards as the organizing principle. A standard is considered aligned if the content covered by the Michigan standard is measured on the SAT. For those standards that are covered, the SAT content dimensions are presented in the right-hand column. If the SAT column is blank, the knowledge or skill covered by the standard is not assessed on the SAT.

Table 16, SAT Math Test Alignment: SAT to MI, details the SAT-Michigan alignment using SAT content specifications as the organization principle. In this table, the complete SAT content specifications are shown with the relevant Michigan standards aligned to each SAT content dimension.

Table 15: Michigan High School Math Standards Alignment: MI to SAT

Michigan High School Math Standards: Number and Quantity	SAT Math Test
N-RN The Real Number System	
Extend the properties of exponents to rational exponents.	
1. Explain how the definition of the meaning of rational exponents follows from extending the properties of integer exponents to those values, allowing for a notation for radicals in terms of rational exponents.	
2. Rewrite expressions involving radicals and rational exponents using the properties of exponents.	Passport to advanced math Equivalent expressions
Use properties of rational and irrational numbers.	
3. Explain why the sum or product of two rational numbers is rational; that the sum of a rational number and an irrational number is irrational; and that the product of a nonzero rational number and an irrational number is irrational.	
N-Q Quantities	
Reason quantitatively and use units to solve problems.	
1. Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.	Problem solving and data analysis Ratios, rates, proportional relationships, and units
2. Define appropriate quantities for the purpose of descriptive modeling.	
3. Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.	
N-CN The Complex Number System	
Perform arithmetic operations with complex numbers.	
1. Know there is a complex number i such that $i^2 = -1$, and every complex number has the form $a + bi$ with a and b real.	Additional topics in math Complex numbers
2. Use the relation $i^2 = -1$ and the commutative, associative, and distributive properties to add, subtract, and multiply complex	Additional topics in math Complex numbers

	Michigan High School Math Standards: Number and Quantity	SAT Math Test
	numbers.	
	Use complex numbers in polynomial identities and equations.	
	7. Solve quadratic equations with real coefficients that have complex solutions.	

	Michigan High School Math Standards: Algebra	SAT Math Test
A-SSE Seeing Structure in Expressions		
	Interpret the structure of expressions	
	1. Interpret expressions that represent a quantity in terms of its context. a. Interpret parts of an expression, such as terms, factors, and coefficients. b. Interpret complicated expressions by viewing one or more of their parts as a single entity.	Heart of algebra Linear functions Linear equations in two variables Passport to advanced math Equivalent expressions Nonlinear equations in one variable and systems of equations in two variables Nonlinear functions
	2. Use the structure of an expression to identify ways to rewrite it.	Heart of algebra Linear functions Linear equations in two variables Passport to advanced math Equivalent expressions Nonlinear equations in one variable and systems of equations in two variables Nonlinear functions
	Write expressions in equivalent forms to solve problems	

Michigan High School Math Standards: Algebra		SAT Math Test
	3. Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression. a. Factor a quadratic expression to reveal the zeros of the function it defines. b. Complete the square in a quadratic expression to reveal the maximum or minimum value of the function it defines. c. Use the properties of exponents to transform expressions for exponential functions.	Passport to advanced math Nonlinear functions
	4. Derive the formula for the sum of a finite geometric series (when the common ratio is not 1), and use the formula to solve problems.	
A-APR Arithmetic with Polynomials and Rational Expressions		
	Perform arithmetic operations on polynomials	
	1. Understand that polynomials form a system analogous to the integers, namely, they are closed under the operations of addition, subtraction, and multiplication; add, subtract, and multiply polynomials.	Passport to advanced math Equivalent expressions
	Understand the relationship between zeros and factors of polynomials	
	2. Know and apply the Remainder Theorem: For a polynomial $p(x)$ and a number a, the remainder on division by $x - a$ is $p(a)$, so $p(a) = 0$ if and only if $(x - a)$ is a factor of $p(x)$.	Passport to advanced math Nonlinear functions
	3. Identify zeros of polynomials when suitable factorizations are available, and use the zeros to construct a rough graph of the function defined by the polynomial.	Passport to advanced math Nonlinear equations in one variable and systems of equations in two variables
	Use polynomial identities to solve problems	
	4. Prove polynomial identities and use them to describe numerical relationships.	
	Rewrite rational expressions	
	6. Rewrite simple rational expressions in different forms; write $a(x)/b(x)$ in the form $q(x) + r(x)/ b(x)$, where $a(x)$, $b(x)$, $q(x)$, and $r(x)$ are polynomials with the degree of $r(x)$ less than the degree of $b(x)$, using inspection, long division, or, for the more complicated examples, a computer algebra system.	Passport to advanced math Equivalent expressions.
A-CED Creating Equations		
	Create equations that describe numbers or relationships	
	1. Create equations and inequalities in one variable and use them to solve problems.	Heart of algebra Linear equations in one variable Linear inequalities in one or two variables

	Michigan High School Math Standards: Algebra	SAT Math Test
	2. Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.	Heart of algebra Linear functions
	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.	Heart of algebra Linear equations in two variables Linear inequalities in one or two variables
	4. Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations.	Passport to advanced math Nonlinear equations in one variable and systems of equations in two variables
A-REI Reasoning with Equations and Inequalities		
	Understand solving equations as a process of reasoning and explain the reasoning	
	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.	Heart of algebra Linear equations in one variable Linear equations in two variables Systems of two linear equations in two variables Linear inequalities in one or two variables Passport to advanced math Nonlinear equations in one variable and systems of equations in two variables Nonlinear functions
	2. Solve simple rational and radical equations in one variable, and give examples showing how extraneous solutions may arise.	Passport to advanced math Nonlinear equations in one variable and systems of equations in two variables
	Solve equations and inequalities in one variable	
	3. Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.	Heart of algebra Linear equations in one variable Linear inequalities in one or two variables Problem solving and data analysis

	Michigan High School Math Standards: Algebra	SAT Math Test
		Ratios, rates, proportional relationships, and units Two-variable data: Models and scatterplots
	4. Solve quadratic equations in one variable. a. Use the method of completing the square to transform any quadratic equation in x into an equation of the form $(x - p)^2 = q$ that has the same solutions. Derive the quadratic formula from this form. b. Solve quadratic equations by inspection (e.g., for $x^2 = 49$), taking square roots, completing the square, the quadratic formula and factoring, as appropriate to the initial form of the equation. Recognize when the quadratic formula gives complex solutions and write them as $a \pm bi$ for real numbers a and b.	Passport to advanced math Nonlinear equations in one variable and systems of equations in two variables
	Solve systems of equations	
	5. Prove that, given a system of two equations in two variables, replacing one equation by the sum of that equation and a multiple of the other produces a system with the same solutions.	
	6. Solve systems of linear equations exactly and approximately (e.g., with graphs), focusing on pairs of linear equations in two variables.	Heart of algebra Systems of two linear equations in two variables
	7. Solve a simple system consisting of a linear equation and a quadratic equation in two variables algebraically and graphically.	Passport to advanced math Nonlinear equations in one variable and systems of equations in two variables
	Represent and solve equations and inequalities graphically	
	10. Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve (which could be a line).	Heart of algebra Linear equations in two variables Nonlinear functions
	11. Explain why the x-coordinates of the points where the graphs of the equations $y = f(x)$ and $y = g(x)$ intersect are the solutions of the equation $f(x) = g(x)$; find the solutions approximately, e.g., using technology to graph the functions, make tables of values, or find successive approximations. Include cases where $f(x)$ and/or $g(x)$ are linear, polynomial, rational, absolute value, exponential, and logarithmic functions.	
	12. Graph the solutions to a linear inequality in two variables as a half-plane (excluding the boundary in the case of a strict inequality), and graph the solution set to a system of linear inequalities in two variables as the intersection of the corresponding half-planes.	Heart of algebra Linear inequalities in one or two variables

Michigan High School Math Standards: Functions		SAT Math Test
F-IF Interpreting Functions		
	Understand the concept of a function and use function notation	
	1. Understand that a function from one set (called the domain) to another set (called the range) assigns to each element of the domain exactly one element of the range. If *f* is a function and *x* is an element of its domain, then *f*(*x*) denotes the output of *f* corresponding to the input *x*. The graph of *f* is the graph of the equation *y* = *f*(*x*).	Heart of algebra Linear functions Passport to advanced math Nonlinear functions
	2. Use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a context.	Heart of algebra Linear functions Passport to advanced math Nonlinear functions
	3. Recognize that sequences are functions, sometimes defined recursively, whose domain is a subset of the integers.	
	Interpret functions that arise in applications in terms of the context	
	4. For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship.	Heart of algebra Linear functions Passport to advanced math Nonlinear functions
	5. Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes.	
	6. Calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval. Estimate the rate of change from a graph.	
	Analyze functions using different representations	
	7. Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases. a. Graph linear and quadratic functions and show intercepts, maxima, and minima. b. Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions. c. Graph polynomial functions, identifying zeros when suitable factorizations are available, and showing end behavior. e. Graph exponential and logarithmic functions, showing intercepts and end behavior, and trigonometric functions, showing period, midline, and amplitude.	Heart of algebra Linear functions Problem solving and data analysis One variable data: Distributions and measures of center and spread Passport to advanced math Nonlinear functions

Michigan High School Math Standards: Functions	SAT Math Test
8. Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function. a. Use the process of factoring and completing the square in a quadratic function to show zeros, extreme values, and symmetry of the graph, and interpret these in terms of a context. b. Use the properties of exponents to interpret expressions for exponential functions.	Heart of algebra Linear functions Passport to advanced math Nonlinear functions
9. Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions).	Heart of algebra Linear functions Passport to advanced math Nonlinear functions
F-BF Building Functions	
Build a function that models a relationship between two quantities	
1. Write a function that describes a relationship between two quantities. a. Determine an explicit expression, a recursive process, or steps for calculation from a context. b. Combine standard function types using arithmetic operations.	Heart of algebra Linear functions Passport to advanced math Nonlinear functions
2. Write arithmetic and geometric sequences both recursively and with an explicit formula, use them to model situations, and translate between the two forms.	
Build new functions from existing functions	
3. Identify the effect on the graph of replacing $f(x)$ by $f(x) + k$, $k f(x)$, $f(kx)$, and $f(x + k)$ for specific values of k (both positive and negative); find the value of k given the graphs. Experiment with cases and illustrate an explanation of the effects on the graph using technology.	
4. Find inverse functions. a. Solve an equation of the form $f(x) = c$ for a simple function f that has an inverse and write an expression for the inverse.	

Michigan High School Math Standards: Functions		SAT Math Test
F-LE Linear, Quadratic, and Exponential Models		
	Construct and compare linear, quadratic, and exponential models and solve problems	
	1. Distinguish between situations that can be modeled with linear functions and with exponential functions. a. Prove that linear functions grow by equal differences over equal intervals, and that exponential functions grow by equal factors over equal intervals. b. Recognize situations in which one quantity changes at a constant rate per unit interval relative to another. c. Recognize situations in which a quantity grows or decays by a constant percent rate per unit interval relative to another.	Heart of algebra Linear functions Problem solving and data analysis Ratios, rates, proportional relationships, and units Two-variable data: Models and scatterplots Passport to advanced math Nonlinear functions
	2. Construct linear and exponential functions, including arithmetic and geometric sequences, given a graph, a description of a relationship, or two input-output pairs (include reading these from a table).	Heart of algebra Linear functions Passport to advanced math Nonlinear functions
	3. Observe using graphs and tables that a quantity increasing exponentially eventually exceeds a quantity increasing linearly, quadratically, or (more generally) as a polynomial function.	
	4. For exponential models, express as a logarithm the solution to $ab^{ct} = d$ where a, c, and d are numbers and the base b is 2, 10, or e; evaluate the logarithm using technology.	
	Interpret expressions for functions in terms of the situation they model	
	5. Interpret the parameters in a linear or exponential function in terms of a context.	Heart of algebra Linear functions Passport to advanced math Nonlinear functions
F-TF Trigonometric Functions		
	Extend the domain of trigonometric functions using the unit circle	
	1. Understand radian measure of an angle as the length of the arc on the unit circle subtended by the angle.	Additional topics in math Circles
	2. Explain how the unit circle in the coordinate plane enables the extension of trigonometric functions to all real numbers, interpreted as radian measures of angles traversed counterclockwise around the unit circle.	Additional topics in math Circles
	Model periodic phenomena with trigonometric functions	
	5. Choose trigonometric functions to model periodic phenomena with specified amplitude, frequency, and midline.	
	Prove and apply trigonometric identities	

Michigan High School Math Standards: Functions		SAT Math Test
	8. Prove the Pythagorean identity $\sin^2(\theta) + \cos^2(\theta) = 1$ and use it to find $\sin(\theta)$, $\cos(\theta)$, or $\tan(\theta)$ given $\sin(\theta)$, $\cos(\theta)$, or $\tan(\theta)$ and the quadrant of the angle.	

Michigan High School Math Standards: Modeling	SAT Math Test
Modeling Standards: Modeling is best interpreted not as a collection of isolated topics but rather in relation to other standards. Making mathematical models is a Standard for Mathematical Practice, and specific modeling standards appear throughout the high school standards indicated by a star symbol.	An emphasis on modeling is apparent throughout the redesigned SAT Math Test

Michigan High School Math Standards: Geometry		SAT Math Test
G-CO Congruence		
	Experiment with transformations in the plane	
	1. Know precise definitions of angle, circle, perpendicular line, parallel line, and line segment, based on the undefined notions of point, line, distance along a line, and distance around a circular arc.	Additional topics in math Lines, angles, and triangles Right angles and trigonometry Circles
	2. Represent transformations in the plane using, e.g., transparencies and geometry software; describe transformations as functions that take points in the plane as inputs and give other points as outputs. Compare transformations that preserve distance and angle to those that do not (e.g., translation versus horizontal stretch).	
	3. Given a rectangle, parallelogram, trapezoid, or regular polygon, describe the rotations and reflections that carry it onto itself.	
	4. Develop definitions of rotations, reflections, and translations in terms of angles, circles, perpendicular lines, parallel lines, and line segments.	
	5. Given a geometric figure and a rotation, reflection, or translation, draw the transformed figure using, e.g., graph paper, tracing paper, or geometry software. Specify a sequence of transformations that will carry a given figure onto another.	
	Understand congruence in terms of rigid motions	
	6. Use geometric descriptions of rigid motions to transform figures and to predict the effect of a given rigid motion on a given figure; given two figures, use the definition of congruence in terms of rigid motions to decide if they are congruent.	

Michigan High School Math Standards: Geometry		SAT Math Test
	7. Use the definition of congruence in terms of rigid motions to show that two triangles are congruent if and only if corresponding pairs of sides and corresponding pairs of angles are congruent.	
	8. Explain how the criteria for triangle congruence (ASA, SAS, and SSS) follow from the definition of congruence in terms of rigid motions.	
	Prove geometric theorems	
	9. Prove theorems about lines and angles.	Additional topics in math Lines, angles, and triangles
	10. Prove theorems about triangles.	Additional topics in math Lines, angles, and triangles
	11. Prove theorems about parallelograms.	
	Make geometric constructions	
	12. Make formal geometric constructions with a variety of tools and methods (compass and straightedge, string, reflective devices, paper folding, dynamic geometric software, etc.).	
	13. Construct an equilateral triangle, a square, and a regular hexagon inscribed in a circle.	
G-SRT Similarity, Right Triangles, and Trigonometry		
	Understand similarity in terms of similarity transformations	
	1. Verify experimentally the properties of dilations given by a center and a scale factor: a. A dilation takes a line not passing through the center of the dilation to a parallel line, and leaves a line passing through the center unchanged. b. The dilation of a line segment is longer or shorter in the ratio given by the scale factor. 2. Given two figures, use the definition of similarity in terms of similarity transformations to decide if they are similar; explain using similarity transformations the meaning of similarity for triangles as the equality of all corresponding pairs of angles and the proportionality of all corresponding pairs of sides.	
	3. Use the properties of similarity transformations to establish the AA criterion for two triangles to be similar.	
	Prove theorems involving similarity	
	4. Prove theorems about triangles.	Additional topics in math Lines, angles, and triangles
	5. Use congruence and similarity criteria for triangles to solve problems and to prove relationships in geometric figures.	Additional topics in math Lines, angles, and triangles
	Define trigonometric ratios and solve problems involving right triangles	

Michigan High School Math Standards: Geometry		SAT Math Test
	6. Understand that by similarity, side ratios in right triangles are properties of the angles in the triangle, leading to definitions of trigonometric ratios for acute angles.	Additional topics in math Right triangles and trigonometry
	7. Explain and use the relationship between the sine and cosine of complementary angles.	Additional topics in math Right triangles and trigonometry
	8. Use trigonometric ratios and the Pythagorean Theorem to solve right triangles in applied problems.	Additional topics in math Right triangles and trigonometry
G-C Circles		
	Understand and apply theorems about circles	
	1. Prove that all circles are similar.	
	2. Identify and describe relationships among inscribed angles, radii, and chords.	Additional topics in math Circles
	3. Construct the inscribed and circumscribed circles of a triangle, and prove properties of angles for a quadrilateral inscribed in a circle.	Additional topics in math Circles
	Find arc lengths and areas of sectors of circle	
	5. Derive using similarity the fact that the length of the arc intercepted by an angle is proportional to the radius, and define the radian measure of the angle as the constant of proportionality; derive the formula for the area of a sector.	Additional topics in math Circles
G-GPE Expressing Geometric Properties with Equations		
	Translate between the geometric description and the equation for a conic section	
	1. Derive the equation of a circle of given center and radius using the Pythagorean Theorem; complete the square to find the center and radius of a circle given by an equation.	Additional topics in math Circles
	2. Derive the equation of a parabola given a focus and directrix.	
	Use coordinates to prove simple geometric theorems algebraically	
	4. Use coordinates to prove simple geometric theorems algebraically.	
	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).	Heart of algebra Linear equations in two variables
	6. Find the point on a directed line segment between two given points that partitions the segment in a given ratio.	
	7. Use coordinates to compute perimeters of polygons and areas of triangles and rectangles, e.g., using the distance formula.	
G-GMD Geometric Measurement and Dimension		
	Explain volume formulas and use them to solve problems	
	1. Give an informal argument for the formulas for the circumference of a circle, area of a circle, volume of a cylinder, pyramid, and cone.	

Michigan High School Math Standards: Geometry		SAT Math Test
	3. Use volume formulas for cylinders, pyramids, cones, and spheres to solve problems.	Additional topics in math Area and volume
	Visualize relationships between two-dimensional and three-dimensional objects	
	4. Identify the shapes of two-dimensional cross-sections of three-dimensional objects, and identify three-dimensional objects generated by rotations of two-dimensional objects.	
G-MG Modeling with Geometry		
	Apply geometric concepts in modeling situations	
	1. Use geometric shapes, their measures, and their properties to describe objects (e.g., modeling a tree trunk or a human torso as a cylinder).	
	2. Apply concepts of density based on area and volume in modeling situations (e.g., persons per square mile, BTUs per cubic foot).	Problem solving and data analysis Ratios, rates, proportional relationships, and units
	3. Apply geometric methods to solve design problems (e.g., designing an object or structure to satisfy physical constraints or minimize cost; working with typographic grid systems based on ratios).	

Michigan High School Math Standards: Statistics and Probability		SAT Math Test
S-ID Interpreting Categorical and Quantitative Data		
	Summarize, represent, and interpret data on a single count or measurement variable	
	1. Represent data with plots on the real number line (dot plots, histograms, and box plots).	Problem solving and data analysis One variable data: Distributions and measures of center and spread
	2. Use statistics appropriate to the shape of the data distribution to compare center (median, mean) and spread (interquartile range, standard deviation) of two or more different data sets.	Problem solving and data analysis One variable data: Distributions and measures of center and spread
	3. Interpret differences in shape, center, and spread in the context of the data sets, accounting for possible effects of extreme data points (outliers).	Problem solving and data analysis One variable data: Distributions and measures of center and spread

Michigan High School Math Standards: Statistics and Probability	SAT Math Test
4. Use the mean and standard deviation of a data set to fit it to a normal distribution and to estimate population percentages. Recognize that there are data sets for which such a procedure is not appropriate. Use calculators, spreadsheets, and tables to estimate areas under the normal curve.	
Summarize, represent, and interpret data on two categorical and quantitative variables	
5. Summarize categorical data for two categories in two-way frequency tables. Interpret relative frequencies in the context of the data (including joint, marginal, and conditional relative frequencies). Recognize possible associations and trends in the data.	Problem solving and data analysis Probability and conditional probability
6. Represent data on two quantitative variables on a scatter plot, and describe how the variables are related. a. Fit a function to the data; use functions fitted to data to solve problems in the context of the data. b. Informally assess the fit of a function by plotting and analyzing residuals. c. Fit a linear function for a scatter plot that suggests a linear association.	Problem solving and data analysis Two variable data: Models and scatterplots
Interpret linear models	
7. Interpret the slope (rate of change) and the intercept (constant term) of a linear model in the context of the data.	Problem solving and data analysis Two variable data: Models and scatterplots Heart of algebra Linear equations in two variables
8. Compute (using technology) and interpret the correlation coefficient of a linear fit.	
9. Distinguish between correlation and causation.	
S-IC Making Inferences and Justifying Conclusions	
Understand and evaluate random processes underlying statistical experiments	
1. Understand statistics as a process for making inferences about population parameters based on a random sample from that population.	Problem solving and data analysis Inference from sample statistics and margin of error
2. Decide if a specified model is consistent with results from a given data-generating process, e.g., using simulation.	
Make inferences and justify conclusions from sample surveys, experiments, and observational studies	

	Michigan High School Math Standards: Statistics and Probability	SAT Math Test
	3. Recognize the purposes of and differences among sample surveys, experiments, and observational studies; explain how randomization relates to each.	
	4. Use data from a sample survey to estimate a population mean or proportion; develop a margin of error through the use of simulation models for random sampling.	
	5. Use data from a randomized experiment to compare two treatments; use simulations to decide if differences between parameters are significant.	
	6. Evaluate reports based on data.	Problem solving and data analysis Evaluating statistical claims: Observational studies and experiments
S-CP Conditional Probability and the Rules of Probability		
	Understand independence and conditional probability and use them to interpret data	
	1. Describe events as subsets of a sample space (the set of outcomes) using characteristics (or categories) of the outcomes, or as unions, intersections, or complements of other events ("or," "and," "not").	
	2. Understand that two events *A* and *B* are independent if the probability of *A* and *B* occurring together is the product of their probabilities, and use this characterization to determine if they are independent.	
	3. Understand the conditional probability of *A* given *B* as *P*(*A* and *B*)/*P*(*B*), and interpret independence of *A* and *B* as saying that the conditional probability of *A* given *B* is the same as the probability of *A*, and the conditional probability of *B* given *A* is the same as the probability of *B*.	
	4. Construct and interpret two-way frequency tables of data when two categories are associated with each object being classified. Use the two-way table as a sample space to decide if events are independent and to approximate conditional probabilities.	Problem solving and data analysis Probability and conditional probability
	5. Recognize and explain the concepts of conditional probability and independence in everyday language and everyday situations.	
	Use the rules of probability to compute probabilities of compound events in a uniform probability model	
	6. Find the conditional probability of *A* given *B* as the fraction of *B*'s outcomes that also belong to *A*, and interpret the answer in terms of the model.	
	7. Apply the Addition Rule, *P*(*A* or *B*) = *P*(*A*) + *P*(*B*) – *P*(*A* and *B*), and interpret the answer in terms of the model.	

Table 16: SAT Math Test Alignment: SAT to MI

The following table details the SAT-Michigan alignment using SAT content specifications as the organizing principle. In the interest of brevity, the Michigan standards in the right-hand column are presented in their abbreviated form (consistent with how they are numbered and lettered in Michigan standards documents).

SAT Math Test		Michigan Math Standards
SAT HEART OF ALGEBRA		
	Linear equations in one variable	
	• Create and use linear equations in one variable to solve problems in a variety of contexts. • Create a linear equation in one variable, and when in context interpret solutions in terms of the context. • Solve a linear equation in one variable making strategic use of algebraic structure. • For a linear equation in one variable, o interpret a constant, variable, factor or term in a context; o determine the conditions under which the equation has no solution, a unique solution, or infinitely many solutions. • Fluently solve a linear equation in one variable.	A-CED.A.1 A-REI.B.3 See also these relevant precursors: 8-EE.C.7
	Linear functions	
	• Create and use linear functions to solve problems in a variety of contexts. • Create a linear function to model a relationship between two quantities. • For a linear function that represents a context a. interpret the meaning of an input/output pair, constant, variable, factor, or term based on the context, including situations where seeing structure provides an advantage; b. given an input value, find and/or interpret the output value using the given representation; c. given an output value, find and/or interpret the input value using the given representation, if it exists. • Make connections between verbal, tabular, algebraic, and graphical representations of a linear function, by a. deriving one representation from the other; b. identifying features of one representation given another representation; c. determining how a graph is affected by a change to its equation. • Write the rule for a linear function given two input/output pairs or one input/output pair and the rate of change.	A-SSE.A.1 A-SSE.A.2 A-SSE.A.2 F-BF.A.1 F-IF.C.8 A-CED.A.2 F-IF.A.1 F-IF.A.2 F-IF.B.4 F-IF.C.7a F-IF.C.9 F-BF.A.1b F-LE.A.1b F-LE.A.2 F-LE.B.5
	Linear equations in two variables	

	SAT Math Test	Michigan Math Standards
	• Create and use a linear equation in two variables to solve problems in a variety of contexts. • Create a linear equation in two variables to model a constraint or condition on two quantities. • For a linear equation in two variables that represents a context o interpret a solution, constant, variable, factor, or term based on the context, including situations where seeing structure provides an advantage; o given a value of one quantity in the relationship, find a value of the other, if it exists. • Make connections between tabular, algebraic, and graphical representations of a linear equation in two variables by o deriving one representation from the other; o identifying features of one representation given the other representation; o determining how a graph is affected by a change to its equation. • Write an equation for a line given two points on the line, one point and the slope of the line, or one point and a parallel or perpendicular line.	A-SSE.A.1 A-SSE.A.2 A-CED.A.3 A-REI.D.10 G-GPE.B.5 S-ID.C.7
	Systems of two linear equations in two variables	
	• Create and use a system of two linear equations in two variables to solve problems in a variety of contexts. • Create a system of linear equations in two variables, and when in context interpret solutions in terms of the context. • Make connections between tabular, algebraic, and graphical representations of the system by deriving one representation from the other. • Solve a system of two linear equations in two variables making strategic use of algebraic structure. • For a system of linear equations in two variables, o interpret a solution, constant, variable, factor, or term based on the context, including situations where seeing structure provides an advantage; o determine the conditions under which the system has no solution, a unique solution, or infinitely many solutions. • Fluently solve a system of linear equations in two variables.	A.REI.C.6
	Linear inequalities in one or two variables	

SAT Math Test	Michigan Math Standards
• Create and use linear inequalities in one or two variables to solve problems in a variety of contexts. • Create linear inequalities in one or two variables, and when in context interpret the solutions in terms of the context. • For linear inequalities in one or two variables, interpret a constant, variable, factor, or term, including situations where seeing structure provides an advantage. • Make connections between tabular, algebraic, and graphical representations of linear inequalities in one or two variables by deriving one from the other. Given a linear inequality or system of linear inequalities, interpret a point in the solution set.	A-CED.A.1 A-CED.A.3 A-REI.B.3 A.REI.D.12
SAT PROBLEM SOLVING AND DATA ANALYSIS	
Ratios, rates, proportional relationships, and units	
Items will requires students to solve problems by using a proportional relationship between quantities, calculating or using a ratio or rate, and/or using units, derived units, and unit conversion. • Apply proportional relationships, ratios, rates and units in a wide variety of contexts. Examples include but are not limited to scale drawings and problems in the natural and social sciences. • Solve problems involving o derived units including those that arise from products (e.g., kilowatt-hours) and quotients (e.g., population per square kilometer) o unit conversion including currency exchange and conversion between different measurement systems. • Understand and use the fact that when two quantities are in a proportional relationship, if one changes by a scale factor, then the other also changes by the same scale factor.	A-REI.B.3 F-LE.1 N-Q.A.1 G-MG.A.2 Modeling See also these relevant precursors: 6-RP.A.3b; 6-RP.A.3c; 6-RP.A.3d; 7-RP.A.1; 7-RP.A.2b; 7-RP.A.3.
Percentages	
• Use percentages to solve problems in a variety of contexts. Examples include, but are not limited to, discounts, interest, taxes, tips, and percent increases and decreases for many different quantities. • Understand and use the relationship between percent change and growth factor (5% and 1.05, for example); include percentages greater than or equal to 100%.	Modeling; See also these relevant precursors: 6.RP.A.3c; 7-RP.A.3
One variable data: Distributions and measures of center and spread	
• Choose an appropriate graphical representation for a given data set. • Interpret information from a given representation of data in context. • Analyze and interpret numerical data distributions	S-ID.A.1 S-ID.A.2 S-ID.A.3 F-IF.C.7

	SAT Math Test	Michigan Math Standards
	represented with frequency tables, histograms, dot plots, and boxplots. • For quantitative variables, calculate, compare, and interpret mean, median, and range. Interpret (but don't calculate) standard deviation. • Compare distributions using measures of center and spread, including distributions with different means and the same standard deviations and ones with the same mean and different standard deviations. • Understand and describe the effect of outliers on mean and median. • Given an appropriate data set, calculate the mean.	
	Two-variable data: Models and scatterplots	
	• Using a model that fits the data in a scatterplot, compare values predicted by the model to values given in the data set. • Interpret the slope and intercepts of the line of best fit in context. • Given a relationship between two quantities, read and interpret graphs and tables modeling the relationship. • Analyze and interpret data represented in a scatterplot or line graph; fit linear, quadratic, and exponential models. • Select a graph that represents a context, identify a value on a graph, or interpret information on the graph. • For a given function type (linear, quadratic, exponential), choose the function of that type that best fits given data. • Compare linear and exponential growth. • Estimate the line of best fit for a given scatterplot; use the line to make predictions.	A-REI.B.3 F-LE.1 S-ID.B.6a S-ID.B.6c S-ID.C.7
	Probability and conditional probability	
	Use one- and two-way tables, tree diagrams, area models, and other representations to find relative frequency, probabilities, and conditional probabilities. • Compute and interpret probability and conditional probability in simple contexts. • Understand formulas for probability, and conditional probability in terms of frequency.	S-ID.B.5 S-CP.A.4
	Inference from sample statistics and margin of error	
	• Use sample mean and sample proportion to estimate population mean and population proportion. Utilize, but do not calculate, margin of error. • Interpret margin of error; understand that a larger sample size generally leads to a smaller margin of error.	S-IC.A.1
	Evaluating statistical claims: Observational studies and experiments	

SAT Math Test	Michigan Math Standards
• With random samples, describe which population the results can be extended to. • Given a description of a study with or without random assignment, determine whether there is evidence for a causal relationship. • Understand why random assignment provides evidence for a causal relationship. • Understand why a result can be extended only to the population from which the sample was selected.	S-IC.B.6
SAT PASSPORT TO ADVANCED MATH	
Equivalent expressions	
• Make strategic use of algebraic structure and the properties of operations to identify and create equivalent expressions, including o rewriting simple rational expressions; o rewriting expressions with rational exponents and radicals; o factoring polynomials. • Fluently add, subtract, and multiply polynomials.	N-RN.A.2 A-SSE.A.1a A-SSE.A.2 A-APR.A.1 A-APR.D.6
Nonlinear equations in one variable and systems of equations in two variables	
• Make strategic use of algebraic structure, the properties of operations, and reasoning about equality to o solve quadratic equations in one variable presented in a wide variety of forms; determine the conditions under which a quadratic equation has no real solutions, 1 real solution, or 2 real solutions; o solve simple rational and radical equations in one variable; o identify when the procedures used to solve a simple rational or radical equation in one variable lead to an equation with solutions that do not satisfy the original equation (extraneous solutions); o solve polynomial equations in one variable that are written in factored form; o solve linear absolute value equations in one variable; o solve systems of linear and nonlinear equations in two variables, including relating the solutions to the graphs of the equations in the system. • Given a nonlinear equation in one variable that represents a context, interpret a solution, constant, variable, factor, or term based on the context, including situations where seeing structure provides an advantage. • Given an equation or formula in two or more variables that represents a context, view it as an equation in a single variable of interest where the other variables are parameters and solve for the variable of interest.	A-SSE.A.1 A-SSE.A.2 A-APR.B.3 A-CED.A.4 A-REI.A.2 A-REI.B.4 A.REI.C.7

	SAT Math Test	Michigan Math Standards
	• Fluently solve quadratic equations in one variable, written as a quadratic expression in standard form equal to zero, where using the quadratic formula or completing the square is the most efficient method for solving the equation.	
	Nonlinear functions	
	• Create and use quadratic or exponential functions to solve problems in a variety of contexts. • For a quadratic or exponential function, o identify or create an appropriate function to model a relationship between quantities; o use function notation to represent and interpret input/output pairs in terms of a context and points on the graph; o for a function that represents a context, interpret the meaning of an input/output pair, constant, variable, factor, or term based on the context, including situations where seeing structure provides an advantage; o determine the most suitable form of the expression representing the output of the function to display key features of the context, including selecting the form of a quadratic that displays the initial value, the zeros, or the extreme value; selecting the form of an exponential that displays the initial value, the end-behavior (for exponential decay), or the doubling or halving time; o make connections between tabular, algebraic, and graphical representations of the function, by given one representation, selecting another representation; identifying features of one representation given the another representation, including maximum and minimum values of the function; determining how a graph is affected by a change to its equation, including a vertical shift or scaling of the graph. • For a factorable or factored polynomial or simple rational function, o use function notation to represent and interpret input/output pairs in terms of a context and points on the graph; o understand and use the fact that for the graph of y = f(x), the solutions to f(x) = 0 correspond to x-intercepts of the graph and f(0) corresponds to the y-intercept of the graph; interpret these key features in terms of a context; o identify the graph given an algebraic representation of the function and an algebraic representation given the graph (with or without a context).	A-SSE.A.1 A-SSE.A.2 A-SSE.B.3 A-APR.B.2 A-REI.D.10 A-REI.D.1 F-IF.A.1 F-IF.A.2 F-IF.B.4 F-IF.C.7b F-IF.C.7c F-IF.C.7e F-IF.C.8a F-IF.C.8b F-IF.C.9 F-BF.A.1a F-LE.A.1a F-LE.A.1c F-LE.A.2 F-LE.B.5
SAT ADDITIONAL TOPICS IN MATH		
	Area and volume	

	SAT Math Test	Michigan Math Standards
	• Solve real-world and mathematical problems about a geometric figure or an object that can be modeled by a geometric figure using given information such as length, area, surface area, or volume. o Apply knowledge that changing by a scale factor of k changes all lengths by a factor of k, changes all areas by a factor of k2, and changes all volumes by a factor of k3. o Demonstrate procedural fluency by selecting the correct area or volume formula and correctly calculating a specified value.	G-GMD.A.3
	Lines, angles, and triangles	
	• Use concepts and theorems relating to congruence and similarity of triangles to solve problems. • Determine which statements may be required to prove certain relationships or to satisfy a given theorem. • Apply knowledge that changing by a scale factor of k changes all lengths by a factor of k, but angle measures remain unchanged. • Know and directly apply relevant theorems such as o the vertical angle theorem; o triangle similarity and congruence criteria; o triangle angle sum theorem; o the relationship of angles formed when a transversal cuts parallel lines.	G-CO.A.1 G-CO.C.9 G-CO.C.10 G-SRT.B.4 G-SRT.B.5
	Right triangles and trigonometry	
	• Solve problems in a variety of contexts using o the Pythagorean theorem; o right triangle trigonometry; o properties of special right triangles. • Use similarity to calculate values of sine, cosine, and tangent. • Understand that when given one side length and one acute angle measure in a right triangle, the remaining values can be determined. • Solve problems using the relationship between sine and cosine of complementary angles. • Fluently apply properties of special right triangles to determine side-lengths and calculate trigonometric ratios of 30, 45, and 60 degrees.	G-CO.A.1 G-SRT.C.6 G-SRT.C.7 G-SRT.C.8
	Circles	

	SAT Math Test	Michigan Math Standards
	• Use definitions, properties, and theorems relating to circles and parts of circles, such as radii, diameters, tangents, angles, arcs, arc lengths, and sector areas to solve problems. • Solve problems using o radian measure; o trigonometric ratios in the unit circle. • Create an equation to represent a circle in the xy-plane. • Describe how o a change to the equation representing a circle in the xy-plane affects the graph of the circle; o a change in the graph of the circle affects the equation of the circle. • Understand that the ordered pairs that satisfy an equation of the form (x – h)2 + (y – k)2 = r2 form a circle when plotted in the xy-plane. • Convert between angle measures in degrees and radians. • Complete the square in an equation representing a circle to determine properties of the circle when it is graphed in the xy-plane, and use the distance formula in problems related to circles.	F-TF.A.1 F-TF.A.2 G-CO.A.1 G-C.A.2 G-C.A.3 G-C.B.5 G-GPE.A.1
	Complex numbers	
	• Apply knowledge and understanding of the complex number system to add, subtract, multiply and divide with complex numbers and solve problems.	N-CN.A.1 N-CN.A.2

Section 5: State Standards Alignment Tables—PSAT/NMSQT and PSAT 10

The detailed results of the alignments conducted between Michigan's standards and the knowledge and skills assessed by the redesigned PSAT/NMSQT and PSAT 10 are presented in this section. The English Language Arts/Literacy alignment results are presented in tables 17 through 25 and are followed by the Math alignment results in tables 26 and 27. Tables 17 through 23 (English Language Arts/Literacy) and table 26 (Math) show Michigan's standards in the left-hand column and aligned PSAT/NMSQT and PSAT 10 content specifications in the right-hand column. Tables 24 and 25 (English Language Arts/Literacy) and table 27 (Math) present the PSAT/NMSQT and PSAT 10 content specifications in the left-hand column and aligned Michigan standards in the right-hand column.

English Language Arts/Literacy Alignment: Michigan's Standards to PSAT/NMSQT and PSAT 10
Tables 17 through 23 detail the PSAT/NMSQT and PSAT 10–Michigan alignment using Michigan's standards as the organizing principle. In selected cases, a partial or otherwise qualified alignment was noted through the use of red text. A partial or qualified alignment was indicated only when College Board staff felt that doing so identified an essential agreement that respected the spirit of the element being incompletely aligned to. Additional explanatory notes (also in red, in the right-hand column) are included to help illuminate College Board's methodology.

Table 17: Reading Standards for Literature 9–10: MI to PSAT/NMSQT and PSAT 10

Reading Standards for Literature Grades 9–10	PSAT/NMSQT and PSAT 10 Reading Test
1. Cite strong and thorough textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text.	Determining explicit meanings: The student will identify information and ideas explicitly stated in text. Determining implicit meanings: The student will draw reasonable inferences and logical conclusions from text. Using analogical reasoning: The student will extrapolate in a reasonable way from the information and ideas in a text or apply information and ideas in a text to a new, analogous situation. Citing textual evidence: The student will cite the textual evidence that best supports a given claim or point.

Reading Standards for Literature Grades 9–10	PSAT/NMSQT and PSAT 10 Reading Test
2. Determine a theme or central idea of a text and analyze in detail its development over the course of the text, including how it emerges and is shaped and refined by specific details; provide an objective summary of the text.	Determining central ideas and themes: The student will identify explicitly stated central ideas or themes in text and determine implicit central ideas or themes from text. Summarizing: The student will identify a reasonable summary of a text or of key information and ideas in text. Analyzing part-whole relationships: The student will analyze the relationship between a particular part of a text (e.g., a sentence) and the whole text.
3. Analyze how complex characters (e.g., those with multiple or conflicting motivations) develop over the course of a text, interact with other characters, and advance the plot or develop the theme.	Understanding relationships: The student will identify explicitly stated relationships or determine implicit relationships between and among individuals, events, or ideas (e.g., cause-effect, comparison-contrast, sequence). Analyzing overall text structure: The student will describe the overall structure of a text. Analyzing part-whole relationships: The student will analyze the relationship between a particular part of a text (e.g., a sentence) and the whole text. Analyzing point of view: The student will determine the point of view or perspective from which a text is related or the influence this point of view or perspective has on content and style.
4. Determine the meaning of words and phrases as they are used in the text, including figurative and connotative meanings; analyze the cumulative impact of specific word choices on meaning and tone (e.g., how the language evokes a sense of time and place; how it sets a formal or informal tone).	Determining explicit meanings: The student will identify information and ideas explicitly stated in text. Determining implicit meanings: The student will draw reasonable inferences and logical conclusions from text. Interpreting words and phrases in context: The student will determine the meaning of words and phrases in context. Analyzing word choice: The student will determine how the selection of specific words and phrases or the use of patterns of words and phrases shapes meaning and tone in text.

Reading Standards for Literature Grades 9–10	PSAT/NMSQT and PSAT 10 Reading Test
5. Analyze how an author's choices concerning how to structure a text, order events within it (e.g., parallel plots), and manipulate time (e.g., pacing, flashbacks) create such effects as mystery, tension, or surprise.	Analyzing overall text structure: The student will describe the overall structure of a text. Analyzing part-whole relationships: The student will analyze the relationship between a particular part of a text (e.g., a sentence) and the whole text.
6. Analyze a particular point of view or cultural experience reflected in a work of literature from outside the United States, drawing on a wide reading of world literature.	Analyzing point of view: The student will determine the point of view or perspective from which a text is related or the influence this point of view or perspective has on content and style. *Works of literature on the test may be authored by people from or outside the United States. Prior knowledge of world literature is not directly assessed.*
7. Analyze the representation of a subject or a key scene in two different artistic mediums, including what is emphasized or absent in each treatment (e.g., Auden's "Musée des Beaux Arts" and Breughel's Landscape with the Fall of Icarus).	
8. (Not applicable to literature)	
9. Analyze how an author draws on and transforms source material in a specific work (e.g., how Shakespeare treats a theme or topic from Ovid or the Bible or how a later author draws on a play by Shakespeare).	
10. By the end of grade 9, read and comprehend literature, including stories, dramas, and poems, in the grades 9-10 text complexity band proficiently, with scaffolding as needed at the high end of the range. By the end of grade 10, read and comprehend literature, including stories, dramas, and poems, at the high end of the grades 9-10 text complexity band independently and proficiently.	Text complexity: The passages/pair on the PSAT/NMSQT and PSAT 10 Reading Tests represent a specified range of text complexities from grades 9–12.

Table 18: Reading Standards for Informational Text 9–10: MI to PSAT/NMSQT and PSAT 10

Reading Standards for Informational Text Grades 9–10	PSAT/NMSQT and PSAT 10 Reading Test
1. Cite strong and thorough textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text.	Determining explicit meanings: The student will identify information and ideas explicitly stated in text. Determining implicit meanings: The student will draw reasonable inferences and logical conclusions from text. Using analogical reasoning: The student will extrapolate in a reasonable way from the information and ideas in a text or apply information and ideas in a text to a new, analogous situation. Citing textual evidence: The student will cite the textual evidence that best supports a given claim or point.
2. Determine a central idea of a text and analyze its development over the course of the text, including how it emerges and is shaped and refined by specific details; provide an objective summary of the text.	Determining central ideas and themes: The student will identify explicitly stated central ideas or themes in text and determine implicit central ideas or themes from text. Summarizing: The student will identify a reasonable summary of a text or of key information and ideas in text. Analyzing part-whole relationships: The student will analyze the relationship between a particular part of a text (e.g., a sentence) and the whole text.
3. Analyze how the author unfolds an analysis or series of ideas or events, including the order in which the points are made, how they are introduced and developed, and the connections that are drawn between them.	Understanding relationships: The student will identify explicitly stated relationships or determine implicit relationships between and among individuals, events, or ideas (e.g., cause-effect, comparison-contrast, sequence). Analyzing overall text structure: The student will describe the overall structure of a text. Analyzing part-whole relationships: The student will analyze the relationship between a particular part of a text (e.g., a sentence) and the whole text.

Reading Standards for Informational Text Grades 9–10	PSAT/NMSQT and PSAT 10 Reading Test
4. Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings; analyze the cumulative impact of specific word choices on meaning and tone (e.g., how the language of a court opinion differs from that of a newspaper).	Determining explicit meanings: The student will identify information and ideas explicitly stated in text. Determining implicit meanings: The student will draw reasonable inferences and logical conclusions from text. Interpreting words and phrases in context: The student will determine the meaning of words and phrases in context. Analyzing word choice: The student will determine how the selection of specific words and phrases or the use of patterns of words and phrases shapes meaning and tone in text.
5. Analyze in detail how an author's ideas or claims are developed and refined by particular sentences, paragraphs, or larger portions of a text (e.g., a section or chapter).	Analyzing overall text structure: The student will describe the overall structure of a text. Analyzing part-whole relationships: The student will analyze the relationship between a particular part of a text (e.g., a sentence) and the whole text. Analyzing purpose: The student will determine the main or most likely purpose of a text or of a particular part of a text (typically, one or more paragraphs). *Reading Test passages are too short to have defined "larger portions."*
6. Determine an author's point of view or purpose in a text and analyze how an author uses rhetoric to advance that point of view or purpose.	Analyzing point of view: The student will determine the point of view or perspective from which a text is related or the influence this point of view or perspective has on content and style. Analyzing purpose: The student will determine the main or most likely purpose of a text or of a particular part of a text (typically, one or more paragraphs).
7. Analyze various accounts of a subject told in different mediums (e.g., a person's life story in both print and multimedia), determining which details are emphasized in each account.	

Reading Standards for Informational Text Grades 9–10	PSAT/NMSQT and PSAT 10 Reading Test
8. Delineate and evaluate the argument and specific claims in a text, assessing whether the reasoning is valid and the evidence is relevant and sufficient; identify false statements and fallacious reasoning.	Analyzing claims and counterclaims: The student will identify claims and counterclaims explicitly stated in text or determine implicit claims and counterclaims from text. Assessing reasoning: The student will assess an author's reasoning for soundness. Analyzing evidence: The student will assess how an author uses or fails to use evidence to support a claim or counterclaim. *Sufficiency is a subjective judgment not assessed by the multiple-choice Reading Test questions. Students are not asked to identify "false statements," which would require external validation. Students may be asked to recognize weaknesses or inconsistencies in authors' reasoning but not to identify fallacies by name.*
9. Analyze seminal U.S. documents of historical and literary significance (e.g., Washington's Farewell Address, the Gettysburg Address, Roosevelt's Four Freedoms speech, King's "Letter from Birmingham Jail"), including how they address related themes and concepts.	Determining explicit meanings: The student will identify information and ideas explicitly stated in text. Determining implicit meanings: The student will draw reasonable inferences and logical conclusions from text. Using analogical reasoning: The student will extrapolate in a reasonable way from the information and ideas in a text or apply information and ideas in a text to a new, analogous situation. Determining central ideas and themes: The student will identify explicitly stated central ideas or themes in text and determine implicit central ideas or themes from text. Analyzing multiple texts: The student will synthesize information and ideas from paired texts. *The Reading Test includes either a selection or pair from a US founding document or documents, or a selection or pair from a text or texts in the Great Global Conversation.*

Reading Standards for Informational Text Grades 9–10	PSAT/NMSQT and PSAT 10 Reading Test
10. By the end of grade 9, read and comprehend literacy nonfiction in the grades 9-10 text complexity band proficiently, with scaffolding as needed at the high end of the range. By the end of grade 10, read and comprehend literary nonfiction at the high end of the grades 9-10 text complexity band independently and proficiently.	Text complexity: The passages/pair on the PSAT/NMSQT and PSAT 10 Reading Tests represent a specified range of text complexities from grades 9–12.

Table 19: Writing Standards 9–10: MI to PSAT/NMSQT and PSAT 10

Writing Standards Grades 9–10	PSAT/NMSQT and PSAT 10 Writing and Language Test
1. Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence. a. Introduce precise claim(s), distinguish the claim(s) from alternate or opposing claims, and create an organization that establishes clear relationships among claim(s), counterclaims, reasons, and evidence. b. Develop claim(s) and counterclaims fairly, supplying evidence for each while pointing out the strengths and limitations of both in a manner that anticipates the audience's knowledge level and concerns. c. Use words, phrases, and clauses to link the major sections of the text, create cohesion, and clarify the relationships between claim(s) and reasons, between reasons and evidence, and between claim(s) and counterclaims. d. Establish and maintain a formal style and objective tone while attending to the norms and conventions of the discipline in which they are writing. e. Provide a concluding statement or section that follows from and supports the argument presented.	Proposition: The student will add, revise, or retain central ideas, main claims, counterclaims, topic sentences, and the like to structure text and convey arguments, information, and ideas clearly and effectively. Support: The student will add, revise, or retain information and ideas (e.g., details, facts, statistics) intended to support claims or points in text. Focus: The student will add, revise, retain, or delete information and ideas in text for the sake of relevance to topic and purpose. Quantitative information: The student will relate information presented quantitatively in such forms as graphs, charts, and tables to information presented in text. Logical sequence: The student will revise text as needed to ensure that information and ideas are presented in the most logical order. Introductions, conclusions, and transitions: The student will revise text as needed to improve the beginning or ending of a text or paragraph to ensure that transition words, phrases, or sentences are used effectively to connect information and ideas. Precision: The student will revise text as needed to improve the exactness or content appropriateness of word choice. Style and tone: The student will revise text as necessary to ensure consistency of style and tone within a text or to improve the match of style and tone to purpose. Syntax: The student will use various sentence structures to accomplish needed rhetorical purposes.

Writing Standards Grades 9–10	PSAT/NMSQT and PSAT 10 Writing and Language Test
	Writing and Language items address topics, not texts. Sufficiency is a subjective judgment not assessed by the multiple-choice Writing and Language Test questions. The Writing and Language Test does not directly address the particular audience concerns identified in (b), above. Writing and Language passages are too short to have distinct sections.
2. Write informative/explanatory texts to examine and convey complex ideas, concepts, and information clearly and accurately through the effective selection, organization, and analysis of content. a. Introduce a topic; organize complex ideas, concepts, and information to make important connections and distinctions; include formatting (e.g., headings), graphics (e.g., figures, tables), and multimedia when useful to aiding comprehension. b. Develop the topic with well-chosen, relevant, and sufficient facts, extended definitions, concrete details, quotations, or other information and examples appropriate to the audience's knowledge of the topic. c. Use appropriate and varied transitions to link the major sections of the text, create cohesion, and clarify the relationships among complex ideas and concepts. d. Use precise language and domain-specific vocabulary to manage the complexity of the topic. e. Establish and maintain a formal style and objective tone while attending to the norms and conventions of the discipline in which they are writing. f. Provide a concluding statement or section that follows from and supports the information or explanation presented (e.g., articulating implications or the significance of the topic).	Proposition: The student will add, revise, or retain central ideas, main claims, counterclaims, topic sentences, and the like to structure text and convey arguments, information, and ideas clearly and effectively. Support: The student will add, revise, or retain information and ideas (e.g., details, facts, statistics) intended to support claims or points in text. Focus: The student will add, revise, retain, or delete information and ideas in text for the sake of relevance to topic and purpose. Quantitative information: The student will relate information presented quantitatively in such forms as graphs, charts, and tables to information presented in text. Logical sequence: The student will revise text as needed to ensure that information and ideas are presented in the most logical order. Introductions, conclusions, and transitions: The student will revise text as needed to improve the beginning or ending of a text or paragraph to ensure that transition words, phrases, or sentences are used effectively to connect information and ideas. Precision: The student will revise text as needed to improve the exactness or content appropriateness of word choice. Style and tone: The student will revise text as necessary to ensure consistency of style and tone within a text or to improve the match of style and

Writing Standards Grades 9–10	PSAT/NMSQT and PSAT 10 Writing and Language Test
	tone to purpose. Syntax: The student will use various sentence structures to accomplish needed rhetorical purposes. *Formatting and multimedia are not used in the Writing and Language Test. Sufficiency is a subjective judgment not assessed by the multiple-choice Writing and Language Test questions. The Writing and Language Test does not directly address the particular audience concern identified in (b), above. Writing and Language passages are too short to have distinct sections.*
3. Write narratives to develop real or imagined experiences or events using effective technique, well-chosen details, and well-structured event sequences. a. Engage and orient the reader by setting out a problem, situation, or observation, establishing one or multiple point(s) of view, and introducing a narrator and/or characters; create a smooth progression of experiences or events. b. Use narrative techniques, such as dialogue, pacing, description, reflection, and multiple plot lines, to develop experiences, events, and/or characters. c. Use a variety of techniques to sequence events so that they build on one another to create a coherent whole. d. Use precise words and phrases, telling details, and sensory language to convey a vivid picture of the experiences, events, setting, and/or characters. e. Provide a conclusion that follows from and reflects on what is experienced, observed, or resolved over the course of the narrative.	Proposition: The student will add, revise, or retain central ideas, main claims, counterclaims, topic sentences, and the like to structure text and convey arguments, information, and ideas clearly and effectively. Support: The student will add, revise, or retain information and ideas (e.g., details, facts, statistics) intended to support claims or points in text. Focus: The student will add, revise, retain, or delete information and ideas in text for the sake of relevance to topic and purpose. Logical sequence: The student will revise text as needed to ensure that information and ideas are presented in the most logical order. Introductions, conclusions, and transitions: The student will revise text as needed to improve the beginning or ending of a text or paragraph to ensure that transition words, phrases, or sentences are used effectively to connect information and ideas. Precision: The student will revise text as needed to improve the exactness or content appropriateness of word choice. Style and tone: The student will revise text as necessary to ensure consistency of style and tone

Writing Standards Grades 9–10	PSAT/NMSQT and PSAT 10 Writing and Language Test
	within a text or to improve the match of style and tone to purpose. *Fictional narratives are not included on the Writing and Language Test.*
4. Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.	Proposition: The student will add, revise, or retain central ideas, main claims, counterclaims, topic sentences, and the like to structure text and convey arguments, information, and ideas clearly and effectively. Support: The student will add, revise, or retain information and ideas (e.g., details, facts, statistics) intended to support claims or points in text. Focus: The student will add, revise, retain, or delete information and ideas in text for the sake of relevance to topic and purpose. Quantitative information: The student will relate information presented quantitatively in such forms as graphs, charts, and tables to information presented in text. Logical sequence: The student will revise text as needed to ensure that information and ideas are presented in the most logical order. Introductions, conclusions, and transitions: The student will revise text as needed to improve the beginning or ending of a text or paragraph to ensure that transition words, phrases, or sentences are used effectively to connect information and ideas. Style and tone: The student will revise text as necessary to ensure consistency of style and tone within a text or to improve the match of style and tone to purpose.
5. Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience.	Proposition: The student will add, revise, or retain central ideas, main claims, counterclaims, topic sentences, and the like to structure text and convey arguments, information, and ideas clearly and effectively.

Writing Standards Grades 9–10	PSAT/NMSQT and PSAT 10 Writing and Language Test
	Support: The student will add, revise, or retain information and ideas (e.g., details, facts, statistics) intended to support claims or points in text. Focus: The student will add, revise, retain, or delete information and ideas in text for the sake of relevance to topic and purpose. Quantitative information: The student will relate information presented quantitatively in such forms as graphs, charts, and tables to information presented in text. Logical sequence: The student will revise text as needed to ensure that information and ideas are presented in the most logical order. Introductions, conclusions, and transitions: The student will revise text as needed to improve the beginning or ending of a text or paragraph to ensure that transition words, phrases, or sentences are used effectively to connect information and ideas. Precision: The student will revise text as needed to improve the exactness or content appropriateness of word choice. Concision: The student will revise text as needed to improve the economy of word choice (i.e., to eliminate wordiness and redundancy). Style and tone: The student will revise text as necessary to ensure consistency of style and tone within a text or to improve the match of style and tone to purpose. Syntax: The student will use various sentence structures to accomplish needed rhetorical purposes. Sentence boundaries: The student will recognize and correct grammatically incomplete sentences (e.g., rhetorically inappropriate fragments and run-ons).

Writing Standards Grades 9–10	PSAT/NMSQT and PSAT 10 Writing and Language Test
	Subordination and coordination: The student will recognize and correct problems in coordination and subordination in sentences. Parallel structure: The student will recognize and correct problems in parallel structure in sentences. Modifier placement: The student will recognize and correct problems in modifier placement (e.g., misplaced or dangling modifiers). Verb tense, mood, and voice: The student will recognize and correct inappropriate shifts in verb tense, voice, and mood within and between sentences. Pronoun number and person: The student will recognize and correct inappropriate shifts in pronoun person and number within and between sentences. Pronoun clarity: The student will recognize and correct pronouns with unclear or ambiguous antecedents. Possessive determiners: The student will recognize and correct cases in which possessive determiners (its, your, their), contractions (it's, you're, they're), and adverbs (there) are confused with each other. Pronoun-antecedent agreement: The student will recognize and correct lack of agreement between pronoun and antecedent. Subject-verb agreement: The student will recognize and correct lack of agreement between subject and verb. Noun agreement: The student will recognize and correct lack of agreement between nouns. Frequently confused words: The student will recognize and correct instances in which a word or phrase is confused with another (e.g., accept/except, allusion/illusion).

Writing Standards Grades 9–10	PSAT/NMSQT and PSAT 10 Writing and Language Test
	Logical comparison: The student will recognize and correct cases in which unlike terms are compared. Conventional expression: The student will recognize and correct cases in which a given expression is inconsistent with standard written English. End-of-sentence punctuation: The student will recognize and correct inappropriate uses of ending punctuation in cases in which the context makes the intent clear. Within-sentence punctuation: The student will correctly use and recognize and correct inappropriate uses of colons, semicolons, and dashes to indicate sharp breaks in thought within sentences. Possessive nouns and pronouns: The student will recognize and correct inappropriate uses of possessive nouns and pronouns as well as differentiate between possessive and plural forms. Items in a series: The student will correctly use and recognize and correct inappropriate uses of punctuation (commas and sometimes semicolons) to separate items in a series. Nonrestrictive and parenthetical elements: The student will correctly use punctuation (commas, parentheses, dashes) to set off nonrestrictive and parenthetical sentence elements as well as recognize and correct cases in which restrictive or essential sentence elements are inappropriately set off with punctuation. Unnecessary punctuation: The student will recognize and correct cases in which unnecessary punctuation appears in a sentence. *The Writing and Language Test is a test of revision and editing.*
6. Use technology, including the Internet, to produce, publish, and update individual or shared	

Writing Standards Grades 9–10	PSAT/NMSQT and PSAT 10 Writing and Language Test
writing products, taking advantage of technology's capacity to link to other information and to display information flexibly and dynamically.	
7. Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.	
8. Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the usefulness of each source in answering the research question; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and following a standard format for citation.	
9. Draw evidence from literary or informational texts to support analysis, reflection, and research. a. Apply *grades 9-10 Reading standards* to literature (e.g., "Analyze how an author draws on and transforms source material in a specific work [e.g., how Shakespeare treats a theme or topic from Ovid or the Bible or how a later author draws on a play by Shakespeare]"). b. Apply *grades 9-10 Reading standards* to literary nonfiction (e.g., "Delineate and evaluate the argument and specific claims in a text, assessing whether the reasoning is valid and the evidence is relevant and sufficient; identify false statements and fallacious reasoning").	
10. Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of tasks, purposes, and audiences.	

Note: The Speaking and Listening standards 9–10 are not included here as neither the PSAT/NMSQT nor PSAT 10 measures speaking and listening and therefore neither aligns with any of these standards.

Table 20: Language Standards 9–10: MI to PSAT/NMSQT and PSAT 10

Language Standards Grades 9–10	PSAT/NMSQT and PSAT 10 Reading Test PSAT/NMSQT and PSAT 10 Writing and Language Test
1. Demonstrate command of the conventions of standard English grammar and usage when writing or speaking. a. Use parallel structure.* b. Use various types of phrases (noun, verb, adjectival, adverbial, participial, prepositional, absolute) and clauses (independent, dependent; noun, relative, adverbial) to convey specific meanings and add variety and interest to writing or presentations.	Precision: The student will revise text as needed to improve the exactness or content appropriateness of word choice. Style and tone: The student will revise text as necessary to ensure consistency of style and tone within a text or to improve the match of style and tone to purpose. Syntax: The student will use various sentence structures to accomplish needed rhetorical purposes. Sentence boundaries: The student will recognize and correct grammatically incomplete sentences (e.g., rhetorically inappropriate fragments and run-ons). Subordination and coordination: The student will recognize and correct problems in coordination and subordination in sentences. Parallel structure: The student will recognize and correct problems in parallel structure in sentences. Modifier placement: The student will recognize and correct problems in modifier placement (e.g., misplaced or dangling modifiers). *Speaking and presentations are not assessed.*
2. Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing. a. Use a semicolon (and perhaps a conjunctive adverb) to link two or more closely related independent clauses. b. Use a colon to introduce a list or quotation. c. Spell correctly.	Within-sentence punctuation: The student will correctly use and recognize and correct inappropriate uses of colons, semicolons, and dashes to indicate sharp breaks in thought within sentences. *Capitalization and spelling are not assessed on the Writing and Language Test.*
3. Apply knowledge of language to understand how language functions in different contexts, to	

Language Standards Grades 9–10	PSAT/NMSQT and PSAT 10 Reading Test PSAT/NMSQT and PSAT 10 Writing and Language Test
make effective choices for meaning or style, and to comprehend more fully when reading or listening. a. Write and edit work so that it conforms to the guidelines in a style manual (e.g., *MLA Handbook*, Turabian's *Manual for Writers*) appropriate for the discipline and writing type.	
4. Determine or clarify the meaning of unknown and multiple-meaning words and phrases based on *grades 9–10 reading and content*, choosing flexibly from a range of strategies. a. Use context (e.g., the overall meaning of a sentence, paragraph, or text; a word's position or function in a sentence) as a clue to the meaning of a word or phrase. b. Identify and correctly use patterns of word changes that indicate different meanings or parts of speech (e.g., *analyze, analysis, analytical; advocate, advocacy*). c. Consult general and specialized reference materials (e.g., dictionaries, glossaries, thesauruses), both print and digital, to find the pronunciation of a word or determine or clarify its precise meaning, its part of speech, or its etymology. d. Verify the preliminary determination of the meaning of a word or phrase (e.g., by checking the inferred meaning in context or in a dictionary).	Determining explicit meanings: The student will identify information and ideas explicitly stated in text. Determining implicit meanings: The student will draw reasonable inferences and logical conclusions from text. Interpreting words and phrases in context: The student will determine the meaning of words and phrases in context. *Students are assessed on passages, not directly on content. Students' flexible use of strategies is not directly assessed. Reference materials are not available to students.*
5. Demonstrate understanding of figurative language, word relationships, and nuances in word meanings. a. Interpret figures of speech (e.g., euphemism, oxymoron) in context and analyze their role in the text. b. Analyze nuances in the meaning of words with similar denotations.	Determining explicit meanings: The student will identify information and ideas explicitly stated in text. Determining implicit meanings: The student will draw reasonable inferences and logical conclusions from text. Interpreting words and phrases in context: The student will determine the meaning of words and phrases in context. Analyzing word choice: The student will determine

Language Standards Grades 9–10	PSAT/NMSQT and PSAT 10 Reading Test PSAT/NMSQT and PSAT 10 Writing and Language Test
	how the selection of specific words and phrases or the use of patterns of words and phrases shapes meaning and tone in text. Analyzing part-whole relationships: The student will analyze the relationship between a particular part of a text (e.g., a sentence) and the whole text. Precision: The student will revise text as needed to improve the exactness or content appropriateness of word choice.
6. Acquire and use accurately general academic and domain-specific words and phrases, sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression.	Determining explicit meanings: The student will identify information and ideas explicitly stated in text. Determining implicit meanings: The student will draw reasonable inferences and logical conclusions from text. Interpreting words and phrases in context: The student will determine the meaning of words and phrases in context. Analyzing word choice: The student will determine how the selection of specific words and phrases or the use of patterns of words and phrases shapes meaning and tone in text. Analyzing part-whole relationships: The student will analyze the relationship between a particular part of a text (e.g., a sentence) and the whole text. Precision: The student will revise text as needed to improve the exactness or content appropriateness of word choice. *Speaking and listening are not assessed.* *Acquisition of vocabulary knowledge is not directly assessed.*

Table 21: Reading Standards for Literacy in History/Social Studies 9–10: MI to PSAT/NMSQT and PSAT 10

Reading Standards for Literacy in History/Social Studies Grades 9–10	PSAT/NMSQT and PSAT 10 Reading Test
1. Cite specific textual evidence to support analysis of primary and secondary sources, attending to such features as the date and origin of the information.	Determining explicit meanings: The student will identify information and ideas explicitly stated in text. Determining implicit meanings: The student will draw reasonable inferences and logical conclusions from text. Using analogical reasoning: The student will extrapolate in a reasonable way from the information and ideas in a text or apply information and ideas in a text to a new, analogous situation. Citing textual evidence: The student will cite the textual evidence that best supports a given claim or point.
2. Determine the central ideas or information of a primary or secondary source; provide an accurate summary of how key events or ideas develop over the course of the text.	Determining central ideas and themes: The student will identify explicitly stated central ideas or themes in text and determine implicit central ideas or themes from text. Summarizing: The student will identify a reasonable summary of a text or of key information and ideas in text.
3. Analyze in detail a series of events described in a text; determine whether earlier events caused later ones or simply preceded them.	Understanding relationships: The student will identify explicitly stated relationships or determine implicit relationships between and among individuals, events, or ideas (e.g., cause-effect, comparison-contrast, sequence).
4. Determine the meaning of words and phrases as they are used in a text, including vocabulary describing political, social, or economic aspects of history/social science.	Determining explicit meanings: The student will identify information and ideas explicitly stated in text. Determining implicit meanings: The student will draw reasonable inferences and logical conclusions from text. Interpreting words and phrases in context: The student will determine the meaning of words and phrases in context.
5. Analyze how a text uses structure to emphasize	Analyzing overall text structure: The student will

Reading Standards for Literacy in History/Social Studies Grades 9–10	PSAT/NMSQT and PSAT 10 Reading Test
key points or advance an explanation or analysis.	describe the overall structure of a text. Analyzing part-whole relationships: The student will analyze the relationship between a particular part of a text (e.g., a sentence) and the whole text.
6. Compare the point of view of two or more authors for how they treat the same or similar topics, including which details they include and emphasize in their respective accounts.	Analyzing part-whole relationships: The student will analyze the relationship between a particular part of a text (e.g., a sentence) and the whole text. Analyzing point of view: The student will determine the point of view or perspective from which a text is related or the influence this point of view or perspective has on content and style. Analyzing multiple texts: The student will synthesize information and ideas from paired texts *Passages from US founding documents and texts in the Great Global Conversation may be (but are not necessarily) paired. Social science passages are not paired.*
7. Integrate quantitative or technical analysis (e.g., charts, research data) with qualitative analysis in print or digital text.	Analyzing quantitative information: The student will analyze information presented quantitatively in such forms as graphs, tables, and charts and/or relate that information to information presented in text. *Purely digital texts do not appear on the Reading Test, though print versions of digitally published texts do.*
8. Assess the extent to which the reasoning and evidence in a text support the author's claims.	Analyzing claims and counterclaims: The student will identify claims and counterclaims explicitly stated in text or determine implicit claims and counterclaims from text. Assessing reasoning: The student will assess an author's reasoning for soundness. Analyzing evidence: The student will assess how an author uses or fails to use evidence to support a claim or counterclaim.
9. Compare and contrast treatments of the same topic in several primary and secondary sources.	Analyzing multiple texts: The student will synthesize information and ideas from paired texts.

Reading Standards for Literacy in History/Social Studies Grades 9–10	PSAT/NMSQT and PSAT 10 Reading Test
	The Reading Test contains one pair of passages.
10. By the end of grade 10, read and comprehend history/social studies texts in the grades 9–10 text complexity band independently and proficiently.	Text complexity: The passages/pair on the PSAT/NMSQT and PSAT 10 Reading Tests represent a specified range of text complexities from grades 9–12.

Table 22: Reading Standards for Literacy in Science and Technical Subjects 9–10: MI to PSAT/NMSQT and PSAT 10

Reading Standards for Literacy in Science and Technical Subjects Grades 9–10	PSAT/NMSQT and PSAT 10 Reading Test
1. Cite specific textual evidence to support analysis of science and technical texts, attending to the precise details of explanations or descriptions.	Determining explicit meanings: The student will identify information and ideas explicitly stated in text. Determining implicit meanings: The student will draw reasonable inferences and logical conclusions from text. Using analogical reasoning: The student will extrapolate in a reasonable way from the information and ideas in a text or apply information and ideas in a text to a new, analogous situation. Citing textual evidence: The student will cite the textual evidence that best supports a given claim or point. *While Reading Test passages often do include technical elements, they are better understood as being narrative, informative/explanatory, or argumentative in genre.*
2. Determine the central ideas or conclusions of a text; trace the text's explanation or depiction of a complex process, phenomenon, or concept; provide an accurate summary of the text.	Determining central ideas and themes: The student will identify explicitly stated central ideas or themes in text and determine implicit central ideas or themes from text. Summarizing: The student will identify a reasonable summary of a text or of key information and ideas in text. Understanding relationships: The student will identify explicitly stated relationships or determine implicit relationships between and among individuals, events, or ideas (e.g., cause-effect, comparison-contrast, sequence).
3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.	
4. Determine the meaning of symbols, key terms, and other domain-specific words and phrases as	Determining explicit meanings: The student will identify information and ideas explicitly stated in

Reading Standards for Literacy in Science and Technical Subjects Grades 9–10	PSAT/NMSQT and PSAT 10 Reading Test
they are used in a specific scientific or technical context relevant to *grades 9–10 texts and topics*.	text. Determining implicit meanings: The student will draw reasonable inferences and logical conclusions from text. *Students are assessed on passages, not directly on topics.*
5. Analyze the structure of the relationships among concepts in a text, including relationships among key terms (e.g., *force, friction, reaction force, energy*).	Understanding relationships: The student will identify explicitly stated relationships or determine implicit relationships between and among individuals, events, or ideas (e.g., cause-effect, comparison-contrast, sequence). Analyzing overall text structure: The student will describe the overall structure of a text. Analyzing part-whole relationships: The student will analyze the relationship between a particular part of a text (e.g., a sentence) and the whole text.
6. Analyze the author's purpose in providing an explanation, describing a procedure, or discussing an experiment in a text, defining the question the author seeks to address.	Analyzing part-whole relationships: The student will analyze the relationship between a particular part of a text (e.g., a sentence) and the whole text. Analyzing purpose: The student will determine the main or most likely purpose of a text or of a particular part of a text (typically, one or more paragraphs).
7. Translate quantitative or technical information expressed in words in a text into visual form (e.g., a table or chart) and translate information expressed visually or mathematically (e.g., in an equation) into words.	Analyzing quantitative information: The student will analyze information presented quantitatively in such forms as graphs, tables, and charts and/or relate that information to information presented in text. *Students must draw information and ideas from graphics but do not graphically represent information and ideas. Mathematical representations are not assessed.*
8. Assess the extent to which the reasoning and evidence in a text support the author's claim or a recommendation for solving a scientific or technical problem.	Analyzing claims and counterclaims: The student will identify claims and counterclaims explicitly stated in text or determine implicit claims and counterclaims from text. Assessing reasoning: The student will assess an author's reasoning for soundness.

Reading Standards for Literacy in Science and Technical Subjects Grades 9–10	PSAT/NMSQT and PSAT 10 Reading Test
	Analyzing evidence: The student will assess how an author uses or fails to use evidence to support a claim or counterclaim.
9. Compare and contrast findings presented in a text to those from other sources (including their own experiments), noting when the findings support or contradict previous explanations or accounts.	
10. By the end of grade 10, read and comprehend science/technical texts in the grades 9–10 text complexity band independently and proficiently.	Text complexity: The passages/pair on the PSAT/NMSQT and PSAT 10 Reading Tests represent a specified range of text complexities from grades 9–12. *While Reading Test passages often do include technical elements, they are better understood as being narrative, informative/explanatory, or argumentative in genre.*

Table 23: Writing Standards for Literacy in History/Social Studies, Science, and Technical Subjects 9–10: MI to PSAT/NMSQT and PSAT 10

Writing Standards for Literacy in History/Social Studies, Science, and Technical Subjects Grades 9–10	PSAT/NMSQT and PSAT 10 Writing and Language Test
1. Write arguments focused on *discipline-specific content*. a. Introduce precise claim(s), distinguish the claim(s) from alternate or opposing claims, and create an organization that establishes clear relationships among the claim(s), counterclaims, reasons, and evidence. b. Develop claim(s) and counterclaims fairly, supplying data and evidence for each while pointing out the strengths and limitations of both claim(s) and counterclaims in a discipline-appropriate form and in a manner that anticipates the audience's knowledge level and concerns. c. Use words, phrases, and clauses to link the major sections of the text, create cohesion, and clarify the relationships between claim(s) and reasons, between reasons and evidence, and between claim(s) and counterclaims. d. Establish and maintain a formal style and objective tone while attending to the norms and conventions of the discipline in which they are writing. e. Provide a concluding statement or section that follows from or supports the argument presented.	Proposition: The student will add, revise, or retain central ideas, main claims, counterclaims, topic sentences, and the like to structure text and convey arguments, information, and ideas clearly and effectively. Support: The student will add, revise, or retain information and ideas (e.g., details, facts, statistics) intended to support claims or points in text. Quantitative information: The student will relate information presented quantitatively in such forms as graphs, charts, and tables to information presented in text. Logical sequence: The student will revise text as needed to ensure that information and ideas are presented in the most logical order. Introductions, conclusions, and transitions: The student will revise text as needed to improve the beginning or ending of a text or paragraph to ensure that transition words, phrases, or sentences are used effectively to connect information and ideas. Precision: The student will revise text as needed to improve the exactness or content appropriateness of word choice. Style and tone: The student will revise text as necessary to ensure consistency of style and tone within a text or to improve the match of style and tone to purpose. Syntax: The student will use various sentence structures to accomplish needed rhetorical purposes. *The Writing and Language Test does not directly address the particular audience concerns identified*

Writing Standards for Literacy in History/Social Studies, Science, and Technical Subjects Grades 9–10	PSAT/NMSQT and PSAT 10 Writing and Language Test
	in (b), above. Writing and Language passages are too short to have distinct sections.
2. Write informative/explanatory texts, including the narration of historical events, scientific procedures/experiments, or technical processes. a. Introduce a topic and organize ideas, concepts, and information to make important connections and distinctions; include formatting (e.g., headings), graphics (e.g., figures, tables), and multimedia when useful to aiding comprehension. b. Develop the topic with well-chosen, relevant, and sufficient facts, extended definitions, concrete details, quotations, or other information and examples appropriate to the audience's knowledge of the topic. c. Use varied transitions and sentence structures to link the major sections of the text, create cohesion, and clarify the relationships among ideas and concepts. d. Use precise language and domain-specific vocabulary to manage the complexity of the topic and convey a style appropriate to the discipline and context as well as to the expertise of likely readers. e. Establish and maintain a formal style and objective tone while attending to the norms and conventions of the discipline in which they are writing. f. Provide a concluding statement or section that follows from and supports the information or explanation presented (e.g., articulating implications or the significance of the topic).	Proposition: The student will add, revise, or retain central ideas, main claims, counterclaims, topic sentences, and the like to structure text and convey arguments, information, and ideas clearly and effectively. Support: The student will add, revise, or retain information and ideas (e.g., details, facts, statistics) intended to support claims or points in text. Focus: The student will add, revise, retain, or delete information and ideas in text for the sake of relevance to topic and purpose. Quantitative information: The student will relate information presented quantitatively in such forms as graphs, charts, and tables to information presented in text. Logical sequence: The student will revise text as needed to ensure that information and ideas are presented in the most logical order. Introductions, conclusions, and transitions: The student will revise text as needed to improve the beginning or ending of a text or paragraph to ensure that transition words, phrases, or sentences are used effectively to connect information and ideas. Precision: The student will revise text as needed to improve the exactness or content appropriateness of word choice. Style and tone: The student will revise text as necessary to ensure consistency of style and tone within a text or to improve the match of style and tone to purpose. Syntax: The student will use various sentence structures to accomplish needed rhetorical purposes.

Writing Standards for Literacy in History/Social Studies, Science, and Technical Subjects Grades 9–10	PSAT/NMSQT and PSAT 10 Writing and Language Test
	Formatting and multimedia are not used in the Writing and Language Test. The Writing and Language Test does not directly address such audience concerns as identified in (b) and (d), above. Writing and Language passages are too short to have distinct sections.
3. (Not applicable as a separate requirement)	
4. Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.	Proposition: The student will add, revise, or retain central ideas, main claims, counterclaims, topic sentences, and the like to structure text and convey arguments, information, and ideas clearly and effectively. Support: The student will add, revise, or retain information and ideas (e.g., details, facts, statistics) intended to support claims or points in text. Focus: The student will add, revise, retain, or delete information and ideas in text for the sake of relevance to topic and purpose. Quantitative information: The student will relate information presented quantitatively in such forms as graphs, charts, and tables to information presented in text. Logical sequence: The student will revise text as needed to ensure that information and ideas are presented in the most logical order. Introductions, conclusions, and transitions: The student will revise text as needed to improve the beginning or ending of a text or paragraph to ensure that transition words, phrases, or sentences are used effectively to connect information and ideas. Style and tone: The student will revise text as necessary to ensure consistency of style and tone within a text or to improve the match of style and tone to purpose.
5. Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a	Proposition: The student will add, revise, or retain central ideas, main claims, counterclaims, topic

Writing Standards for Literacy in History/Social Studies, Science, and Technical Subjects Grades 9–10	PSAT/NMSQT and PSAT 10 Writing and Language Test
new approach, focusing on addressing what is most significant for a specific purpose and audience.	sentences, and the like to structure text and convey arguments, information, and ideas clearly and effectively. Support: The student will add, revise, or retain information and ideas (e.g., details, facts, statistics) intended to support claims or points in text. Focus: The student will add, revise, retain, or delete information and ideas in text for the sake of relevance to topic and purpose. Quantitative information: The student will relate information presented quantitatively in such forms as graphs, charts, and tables to information presented in text. Logical sequence: The student will revise text as needed to ensure that information and ideas are presented in the most logical order. Introductions, conclusions, and transitions: The student will revise text as needed to improve the beginning or ending of a text or paragraph to ensure that transition words, phrases, or sentences are used effectively to connect information and ideas. Precision: The student will revise text as needed to improve the exactness or content appropriateness of word choice. Concision: The student will revise text as needed to improve the economy of word choice (i.e., to eliminate wordiness and redundancy). Style and tone: The student will revise text as necessary to ensure consistency of style and tone within a text or to improve the match of style and tone to purpose. Syntax: The student will use various sentence structures to accomplish needed rhetorical purposes.

Writing Standards for Literacy in History/Social Studies, Science, and Technical Subjects Grades 9–10	PSAT/NMSQT and PSAT 10 Writing and Language Test
	Sentence formation: These questions focus on editing text to correct problems with forming grammatically complete and standard sentences. Sentence boundaries: The student will recognize and correct grammatically incomplete sentences (e.g., rhetorically inappropriate fragments and run-ons). Subordination and coordination: The student will recognize and correct problems in coordination and subordination in sentences. Parallel structure: The student will recognize and correct problems in parallel structure in sentences. Modifier placement: The student will recognize and correct problems in modifier placement (e.g., misplaced or dangling modifiers). Inappropriate shifts in construction: These questions focus on editing text to correct inappropriate shifts in verb tense, voice, and mood and pronoun person and number. Verb tense, mood, and voice: The student will recognize and correct inappropriate shifts in verb tense, voice, and mood within and between sentences. Pronoun number and pronoun: The student will recognize and correct inappropriate shifts in pronoun person and number within and between sentences. Pronoun clarity: The student will recognize and correct pronouns with unclear or ambiguous antecedents. Possessive determiners: The student will recognize and correct cases in which possessive determiners (its, your, their), contractions (it's, you're, they're), and adverbs (there) are confused with each other.

Writing Standards for Literacy in History/Social Studies, Science, and Technical Subjects Grades 9–10	PSAT/NMSQT and PSAT 10 Writing and Language Test
	Pronoun-antecedent agreement: The student will recognize and correct lack of agreement between pronoun and antecedent. Subject-verb agreement: The student will recognize and correct lack of agreement between subject and verb. Noun agreement: The student will recognize and correct lack of agreement between nouns. Frequently confused words: The student will recognize and correct instances in which a word or phrase is confused with another (e.g., accept/except, allusion/illusion). Logical comparison: The student will recognize and correct cases in which unlike terms are compared. Conventional expression: The student will recognize and correct cases in which a given expression is inconsistent with standard written English. End-of-sentence punctuation: The student will recognize and correct inappropriate uses of ending punctuation in cases in which the context makes the intent clear. Within-sentence punctuation: The student will correctly use and recognize and correct inappropriate uses of colons, semicolons, and dashes to indicate sharp breaks in thought within sentences. Possessive nouns and pronouns: The student will recognize and correct inappropriate uses of possessive nouns and pronouns as well as differentiate between possessive and plural forms. Items in a series: The student will correctly use and recognize and correct inappropriate uses of punctuation (commas and sometimes semicolons) to separate items in a series.

Writing Standards for Literacy in History/Social Studies, Science, and Technical Subjects Grades 9–10	PSAT/NMSQT and PSAT 10 Writing and Language Test
	Nonrestrictive and parenthetical elements: The student will correctly use punctuation (commas, parentheses, dashes) to set off nonrestrictive and parenthetical sentence elements as well as recognize and correct cases in which restrictive or essential sentence elements are inappropriately set off with punctuation. Unnecessary punctuation: The student will recognize and correct cases in which unnecessary punctuation appears in a sentence. *The Writing and Language Test is a test of revision and editing.*
6. Use technology, including the Internet, to produce, publish, and update individual or shared writing products, taking advantage of technology's capacity to link to other information and to display information flexibly and dynamically.	
7. Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.	
8. Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the usefulness of each source in answering the research question; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and following a standard format for citation.	
9. Draw evidence from informational texts to support analysis, reflection, and research.	
10. Write routinely over extended time frames (time for reflection and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences.	

English Language Arts/Literacy Alignment: PSAT/NMSQT and PSAT 10 to Michigan's Standards
Tables 24 and 25 detail the PSAT/NMSQT and PSAT 10–Michigan alignment using PSAT/NMSQT and PSAT 10 content specifications as the organizing principle. In the interest of brevity, the Michigan standards in the right-hand column are presented in their abbreviated form (consistent with how they are numbered and lettered in Michigan standards documents).

Table 24: PSAT/NMSQT and PSAT 10 Reading Test: PSAT/NMSQT and PSAT 10 to MI

PSAT/NMSQT and PSAT 10 Reading Test	Michigan Standards
Text Complexity The passages/pair on the PSAT/NMSQT and PSAT 10 Reading Tests represent a specified range of text complexities from grades 9–12.	RL.9–10.10 RI.9–10.10 RH.9–10.10 RST.9–10.10
Information and Ideas	
The student will identify information and ideas explicitly stated in text.	RL.9–10.1 RL.9–10.4 RI.9–10.1 RI.9–10.4 RI.9–10.9 L.9–10.4a L.9–10.5a L.9–10.6 RH.9–10.1 RH.9–10.4 RST.9–10.1 RST.9–10.4
The student will draw reasonable inferences and logical conclusions from text.	RL.9–10.1 RL.9–10.4 RI.9–10.1 RI.9–10.4 RI.9–10.9 L.9–10.4a L.9–10.5a L.9–10.6 RH.9–10.1 RH.9–10.4 RST.9–10.1 RST.9–10.4
The student will extrapolate in a reasonable way from the information and ideas in a text or apply information and ideas in a text to a new, analogous situation.	RL.9–10.1 RI.9–10.1 RI.9–10.9 RH.9–10.1 RST.9–10.1
The student will cite the textual evidence that best supports a given claim or point.	RL.9–10.1 RI.9–10.1 RH.9–10.1 RST.9–10.1

PSAT/NMSQT and PSAT 10 Reading Test	Michigan Standards
The student will identify explicitly stated central ideas or themes in text and determine implicit central ideas or themes from text.	RL.9–10.2 RI.9–10.2 RI.9–10.9 RH.9–10.2 RST.9–10.2
The student will identify a reasonable summary of a text or of key information and ideas in text.	RL.9–10.2 RI.9–10.2 RH.9–10.2 RST.9–10.2
The student will identify explicitly stated relationships or determine implicit relationships between and among individuals, events, or ideas (e.g., cause-effect, comparison-contrast, sequence).	RL.9–10.3 RI.9–10.3 RH.9–10.3 RST.9–10.2 RST.9–10.5
The student will determine the meaning of words and phrases in context.	RL.9–10.4 RI.9–10.4 L.9–10.4a L.9–10.5a L.9–10.5b L.9–10.6 RH.9–10.4
Rhetoric	
The student will determine how the selection of specific words and phrases or the use of patterns of words and phrases shapes meaning and tone in text.	RL.9–10.4 RI.9–10.4 L.9–10.5a L.9–10.6
The student will describe the overall structure of a text.	RL.9–10.3 RL.9–10.5 RI.9–10.5 RH.9–10.5 RST.9–10.5
The student will analyze the relationship between a particular part of a text (e.g., a sentence) and the whole text.	RL.9–10.2 RL.9–10.3 RL.9–10.5 RI.9–10.2 RI.9–10.3 RI.9–10.5 L.9–10.5a L.9–10.6 RH.9–10.5 RH.9–10.6 RST.9–10.5 RST.9–10.6

PSAT/NMSQT and PSAT 10 Reading Test	Michigan Standards
The student will determine the point of view or perspective from which a text is related or the influence this point of view or perspective has on content and style.	RL.9–10.3 RL.9–10.6 RI.9–10.6 RH.9–10.6
The student will determine the main or most likely purpose of a text or of a particular part of a text (typically, one or more paragraphs).	RI.9–10.5 RI.9–10.6 RST.9–10.6
The student will identify claims and counterclaims explicitly stated in text or determine implicit claims and counterclaims from text.	RI.9–10.8 RH.9–10.8 RST.9–10.8
The student will assess an author's reasoning for soundness.	RI.9–10.8 RH.9–10.8 RST.9–10.8
The student will assess how an author uses or fails to use evidence to support a claim or counterclaim.	RI.9–10.8 RH.9–10.8 RST.9–10.8
Synthesis	
The student will synthesize information and ideas from paired texts. (Note: These skills listed may be tested with either single or paired passages.)	RI.9–10.9 RH.9–10.6 RH.9–10.9
The student will analyze information presented quantitatively in such forms as graphs, tables, and charts and/or relate that information to information presented in text.	RH.9–10.7 RST.9–10.7

Table 25: PSAT/NMSQT and PSAT 10 Writing and Language Test: PSAT/NMSQT and PSAT 10 to MI

PSAT/NMSQT and PSAT 10 Writing and Language Test	Michigan Standards
Text Complexity The passages on the PSAT/NMSQT and PSAT 10 Writing and Language Tests represent a specified range of text complexities from grades 9–12.	
Expression of Ideas	
The student will add, revise, or retain central ideas, main claims, counterclaims, topic sentences, and the like to structure text and convey arguments, information, and ideas clearly and effectively.	W.9–10.1a W.9–10.2a W.9–10.3a W.9–10.4 W.9–10.5 WHST.9–10.1a WHST.9–10.2a WHST.9–10.4 WHST.9–10.5
The student will add, revise, or retain information and ideas (e.g., details, facts, statistics) intended to support claims or points in text.	W.9–10.1b W.9–10.2b W.9–10.3b W.9–10.3d W.9–10.4 W.9–10.5 WHST.9–10.1b WHST.9–10.2b WHST.9–10.4 WHST.9–10.5
The student will add, revise, retain, or delete information and ideas in text for the sake of relevance to topic and purpose.	W.9–10.1b W.9–10.2b W.9–10.3b W.9–10.3d W.9–10.4 W.9–10.5 WHST.9–10.2b WHST.9–10.4 WHST.9–10.5
The student will relate information presented quantitatively in such forms as graphs, charts, and tables to information presented in text.	W.9–10.1b W.9–10.2b W.9–10.4 W.9–10.5 WHST.9–10.1b WHST.9–10.2b WHST.9–10.4 WHST.9–10.5

PSAT/NMSQT and PSAT 10 Writing and Language Test	Michigan Standards
The student will revise text as needed to ensure that information and ideas are presented in the most logical order.	W.9–10.1a W.9–10.2a W.9–10.3a W.9–10.3c W.9–10.4 W.9–10.5 WHST.9–10.1a WHST.9–10.2a WHST.9–10.4 WHST.9–10.5
The student will revise text as needed to improve the beginning or ending of a text or paragraph to ensure that transition words, phrases, or sentences are used effectively to connect information and ideas.	W.9–10.1a W.9–10.1c W.9–10.1e W.9–10.2a W.9–10.2c W.9–10.2f W.9–10.3a W.9–10.3c W.9–10.3e W.9–10.4 W.9–10.5 WHST.9–10.1a WHST.9–10.1c WHST.9–10.1e WHST.9–10.2a WHST.9–10.2c WHST.9–10.2f WHST.9–10.4 WHST.9–10.5
The student will revise text as needed to improve the exactness or content appropriateness of word choice.	W.9–10.1c W.9–10.2d W.9–10.3d W.9–10.5 L.3.3a—progressive L.7.3a—progressive L.9–10.1b L.9–10.5b L.9–10.6 WHST.9–10.1c WHST.9–10.2d WHST.9–10.5
The student will revise text as needed to improve the economy of word choice (i.e., to eliminate wordiness and redundancy).	W.9–10.5 L.7.3a—progressive WHST.9–10.5

PSAT/NMSQT and PSAT 10 Writing and Language Test	Michigan Standards
The student will revise text as necessary to ensure consistency of style and tone within a text or to improve the match of style and tone to purpose.	W.9–10.1d W.9–10.2e W.9–10.3d W.9–10.4 W.9–10.5 L.6.3b—progressive L.9–10.1b WHST.9–10.1d WHST.9–10.2d WHST.9–10.2e WHST.9–10.4 WHST.9–10.5
The student will use various sentence structures to accomplish needed rhetorical purposes.	W.9–10.1c W.9–10.2c W.9–10.5 W.9–10.5b L.6.3a—progressive L.9–10.1b WHST.9–10.1c WHST.9–10.2c WHST.9–10.5
Standard English Conventions	
The student will recognize and correct grammatically incomplete sentences (e.g., rhetorically inappropriate fragments and run-ons).	W.9–10.5 L.4.1f—progressive L.6.1e—progressive L.9–10.1b WHST.9–10.5
The student will recognize and correct problems in coordination and subordination in sentences.	W.9–10.5 L.6.1e—progressive L.9–10.1b WHST.9–10.5
The student will recognize and correct problems in parallel structure in sentences.	W.9–10.5 L.6.1e—progressive L.9–10.1a L.9–10.1b WHST.9–10.5
The student will recognize and correct problems in modifier placement (e.g., misplaced or dangling modifiers).	W.9–10.5 L.6.1e—progressive L.7.1c—progressive L.9–10.1b WHST.9–10.5
The student will recognize and correct inappropriate shifts in verb tense, voice, and mood within and between sentences.	W.9–10.5 L.5.1d—progressive L.6.1e—progressive L.8.1d—progressive WHST.9–10.5

PSAT/NMSQT and PSAT 10 Writing and Language Test	Michigan Standards
The student will recognize and correct inappropriate shifts in pronoun person and number within and between sentences.	W.9–10.5 L.6.1c—progressive L.6.1e—progressive WHST.9–10.5
The student will recognize and correct pronouns with unclear or ambiguous antecedents.	W.9–10.5 L.6.1d—progressive L.6.1e—progressive WHST.9–10.5
The student will recognize and correct cases in which possessive determiners (*its, your, their*), contractions (*it's, you're, they're*), and adverbs (*there*) are confused with each other.	W.9–10.5 L.4.1g—progressive L.6.1e—progressive WHST.9–10.5
The student will recognize and correct lack of agreement between pronoun and antecedent.	W.9–10.5 L.3.1f—progressive L.6.1e—progressive WHST.9–10.5
The student will recognize and correct lack of agreement between subject and verb.	W.9–10.5 L.3.1f—progressive L.6.1e—progressive WHST.9–10.5
The student will recognize and correct lack of agreement between nouns.	W.9–10.5 L.6.1e—progressive WHST.9–10.5
The student will recognize and correct instances in which a word or phrase is confused with another (e.g., *accept/except*, *allusion/illusion*).	W.9–10.5 L.4.1g—progressive L.6.1e—progressive WHST.9–10.5
The student will recognize and correct cases in which unlike terms are compared.	W.9–10.5 L.6.1e—progressive WHST.9–10.5
The student will recognize and correct cases in which a given expression is inconsistent with standard written English.	W.9–10.5 L.6.1e—progressive WHST.9–10.5
The student will recognize and correct inappropriate uses of ending punctuation in cases in which the content makes the intent clear.	W.9–10.5 L.4.3b—progressive L.6.1e—progressive WHST.9–10.5
The student will correctly use and recognize and correct inappropriate uses of colons, semicolons, and dashes to indicate sharp breaks in thought within sentences.	W.9–10.5 L.4.3b—progressive L.6.1e—progressive L.9–10.2a L.9–10.2b WHST.9–10.5
The student will recognize and correct inappropriate uses of possessive nouns and pronouns as well as differentiate between possessive and plural forms.	W.9–10.5 L.6.1e—progressive WHST.9–10.5

PSAT/NMSQT and PSAT 10 Writing and Language Test	Michigan Standards
The student will correctly use and recognize and correct inappropriate uses of punctuation (commas and sometimes semicolons) to separate items in a series.	W.9–10.5 L.6.1e—progressive L.9–10.1a WHST.9–10.5
The student will correctly use punctuation (commas, parentheses, dashes) to set off nonrestrictive and parenthetical sentence elements as well as recognize and correct cases in which restrictive or essential sentence elements are inappropriately set off with punctuation.	W.9–10.5 L.6.1e—progressive L.6.2a—progressive WHST.9–10.5
The student will recognize and correct cases in which unnecessary punctuation appears in a sentence.	W.9–10.5 L.6.1e—progressive WHST.9–10.5

Math Alignment: Michigan's Standards and PSAT/NMSQT and PSAT 10

The alignment between the Michigan Standards for High School Mathematics and the PSAT/NMSQT and PSAT 10 Math Test is shown in tables 26 and 27. Table 25, Michigan High School Math Standards Alignment: MI to PSAT/NMSQT and PSAT 10, details the Michigan–PSAT/NMSQT and PSAT 10 alignment using Michigan's standards as the organizing principle. A standard is considered aligned if the content covered by the Michigan standard is measured on the PSAT/NMSQT and PSAT 10. For those standards that are covered, the PSAT/NMSQT and PSAT 10 content dimensions are presented in the right-hand column. If the PSAT/NMSQT and PSAT 10 column is blank, the knowledge or skill covered by the standard is not assessed on the PSAT/NMSQT or PSAT 10.

Table 27, Michigan High School Math Standards Alignment: PSAT/NMSQT and PSAT 10 to MI, shows the PSAT/NMSQT and PSAT 10–Michigan alignment using PSAT/NMSQT and PSAT 10 content specifications as the organizing principle. In this table, the complete PSAT/NMSQT and PSAT 10 content specifications are shown with the relevant Michigan standards aligned to each PSAT/NMSQT and PSAT 10 content dimension.

Table 26: Michigan High School Math Standards Alignment: MI to PSAT/NMSQT and PSAT 10

Michigan High School Math Standards: Number and Quantity	PSAT/NMSQT and PSAT 10 Math Test
N-RN The Real Number System	
Extend the properties of exponents to rational exponents.	
1. Explain how the definition of the meaning of rational exponents follows from extending the properties of integer exponents to those values, allowing for a notation for radicals in terms of rational exponents.	
2. Rewrite expressions involving radicals and rational exponents using the properties of exponents.	
Use properties of rational and irrational numbers.	
3. Explain why the sum or product of two rational numbers is rational; that the sum of a rational number and an irrational number is irrational; and that the product of a nonzero rational number and an irrational number is irrational.	
N-Q Quantities	
Reason quantitatively and use units to solve problems.	
1. Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.	Problem solving and data analysis Ratios, rates, proportional relationships, and units
2. Define appropriate quantities for the purpose of descriptive modeling.	
3. Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.	
N-CN The Complex Number System	
Perform arithmetic operations with complex numbers.	

	Michigan High School Math Standards: Number and Quantity	PSAT/NMSQT and PSAT 10 Math Test
	1. Know there is a complex number *i* such that $i^2 = -1$, and every complex number has the form $a + bi$ with a and b real.	
	2. Use the relation $i^2 = -1$ and the commutative, associative, and distributive properties to add, subtract, and multiply complex numbers.	
	Use complex numbers in polynomial identities and equations.	
	7. Solve quadratic equations with real coefficients that have complex solutions.	

	Michigan High School Math Standards: Algebra	PSAT/NMSQT and PSAT 10 Math Test
A-SSE Seeing Structure in Expressions		
	Interpret the structure of expressions	
	1. Interpret expressions that represent a quantity in terms of its context. a. Interpret parts of an expression, such as terms, factors, and coefficients. b. Interpret complicated expressions by viewing one or more of their parts as a single entity.	Heart of algebra Linear functions Linear equations in two variables Passport to advanced math Equivalent expressions Nonlinear equations in one variable and systems of equations in two variables Nonlinear functions
	2. Use the structure of an expression to identify ways to rewrite it.	Heart of algebra Linear functions Linear equations in two variables Passport to advanced math Equivalent expressions Nonlinear equations in one variable and systems of equations in two variables Nonlinear functions
	Write expressions in equivalent forms to solve problems	

Michigan High School Math Standards: Algebra	PSAT/NMSQT and PSAT 10 Math Test
3. Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression. a. Factor a quadratic expression to reveal the zeros of the function it defines. b. Complete the square in a quadratic expression to reveal the maximum or minimum value of the function it defines. c. Use the properties of exponents to transform expressions for exponential functions.	Passport to advanced math Nonlinear functions
4. Derive the formula for the sum of a finite geometric series (when the common ratio is not 1), and use the formula to solve problems.	
A-APR Arithmetic with Polynomials and Rational Expressions	
Perform arithmetic operations on polynomials	
1. Understand that polynomials form a system analogous to the integers, namely, they are closed under the operations of addition, subtraction, and multiplication; add, subtract, and multiply polynomials.	Passport to advanced math Equivalent expressions
Understand the relationship between zeros and factors of polynomials	
2. Know and apply the Remainder Theorem: For a polynomial $p(x)$ and a number a, the remainder on division by $x - a$ is $p(a)$, so $p(a) = 0$ if and only if $(x - a)$ is a factor of $p(x)$.	
3. Identify zeros of polynomials when suitable factorizations are available, and use the zeros to construct a rough graph of the function defined by the polynomial.	
Use polynomial identities to solve problems	
4. Prove polynomial identities and use them to describe numerical relationships.	
Rewrite rational expressions	
6. Rewrite simple rational expressions in different forms; write $a(x)/b(x)$ in the form $q(x) + r(x)/ b(x)$, where $a(x)$, $b(x)$, $q(x)$, and $r(x)$ are polynomials with the degree of $r(x)$ less than the degree of $b(x)$, using inspection, long division, or, for the more complicated examples, a computer algebra system.	
A-CED Creating Equations	
Create equations that describe numbers or relationships	
1. Create equations and inequalities in one variable and use them to solve problems.	Heart of algebra Linear equations in one variable Linear inequalities in one or two variables

Michigan High School Math Standards: Algebra		PSAT/NMSQT and PSAT 10 Math Test
	2. Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.	Heart of algebra Linear functions
	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.	Heart of algebra Linear equations in two variables Linear inequalities in one or two variables
	4. Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations.	Passport to advanced math Nonlinear equations in one variable and systems of equations in two variables
A-REI Reasoning with Equations and Inequalities		
	Understand solving equations as a process of reasoning and explain the reasoning	
	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.	
	2. Solve simple rational and radical equations in one variable, and give examples showing how extraneous solutions may arise.	Passport to advanced math Nonlinear equations in one variable and systems of equations in two variables
	Solve equations and inequalities in one variable	
	3. Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.	Heart of algebra Linear equations in one variable Linear inequalities in one or two variables Problem solving and data analysis Ratios, rates, proportional relationships, and units Two-variable data: Models and scatterplots

	Michigan High School Math Standards: Algebra	PSAT/NMSQT and PSAT 10 Math Test
	4. Solve quadratic equations in one variable. a. Use the method of completing the square to transform any quadratic equation in x into an equation of the form $(x - p)^2 = q$ that has the same solutions. Derive the quadratic formula from this form. b. Solve quadratic equations by inspection (e.g., for $x^2 = 49$), taking square roots, completing the square, the quadratic formula and factoring, as appropriate to the initial form of the equation. Recognize when the quadratic formula gives complex solutions and write them as $a \pm bi$ for real numbers a and b.	Passport to advanced math Nonlinear equations in one variable and systems of equations in two variables
	Solve systems of equations	
	5. Prove that, given a system of two equations in two variables, replacing one equation by the sum of that equation and a multiple of the other produces a system with the same solutions.	
	6. Solve systems of linear equations exactly and approximately (e.g., with graphs), focusing on pairs of linear equations in two variables.	Heart of algebra Systems of two linear equations in two variables
	7. Solve a simple system consisting of a linear equation and a quadratic equation in two variables algebraically and graphically.	Passport to advanced math Nonlinear equations in one variable and systems of equations in two variables
	Represent and solve equations and inequalities graphically	
	10. Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve (which could be a line).	Heart of algebra Linear equations in two variables Passport to advanced math Nonlinear functions
	11. Explain why the x-coordinates of the points where the graphs of the equations $y = f(x)$ and $y = g(x)$ intersect are the solutions of the equation $f(x) = g(x)$; find the solutions approximately, e.g., using technology to graph the functions, make tables of values, or find successive approximations. Include cases where $f(x)$ and/or $g(x)$ are linear, polynomial, rational, absolute value, exponential, and logarithmic functions.	
	12. Graph the solutions to a linear inequality in two variables as a half-plane (excluding the boundary in the case of a strict inequality), and graph the solution set to a system of linear inequalities in two variables as the intersection of the corresponding half-planes.	Heart of algebra Linear inequalities in one or two variables

	Michigan High School Math Standards: Functions	PSAT/NMSQT and PSAT 10 Math Test
F-IF Interpreting Functions		
	Understand the concept of a function and use function notation	

Michigan High School Math Standards: Functions	PSAT/NMSQT and PSAT 10 Math Test
1. Understand that a function from one set (called the domain) to another set (called the range) assigns to each element of the domain exactly one element of the range. If *f* is a function and *x* is an element of its domain, then *f*(*x*) denotes the output of *f* corresponding to the input *x*. The graph of *f* is the graph of the equation *y* = *f*(*x*).	Heart of algebra Linear functions Passport to advanced math Nonlinear functions
2. Use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a context.	Heart of algebra Linear functions Passport to advanced math Nonlinear functions
3. Recognize that sequences are functions, sometimes defined recursively, whose domain is a subset of the integers.	
Interpret functions that arise in applications in terms of the context	
4. For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship.	Heart of algebra Linear functions Passport to advanced math Nonlinear functions
5. Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes.	
6. Calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval. Estimate the rate of change from a graph.	
Analyze functions using different representations	
7. Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases. a. Graph linear and quadratic functions and show intercepts, maxima, and minima. b. Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions. c. Graph polynomial functions, identifying zeros when suitable factorizations are available, and showing end behavior. e. Graph exponential and logarithmic functions, showing intercepts and end behavior, and trigonometric functions, showing period, midline, and amplitude.	Heart of algebra Linear functions Problem solving and data analysis One variable data: Distributions and measures of center and spread Passport to advanced math Nonlinear functions
8. Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function. a. Use the process of factoring and completing the square in a quadratic function to show zeros, extreme values, and symmetry of the graph, and interpret these in terms of a context. b. Use the properties of exponents to interpret	Heart of algebra Linear functions Passport to advanced math Nonlinear functions

Michigan High School Math Standards: Functions	PSAT/NMSQT and PSAT 10 Math Test
expressions for exponential functions.	
9. Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions).	Heart of algebra Linear functions Passport to advanced math Nonlinear functions
F-BF Building Functions	
Build a function that models a relationship between two quantities	
1. Write a function that describes a relationship between two quantities. a. Determine an explicit expression, a recursive process, or steps for calculation from a context. b. Combine standard function types using arithmetic operations.	Heart of algebra Linear functions Passport to advanced math Nonlinear functions
2. Write arithmetic and geometric sequences both recursively and with an explicit formula, use them to model situations, and translate between the two forms.	
Build new functions from existing functions	
3. Identify the effect on the graph of replacing $f(x)$ by $f(x) + k$, $k f(x)$, $f(kx)$, and $f(x + k)$ for specific values of k (both positive and negative); find the value of k given the graphs. Experiment with cases and illustrate an explanation of the effects on the graph using technology.	
4. Find inverse functions. a. Solve an equation of the form $f(x) = c$ for a simple function f that has an inverse and write an expression for the inverse.	

Michigan High School Math Standards: Functions		PSAT/NMSQT and PSAT 10 Math Test
F-LE Linear, Quadratic, and Exponential Models		
	Construct and compare linear, quadratic, and exponential models and solve problems	
	1. Distinguish between situations that can be modeled with linear functions and with exponential functions. a. Prove that linear functions grow by equal differences over equal intervals, and that exponential functions grow by equal factors over equal intervals. b. Recognize situations in which one quantity changes at a constant rate per unit interval relative to another. c. Recognize situations in which a quantity grows or decays by a constant percent rate per unit interval relative to another.	Heart of algebra Linear functions Problem solving and data analysis Ratios, rates, proportional relationships, and units Two-variable data: Models and scatterplots Passport to advanced math Nonlinear functions
	2. Construct linear and exponential functions, including arithmetic and geometric sequences, given a graph, a description of a relationship, or two input-output pairs (include reading these from a table).	Heart of algebra Linear functions Passport to advanced math Nonlinear functions
	3. Observe using graphs and tables that a quantity increasing exponentially eventually exceeds a quantity increasing linearly, quadratically, or (more generally) as a polynomial function.	
	4. For exponential models, express as a logarithm the solution to $ab^{ct} = d$ where a, c, and d are numbers and the base b is 2, 10, or e; evaluate the logarithm using technology.	
	Interpret expressions for functions in terms of the situation they model	
	5. Interpret the parameters in a linear or exponential function in terms of a context.	Heart of algebra Linear functions Passport to advanced math Nonlinear functions
F-TF Trigonometric Functions		
	Extend the domain of trigonometric functions using the unit circle	
	1. Understand radian measure of an angle as the length of the arc on the unit circle subtended by the angle.	
	2. Explain how the unit circle in the coordinate plane enables the extension of trigonometric functions to all real numbers, interpreted as radian measures of angles traversed counterclockwise around the unit circle.	
	Model periodic phenomena with trigonometric functions	
	5. Choose trigonometric functions to model periodic phenomena with specified amplitude, frequency, and midline.	
	Prove and apply trigonometric identities	

Michigan High School Math Standards: Functions		PSAT/NMSQT and PSAT 10 Math Test
	8. Prove the Pythagorean identity $\sin^2(\theta) + \cos^2(\theta) = 1$ and use it to find $\sin(\theta)$, $\cos(\theta)$, or $\tan(\theta)$ given $\sin(\theta)$, $\cos(\theta)$, or $\tan(\theta)$ and the quadrant of the angle.	

Michigan High School Math Standards: Modeling	PSAT/NMSQT and PSAT 10 Math Test
Modeling Standards: Modeling is best interpreted not as a collection of isolated topics but rather in relation to other standards. Making mathematical models is a Standard for Mathematical Practice, and specific modeling standards appear throughout the high school standards indicated by a star symbol.	An emphasis on modeling is apparent throughout the redesigned PSAT 10 Math Test. See for example Problem solving and data analysis Ratios, rates, proportional relationships, and units Percentages

Michigan High School Math Standards: Geometry		PSAT/NMSQT and PSAT 10 Math Test
G-CO Congruence		
	Experiment with transformations in the plane	
	1. Know precise definitions of angle, circle, perpendicular line, parallel line, and line segment, based on the undefined notions of point, line, distance along a line, and distance around a circular arc.	Additional topics in math Lines, angles, and triangles Right angles and trigonometry
	2. Represent transformations in the plane using, e.g., transparencies and geometry software; describe transformations as functions that take points in the plane as inputs and give other points as outputs. Compare transformations that preserve distance and angle to those that do not (e.g., translation versus horizontal stretch).	
	3. Given a rectangle, parallelogram, trapezoid, or regular polygon, describe the rotations and reflections that carry it onto itself.	
	4. Develop definitions of rotations, reflections, and translations in terms of angles, circles, perpendicular lines, parallel lines, and line segments.	
	5. Given a geometric figure and a rotation, reflection, or translation, draw the transformed figure using, e.g., graph paper, tracing paper, or geometry software. Specify a sequence of transformations that will carry a given figure onto another.	
	Understand congruence in terms of rigid motions	

Michigan High School Math Standards: Geometry		PSAT/NMSQT and PSAT 10 Math Test
	6. Use geometric descriptions of rigid motions to transform figures and to predict the effect of a given rigid motion on a given figure; given two figures, use the definition of congruence in terms of rigid motions to decide if they are congruent.	
	7. Use the definition of congruence in terms of rigid motions to show that two triangles are congruent if and only if corresponding pairs of sides and corresponding pairs of angles are congruent.	
	8. Explain how the criteria for triangle congruence (ASA, SAS, and SSS) follow from the definition of congruence in terms of rigid motions.	
	Prove geometric theorems	
	9. Prove theorems about lines and angles.	Additional topics in math Lines, angles, and triangles
	10. Prove theorems about triangles.	Additional topics in math Lines, angles, and triangles
	11. Prove theorems about parallelograms.	
	Make geometric constructions	
	12. Make formal geometric constructions with a variety of tools and methods (compass and straightedge, string, reflective devices, paper folding, dynamic geometric software, etc.).	
	13. Construct an equilateral triangle, a square, and a regular hexagon inscribed in a circle.	
G-SRT Similarity, Right Triangles, and Trigonometry		
	Understand similarity in terms of similarity transformations	
	1. Verify experimentally the properties of dilations given by a center and a scale factor: a. A dilation takes a line not passing through the center of the dilation to a parallel line, and leaves a line passing through the center unchanged. b. The dilation of a line segment is longer or shorter in the ratio given by the scale factor. 2. Given two figures, use the definition of similarity in terms of similarity transformations to decide if they are similar; explain using similarity transformations the meaning of similarity for triangles as the equality of all corresponding pairs of angles and the proportionality of all corresponding pairs of sides.	
	3. Use the properties of similarity transformations to establish the AA criterion for two triangles to be similar.	
	Prove theorems involving similarity	
	4. Prove theorems about triangles.	Additional topics in math Lines, angles, and triangles

Michigan High School Math Standards: Geometry		PSAT/NMSQT and PSAT 10 Math Test
	5. Use congruence and similarity criteria for triangles to solve problems and to prove relationships in geometric figures.	Additional topics in math Lines, angles, and triangles
	Define trigonometric ratios and solve problems involving right triangles	
	6. Understand that by similarity, side ratios in right triangles are properties of the angles in the triangle, leading to definitions of trigonometric ratios for acute angles.	
	7. Explain and use the relationship between the sine and cosine of complementary angles.	
	8. Use trigonometric ratios and the Pythagorean Theorem to solve right triangles in applied problems.	Additional topics in math Right triangles and trigonometry
G-C Circles		
	Understand and apply theorems about circles	
	1. Prove that all circles are similar.	
	2. Identify and describe relationships among inscribed angles, radii, and chords.	
	3. Construct the inscribed and circumscribed circles of a triangle, and prove properties of angles for a quadrilateral inscribed in a circle.	
	Find arc lengths and areas of sectors of circle	
	5. Derive using similarity the fact that the length of the arc intercepted by an angle is proportional to the radius, and define the radian measure of the angle as the constant of proportionality; derive the formula for the area of a sector.	
G-GPE Expressing Geometric Properties with Equations		
	Translate between the geometric description and the equation for a conic section	
	1. Derive the equation of a circle of given center and radius using the Pythagorean Theorem; complete the square to find the center and radius of a circle given by an equation.	
	2. Derive the equation of a parabola given a focus and directrix.	
	Use coordinates to prove simple geometric theorems algebraically	
	4. Use coordinates to prove simple geometric theorems algebraically.	
	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).	Heart of algebra Linear equations in two variables
	6. Find the point on a directed line segment between two given points that partitions the segment in a given ratio.	
	7. Use coordinates to compute perimeters of polygons and areas of triangles and rectangles, e.g., using the distance formula.	
G-GMD Geometric Measurement and Dimension		

Michigan High School Math Standards: Geometry		PSAT/NMSQT and PSAT 10 Math Test
	Explain volume formulas and use them to solve problems	
	1. Give an informal argument for the formulas for the circumference of a circle, area of a circle, volume of a cylinder, pyramid, and cone.	
	3. Use volume formulas for cylinders, pyramids, cones, and spheres to solve problems.	Additional topics in math Area and volume
	Visualize relationships between two-dimensional and three-dimensional objects	
	4. Identify the shapes of two-dimensional cross-sections of three-dimensional objects, and identify three-dimensional objects generated by rotations of two-dimensional objects.	
G-MG Modeling with Geometry		
	Apply geometric concepts in modeling situations	
	1. Use geometric shapes, their measures, and their properties to describe objects (e.g., modeling a tree trunk or a human torso as a cylinder).	
	2. Apply concepts of density based on area and volume in modeling situations (e.g., persons per square mile, BTUs per cubic foot).	Problem solving and data analysis Ratios, rates, proportional relationships, and units
	3. Apply geometric methods to solve design problems (e.g., designing an object or structure to satisfy physical constraints or minimize cost; working with typographic grid systems based on ratios).	

Michigan High School Math Standards: Statistics and Probability		PSAT/NMSQT and PSAT 10 Math Test
S-ID Interpreting Categorical and Quantitative Data		
	Summarize, represent, and interpret data on a single count or measurement variable	
	1. Represent data with plots on the real number line (dot plots, histograms, and box plots).	Problem solving and data analysis One variable data: Distributions and measures of center and spread
	2. Use statistics appropriate to the shape of the data distribution to compare center (median, mean) and spread (interquartile range, standard deviation) of two or more different data sets.	Problem solving and data analysis One variable data: Distributions and measures of center and spread
	3. Interpret differences in shape, center, and spread in the context of the data sets, accounting for possible effects of extreme data points (outliers).	Problem solving and data analysis One variable data: Distributions

	Michigan High School Math Standards: Statistics and Probability	PSAT/NMSQT and PSAT 10 Math Test
		and measures of center and spread
	4. Use the mean and standard deviation of a data set to fit it to a normal distribution and to estimate population percentages. Recognize that there are data sets for which such a procedure is not appropriate. Use calculators, spreadsheets, and tables to estimate areas under the normal curve.	
	Summarize, represent, and interpret data on two categorical and quantitative variables	
	5. Summarize categorical data for two categories in two-way frequency tables. Interpret relative frequencies in the context of the data (including joint, marginal, and conditional relative frequencies). Recognize possible associations and trends in the data.	Problem solving and data analysis Probability and conditional probability
	6. Represent data on two quantitative variables on a scatter plot, and describe how the variables are related. a. Fit a function to the data; use functions fitted to data to solve problems in the context of the data. b. Informally assess the fit of a function by plotting and analyzing residuals. c. Fit a linear function for a scatter plot that suggests a linear association.	Problem solving and data analysis Two variable data: Models and scatterplots
	Interpret linear models	
	7. Interpret the slope (rate of change) and the intercept (constant term) of a linear model in the context of the data.	Problem solving and data analysis Two variable data: Models and scatterplots Heart of algebra Linear equations in two variables
	8. Compute (using technology) and interpret the correlation coefficient of a linear fit.	
	9. Distinguish between correlation and causation.	
S-IC Making Inferences and Justifying Conclusions		
	Understand and evaluate random processes underlying statistical experiments	
	1. Understand statistics as a process for making inferences about population parameters based on a random sample from that population.	
	2. Decide if a specified model is consistent with results from a given data-generating process, e.g., using simulation.	
	Make inferences and justify conclusions from sample surveys, experiments, and observational studies	

Michigan High School Math Standards: Statistics and Probability	PSAT/NMSQT and PSAT 10 Math Test
3. Recognize the purposes of and differences among sample surveys, experiments, and observational studies; explain how randomization relates to each.	
4. Use data from a sample survey to estimate a population mean or proportion; develop a margin of error through the use of simulation models for random sampling.	
5. Use data from a randomized experiment to compare two treatments; use simulations to decide if differences between parameters are significant.	
6. Evaluate reports based on data.	
S-CP Conditional Probability and the Rules of Probability	
Understand independence and conditional probability and use them to interpret data	
1. Describe events as subsets of a sample space (the set of outcomes) using characteristics (or categories) of the outcomes, or as unions, intersections, or complements of other events ("or," "and," "not").	
2. Understand that two events *A* and *B* are independent if the probability of *A* and *B* occurring together is the product of their probabilities, and use this characterization to determine if they are independent.	
3. Understand the conditional probability of *A* given *B* as *P*(*A* and *B*)/*P*(*B*), and interpret independence of *A* and *B* as saying that the conditional probability of *A* given *B* is the same as the probability of *A*, and the conditional probability of *B* given *A* is the same as the probability of *B*.	
4. Construct and interpret two-way frequency tables of data when two categories are associated with each object being classified. Use the two-way table as a sample space to decide if events are independent and to approximate conditional probabilities.	
5. Recognize and explain the concepts of conditional probability and independence in everyday language and everyday situations.	
Use the rules of probability to compute probabilities of compound events in a uniform probability model	
6. Find the conditional probability of *A* given *B* as the fraction of *B*'s outcomes that also belong to *A*, and interpret the answer in terms of the model.	
7. Apply the Addition Rule, *P*(*A* or *B*) = *P*(*A*) + *P*(*B*) – *P*(*A* and *B*), and interpret the answer in terms of the model.	

Table 27: PSAT/NMSQT and PSAT 10 Math Test Alignment: PSAT/NMSQT and PSAT 10 to MI

The following table details the PSAT/NMSQT and PSAT 10–Michigan alignment using PSAT/NMSQT and PSAT 10 content specifications as the organizing principle. In the interest of brevity, the Michigan standards in the right-hand column are presented in their abbreviated form (consistent with how they are numbered and lettered in Michigan standards documents).

PSAT/NMSQT and PSAT 10 Math Test	Michigan Math Standards
PSAT/NMSQT and PSAT 10 HEART OF ALGEBRA	
Linear equations in one variable	
• Create and use linear equations in one variable to solve problems in a variety of contexts. • Create a linear equation in one variable, and when in context interpret solutions in terms of the context. • Solve a linear equation in one variable making strategic use of algebraic structure. • For a linear equation in one variable, o interpret a constant, variable, factor or term in a context; o determine the conditions under which the equation has no solution, a unique solution, or infinitely many solutions. • Fluently solve a linear equation in one variable.	A-CED.A.1 A-REI.B.3 See also these relevant precursors: 6.EE.A.2a 6.EE.A.2b 6.EE.A.2c 6-EE.B.6 6-EE.B.7 6-EE.C.9 7-EE.B.3 7-EE.B.4a 7-EE.B.4b 8-EE.C.7a 8-EE.C.7b
Linear functions	
• Create and use linear functions to solve problems in a variety of contexts. • Create a linear function to model a relationship between two quantities. • For a linear function that represents a context a. interpret the meaning of an input/output pair, constant, variable, factor, or term based on the context, including situations where seeing structure provides an advantage; b. given an input value, find and/or interpret the output value using the given representation; c. given an output value, find and/or interpret the input value using the given representation, if it exists. • Make connections between verbal, tabular, algebraic, and graphical representations of a linear function, by a. deriving one representation from the other; b. identifying features of one representation given another representation; c. determining how a graph is affected by a change to its equation. • Write the rule for a linear function given two input/output pairs or one input/output pair and the rate of change.	A-SSE.A.1 A-SSE.A.2 A-SSE.A.2 F-BF.A.1 F-IF.C.8 A-CED.A.2 F-IF.A.1 F-IF.A.2 F-IF.B.4 F-IF.C.7a F-IF.C.9 F-BF.A.1b F-LE.A.1b F-LE.A.2 F-LE.B.5 See also these relevant precursors: 6.EE.A.2a 6.EE.A.2b 6.EE.A.2c 6-EE.B.6

	PSAT/NMSQT and PSAT 10 Math Test	Michigan Math Standards
		6-EE.B.7 6-EE.C.9 7-EE.A.1 7-EE.B.3 7-EE.B.4a 7-EE.B.4b 8-EE-B.5 8-EE.B.6 8-F.A.1 8-F.A.2 8-F.A.3 8-F.B.4 8-F.B.5
	Linear equations in two variables	
	• Create and use a linear equation in two variables to solve problems in a variety of contexts. • Create a linear equation in two variables to model a constraint or condition on two quantities. • For a linear equation in two variables that represents a context o interpret a solution, constant, variable, factor, or term based on the context, including situations where seeing structure provides an advantage; o given a value of one quantity in the relationship, find a value of the other, if it exists. • Make connections between tabular, algebraic, and graphical representations of a linear equation in two variables by o deriving one representation from the other; o identifying features of one representation given the other representation; o determining how a graph is affected by a change to its equation. • Write an equation for a line given two points on the line, one point and the slope of the line, or one point and a parallel or perpendicular line.	A-SSE.A.1 A-SSE.A.2 A-CED.A.3 A-REI.D.10 G-GPE.B.5 S-ID.C.7 See also these relevant precursors: 6-EE.A.3 6-EE.B.6 6-EE.B.7 6-EE.C.9 7-EE.B.3 7-EE.B.4a 7-EE.B.4b 8-EE-B.5 8-EE.B.6 8-EE.B.8a 8-EE.B.8b 8-EE.B.8c
	Systems of two linear equations in two variables	

PSAT/NMSQT and PSAT 10 Math Test	Michigan Math Standards
• Create and use a system of two linear equations in two variables to solve problems in a variety of contexts. • Create a system of linear equations in two variables, and when in context interpret solutions in terms of the context. • Make connections between tabular, algebraic, and graphical representations of the system by deriving one representation from the other. • Solve a system of two linear equations in two variables making strategic use of algebraic structure. • For a system of linear equations in two variables, o interpret a solution, constant, variable, factor, or term based on the context, including situations where seeing structure provides an advantage; o determine the conditions under which the system has no solution, a unique solution, or infinitely many solutions. • Fluently solve a system of linear equations in two variables.	A.REI.C.6 See also these relevant precursors: 6-EE.B.6 6-EE.B.7 6-EE.C.9 7-EE.B.3 7-EE.B.4a 7-EE.B.4b
Linear inequalities in one or two variables	
• Create and use linear inequalities in one or two variables to solve problems in a variety of contexts. • Create linear inequalities in one or two variables, and when in context interpret the solutions in terms of the context. • For linear inequalities in one or two variables, interpret a constant, variable, factor, or term, including situations where seeing structure provides an advantage. • Make connections between tabular, algebraic, and graphical representations of linear inequalities in one or two variables by deriving one from the other. Given a linear inequality or system of linear inequalities, interpret a point in the solution set.	A-CED.A.1 A-CED.A.3 A-REI.B.3 A.REI.D.12 See also these relevant precursors: 6-EE.B.6 6-EE.B.7 6-EE.C.9 7-EE.B.3 7-EE.B.4a 7-EE.B.4b
PSAT/NMSQT and PSAT 10 PROBLEM SOLVING AND DATA ANALYSIS	
Ratios, rates, proportional relationships, and units	
Items will requires students to solve problems by using a proportional relationship between quantities, calculating or using a ratio or rate, and/or using units, derived units, and unit conversion. • Apply proportional relationships, ratios, rates and units in a wide variety of contexts. Examples include but are not limited to scale drawings and problems in the natural and social sciences. • Solve problems involving o derived units including those that arise from products (e.g., kilowatt-hours) and quotients (e.g., population per square kilometer) o unit conversion including currency exchange and conversion	A-REI.B.3 F-LE.A.1 N-Q.A.1, G-MG.A.2 Modeling See also these relevant precursors: 6-RP.A.3a; 6-RP.A.3b; 6-RP.A.3c; 6-RP.A.3d; 7-RP.A.1; 7-RP.A.2a;

	PSAT/NMSQT and PSAT 10 Math Test	Michigan Math Standards
	between different measurement systems. • Understand and use the fact that when two quantities are in a proportional relationship, if one changes by a scale factor, then the other also changes by the same scale factor.	7-RP.A.2b; 7-RP.A.2c; 7-RP.A.2d; 7-RP.A.3. 7-G.A.1
	Percentages	
	• Use percentages to solve problems in a variety of contexts. Examples include, but are not limited to, discounts, interest, taxes, tips, and percent increases and decreases for many different quantities. • Understand and use the relationship between percent change and growth factor (5% and 1.05, for example); include percentages greater than or equal to 100%.	Modeling; See also these relevant precursors: 6.RP.A.3c; 7-RP.A.3
	One variable data: Distributions and measures of center and spread	
	• Choose an appropriate graphical representation for a given data set. • Interpret information from a given representation of data in context. • Analyze and interpret numerical data distributions represented with frequency tables, histograms, dot plots, and boxplots. • For quantitative variables, calculate, compare, and interpret mean, median, and range. Interpret (but don't calculate) standard deviation. • Compare distributions using measures of center and spread, including distributions with different means and the same standard deviations and ones with the same mean and different standard deviations. • Understand and describe the effect of outliers on mean and median. • Given an appropriate data set, calculate the mean.	S-ID.A.1 S-ID.A.2 S-ID.A.3 F-IF.C.7 See also these relevant precursors: 6-SP.A.2 6-SP.A.3 6-SP.B.4 6-SP.B.5a 6-SP.B.5b 6-SP.B.5c 7-SP.B.3 7-SP.B.4
	Two-variable data: Models and scatterplots	

	PSAT/NMSQT and PSAT 10 Math Test	Michigan Math Standards
	• Using a model that fits the data in a scatterplot, compare values predicted by the model to values given in the data set. • Interpret the slope and intercepts of the line of best fit in context. • Given a relationship between two quantities, read and interpret graphs and tables modeling the relationship. • Analyze and interpret data represented in a scatterplot or line graph; fit linear models. • Select a graph that represents a context, identify a value on a graph, or interpret information on the graph. • For a given function type (linear, quadratic, exponential), choose the function of that type that best fits given data. • Compare linear and exponential growth. • Estimate the line of best fit for a given scatterplot; use the line to make predictions.	A-REI.B.3 F-LE.A.1 S-ID.B.6a S-ID.B.6c S-ID.C.7 See also these relevant precursors: 8-SP.A.1 8-SP.A.2 8-SP.A.3
	Probability and conditional probability	
	Use one- and two-way tables, tree diagrams, area models, and other representations to find relative frequency, probabilities, and conditional probabilities. • Compute and interpret probability and conditional probability in simple contexts.	S-ID.B.5, See also these relevant precursors: 7-SP.C.5 7-SP.C.6 7-SP.C.7a 7-SP.C.7b 7-SP.C.8a 7-SP.C.8b 7-SP.C.8c
	Inference from sample statistics and margin of error	
	• Use sample mean and sample proportion to estimate population mean and population proportion.	See also these relevant precursors: 7-SP.A.1 7-SP.A.2
PSAT/NMSQT and PSAT 10 PASSPORT TO ADVANCED MATH		
	Equivalent expressions	
	• Make strategic use of algebraic structure and the properties of operations to identify and create equivalent expressions, including factoring polynomials. • Fluently add, subtract, and multiply polynomials.	A-SSE.A.1a A-SSE.A.2 A-APR.A.1 See also these relevant precursors: 6-EE.A.4 7-EE.A.1 8-EE.A.1 8-EE.A.2
	Nonlinear equations in one variable and systems of equations in two variables	

PSAT/NMSQT and PSAT 10 Math Test	Michigan Math Standards
• Make strategic use of algebraic structure, the properties of operations, and reasoning about equality to o solve quadratic equations in one variable presented in a wide variety of forms; determine the conditions under which a quadratic equation has no real solutions, 1 real solution, or 2 real solutions; o solve simple rational and radical equations in one variable; o solve linear absolute value equations in one variable; o solve systems of linear and nonlinear equations in two variables, including relating the solutions to the graphs of the equations in the system. • Given a nonlinear equation in one variable that represents a context, interpret a solution, constant, variable, factor, or term based on the context, including situations where seeing structure provides an advantage. • Given an equation or formula in two or more variables that represents a context, view it as an equation in a single variable of interest where the other variables are parameters and solve for the variable of interest. • Fluently solve quadratic equations in one variable, written as a quadratic expression in standard form equal to zero, where using the quadratic formula or completing the square is the most efficient method for solving the equation.	A-SSE.A.1 A-SSE.A.2 A-CED.A.4 A-REI.A.2 A-REI.B.4 A.REI.C.7
Nonlinear functions	
• Create and use quadratic or exponential functions to solve problems in a variety of contexts. • For a quadratic or exponential function, o identify or create an appropriate function to model a relationship between quantities; o use function notation to represent and interpret input/output pairs in terms of a context and points on the graph; o for a function that represents a context, interpret the meaning of an input/output pair, constant, variable, factor, or term based on the context, including situations where seeing structure provides an advantage; o determine the most suitable form of the expression representing the output of the function to display key features of the context, including (i) selecting the form of a quadratic that displays the initial value, the zeros, or the extreme value; (ii) selecting the form of an exponential that displays the initial value, the end-behavior (for exponential decay), or the doubling or halving time; o make connections between tabular, algebraic, and graphical representations of the function, by (i) given one representation, selecting another representation;	A-SSE.A.1 A-SSE.A.2 A-SSE.B.3 A-REI.D.10 F-IF.A.1 F-IF.A.2 F-IF.B.4 F-IF.C.7b F-IF.C.7e F-IF.C.8a F-IF.C.8b F-IF.C.9 F-BF.A.1a F-LE.A.1a F-LE.A.1c F-LE.A.2 F-LE.B.5 See also these relevant precursors: 7-EE.A.2 8-F.A.1 8-F.A.2

PSAT/NMSQT and PSAT 10 Math Test	Michigan Math Standards
(ii) identifying features of one representation given the another representation, including maximum and minimum values of the function.	8-F.B.5
PSAT/NMSQT and PSAT 10 ADDITIONAL TOPICS IN MATH	
Area and volume	
• Solve real-world and mathematical problems about a geometric figure or an object that can be modeled by a geometric figure using given information such as length, area, surface area, or volume. o Apply knowledge that changing by a scale factor of k changes all lengths by a factor of k, changes all areas by a factor of k^2, and changes all volumes by a factor of k^3. o Demonstrate procedural fluency by selecting the correct area or volume formula and correctly calculating a specified value.	G-GMD.A.3
Lines, angles, and triangles	
• Use concepts and theorems relating to congruence and similarity of triangles to solve problems. • Determine which statements may be required to prove certain relationships or to satisfy a given theorem. • Apply knowledge that changing by a scale factor of k changes all lengths by a factor of k, but angle measures remain unchanged. • Know and directly apply relevant theorems such as o the vertical angle theorem; o triangle similarity and congruence criteria; o triangle angle sum theorem; o the relationship of angles formed when a transversal cuts parallel lines.	G-CO.A.1 G-CO.C.9 G-CO.C.10 G-SRT.B.4 G-SRT.B.5
Right triangles and trigonometry	

PSAT/NMSQT and PSAT 10 Math Test	Michigan Math Standards
• Solve problems in a variety of contexts using the Pythagorean theorem; • Fluently apply properties of special right triangles to determine side-lengths and calculate trigonometric ratios of 30, 45, and 60 degrees.	G-CO.A.1

Section 6: State Standards Alignment Tables—PSAT 8/9

The detailed results of the alignments conducted between Michigan's standards and the knowledge and skills assessed by the redesigned PSAT 8/9 are presented in this section. The English Language Arts/Literacy alignment results are presented in tables 28 through 36 and are followed by the Math alignment results in tables 37 and 38. Tables 28 through 34 (English Language Arts/Literacy) and table 37 (Math) show Michigan's standards in the left-hand column and aligned PSAT 8/9 content specifications in the right-hand column. Tables 35 and 36 (English Language Arts/Literacy) and table 38 (Math) present the PSAT 8/9 content specifications in the left-hand column and aligned Michigan standards in the right-hand column.

English Language Arts/Literacy Alignment: Michigan's Standards to PSAT 8/9
Tables 28 through 34 detail the PSAT 8/9–Michigan alignment using Michigan's standards as the organizing principle. In selected cases, a partial or otherwise qualified alignment was noted through the use of red text. A partial or qualified alignment was indicated only when College Board staff felt that doing so identified an essential agreement that respected the spirit of the element being incompletely aligned to. Additional explanatory notes (also in red, in the right-hand column) are included to help illuminate College Board's methodology.

Table 28: Reading Standards for Literature 8: MI to PSAT 8/9

Reading Standards for Literature Grade 8	PSAT 8/9 Reading Test
1. Cite the textual evidence that most strongly supports an analysis of what the text says explicitly as well as inferences drawn from the text.	Determining explicit meanings: The student will identify information and ideas explicitly stated in text. Determining implicit meanings: The student will draw reasonable inferences and logical conclusions from text. Using analogical reasoning: The student will extrapolate in a reasonable way from the information and ideas in a text or apply information and ideas in a text to a new, analogous situation. Citing textual evidence: The student will cite the textual evidence that best supports a given claim or point.

Reading Standards for Literature Grade 8	PSAT 8/9 Reading Test
2. Determine a theme or central idea of a text and analyze its development over the course of the text, including its relationship to the characters, setting, and plot; provide an objective summary of the text.	Determining central ideas and themes: The student will identify explicitly stated central ideas or themes in text and determine implicit central ideas or themes from text. Summarizing: The student will identify a reasonable summary of a text or of key information and ideas in text. Analyzing part-whole relationships: The student will analyze the relationship between a particular part of a text (e.g., a sentence) and the whole text.
3. Analyze how particular lines of dialogue or incidents in a story or drama propel the action, reveal aspects of a character, or provoke a decision.	Analyzing part-whole relationships: The student will analyze the relationship between a particular part of a text (e.g., a sentence) and the whole text. *Drama is not assessed.*
4. Determine the meaning of words and phrases as they are used in a text, including figurative and connotative meanings; analyze the impact of specific word choices on meaning and tone, including analogies or allusions to other texts.	Determining explicit meanings: The student will identify information and ideas explicitly stated in text. Determining implicit meanings: The student will draw reasonable inferences and logical conclusions from text. Interpreting words and phrases in context: The student will determine the meaning of words and phrases in context. Analyzing word choice: The student will determine how the selection of specific words and phrases or the use of patterns of words and phrases shapes meaning and tone in text. *The outside knowledge required to test allusions to other texts is not part of the Reading Test domain.*
5. Compare and contrast the structure of two or more texts and analyze how the differing structure of each text contributes to its meaning and style.	Analyzing multiple texts: The student will synthesize information and ideas from paired texts.

Reading Standards for Literature Grade 8	PSAT 8/9 Reading Test
6. Analyze how differences in the points of view of the characters and the audience or reader (e.g., created through the use of dramatic irony) create such effects as suspense or humor.	Analyzing point of view: The student will determine the point of view or perspective from which a text is related or the influence this point of view or perspective has on content and style. *Such texts are within the Reading Test domain but not guaranteed to appear in any given test administration.*
7. Analyze the extent to which a filmed or live production of a story or drama stays faithful to or departs from the text or script, evaluating the choices made by the director or actors.	
8. (Not applicable to literature)	
9. Analyze how a modern work of fiction draws on themes, patterns of events, or character types from myths, traditional stories, or religious works such as the Bible, including describing how the material is rendered new.	
10. By the end of the year, read and comprehend literature, including stories, dramas, and poems, at the high end of grades 6–8 text complexity band independently and proficiently.	Text complexity: The passages/pair on the PSAT 8/9 Reading Test represent a specified range of text complexities from grades 6–10.

Table 29: Reading Standards for Informational Text 8: MI to PSAT 8/9

Reading Standards for Informational Text Grade 8	PSAT 8/9 Reading Test
1. Cite the textual evidence that most strongly supports an analysis of what the text says explicitly as well as inferences drawn from the text.	Determining explicit meanings: The student will identify information and ideas explicitly stated in text. Determining implicit meanings: The student will draw reasonable inferences and logical conclusions from text. Using analogical reasoning: The student will extrapolate in a reasonable way from the information and ideas in a text or apply information and ideas in a text to a new, analogous situation. Citing textual evidence: The student will cite the textual evidence that best supports a given claim or point.
2. Determine a central idea of a text and analyze its development over the course of the text, including its relationship to supporting ideas; provide an objective summary of the text.	Determining central ideas and themes: The student will identify explicitly stated central ideas or themes in text and determine implicit central ideas or themes from text. Summarizing: The student will identify a reasonable summary of a text or of key information and ideas in text. Analyzing part-whole relationships: The student will analyze the relationship between a particular part of a text (e.g., a sentence) and the whole text.
3. Analyze how a text makes connections among and distinctions between individuals, ideas, or events (e.g., through comparisons, analogies, or categories).	Understanding relationships: The student will identify explicitly stated relationships or determine implicit relationships between and among individuals, events, or ideas (e.g., cause-effect, comparison-contrast, sequence).

Reading Standards for Informational Text Grade 8	PSAT 8/9 Reading Test
4. Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings; analyze the impact of specific word choices on meaning and tone, including analogies or allusions to other texts.	Determining explicit meanings: The student will identify information and ideas explicitly stated in text. Determining implicit meanings: The student will draw reasonable inferences and logical conclusions from text. Interpreting words and phrases in context: The student will determine the meaning of words and phrases in context. Analyzing word choice: The student will determine how the selection of specific words and phrases or the use of patterns of words and phrases shapes meaning and tone in text. *The outside knowledge required to test allusions to other texts is not part of the Reading Test domain.*
5. Analyze in detail the structure of a specific paragraph in a text, including the role of particular sentences in developing and refining a key concept.	Analyzing part-whole relationships: The student will analyze the relationship between a particular part of a text (e.g., a sentence) and the whole text.
6. Determine an author's point of view or purpose in a text and analyze how the author acknowledges and responds to conflicting evidence or viewpoints.	Analyzing point of view: The student will determine the point of view or perspective from which a text is related or the influence this point of view or perspective has on content and style. Analyzing purpose: The student will determine the main or most likely purpose of a text or of a particular part of a text (typically, one or more paragraphs). Analyzing claims and counterclaims: The student will identify claims and counterclaims explicitly stated in text or determine implicit claims and counterclaims from text. Assessing reasoning: The student will assess an author's reasoning for soundness. Analyzing evidence: The student will assess how an author uses or fails to use evidence to support a claim or counterclaim.

Reading Standards for Informational Text Grade 8	PSAT 8/9 Reading Test
7. Evaluate the advantages and disadvantages of using different mediums (e.g., print or digital text, video, multimedia) to present a particular topic or idea.	
8. Delineate and evaluate the argument and specific claims in a text, assessing whether the reasoning is sound and the evidence is relevant and sufficient; recognize when irrelevant evidence is introduced.	Analyzing claims and counterclaims: The student will identify claims and counterclaims explicitly stated in text or determine implicit claims and counterclaims from text. Assessing reasoning: The student will assess an author's reasoning for soundness. Analyzing evidence: The student will assess how an author uses or fails to use evidence to support a claim or counterclaim. *Sufficiency is a subjective judgment not assessed by the multiple-choice Reading Test questions. Reading Test passages generally do not contain irrelevant evidence, as the test's passage selection criteria favor well-reasoned arguments.*
9. Analyze a case in which two or more texts provide conflicting information on the same topic and identify where the texts disagree on matters of fact or interpretation.	Analyzing multiple texts: The student will synthesize information and ideas from paired texts. *The paired passages that appear on the Reading Test may or may not contain conflicting information.*
10. By the end of the year, read and comprehend literary nonfiction at the high end of the grades 6-8 text complexity band independently and proficiently.	Text complexity: The passages/pair on the PSAT 8/9 Reading Test represent a specified range of text complexities from grades 6–10.

Table 30: Writing Standards 8: MI to PSAT 8/9

Writing Standards Grade 8	PSAT 8/9 Writing and Language Test
1. Write arguments to support claims with clear reasons and relevant evidence a. Introduce claim(s), acknowledge and distinguish the claim(s) from alternate or opposing claims, and organize the reasons and evidence logically. b. Support claim(s) with logical reasoning and relevant evidence, using accurate, credible sources and demonstrating an understanding of the topic or text. c. Use words, phrases, and clauses to create cohesion and clarify the relationships among claim(s), counterclaims, reasons, and evidence. d. Establish and maintain a formal style. e. Provide a concluding statement or section that follows from and supports the argument presented.	Proposition: The student will add, revise, or retain central ideas, main claims, counterclaims, topic sentences, and the like to structure text and convey arguments, information, and ideas clearly and effectively. Support: The student will add, revise, or retain information and ideas (e.g., details, facts, statistics) intended to support claims or points in text. Focus: The student will add, revise, retain, or delete information and ideas in text for the sake of relevance to topic and purpose. Quantitative information: The student will relate information presented quantitatively in such forms as graphs, charts, and tables to information presented in text. Logical sequence: The student will revise text as needed to ensure that information and ideas are presented in the most logical order. Introductions, conclusions, and transitions: The student will revise text as needed to improve the beginning or ending of a text or paragraph to ensure that transition words, phrases, or sentences are used effectively to connect information and ideas. Precision: The student will revise text as needed to improve the exactness or content appropriateness of word choice. Style and tone: The student will revise text as necessary to ensure consistency of style and tone within a text or to improve the match of style and tone to purpose. Syntax: The student will use various sentence structures to accomplish needed rhetorical purposes. *The Writing and Language Test does not ask*

Writing Standards Grade 8	PSAT 8/9 Writing and Language Test
	students to evaluate the accuracy and credibility of sources. Writing and Language items address topics, not texts. Writing and Language passages are too short to have distinct sections.
2. Write informative/explanatory texts to examine a topic and convey ideas, concepts, and information through the selection, organization, and analysis of relevant content. a. Introduce a topic clearly, previewing what is to follow; organize ideas, concepts, and information into broader categories; include formatting (e.g., headings), graphics (e.g., charts, tables), and multimedia when useful to aiding comprehension. b. Develop the topic with relevant, well-chosen facts, definitions, concrete details, quotations, or other information and examples. c. Use appropriate and varied transitions to create cohesion and clarify the relationships among ideas and concepts. d. Use precise language and domain-specific vocabulary to inform about or explain the topic. e. Establish and maintain a formal style. f. Provide a concluding statement or section that follows from and supports the information or explanation presented.	Proposition: The student will add, revise, or retain central ideas, main claims, counterclaims, topic sentences, and the like to structure text and convey arguments, information, and ideas clearly and effectively. Support: The student will add, revise, or retain information and ideas (e.g., details, facts, statistics) intended to support claims or points in text. Focus: The student will add, revise, retain, or delete information and ideas in text for the sake of relevance to topic and purpose. Quantitative information: The student will relate information presented quantitatively in such forms as graphs, charts, and tables to information presented in text. Logical sequence: The student will revise text as needed to ensure that information and ideas are presented in the most logical order. Introductions, conclusions, and transitions: The student will revise text as needed to improve the beginning or ending of a text or paragraph to ensure that transition words, phrases, or sentences are used effectively to connect information and ideas. Precision: The student will revise text as needed to improve the exactness or content appropriateness of word choice. Style and tone: The student will revise text as necessary to ensure consistency of style and tone within a text or to improve the match of style and tone to purpose. Syntax: The student will use various sentence structures to accomplish needed rhetorical purposes.

Writing Standards Grade 8	PSAT 8/9 Writing and Language Test
	Formatting and multimedia are not used in the Writing and Language Test. Writing and Language passages are too short to have distinct sections.
3. Write narratives to develop real or imagined experiences or events using effective technique, relevant descriptive details, and well-structured event sequences. a. Engage and orient the reader by establishing a context and point of view and introducing a narrator and/or characters; organize an event sequence that unfolds naturally and logically. b. Use narrative techniques, such as dialogue, pacing, description, and reflection, to develop experiences, events, and/or characters. c. Use a variety of transition words, phrases, and clauses to convey sequence, signal shifts from one time frame or setting to another, and show the relationships among experiences and events. d. Use precise words and phrases, relevant descriptive details, and sensory language to capture the action and convey experiences and events. e. Provide a conclusion that follows from and reflects on the narrated experiences or events.	Proposition: The student will add, revise, or retain central ideas, main claims, counterclaims, topic sentences, and the like to structure text and convey arguments, information, and ideas clearly and effectively. Support: The student will add, revise, or retain information and ideas (e.g., details, facts, statistics) intended to support claims or points in text. Focus: The student will add, revise, retain, or delete information and ideas in text for the sake of relevance to topic and purpose. Logical sequence: The student will revise text as needed to ensure that information and ideas are presented in the most logical order. Introductions, conclusions, and transitions: The student will revise text as needed to improve the beginning or ending of a text or paragraph to ensure that transition words, phrases, or sentences are used effectively to connect information and ideas. Precision: The student will revise text as needed to improve the exactness or content appropriateness of word choice. Style and tone: The student will revise text as necessary to ensure consistency of style and tone within a text or to improve the match of style and tone to purpose. *Fictional narratives are not included on the Writing and Language Test.*
4. Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.	Proposition: The student will add, revise, or retain central ideas, main claims, counterclaims, topic sentences, and the like to structure text and convey arguments, information, and ideas clearly and effectively.

Writing Standards Grade 8	PSAT 8/9 Writing and Language Test
	Support: The student will add, revise, or retain information and ideas (e.g., details, facts, statistics) intended to support claims or points in text. Focus: The student will add, revise, retain, or delete information and ideas in text for the sake of relevance to topic and purpose. Quantitative information: The student will relate information presented quantitatively in such forms as graphs, charts, and tables to information presented in text. Logical sequence: The student will revise text as needed to ensure that information and ideas are presented in the most logical order. Introductions, conclusions, and transitions: The student will revise text as needed to improve the beginning or ending of a text or paragraph to ensure that transition words, phrases, or sentences are used effectively to connect information and ideas. Style and tone: The student will revise text as necessary to ensure consistency of style and tone within a text or to improve the match of style and tone to purpose.
5. With some guidance and support from peers and adults, develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on how well purpose and audience have been addressed.	Proposition: The student will add, revise, or retain central ideas, main claims, counterclaims, topic sentences, and the like to structure text and convey arguments, information, and ideas clearly and effectively. Support: The student will add, revise, or retain information and ideas (e.g., details, facts, statistics) intended to support claims or points in text. Focus: The student will add, revise, retain, or delete information and ideas in text for the sake of relevance to topic and purpose. Quantitative information: The student will relate information presented quantitatively in such forms as graphs, charts, and tables to information

Writing Standards Grade 8	PSAT 8/9 Writing and Language Test
	presented in text. Logical sequence: The student will revise text as needed to ensure that information and ideas are presented in the most logical order. Introductions, conclusions, and transitions: The student will revise text as needed to improve the beginning or ending of a text or paragraph to ensure that transition words, phrases, or sentences are used effectively to connect information and ideas. Precision: The student will revise text as needed to improve the exactness or content appropriateness of word choice. Concision: The student will revise text as needed to improve the economy of word choice (i.e., to eliminate wordiness and redundancy). Style and tone: The student will revise text as necessary to ensure consistency of style and tone within a text or to improve the match of style and tone to purpose. Syntax: The student will use various sentence structures to accomplish needed rhetorical purposes. Sentence boundaries: The student will recognize and correct grammatically incomplete sentences (e.g., rhetorically inappropriate fragments and run-ons). Subordination and coordination: The student will recognize and correct problems in coordination and subordination in sentences. Parallel structure: The student will recognize and correct problems in parallel structure in sentences. Modifier placement: The student will recognize and correct problems in modifier placement (e.g., misplaced or dangling modifiers). Verb tense, mood, and voice: The student will

Writing Standards Grade 8	PSAT 8/9 Writing and Language Test
	recognize and correct inappropriate shifts in verb tense, voice, and mood within and between sentences. Pronoun number and person: The student will recognize and correct inappropriate shifts in pronoun person and number within and between sentences. Pronoun clarity: The student will recognize and correct pronouns with unclear or ambiguous antecedents. Possessive determiners: The student will recognize and correct cases in which possessive determiners (*its*, *your*, *their*), contractions (*it's*, *you're*, *they're*), and adverbs (*there*) are confused with each other. Pronoun-antecedent agreement: The student will recognize and correct lack of agreement between pronoun and antecedent. Subject-verb agreement: The student will recognize and correct lack of agreement between subject and verb. Noun agreement: The student will recognize and correct lack of agreement between nouns. Frequently confused words: The student will recognize and correct instances in which a word or phrase is confused with another (e.g., *accept*/*except*, *allusion*/*illusion*). Logical comparison: The student will recognize and correct cases in which unlike terms are compared. Conventional expression: The student will recognize and correct cases in which a given expression is inconsistent with standard written English. End-of-sentence punctuation: The student will recognize and correct inappropriate uses of ending punctuation in cases in which the context makes the intent clear.

Writing Standards Grade 8	PSAT 8/9 Writing and Language Test
	Within-sentence punctuation: The student will correctly use and recognize and correct inappropriate uses of colons, semicolons, and dashes to indicate sharp breaks in thought within sentences. Possessive nouns and pronouns: The student will recognize and correct inappropriate uses of possessive nouns and pronouns as well as differentiate between possessive and plural forms. Items in a series: The student will correctly use and recognize and correct inappropriate uses of punctuation (commas and sometimes semicolons) to separate items in a series. Nonrestrictive and parenthetical elements: The student will correctly use punctuation (commas, parentheses, dashes) to set off nonrestrictive and parenthetical sentence elements as well as recognize and correct cases in which restrictive or essential sentence elements are inappropriately set off with punctuation. Unnecessary punctuation: The student will recognize and correct cases in which unnecessary punctuation appears in a sentence. *Guidance and support are not available on the summative Writing and Language Test. The Writing and Language Test is a test of revision and editing.*
6. Use technology, including the Internet, to produce and publish writing and present the relationships between information and ideas efficiently as well as to interact and collaborate with others.	
7. Conduct short research projects to answer a question (including a self-generated question), drawing on several sources and generating additional related, focused questions that allow for multiple avenues of exploration.	
8. Gather relevant information from multiple print and digital sources, using search terms effectively; assess the credibility and accuracy of each source; and quote or paraphrase the data and conclusions of others while avoiding plagiarism and following a	

Writing Standards Grade 8	PSAT 8/9 Writing and Language Test
standard format for citation.	
9. Draw evidence from literary or informational texts to support analysis, reflection, and research. a. Apply *grade 8 Reading standards* to literature (e.g., "Analyze how a modern work of fiction draws on themes, patterns of events, or character types from myths, traditional stories, or religious works such as the Bible, including describing how the material is rendered new"). b. Apply *grade 8 Reading standards* to literary nonfiction (e.g., "Delineate and evaluate the argument and specific claims in a text, assessing whether the reasoning is sound and the evidence is relevant and sufficient; recognize when irrelevant evidence is introduced").	
10. Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences.	

Note: The Speaking and Listening 8 standards are not included here as the PSAT 8/9 does not measure speaking and listening and therefore does not align with any of these standards.

Table 31: Language Standards 8: MI to PSAT 8/9

Language Standards Grade 8	PSAT 8/9 Reading Test and PSAT 8/9 Writing and Language Test
1. Demonstrate command of the conventions of standard English grammar and usage when writing or speaking. a. Explain the function of verbals (gerunds, participles, infinitives) in general and their function in particular sentences. b. Form and use verbs in the active and passive voice. c. Form and use verbs in the indicative, imperative, interrogative, conditional, and subjunctive mood. d. Recognize and correct inappropriate shifts in verb voice and mood.	Sentence boundaries: The student will recognize and correct grammatically incomplete sentences (e.g., rhetorically inappropriate fragments and run-ons). Subordination and coordination: The student will recognize and correct problems in coordination and subordination in sentences. Parallel structure: The student will recognize and correct problems in parallel structure in sentences. Modifier placement: The student will recognize and correct problems in modifier placement (e.g., misplaced or dangling modifiers). Verb tense, mood, and voice: The student will recognize and correct inappropriate shifts in verb tense, voice, and mood within and between sentences. *Speaking is not assessed. Students are expected to understand but not directly explain the function of verbals in general or in particular sentences.*
2. Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing. a. Use punctuation (comma, ellipsis, dash) to indicate a pause or break. b. Use an ellipsis to indicate an omission. c. Spell correctly.	Within-sentence punctuation: The student will correctly use and recognize and correct inappropriate uses of colons, semicolons, and dashes to indicate sharp breaks in thought within sentences. *Ellipsis use is not directly assessed on the Writing and Language Test. Capitalization and spelling are not assessed on the Writing and Language Test.*
3. Use knowledge of language and its conventions when writing, speaking, reading, or listening. a. Use verbs in the active and passive voice and in the conditional and subjunctive mood to achieve particular effects (e.g., emphasizing the actor or the action; expressing uncertainty or describing a state contrary to fact).	Verb tense, mood, and voice: The student will recognize and correct inappropriate shifts in verb tense, voice, and mood within and between sentences. *Speaking and listening are not assessed. Despite the wording of the testing point, items may sometimes ask students to make appropriate shifts as well.*
4. Determine or clarify the meaning of unknown	Determining explicit meanings: The student will

Language Standards Grade 8	PSAT 8/9 Reading Test and PSAT 8/9 Writing and Language Test
and multiple-meaning words or phrases based on *grade 8 reading and content*, choosing flexibly from a range of strategies. a. Use context (e.g., the overall meaning of a sentence or paragraph; a word's position or function in a sentence) as a clue to the meaning of a word or phrase. b. Use common, grade-appropriate Greek or Latin affixes and roots as clues to the meaning of a word (e.g., *precede, recede, secede*). c. Consult general and specialized reference materials (e.g., dictionaries, glossaries, thesauruses), both print and digital, to find the pronunciation of a word or determine or clarify its precise meaning or its part of speech. d. Verify the preliminary determination of the meaning of a word or phrase (e.g., by checking the inferred meaning in context or in a dictionary).	identify information and ideas explicitly stated in text. Determining implicit meanings: The student will draw reasonable inferences and logical conclusions from text. Interpreting words and phrases in context: The student will determine the meaning of words and phrases in context. *Students are assessed on passages, not directly on content. Students' flexible use of strategies is not directly assessed. Reference materials are not available to students.*
5. Demonstrate understanding of figurative language, word relationships, and nuances in word meanings. a. Interpret figures of speech (e.g. verbal irony, puns) in context. b. Use the relationship between particular words to better understand each of the words. c. Distinguish among the connotations (associations) of words with similar denotations (definitions) (e.g., *bullheaded*, *willful*, *firm*, *persistent*, *resolute*).	Determining explicit meanings: The student will identify information and ideas explicitly stated in text. Determining implicit meanings: The student will draw reasonable inferences and logical conclusions from text. Interpreting words and phrases in context: The student will determine the meaning of words and phrases in context. Analyzing word choice: The student will determine how the selection of specific words and phrases or the use of patterns of words and phrases shapes meaning and tone in text. Analyzing part-whole relationships: The student will analyze the relationship between a particular part of a text (e.g., a sentence) and the whole text. Precision: The student will revise text as needed to improve the exactness or content appropriateness of word choice.

Language Standards Grade 8	PSAT 8/9 Reading Test and PSAT 8/9 Writing and Language Test
6. Acquire and use accurately grade-appropriate general academic and domain-specific words and phrases; gather vocabulary knowledge when considering a word or phrase important to comprehension or expression.	Determining explicit meanings: The student will identify information and ideas explicitly stated in text. Determining implicit meanings: The student will draw reasonable inferences and logical conclusions from text. Interpreting words and phrases in context: The student will determine the meaning of words and phrases in context. Analyzing word choice: The student will determine how the selection of specific words and phrases or the use of patterns of words and phrases shapes meaning and tone in text. Analyzing part-whole relationships: The student will analyze the relationship between a particular part of a text (e.g., a sentence) and the whole text. Precision: The student will revise text as needed to improve the exactness or content appropriateness of word choice. *Acquisition of vocabulary knowledge is not directly assessed.*

Table 32: Reading Standards for Literacy in History/Social Studies 6–8: MI to PSAT 8/9

Reading Standards for Literacy in History/Social Studies Grades 6–8	PSAT 8/9 Reading Test
1. Cite specific textual evidence to support analysis of primary and secondary sources.	Determining explicit meanings: The student will identify information and ideas explicitly stated in text. Determining implicit meanings: The student will draw reasonable inferences and logical conclusions from text. Using analogical reasoning: The student will extrapolate in a reasonable way from the information and ideas in a text or apply information and ideas in a text to a new, analogous situation. Citing textual evidence: The student will cite the textual evidence that best supports a given claim or point.
2. Determine the central ideas or information of a primary or secondary source; provide an accurate summary of the source distinct from prior knowledge or opinions.	Determining central ideas and themes: The student will identify explicitly stated central ideas or themes in text and determine implicit central ideas or themes from text. Summarizing: The student will identify a reasonable summary of a text or of key information and ideas in text.
3. Identify key steps in a text's description of a process related to history/social studies (e.g., how a bill becomes law, how interest rates are raised or lowered).	Summarizing: The student will identify a reasonable summary of a text or of key information and ideas in text. Understanding relationships: The student will identify explicitly stated relationships or determine implicit relationships between and among individuals, events, or ideas (e.g., cause-effect, comparison-contrast, sequence).

Reading Standards for Literacy in History/Social Studies Grades 6–8	PSAT 8/9 Reading Test
4. Determine the meaning of words and phrases as they are used in a text, including vocabulary specific to domains related to history/social studies.	Determining explicit meanings: The student will identify information and ideas explicitly stated in text. Determining implicit meanings: The student will draw reasonable inferences and logical conclusions from text. Interpreting words and phrases in context: The student will determine the meaning of words and phrases in context.
5. Describe how a text presents information (e.g., sequentially, comparatively, causally).	Analyzing overall text structure: The student will describe the overall structure of a text. Analyzing part-whole relationships: The student will analyze the relationship between a particular part of a text (e.g., a sentence) and the whole text.
6. Identify aspects of a text that reveal an author's point of view or purpose (e.g., loaded language, inclusion or avoidance of particular facts).	Analyzing point of view: The student will determine the point of view or perspective from which a text is related or the influence this point of view or perspective has on content and style. Analyzing purpose: The student will determine the main or most likely purpose of a text or of a particular part of a text (typically, one or more paragraphs).
7. Integrate visual information (e.g., in charts, graphs, photographs, videos, or maps) with other information in print and digital texts.	Analyzing quantitative information: The student will analyze information presented quantitatively in such forms as graphs, tables, and charts and/or relate that information to information presented in text. *Purely digital texts do not appear on the Reading Test, though print versions of digitally published texts do.*
8. Distinguish among fact, opinion, and reasoned judgment in a text.	Analyzing claims and counterclaims: The student will identify claims and counterclaims explicitly stated in text or determine implicit claims and counterclaims from text. Assessing reasoning: The student will assess an author's reasoning for soundness. Analyzing evidence: The student will assess how an author uses or fails to use evidence to support a

Reading Standards for Literacy in History/Social Studies Grades 6–8	PSAT 8/9 Reading Test
	claim or counterclaim.
9. Analyze the relationship between a primary and secondary source on the same topic.	Analyzing multiple texts: The student will synthesize information and ideas from paired texts. *The Reading Test includes one passage pair as well as a number of items requiring cross-text "bridging." Pairing may involve either primary and secondary sources or both, depending on test administration.*
10. By the end of grade 8, read and comprehend history/social studies texts in the grades 6–8 text complexity band independently and proficiently.	Text complexity: The passages/pair on the PSAT 8/9 Reading Test represent a specified range of text complexities from grades 6–10.

Table 33: Reading Standards for Literacy in Science and Technical Subjects 6–8: MI to PSAT 8/9

Reading Standards for Literacy in Science and Technical Subjects Grades 6–8	PSAT 8/9 Reading Test
1. Cite specific textual evidence to support analysis of science and technical texts.	Determining explicit meanings: The student will identify information and ideas explicitly stated in text. Determining implicit meanings: The student will draw reasonable inferences and logical conclusions from text. Using analogical reasoning: The student will extrapolate in a reasonable way from the information and ideas in a text or apply information and ideas in a text to a new, analogous situation. Citing textual evidence: The student will cite the textual evidence that best supports a given claim or point. *While Reading passages often do include technical elements, they are better understood as being narrative, informative/explanatory, or argumentative in genre.*
2. Determine the central ideas or conclusions of a text; provide an accurate summary of the text distinct from prior knowledge or opinions.	Determining central ideas and themes: The student will identify explicitly stated central ideas or themes in text and determine implicit central ideas or themes from text. Summarizing: The student will identify a reasonable summary of a text or of key information and ideas in text.
3. Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks.	
4. Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to *grades 6–8 texts and topics*.	Determining explicit meanings: The student will identify information and ideas explicitly stated in text. Determining implicit meanings: The student will draw reasonable inferences and logical conclusions from text. *Students are assessed on passages, not directly on topics.*

Reading Standards for Literacy in Science and Technical Subjects Grades 6–8	PSAT 8/9 Reading Test
5. Analyze the structure an author uses to organize a text, including how the major sections contribute to the whole and to an understanding of the topic.	Analyzing overall text structure: The student will describe the overall structure of a text. Analyzing part-whole relationships: The student will analyze the relationship between a particular part of a text (e.g., a sentence) and the whole text.
6. Analyze the author's purpose in providing an explanation, describing a procedure, or discussing an experiment in a text.	Analyzing part-whole relationships: The student will analyze the relationship between a particular part of a text (e.g., a sentence) and the whole text. Analyzing purpose: The student will determine the main or most likely purpose of a text or of a particular part of a text (typically, one or more paragraphs).
7. Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually (e.g., in a flowchart, diagram, model, graph, or table).	Analyzing quantitative information: The student will analyze information presented quantitatively in such forms as graphs, tables, and charts and/or relate that information to information presented in text.
8. Distinguish among facts, reasoned judgment based on research findings, and speculation in a text.	Analyzing claims and counterclaims: The student will identify claims and counterclaims explicitly stated in text or determine implicit claims and counterclaims from text. Assessing reasoning: The student will assess an author's reasoning for soundness. Analyzing evidence: The student will assess how an author uses or fails to use evidence to support a claim or counterclaim.
9. Compare and contrast the information gained from experiments, simulations, video, or multimedia sources with that gained from reading a text on the same topic.	
10. By the end of grade 8, read and comprehend science/technical texts in the grades 6–8 text complexity band independently and proficiently.	The passages/pair on the PSAT 8/9 Reading Test represent a specified range of text complexities from grades 6–10. *While Reading passages often do include technical elements, they are better understood as being narrative, informative/explanatory, or argumentative in genre.*

Table 34: Writing Standards for Literacy in History/Social Studies, Science, and Technical Subjects 6–8: MI to PSAT 8/9

Writing Standards for Literacy in History/Social Studies, Science, and Technical Subjects Grades 6–8	PSAT 8/9 Writing and Language Test
1. Write arguments focused on *discipline-specific content*. a. Introduce claim(s) about a topic or issue, acknowledge and distinguish the claim(s) from alternate or opposing claims, and organize the reasons and evidence logically. b. Support claim(s) with logical reasoning and relevant, accurate data and evidence that demonstrate an understanding of the topic or text, using credible sources. c. Use words, phrases, and clauses to create cohesion and clarify the relationships among claim(s), counterclaims, reasons, and evidence. d. Establish and maintain a formal style. e. Provide a concluding statement or section that follows from and supports the argument presented.	Proposition: The student will add, revise, or retain central ideas, main claims, counterclaims, topic sentences, and the like to structure text and convey arguments, information, and ideas clearly and effectively. Support: The student will add, revise, or retain information and ideas (e.g., details, facts, statistics) intended to support claims or points in text. Focus: The student will add, revise, retain, or delete information and ideas in text for the sake of relevance to topic and purpose. Quantitative information: The student will relate information presented quantitatively in such forms as graphs, charts, and tables to information presented in text. Logical sequence: The student will revise text as needed to ensure that information and ideas are presented in the most logical order. Introductions, conclusions, and transitions: The student will revise text as needed to improve the beginning or ending of a text or paragraph to ensure that transition words, phrases, or sentences are used effectively to connect information and ideas. Precision: The student will revise text as needed to improve the exactness or content appropriateness of word choice. Style and tone: The student will revise text as necessary to ensure consistency of style and tone within a text or to improve the match of style and tone to purpose. Syntax: The student will use various sentence structures to accomplish needed rhetorical

Writing Standards for Literacy in History/Social Studies, Science, and Technical Subjects Grades 6–8	PSAT 8/9 Writing and Language Test
	purposes. *Writing and Language items address topics, not texts. The Writing and Language Test does not ask students to evaluate the credibility of sources. Writing and Language passages are too short to have distinct sections.*

Writing Standards for Literacy in History/Social Studies, Science, and Technical Subjects Grades 6–8	PSAT 8/9 Writing and Language Test
2. Write informative/explanatory texts, including the narration of historical events, scientific procedures/experiments, or technical processes. a. Introduce a topic clearly, previewing what is to follow; organize ideas, concepts, and information into broader categories as appropriate to achieving purpose; include formatting (e.g., headings), graphics (e.g., charts, tables), and multimedia when useful to aiding comprehension. b. Develop the topic with relevant, well-chosen facts, definitions, concrete details, quotations, or other information and examples. c. Use appropriate and varied transitions to create cohesion and clarify the relationships among ideas and concepts. d. Use precise language and domain-specific vocabulary to inform about or explain the topic. e. Establish and maintain a formal style and objective tone. f. Provide a concluding statement or section that follows from and supports the information or explanation presented.	Proposition: The student will add, revise, or retain central ideas, main claims, counterclaims, topic sentences, and the like to structure text and convey arguments, information, and ideas clearly and effectively. Support: The student will add, revise, or retain information and ideas (e.g., details, facts, statistics) intended to support claims or points in text. Focus: The student will add, revise, retain, or delete information and ideas in text for the sake of relevance to topic and purpose. Quantitative information: The student will relate information presented quantitatively in such forms as graphs, charts, and tables to information presented in text. Logical sequence: The student will revise text as needed to ensure that information and ideas are presented in the most logical order. Introductions, conclusions, and transitions: The student will revise text as needed to improve the beginning or ending of a text or paragraph to ensure that transition words, phrases, or sentences are used effectively to connect information and ideas. Precision: The student will revise text as needed to improve the exactness or content appropriateness of word choice. Style and tone: The student will revise text as necessary to ensure consistency of style and tone within a text or to improve the match of style and tone to purpose. *Formatting and multimedia are not used in the Writing and Language Test. Writing and Language passages are too short to have distinct sections.*
3. (Not applicable as a separate requirement)	
4. Produce clear and coherent writing in which the	Proposition: The student will add, revise, or retain

Writing Standards for Literacy in History/Social Studies, Science, and Technical Subjects Grades 6–8	PSAT 8/9 Writing and Language Test
development, organization, and style are appropriate to task, purpose, and audience.	central ideas, main claims, counterclaims, topic sentences, and the like to structure text and convey arguments, information, and ideas clearly and effectively. Support: The student will add, revise, or retain information and ideas (e.g., details, facts, statistics) intended to support claims or points in text. Focus: The student will add, revise, retain, or delete information and ideas in text for the sake of relevance to topic and purpose. Quantitative information: The student will relate information presented quantitatively in such forms as graphs, charts, and tables to information presented in text. Logical sequence: The student will revise text as needed to ensure that information and ideas are presented in the most logical order. Introductions, conclusions, and transitions: The student will revise text as needed to improve the beginning or ending of a text or paragraph to ensure that transition words, phrases, or sentences are used effectively to connect information and ideas. Style and tone: The student will revise text as necessary to ensure consistency of style and tone within a text or to improve the match of style and tone to purpose.
5. With some guidance and support from peers and adults, develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on how well purpose and audience have been addressed.	Proposition: The student will add, revise, or retain central ideas, main claims, counterclaims, topic sentences, and the like to structure text and convey arguments, information, and ideas clearly and effectively. Support: The student will add, revise, or retain information and ideas (e.g., details, facts, statistics) intended to support claims or points in text.

Writing Standards for Literacy in History/Social Studies, Science, and Technical Subjects Grades 6–8	PSAT 8/9 Writing and Language Test
	Focus: The student will add, revise, retain, or delete information and ideas in text for the sake of relevance to topic and purpose. Quantitative information: The student will relate information presented quantitatively in such forms as graphs, charts, and tables to information presented in text. Logical sequence: The student will revise text as needed to ensure that information and ideas are presented in the most logical order. Introductions, conclusions, and transitions: The student will revise text as needed to improve the beginning or ending of a text or paragraph to ensure that transition words, phrases, or sentences are used effectively to connect information and ideas. Precision: The student will revise text as needed to improve the exactness or content appropriateness of word choice. Concision: The student will revise text as needed to improve the economy of word choice (i.e., to eliminate wordiness and redundancy). Style and tone: The student will revise text as necessary to ensure consistency of style and tone within a text or to improve the match of style and tone to purpose. Syntax: The student will use various sentence structures to accomplish needed rhetorical purposes. Sentence boundaries: The student will recognize and correct grammatically incomplete sentences (e.g., rhetorically inappropriate fragments and run-ons). Subordination and coordination: The student will recognize and correct problems in coordination and subordination in sentences.

Writing Standards for Literacy in History/Social Studies, Science, and Technical Subjects Grades 6–8	PSAT 8/9 Writing and Language Test
	Parallel structure: The student will recognize and correct problems in parallel structure in sentences. Modifier placement: The student will recognize and correct problems in modifier placement (e.g., misplaced or dangling modifiers). Verb tense, mood, and voice: The student will recognize and correct inappropriate shifts in verb tense, voice, and mood within and between sentences. Pronoun number and pronoun: The student will recognize and correct inappropriate shifts in pronoun person and number within and between sentences. Pronoun clarity: The student will recognize and correct pronouns with unclear or ambiguous antecedents. Possessive determiners: The student will recognize and correct cases in which possessive determiners (its, your, their), contractions (it's, you're, they're), and adverbs (there) are confused with each other. Pronoun-antecedent agreement: The student will recognize and correct lack of agreement between pronoun and antecedent. Subject-verb agreement: The student will recognize and correct lack of agreement between subject and verb. Noun agreement: The student will recognize and correct lack of agreement between nouns. Frequently confused words: The student will recognize and correct instances in which a word or phrase is confused with another (e.g., accept/except, allusion/illusion). Logical comparison: The student will recognize and correct cases in which unlike terms are compared.

Writing Standards for Literacy in History/Social Studies, Science, and Technical Subjects Grades 6–8	PSAT 8/9 Writing and Language Test
	Conventional expression: The student will recognize and correct cases in which a given expression is inconsistent with standard written English. End-of-sentence punctuation: The student will recognize and correct inappropriate uses of ending punctuation in cases in which the context makes the intent clear. Within-sentence punctuation: The student will correctly use and recognize and correct inappropriate uses of colons, semicolons, and dashes to indicate sharp breaks in thought within sentences. Possessive nouns and pronouns: The student will recognize and correct inappropriate uses of possessive nouns and pronouns as well as differentiate between possessive and plural forms. Items in a series: The student will correctly use and recognize and correct inappropriate uses of punctuation (commas and sometimes semicolons) to separate items in a series. Nonrestrictive and parenthetical elements: The student will correctly use punctuation (commas, parentheses, dashes) to set off nonrestrictive and parenthetical sentence elements as well as recognize and correct cases in which restrictive or essential sentence elements are inappropriately set off with punctuation. Unnecessary punctuation: The student will recognize and correct cases in which unnecessary punctuation appears in a sentence. *Guidance and support are not available on the summative Writing and Language Test. The Writing and Language Test is a test of revision and editing.*
6. Use technology, including the Internet, to produce and publish writing and present the	

Writing Standards for Literacy in History/Social Studies, Science, and Technical Subjects Grades 6–8	PSAT 8/9 Writing and Language Test
relationships between information and ideas clearly and efficiently.	
7. Conduct short research projects to answer a question (including a self-generated question), drawing on several sources and generating additional related, focused questions that allow for multiple avenues of exploration.	
8. Gather relevant information from multiple print and digital sources, using search terms effectively; assess the credibility and accuracy of each source; and quote or paraphrase the data and conclusions of others while avoiding plagiarism and following a standard format for citation.	
9. Draw evidence from informational texts to support analysis, reflection, and research.	
10. Write routinely over extended time frames (time for reflection and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences.	

English Language Arts/Literacy Alignment: PSAT 8/9 to Michigan's Standards
Tables 35 and 36 detail the PSAT 8/9-Michigan alignment using PSAT 8/9 content specifications as the organizing principle. In the interest of brevity, the Michigan standards in the right-hand column are presented in their abbreviated form (consistent with how they are numbered and lettered in Michigan standards documents).

Table 35: PSAT 8/9 Reading Test: PSAT 8/9 to MI

PSAT 8/9 Reading Test	Michigan Standards
Text Complexity The passages/pair on the PSAT 8/9 Reading Test represent a specified range of text complexities from grades 6–10.	RL.8.10 RI.8.10 RH.8.10 RST.8.10
Information and Ideas	
The student will identify information and ideas explicitly stated in text.	RL.8.1 RL.8.4 RI.8.1 RI.8.4 L.8.4a L.8.5a L.8.5b L.8.6 RH.8.1 RH.8.4 RST.8.1 RST.8.4
The student will draw reasonable inferences and logical conclusions from text.	RL.8.1 RL.8.4 RI.8.1 RI.8.4 L.8.4a L.8.5a L.8.5b L.8.6 RH.8.1 RH.8.4 RST.8.1 RST.8.4
The student will extrapolate in a reasonable way from the information and ideas in a text or apply information and ideas in a text to a new, analogous situation.	RL.8.1 RI.8.1 RH.8.1 RST.8.1
The student will cite the textual evidence that best supports a given claim or point.	RL.8.1 RI.8.1 RH.8.1 RST.8.1

PSAT 8/9 Reading Test	Michigan Standards
The student will identify explicitly stated central ideas or themes in text and determine implicit central ideas or themes from text.	RL.8.2 RI.8.2 RH.8.2 RST.8.2
The student will identify a reasonable summary of a text or of key information and ideas in text.	RL.8.2 RI.8.2 RH.8.2 RH.8.3 RST.8.2
The student will identify explicitly stated relationships or determine implicit relationships between and among individuals, events, or ideas (e.g., cause-effect, comparison-contrast, sequence).	RI.8.3 RH.8.3
The student will determine the meaning of words and phrases in context.	RL.8.4 RI.8.4 L.8.4a L.8.5a L.8.5b L.8.5c L.8.6 RH.8.4
Rhetoric	
The student will determine how the selection of specific words and phrases or the use of patterns of words and phrases shapes meaning and tone in text.	RL.8.4 RI.8.4 L.8.5b L.8.6
The student will describe the overall structure of a text.	RL.8.3 RH.8.5 RST.8.5
The student will analyze the relationship between a particular part of a text (e.g., a sentence) and the whole text.	RL.8.2 RL.8.3 RI.8.2 RI.8.5 L.8.5b L.8.6 RH.8.5 RST.8.5 RST.8.6
The student will determine the point of view or perspective from which a text is related or the influence this point of view or perspective has on content and style.	RL.8.3 RL.8.6 RI.8.6 RH.8.6
The student will determine the main or most likely purpose of a text or of a particular part of a text (typically, one or more paragraphs).	RL.8.3 RI.8.6 RH.8.6 RST.8.6

PSAT 8/9 Reading Test	Michigan Standards
The student will identify claims and counterclaims explicitly stated in text or determine implicit claims and counterclaims from text.	RI.8.6 RI.8.8 RH.8.6 RH.8.8 RST.8.8
The student will assess an author's reasoning for soundness.	RI.8.6 RI.8.8 RH.8.6 RH.8.8 RST.8.8
The student will assess how an author uses or fails to use evidence to support a claim or counterclaim.	RI.8.6 RI.8.8 RH.8.6 RH.8.8 RST.8.8
Synthesis	
The student will synthesize information and ideas from paired texts. (Note: These skills listed may be tested with either single or paired passages.)	RL.8.5 RI.8.9 RH.8.9
The student will analyze information presented quantitatively in such forms as graphs, tables, and charts and/or relate that information to information presented in text.	RH.8.7 RST.8.7

Table 36: PSAT 8/9 Writing and Language Test: PSAT 8/9 to MI

PSAT 8/9 Writing and Language Test	Michigan Standards
Text Complexity The passages on the PSAT 8/9 Writing and Language Test represent a specified range of text complexities from grades 6–10.	
Expression of Ideas	
The student will add, revise, or retain central ideas, main claims, counterclaims, topic sentences, and the like to structure text and convey arguments, information, and ideas clearly and effectively.	W.8.1a W.8.2a W.8.3a W.8.4 W.8.5 WHST.8.1a WHST.8.2a WHST.8.4 WHST.8.5
The student will add, revise, or retain information and ideas (e.g., details, facts, statistics) intended to support claims or points in text.	W.8.1b W.8.2b W.8.3b W.8.3d W.8.4 W.8.5 WHST.8.1b WHST.8.2b WHST.8.4 WHST.8.5
The student will add, revise, retain, or delete information and ideas in text for the sake of relevance to topic and purpose.	W.8.1b W.8.2b W.8.3b W.8.3d W.8.4 W.8.5 WHST.8.1b WHST.8.2b WHST.8.4 WHST.8.5
The student will relate information presented quantitatively in such forms as graphs, charts, and tables to information presented in text.	W.8.1b W.8.2b W.8.4 W.8.5 WHST.8.1b WHST.8.2b WHST.8.4 WHST.8.5

PSAT 8/9 Writing and Language Test	Michigan Standards
The student will revise text as needed to ensure that information and ideas are presented in the most logical order.	W.8.1a W.8.2a W.8.3a W.8.4 W.8.5 WHST.8.1a WHST.8.1e WHST.8.2a WHST.8.2f WHST.8.4 WHST.8.5
The student will revise text as needed to improve the beginning or ending of a text or paragraph to ensure that transition words, phrases, or sentences are used effectively to connect information and ideas.	W.8.1a W.8.1c W.8.1e W.8.2a W.8.2c W.8.2f W.8.3a W.8.3c W.8.3e W.8.4 W.8.5 WHST.8.1a WHST.8.1c WHST.8.1e WHST.8.2a WHST.8.2c WHST.8.2f WHST.8.4 WHST.8.5
The student will revise text as needed to improve the exactness or content appropriateness of word choice.	W.8.1c W.8.2d W.8.3d W.8.5 L.3.3a—progressive L.7.3a—progressive L.8.5c L.8.6 WHST.8.1c WHST.8.2d WHST.8.5
The student will revise text as needed to improve the economy of word choice (i.e., to eliminate wordiness and redundancy).	W.8.5 L.7.3a—progressive WHST.8.5

PSAT 8/9 Writing and Language Test	Michigan Standards
The student will revise text as necessary to ensure consistency of style and tone within a text or to improve the match of style and tone to purpose.	W.8.1d W.8.2e W.8.3d W.8.4 W.8.5 L.6.3b—progressive WHST.8.1d WHST.8.2e WHST.8.4 WHST.8.5
The student will use various sentence structures to accomplish needed rhetorical purposes.	W.8.1c W.8.2c W.8.5 L.6.3a—progressive WHST.8.1c WHST.8.2c WHST.8.5
Standard English Conventions	
The student will recognize and correct grammatically incomplete sentences (e.g., rhetorically inappropriate fragments and run-ons).	W.8.5 L.4.1f—progressive L.6.1e—progressive L.8.1a WHST.8.5
The student will recognize and correct problems in coordination and subordination in sentences.	W.8.5 L.6.1e—progressive L.8.1a WHST.8.5
The student will recognize and correct problems in parallel structure in sentences.	W.8.5 L.6.1e—progressive L.8.1a WHST.8.5
The student will recognize and correct problems in modifier placement (e.g., misplaced or dangling modifiers).	W.8.5 L.6.1e—progressive L.7.1c—progressive L.8.1a WHST.8.5
The student will recognize and correct inappropriate shifts in verb tense, voice, and mood within and between sentences.	W.8.5 L.5.1d—progressive L.6.1e—progressive L.8.1b L.8.3a WHST.8.5
The student will recognize and correct inappropriate shifts in pronoun person and number within and between sentences.	W.8.5 L.6.1c—progressive L.6.1e—progressive WHST.8.5

PSAT 8/9 Writing and Language Test	Michigan Standards
The student will recognize and correct pronouns with unclear or ambiguous antecedents.	W.8.5 L.6.1d—progressive L.6.1e—progressive WHST.8.5
The student will recognize and correct cases in which possessive determiners (*its, your, their*), contractions (*it's, you're, they're*), and adverbs (*there*) are confused with each other.	W.8.5 L.4.1g—progressive L.6.1e—progressive WHST.8.5
The student will recognize and correct lack of agreement between pronoun and antecedent.	W.8.5 L.3.1f—progressive L.6.1e—progressive WHST.8.5
The student will recognize and correct lack of agreement between subject and verb.	W.8.5 L.3.1f—progressive L.6.1e—progressive WHST.8.5
The student will recognize and correct lack of agreement between nouns.	W.8.5 L.6.1e—progressive WHST.8.5
The student will recognize and correct instances in which a word or phrase is confused with another (e.g., *accept/except*, *allusion/illusion*).	W.8.5 L.4.1g—progressive L.6.1e—progressive WHST.8.5
The student will recognize and correct cases in which unlike terms are compared.	W.8.5 L.6.1e—progressive WHST.8.5
The student will recognize and correct cases in which a given expression is inconsistent with standard written English.	W.8.5 L.6.1e—progressive WHST.8.5
The student will recognize and correct inappropriate uses of ending punctuation in cases in which the content makes the intent clear.	W.8.5 L.4.3b—progressive L.6.1e—progressive WHST.8.5
The student will correctly use and recognize and correct inappropriate uses of colons, semicolons, and dashes to indicate sharp breaks in thought within sentences.	W.8.5 L.4.3b—progressive L.6.1e—progressive L.8.2a WHST.8.5
The student will recognize and correct inappropriate uses of possessive nouns and pronouns as well as differentiate between possessive and plural forms.	W.8.5 L.6.1e—progressive WHST.8.5
The student will correctly use and recognize and correct inappropriate uses of punctuation (commas and sometimes semicolons) to separate items in a series.	W.8.5 L.5.2a—progressive L.6.1e—progressive WHST.8.5

PSAT 8/9 Writing and Language Test	Michigan Standards
The student will correctly use punctuation (commas, parentheses, dashes) to set off nonrestrictive and parenthetical sentence elements as well as recognize and correct cases in which restrictive or essential sentence elements are inappropriately set off with punctuation.	W.8.5 L.6.1e—progressive L.6.2a—progressive WHST.8.5
The student will recognize and correct cases in which unnecessary punctuation appears in a sentence.	W.8.5 L.6.1e—progressive WHST.8.5

Math Alignment: Michigan's Standards and PSAT 8/9

The alignment between the Michigan Standards for Mathematics, Grades 6, 7, 8, and High School, and the PSAT 8/9 Math Test is shown in tables 37 and 38. Table 37, Michigan Math Standards Alignment: MI to PSAT 8/9, details the Michigan-PSAT 8/9 alignment using Michigan's standards as the organizing principle. A standard is considered aligned if the content covered by the Michigan standard is measured on the PSAT 8/9. For those standards that are covered, the PSAT 8/9 content dimensions are presented in the right-hand column. If the PSAT 8/9 column is blank, the knowledge or skill covered by the standard is not assessed on the PSAT 8/9.

Table 38, Michigan Math Standards Alignment: PSAT 8/9 to MI, shows the PSAT 8/9-Michigan alignment using PSAT 8/9 content specifications as the organizing principle. In this table, the complete PSAT 8/9 content specifications are shown with the relevant Michigan standards aligned to each PSAT 8/9 content dimension.

Table 37: Michigan Math Standards Alignment: MI to PSAT 8/9

Michigan Grade 6 Math Standards to PSAT 8/9

Michigan Grade 6 Math Standards: Ratios and Proportional Relationships	PSAT 8/9 Math Test
Understand ratio concepts and use ratio reasoning to solve problems.	
1. Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities. *For example, "The ratio of wings to beaks in the bird house at the zoo was 2:1, because for every 2 wings there was 1 beak." "For every vote candidate A received, candidate C received nearly three votes."*	Problem solving and data analysis Ratios, rates, proportional relationships, and units
2. Understand the concept of a unit rate a/b associated with a ratio a:b with b ≠ 0, and use rate language in the context of a ratio relationship. *For example, "This recipe has a ratio of 3 cups of flour to 4 cups of sugar, so there is 3/4 cup of flour for each cup of sugar." "We paid $75 for 15 hamburgers, which is a rate of $5 per hamburger."*[1]	Problem solving and data analysis Ratios, rates, proportional relationships, and units

Michigan Grade 6 Math Standards: Ratios and Proportional Relationships	PSAT 8/9 Math Test
3. Use ratio and rate reasoning to solve real-world and mathematical problems, e.g., by reasoning about tables of equivalent ratios, tape diagrams, double number line diagrams, or equations. a. Make tables of equivalent ratios relating quantities with whole-number measurements, find missing values in the tables, and plot the pairs of values on the coordinate plane. Use tables to compare ratios. b. Solve unit rate problems including those involving unit pricing and constant speed. *For example, if it took 7 hours to mow 4 lawns, then at that rate, how many lawns could be mowed in 35 hours? At what rate were lawns being mowed?* *c.* Find a percent of a quantity as a rate per 100 (e.g., 30% of a quantity means 30/100 times the quantity); solve problems involving finding the whole, given a part and the percent. d. Use ratio reasoning to convert measurement units; manipulate and transform units appropriately when multiplying or dividing quantities.	Problem solving and data analysis Ratios, rates, proportional relationships, and units Percentages

[1] Expectations for unit rates in this grade are limited to non-complex fractions.

Michigan Grade 6 Math Standards: The Number System	PSAT 8/9 Math Test
Apply and extend previous understandings of multiplication and division to divide fractions by fractions.	
1. Interpret and compute quotients of fractions, and solve word problems involving division of fractions by fractions, e.g., by using visual fraction models and equations to represent the problem. *For example, create a story context for (2/3) ÷ (3/4) and use a visual fraction model to show the quotient; use the relationship between multiplication and division to explain that (2/3) ÷ (3/4) = 8/9 because 3/4 of 8/9 is 2/3. (In general, (a/b) ÷ (c/d) = ad/bc.) How much chocolate will each person get if 3 people share 1/2 lb of chocolate equally? How many 3/4-cup servings are in 2/3 of a cup of yogurt? How wide is a rectangular strip of land with length 3/4 mi and*	

Michigan Grade 6 Math Standards: The Number System	PSAT 8/9 Math Test
area 1/2 square mi?.	
Compute fluently with multi-digit numbers and find common factors and multiples.	
2. Fluently divide multi-digit numbers using the standard algorithm.	
3. Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation.	
4. Find the greatest common factor of two whole numbers less than or equal to 100 and the least common multiple of two whole numbers less than or equal to 12. Use the distributive property to express a sum of two whole numbers 1-100 with a common factor as a multiple of a sum of two whole numbers with no common factor. *For example, express 36 + 8 as 4 (9 + 2).*	
Apply and extend previous understandings of numbers to the system of rational numbers.	
5. Understand that positive and negative numbers are used together to describe quantities having opposite directions or values (e.g., temperature above/below zero, elevation above/below sea level, credits/debits, positive/negative electric charge); use positive and negative numbers to represent quantities in real-world contexts, explaining the meaning of 0 in each situation.	
6. Understand a rational number as a point on the number line. Extend number line diagrams and coordinate axes familiar from previous grades to represent points on the line and in the plane with negative number coordinates. a. Recognize opposite signs of numbers as indicating locations on opposite sides of 0 on the number line; recognize that the opposite of the opposite of a number is the number itself, e.g., -(-3) = 3, and that 0 is its own opposite. b. Understand signs of numbers in ordered pairs as indicating locations in quadrants of the coordinate plane; recognize that when two ordered pairs differ only by signs, the locations of the points are related by reflections across one or both axes. c. Find and position integers and other rational numbers on a horizontal or vertical number line diagram; find and position pairs of integers and	

Michigan Grade 6 Math Standards: The Number System	PSAT 8/9 Math Test
other rational numbers on a coordinate plane.	
7. Understand ordering and absolute value of rational numbers. a. Interpret statements of inequality as statements about the relative position of two numbers on a number line diagram. *For example, interpret -3 > -7 as a statement that -3 is located to the right of -7 on a number line oriented from left to right*. b. Write, interpret, and explain statements of order for rational numbers in real-world contexts. *For example, write -3 ^{o}C > -7 ^{o}C to express the fact that -3 ^{o}C is warmer than -7 ^{o}C*. c. Understand the absolute value of a rational number as its distance from 0 on the number line; interpret absolute value as magnitude for a positive or negative quantity in a real-world situation. *For example, for an account balance of -30 dollars, write |-30| = 30 to describe the size of the debt in dollars*. d. Distinguish comparisons of absolute value from statements about order. *For example, recognize that an account balance less than -30 dollars represents a debt greater than 30 dollars*.	
8. Solve real-world and mathematical problems by graphing points in all four quadrants of the coordinate plane. Include use of coordinates and absolute value to find distances between points with the same first coordinate or the same second coordinate.	

Michigan Grade 6 Math Standards: Expressions and Equations	PSAT 8/9 Math Test
Apply and extend previous understandings of arithmetic to algebraic expressions.	
1. Write and evaluate numerical expressions involving whole-number exponents.	
2. Write, read, and evaluate expressions in which letters stand for numbers. a. Write expressions that record operations with numbers and with letters standing for numbers. *For example, express the calculation*	Heart of algebra Linear equations in one variable Linear functions

Michigan Grade 6 Math Standards: Expressions and Equations	PSAT 8/9 Math Test
"Subtract y from 5" as 5 - y. b. Identify parts of an expression using mathematical terms (sum, term, product, factor, quotient, coefficient); view one or more parts of an expression as a single entity. *For example, describe the expression 2 (8 + 7) as a product of two factors; view (8 + 7) as both a single entity and a sum of two terms*. c. Evaluate expressions at specific values of their variables. Include expressions that arise from formulas used in real-world problems. Perform arithmetic operations, including those involving whole-number exponents, in the conventional order when there are no parentheses to specify a particular order (Order of Operations). *For example, use the formulas $V = s^3$ and $A = 6 s^2$ to find the volume and surface area of a cube with sides of length s = 1/2*.	
3. Apply the properties of operations to generate equivalent expressions. *For example, apply the distributive property to the expression 3 (2 + x) to produce the equivalent expression 6 + 3x; apply the distributive property to the expression 24x + 18y to produce the equivalent expression 6 (4x + 3y); apply properties of operations to y + y + y to produce the equivalent expression 3y*.	Heart of algebra Linear equations in two variables
4. Identify when two expressions are equivalent (i.e., when the two expressions name the same number regardless of which value is substituted into them). *For example, the expressions y + y + y and 3y are equivalent because they name the same number regardless of which number y stands for.*	Passport to advanced math Equivalent Expressions
Reason about and solve one-variable equations and inequalities.	
5. Understand solving an equation or inequality as a process of answering a question: which values from a specified set, if any, make the equation or inequality true? Use substitution to determine whether a given number in a specified set makes an equation or inequality true.	Heart of algebra Linear equations in one variable Linear equations in two variables Systems of two linear equations in two variables Linear inequalities in one or two variables
6. Use variables to represent numbers and write expressions when solving a real-world or mathematical problem; understand that a variable can represent an unknown number, or, depending	Heart of algebra Linear equations in one variable Linear functions

Michigan Grade 6 Math Standards: Expressions and Equations	PSAT 8/9 Math Test
on the purpose at hand, any number in a specified set.	Linear equations in two variables Systems of two linear equations in two variables Linear inequalities in one or two variables
7. Solve real-world and mathematical problems by writing and solving equations of the form $x + p = q$ and $px = q$ for cases in which p, q and x are all nonnegative rational numbers.	Heart of algebra Linear equations in one variable Linear functions Linear equations in two variables Systems of two linear equations in two variables Linear inequalities in one or two variables
8. Write an inequality of the form $x > c$ or $x < c$ to represent a constraint or condition in a real-world or mathematical problem. Recognize that inequalities of the form $x > c$ or $x <$ c have infinitely many solutions; represent solutions of such inequalities on number line diagrams.	Heart of algebra Linear inequalities in one or two variables
Represent and analyze quantitative relationships between dependent and independent variables.	
9. Use variables to represent two quantities in a real-world problem that change in relationship to one another; write an equation to express one quantity, thought of as the dependent variable, in terms of the other quantity, thought of as the independent variable. Analyze the relationship between the dependent and independent variables using graphs and tables, and relate these to the equation. For example, in a problem involving motion at constant speed, list and graph ordered pairs of distances and times, and write the equation d = 65t to represent the relationship between distance and time.	Heart of algebra Linear equations in one variable Linear functions Linear equations in two variables Systems of two linear equations in two variables Linear inequalities in one or two variables

Michigan Grade 6 Math Standards: Geometry	PSAT 8/9 Math Test
Solve real-world and mathematical problems involving area, surface area, and volume.	
1. Find the area of right triangles, other triangles, special quadrilaterals, and polygons by composing into rectangles or decomposing into triangles and other shapes; apply these techniques in the context of solving real-world and mathematical problems.	
2. Find the volume of a right rectangular prism with fractional edge lengths by packing it with unit cubes of the appropriate unit fraction edge lengths, and show that the volume is the same as would be found by multiplying the edge lengths of the prism. Apply the formulas $V = l\ w\ h$ and $V = b$	

Michigan Grade 6 Math Standards: Geometry	PSAT 8/9 Math Test
h to find volumes of right rectangular prisms with fractional edge lengths in the context of solving real-world and mathematical problems.	
3. Draw polygons in the coordinate plane given coordinates for the vertices; use coordinates to find the length of a side joining points with the same first coordinate or the same second coordinate. Apply these techniques in the context of solving real-world and mathematical problems.	
4. Represent three-dimensional figures using nets made up of rectangles and triangles, and use the nets to find the surface area of these figures. Apply these techniques in the context of solving real-world and mathematical problems.	

Michigan Grade 6 Math Standards: Statistics and Probability	PSAT 8/9 Math Test
Develop understanding of statistical variability.	
1. Recognize a statistical question as one that anticipates variability in the data related to the question and accounts for it in the answers. *For example, "How old am I?" is not a statistical question, but "How old are the students in my school?" is a statistical question because one anticipates variability in students' ages*.	
2. Understand that a set of data collected to answer a statistical question has a distribution which can be described by its center, spread, and overall shape.	Problem solving and data analysis One variable data
3. Recognize that a measure of center for a numerical data set summarizes all of its values with a single number, while a measure of variation describes how its values vary with a single number.	Problem solving and data analysis One variable data
Summarize and describe distributions.	
4. Display numerical data in plots on a number line, including dot plots, histograms, and box plots.	Problem solving and data analysis One variable data
5. Summarize numerical data sets in relation to their context, such as by: a. Reporting the number of observations. b. Describing the nature of the attribute under investigation, including how it was measured and its units of measurement.	Problem solving and data analysis One variable data

Michigan Grade 6 Math Standards: Statistics and Probability	PSAT 8/9 Math Test
c. Giving quantitative measures of center (median and/or mean) and variability (interquartile range and/or mean absolute deviation), as well as describing any overall pattern and any striking deviations from the overall pattern with reference to the context in which the data were gathered. d. Relating the choice of measures of center and variability to the shape of the data distribution and the context in which the data were gathered.	

Michigan Grade 7 Math Standards to PSAT 8/9

Michigan Grade 7 Math Standards: Ratios & Proportional Relationships	PSAT 8/9 Math Test
Analyze proportional relationships and use them to solve real-world and mathematical problems.	
1. Compute unit rates associated with ratios of fractions, including ratios of lengths, areas and other quantities measured in like or different units. *For example, if a person walks 1/2 mile in each 1/4 hour, compute the unit rate as the complex fraction* $^{1/2}/_{1/4}$ *miles per hour, equivalently 2 miles per hour*.	Problem solving and data analysis Ratios, rates, proportional relationships, and units
2. Recognize and represent proportional relationships between quantities. a. Decide whether two quantities are in a proportional relationship, e.g., by testing for equivalent ratios in a table or graphing on a coordinate plane and observing whether the graph is a straight line through the origin. b. Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships. c. Represent proportional relationships by equations. *For example, if total cost t is proportional to the number n of items purchased at a constant price p, the relationship between the total cost and the number of items can be expressed as t = pn*. d. Explain what a point (*x*, *y*) on the graph of a proportional relationship means in terms of the situation, with special attention to the points (0, 0) and (1, *r*) where r is the unit rate.	Problem solving and data analysis Ratios, rates, proportional relationships, and units
3. Use proportional relationships to solve multistep ratio and percent problems. Examples: simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease, percent error.	Problem solving and data analysis Ratios, rates, proportional relationships, and units Percentages

Michigan Grade 7 Math Standards: The Number System	PSAT 8/9 Math Test
Apply and extend previous understandings of operations with fractions.	
1. Apply and extend previous understandings of addition and subtraction to add and subtract	

Michigan Grade 7 Math Standards: The Number System	PSAT 8/9 Math Test
rational numbers; represent addition and subtraction on a horizontal or vertical number line diagram. a. Describe situations in which opposite quantities combine to make 0. *For example, a hydrogen atom has 0 charge because its two constituents are oppositely charged*. b. Understand $p + q$ as the number located a distance $\|q\|$ from p, in the positive or negative direction depending on whether q is positive or negative. Show that a number and its opposite have a sum of 0 (are additive inverses). Interpret sums of rational numbers by describing real-world contexts. c. Understand subtraction of rational numbers as adding the additive inverse, $p - q = p + (-q)$. Show that the distance between two rational numbers on the number line is the absolute value of their difference, and apply this principle in real-world contexts. d. Apply properties of operations as strategies to add and subtract rational numbers.	
2. Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers. a. Understand that multiplication is extended from fractions to rational numbers by requiring that operations continue to satisfy the properties of operations, particularly the distributive property, leading to products such as $(-1)(-1) = 1$ and the rules for multiplying signed numbers. Interpret products of rational numbers by describing real-world contexts. b. Understand that integers can be divided, provided that the divisor is not zero, and every quotient of integers (with non-zero divisor) is a rational number. If p and q are integers, then $-(p/q) = (-p)/q = p/(-q)$. Interpret quotients of rational numbers by describing real-world contexts.	

Michigan Grade 7 Math Standards: The Number System	PSAT 8/9 Math Test
c. Apply properties of operations as strategies to multiply and divide rational numbers. d. Convert a rational number to a decimal using long division; know that the decimal form of a rational number terminates in 0s or eventually repeats.	
3. Solve real-world and mathematical problems involving the four operations with rational numbers.[1]	

[1] Computations with rational numbers extend the rules for manipulating fractions to complex fractions.

Michigan Grade 7 Math Standards: Expressions and Equations	PSAT 8/9 Math Test
Use properties of operations to generate equivalent expressions.	
1. Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients.	Passport to advanced math Equivalent expressions
2. Understand that rewriting an expression in different forms in a problem context can shed light on the problem and how the quantities in it are related. *For example, a + 0.05a = 1.05a means that "increase by 5%" is the same as "multiply by 1.05."*	Heart of algebra Linear functions Passport to advanced math Nonlinear functions
Solve real-life and mathematical problems using numerical and algebraic expressions and equations.	
3. Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies. *For example: If a woman making $25 an hour gets a 10% raise, she will make an additional 1/10 of her salary an hour, or $2.50, for a new salary of $27.50. If you want to place a towel bar 9 3/4 inches long in the center of a door that is 27 1/2 inches wide, you will need to place the bar about 9 inches from each edge; this estimate can be used as a check on the exact computation*.	Heart of algebra Linear equations in one variable Linear functions Linear equations in two variables Systems of two linear equations in two variables Linear inequalities in one or two variables
4. Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve	Heart of algebra Linear equations in one variable

Michigan Grade 7 Math Standards: Expressions and Equations	PSAT 8/9 Math Test
problems by reasoning about the quantities. a. Solve word problems leading to equations of the form $px + q = r$ and $p(x + q) = r$, where p, q, and r are specific rational numbers. Solve equations of these forms fluently. Compare an algebraic solution to an arithmetic solution, identifying the sequence of the operations used in each approach. *For example, the perimeter of a rectangle is 54 cm. Its length is 6 cm. What is its width?* b. Solve word problems leading to inequalities of the form $px + q > r$ or $px + q < r$, where p, q, and r are specific rational numbers. Graph the solution set of the inequality and interpret it in the context of the problem. *For example: As a salesperson, you are paid $50 per week plus $3 per sale. This week you want your pay to be at least $100. Write an inequality for the number of sales you need to make, and describe the solutions*.	Linear functions Linear equations in two variables Systems of two linear equations in two variables Linear inequalities in one or two variables

Michigan Grade 7 Math Standards: Geometry	PSAT 8/9 Math Test
Draw construct, and describe geometrical figures and describe the relationships between them.	
1. Solve problems involving scale drawings of geometric figures, including computing actual lengths and areas from a scale drawing and reproducing a scale drawing at a different scale.	Problem solving and data analysis Ratios, rates, proportional relationships, and units
2. Draw (freehand, with ruler and protractor, and with technology) geometric shapes with given conditions. Focus on constructing triangles from three measures of angles or sides, noticing when the conditions determine a unique triangle, more than one triangle, or no triangle.	
3. Describe the two-dimensional figures that result from slicing three-dimensional figures, as in plane sections of right rectangular prisms and right rectangular pyramids.	
Solve real-life and mathematical problems involving angle measure, area, surface area, and volume.	
4. Know the formulas for the area and circumference of a circle and use them to solve problems; give an informal derivation of the relationship between the circumference and area of a circle.	
5. Use facts about supplementary,	

Michigan Grade 7 Math Standards: Geometry	PSAT 8/9 Math Test
complementary, vertical, and adjacent angles in a multi-step problem to write and solve simple equations for an unknown angle in a figure.	
6. Solve real-world and mathematical problems involving area, volume and surface area of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms.	

Michigan Grade 7 Math Standards: Statistics and Probability	PSAT 8/9 Math Test
Use random sampling to draw inferences about a population.	
1. Understand that statistics can be used to gain information about a population by examining a sample of the population; generalizations about a population from a sample are valid only if the sample is representative of that population. Understand that random sampling tends to produce representative samples and support valid inferences.	Problem solving and data analysis Inference from sample statistics and margin of error
2. Use data from a random sample to draw inferences about a population with an unknown characteristic of interest. Generate multiple samples (or simulated samples) of the same size to gauge the variation in estimates or predictions. *For example, estimate the mean word length in a book by randomly sampling words from the book; predict the winner of a school election based on randomly sampled survey data. Gauge how far off the estimate or prediction might be*.	Problem solving and data analysis Inference from sample statistics and margin of error
Draw informal comparative inferences about two populations.	
3. Informally assess the degree of visual overlap of two numerical data distributions with similar variabilities, measuring the difference between the centers by expressing it as a multiple of a measure of variability. *For example, the mean height of players on the basketball team is 10 cm greater than the mean height of players on the soccer team, about twice the variability (mean absolute deviation) on either team; on a dot plot, the separation between the two distributions of heights is noticeable*.	Problem solving and data analysis One variable data
4. Use measures of center and measures of variability for numerical data from random samples to draw informal comparative inferences about two populations. *For example, decide*	Problem solving and data analysis One variable data

Michigan Grade 7 Math Standards: Statistics and Probability	PSAT 8/9 Math Test
whether the words in a chapter of a seventh-grade science book are generally longer than the words in a chapter of a fourth-grade science book.	
Investigate chance processes and develop, use, and evaluate probability models.	
5. Understand that the probability of a chance event is a number between 0 and 1 that expresses the likelihood of the event occurring. Larger numbers indicate greater likelihood. A probability near 0 indicates an unlikely event, a probability around 1/2 indicates an event that is neither unlikely nor likely, and a probability near 1 indicates a likely event.	Problem solving and data analysis Probability and conditional probability
6. Approximate the probability of a chance event by collecting data on the chance process that produces it and observing its long-run relative frequency, and predict the approximate relative frequency given the probability. *For example, when rolling a number cube 600 times, predict that a 3 or 6 would be rolled roughly 200 times, but probably not exactly 200 times*.	Problem solving and data analysis Probability and conditional probability
7. Develop a probability model and use it to find probabilities of events. Compare probabilities from a model to observed frequencies; if the agreement is not good, explain possible sources of the discrepancy. a. Develop a uniform probability model by assigning equal probability to all outcomes, and use the model to determine probabilities of events. *For example, if a student is selected at random from a class, find the probability that Jane will be selected and the probability that a girl will be selected*. b. Develop a probability model (which may not be uniform) by observing frequencies in data generated from a chance process. *For example, find the approximate probability that a spinning penny will land heads up or that a tossed paper cup will land open-end down. Do the outcomes for the spinning penny appear to be equally likely based on the observed frequencies?*	Problem solving and data analysis Probability and conditional probability
8. Find probabilities of compound events using organized lists, tables, tree diagrams, and simulation.	Problem solving and data analysis Probability and conditional probability

Michigan Grade 7 Math Standards: Statistics and Probability	PSAT 8/9 Math Test
a. Understand that, just as with simple events, the probability of a compound event is the fraction of outcomes in the sample space for which the compound event occurs. b. Represent sample spaces for compound events using methods such as organized lists, tables and tree diagrams. For an event described in everyday language (e.g., "rolling double sixes"), identify the outcomes in the sample space which compose the event. c. Design and use a simulation to generate frequencies for compound events. *For example, use random digits as a simulation tool to approximate the answer to the question: If 40% of donors have type A blood, what is the probability that it will take at least 4 donors to find one with type A blood?*	

<u>Michigan Grade 8 Math Standards to PSAT 8/9</u>

Michigan Grade 8 Math Standards: The Number System	PSAT 8/9 Math Test
Know that there are numbers that are not rational, and approximate them by rational numbers.	
1. Know that numbers that are not rational are called irrational. Understand informally that every number has a decimal expansion; for rational numbers show that the decimal expansion repeats eventually, and convert a decimal expansion which repeats eventually into a rational number.	
2. Use rational approximations of irrational numbers to compare the size of irrational numbers, locate them approximately on a number line diagram, and estimate the value of expressions (e.g., π^2). *For example, by truncating the decimal expansion of √2, show that √2 is between 1 and 2, then between 1.4 and 1.5, and explain how to continue on to get better approximations*.	

Michigan Grade 8 Math Standards: Expressions and Equations	PSAT 8/9 Math Test
Work with radicals and integer exponents.	

Michigan Grade 8 Math Standards: Expressions and Equations	PSAT 8/9 Math Test
1. Know and apply the properties of integer exponents to generate equivalent numerical expressions. For example, $3^2 \times 3^{-5} = 3^{-3} = 1/3^3 = 1/27$.	Passport to advanced math Equivalent Expressions
2. Use square root and cube root symbols to represent solutions to equations of the form $x^2 = p$ and $x^3 = p$, where p is a positive rational number. Evaluate square roots of small perfect squares and cube roots of small perfect cubes. Know that √2 is irrational.	Passport to advanced math Equivalent Expressions
3. Use numbers expressed in the form of a single digit times an integer power of 10 to estimate very large or very small quantities, and to express how many times as much one is than the other. *For example, estimate the population of the United States as 3 times 10^8 and the population of the world as 7 times 10^9, and determine that the world population is more than 20 times larger*.	
4. Perform operations with numbers expressed in scientific notation, including problems where both decimal and scientific notation are used. Use scientific notation and choose units of appropriate size for measurements of very large or very small quantities (e.g., use millimeters per year for seafloor spreading). Interpret scientific notation that has been generated by technology.	
Understand the connections between proportional relationships, lines, and linear equations.	
5. Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways. For example, compare a distance-time graph to a distance-time equation to determine which of two moving objects has greater speed.	Heart of algebra Linear functions Linear equations in two variables
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.	Heart of algebra Linear functions Linear equations in two variables
Analyze and solve linear equations and pairs of simultaneous linear equations.	
7. Solve linear equations in one variable. a. Give examples of linear equations in one variable with one solution, infinitely many	Heart of algebra Linear equations in one variable

Michigan Grade 8 Math Standards: Expressions and Equations	PSAT 8/9 Math Test
solutions, or no solutions. Show which of these possibilities is the case by successively transforming the given equation into simpler forms, until an equivalent equation of the form $x = a$, $a = a$, or $a = b$ results (where a and b are different numbers). b. Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms.	
8. Analyze and solve pairs of simultaneous linear equations. a. Understand that solutions to a system of two linear equations in two variables correspond to points of intersection of their graphs, because points of intersection satisfy both equations simultaneously. b. Solve systems of two linear equations in two variables algebraically, and estimate solutions by graphing the equations. Solve simple cases by inspection. *For example, $3x + 2y = 5$ and $3x + 2y = 6$ have no solution because $3x + 2y$ cannot simultaneously be 5 and 6*. c. Solve real-world and mathematical problems leading to two linear equations in two variables. *For example, given coordinates for two pairs of points, determine whether the line through the first pair of points intersects the line through the second pair*.	Heart of algebra Systems of two linear equations in two variables

Michigan Grade 8 Math Standards: Functions	PSAT 8/9 Math Test
Define, evaluate, and compare functions.	
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.[1]	Heart of algebra Linear functions Passport to advanced math Nonlinear functions
2. Compare properties of two functions each	Heart of algebra

Michigan Grade 8 Math Standards: Functions	PSAT 8/9 Math Test
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*.	Linear functions Passport to advanced math Nonlinear functions
3. Interpret the equation $y = mx + b$ as defining a linear function, whose graph is a straight line; give examples of functions that are not linear. *For example, the function $A = s^2$ giving the area of a square as a function of its side length is not linear because its graph contains the points (1,1), (2,4) and (3,9), which are not on a straight line*.	Heart of algebra Linear functions
Use functions to model relationships between quantities.	
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 it models, and in terms of its graph or a table of values.	Heart of algebra Linear functions
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.	Heart of algebra Linear functions Passport to advanced math Nonlinear functions

[1] Function notation is not required for Grade 8.

Michigan Grade 8 Math Standards: Geometry	PSAT 8/9 Math Test
Understand congruence and similarity using physical models, transparencies, or geometry software.	
1. Verify experimentally the properties of rotations, reflections, and translations: a. Lines are taken to lines, and line segments to line segments of the same length. b. Angles are taken to angles of the same measure. c. Parallel lines are taken to parallel lines.	
2. Understand that a two-dimensional figure is congruent to another if the second can be	

Michigan Grade 8 Math Standards: Geometry	PSAT 8/9 Math Test
obtained from the first by a sequence of rotations, reflections, and translations; given two congruent figures, describe a sequence that exhibits the congruence between them.	
3. Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates.	
4. Understand that a two-dimensional figure is similar to another if the second can be obtained from the first by a sequence of rotations, reflections, translations, and dilations; given two similar two-dimensional figures, describe a sequence that exhibits the similarity between them.	
5. Use informal arguments to establish facts about the angle sum and exterior angle of triangles, about the angles created when parallel lines are cut by a transversal, and the angle-angle criterion for similarity of triangles. *For example, arrange three copies of the same triangle so that the sum of the three angles appears to form a line, and give an argument in terms of transversals why this is so*.	
Understand and apply the Pythagorean Theorem.	
6. Explain a proof of the Pythagorean Theorem and its converse.	
7. Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two and three dimensions.	
8. Apply the Pythagorean Theorem to find the distance between two points in a coordinate system.	
Solve real-world and mathematical problems involving volume of cylinders, cones, and spheres.	
9. Know the formulas for the volumes of cones, cylinders, and spheres and use them to solve real-world and mathematical problems.	

Michigan Grade 8 Math Standards: Statistics and Probability	PSAT 8/9 Math Test
Investigate patterns of association in bivariate data.	
1. Construct and interpret scatter plots for bivariate measurement data to investigate patterns of association between two quantities. Describe patterns such as clustering, outliers, positive or negative association, linear association, and nonlinear association.	Problem solving and data analysis Two variable data

Michigan Grade 8 Math Standards: Statistics and Probability	PSAT 8/9 Math Test
2. Know that straight lines are widely used to model relationships between two quantitative variables. For scatter plots that suggest a linear association, informally fit a straight line, and informally assess the model fit by judging the closeness of the data points to the line.	Problem solving and data analysis Two variable data
3. Use the equation of a linear model to solve problems in the context of bivariate measurement data, interpreting the slope and intercept. *For example, in a linear model for a biology experiment, interpret a slope of 1.5 cm/hr as meaning that an additional hour of sunlight each day is associated with an additional 1.5 cm in mature plant height*.	Problem solving and data analysis Two variable data
4. Understand that patterns of association can also be seen in bivariate categorical data by displaying frequencies and relative frequencies in a two-way table. Construct and interpret a two-way table summarizing data on two categorical variables collected from the same subjects. Use relative frequencies calculated for rows or columns to describe possible association between the two variables. *For example, collect data from students in your class on whether or not they have a curfew on school nights and whether or not they have assigned chores at home. Is there evidence that those who have a curfew also tend to have chores?*	

<u>Michigan High School Math Standards to PSAT 8/9</u>

Michigan High School Math Standards: Number and Quantity	PSAT 8/9 Math Test
N-RN The Real Number System	
Extend the properties of exponents to rational exponents.	
1. Explain how the definition of the meaning of rational exponents follows from extending the properties of integer exponents to those values, allowing for a notation for radicals in terms of rational exponents.	
2. Rewrite expressions involving radicals and rational exponents using the properties of exponents.	
Use properties of rational and irrational numbers.	
3. Explain why the sum or product of two rational numbers is rational; that the sum of a rational number and an irrational number is irrational; and that the product of a nonzero rational	

Michigan High School Math Standards: Number and Quantity	PSAT 8/9 Math Test
number and an irrational number is irrational.	
N-Q Quantities	
Reason quantitatively and use units to solve problems.	
1. Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.	Problem solving and data analysis Ratios, rates, proportional relationships, and units
2. Define appropriate quantities for the purpose of descriptive modeling.	
3. Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.	
N-CN The Complex Number System	
Perform arithmetic operations with complex numbers.	
1. Know there is a complex number *i* such that $i^2 = -1$, and every complex number has the form $a + bi$ with a and b real.	
2. Use the relation $i^2 = -1$ and the commutative, associative, and distributive properties to add, subtract, and multiply complex numbers.	
Use complex numbers in polynomial identities and equations.	
7. Solve quadratic equations with real coefficients that have complex solutions.	

Michigan High School Math Standards: Algebra	PSAT 8/9 Math Test
A-SSE Seeing Structure in Expressions	
Interpret the structure of expressions	
1. Interpret expressions that represent a quantity in terms of its context. a. Interpret parts of an expression, such as terms, factors, and coefficients. b. Interpret complicated expressions by viewing one or more of their parts as a single entity.	Heart of algebra Linear functions Linear equations in two variables Passport to advanced math Equivalent expressions Nonlinear equations in one variable and systems of equations in two variables Nonlinear functions
2. Use the structure of an expression to identify ways to rewrite it.	Heart of algebra Linear functions Linear equations in two variables

Michigan High School Math Standards: Algebra		PSAT 8/9 Math Test
		Passport to advanced math Equivalent expressions Nonlinear equations in one variable and systems of equations in two variables Nonlinear functions
	Write expressions in equivalent forms to solve problems	
	3. Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression. a. Factor a quadratic expression to reveal the zeros of the function it defines. b. Complete the square in a quadratic expression to reveal the maximum or minimum value of the function it defines. c. Use the properties of exponents to transform expressions for exponential functions.	Passport to advanced math Nonlinear functions
	4. Derive the formula for the sum of a finite geometric series (when the common ratio is not 1), and use the formula to solve problems.	
A-APR Arithmetic with Polynomials and Rational Expressions		
	Perform arithmetic operations on polynomials	
	1. Understand that polynomials form a system analogous to the integers, namely, they are closed under the operations of addition, subtraction, and multiplication; add, subtract, and multiply polynomials.	Passport to advanced math Equivalent expressions
	Understand the relationship between zeros and factors of polynomials	
	2. Know and apply the Remainder Theorem: For a polynomial $p(x)$ and a number a, the remainder on division by $x - a$ is $p(a)$, so $p(a) = 0$ if and only if $(x - a)$ is a factor of $p(x)$.	
	3. Identify zeros of polynomials when suitable factorizations are available, and use the zeros to construct a rough graph of the function defined by the polynomial.	
	Use polynomial identities to solve problems	
	4. Prove polynomial identities and use them to describe numerical relationships.	
	Rewrite rational expressions	
	6. Rewrite simple rational expressions in different forms; write $a(x)/b(x)$ in the form $q(x) + r(x)/ b(x)$, where $a(x)$, $b(x)$, $q(x)$, and $r(x)$ are polynomials with the degree of $r(x)$ less than the degree of $b(x)$, using inspection, long division, or, for the more complicated examples, a computer algebra system.	
A-CED Creating Equations		

Michigan High School Math Standards: Algebra		PSAT 8/9 Math Test
	Create equations that describe numbers or relationships	
	1. Create equations and inequalities in one variable and use them to solve problems.	Heart of algebra Linear equations in one variable Linear inequalities in one or two variables
	2. Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.	Heart of algebra Linear functions
	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.	Heart of algebra Linear equations in two variables Linear inequalities in one or two variables
	4. Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations.	Passport to advanced math Nonlinear equations in one variable and systems of equations in two variables
A-REI Reasoning with Equations and Inequalities		
	Understand solving equations as a process of reasoning and explain the reasoning	
	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.	
	2. Solve simple rational and radical equations in one variable, and give examples showing how extraneous solutions may arise.	
	Solve equations and inequalities in one variable	
	3. Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.	Heart of algebra Linear equations in one variable Linear inequalities in one or two variables Problem solving and data analysis Ratios, rates, proportional relationships, and units Two-variable data: Models and scatterplots

	Michigan High School Math Standards: Algebra	PSAT 8/9 Math Test
	4. Solve quadratic equations in one variable. a. Use the method of completing the square to transform any quadratic equation in x into an equation of the form $(x - p)^2 = q$ that has the same solutions. Derive the quadratic formula from this form. b. Solve quadratic equations by inspection (e.g., for $x^2 = 49$), taking square roots, completing the square, the quadratic formula and factoring, as appropriate to the initial form of the equation. Recognize when the quadratic formula gives complex solutions and write them as $a \pm bi$ for real numbers a and b.	Passport to advanced math Nonlinear equations in one variable and systems of equations in two variables
	Solve systems of equations	
	5. Prove that, given a system of two equations in two variables, replacing one equation by the sum of that equation and a multiple of the other produces a system with the same solutions.	
	6. Solve systems of linear equations exactly and approximately (e.g., with graphs), focusing on pairs of linear equations in two variables.	Heart of algebra Systems of two linear equations in two variables
	7. Solve a simple system consisting of a linear equation and a quadratic equation in two variables algebraically and graphically.	Passport to advanced math Nonlinear equations in one variable and systems of equations in two variables
	Represent and solve equations and inequalities graphically	
	10. Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve (which could be a line).	Heart of algebra Linear equations in two variables Passport to advanced math Nonlinear functions
	11. Explain why the x-coordinates of the points where the graphs of the equations $y = f(x)$ and $y = g(x)$ intersect are the solutions of the equation $f(x) = g(x)$; find the solutions approximately, e.g., using technology to graph the functions, make tables of values, or find successive approximations. Include cases where $f(x)$ and/or $g(x)$ are linear, polynomial, rational, absolute value, exponential, and logarithmic functions.	
	12. Graph the solutions to a linear inequality in two variables as a half-plane (excluding the boundary in the case of a strict inequality), and graph the solution set to a system of linear inequalities in two variables as the intersection of the corresponding half-planes.	

	Michigan High School Math Standards: Functions	PSAT 8/9 Math Test
F-IF Interpreting Functions		
	Understand the concept of a function and use function notation	

Michigan High School Math Standards: Functions	PSAT 8/9 Math Test
1. Understand that a function from one set (called the domain) to another set (called the range) assigns to each element of the domain exactly one element of the range. If *f* is a function and *x* is an element of its domain, then *f*(*x*) denotes the output of *f* corresponding to the input *x*. The graph of *f* is the graph of the equation *y* = *f*(*x*).	Heart of algebra Linear functions Passport to advanced math Nonlinear functions
2. Use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a context.	Heart of algebra Linear functions Passport to advanced math Nonlinear functions
3. Recognize that sequences are functions, sometimes defined recursively, whose domain is a subset of the integers.	
Interpret functions that arise in applications in terms of the context	
4. For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship.	Heart of algebra Linear functions Passport to advanced math Nonlinear functions
5. Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes.	
6. Calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval. Estimate the rate of change from a graph.	
Analyze functions using different representations	
7. Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases. a. Graph linear and quadratic functions and show intercepts, maxima, and minima. b. Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions. c. Graph polynomial functions, identifying zeros when suitable factorizations are available, and showing end behavior. e. Graph exponential and logarithmic functions, showing intercepts and end behavior, and trigonometric functions, showing period, midline, and amplitude.	Heart of algebra Linear functions Problem solving and data analysis One variable data: Distributions and measures of center and spread Passport to advanced math Nonlinear functions
8. Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function. a. Use the process of factoring and completing the square in a quadratic function to show zeros, extreme values, and symmetry of the graph, and interpret these in terms of a context. b. Use the properties of exponents to interpret	Heart of algebra Linear functions Passport to advanced math Nonlinear functions

Michigan High School Math Standards: Functions	PSAT 8/9 Math Test
expressions for exponential functions.	
9. Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions).	Heart of algebra Linear functions Passport to advanced math Nonlinear functions
F-BF Building Functions	
Build a function that models a relationship between two quantities	
1. Write a function that describes a relationship between two quantities. a. Determine an explicit expression, a recursive process, or steps for calculation from a context. b. Combine standard function types using arithmetic operations.	Heart of algebra Linear functions Passport to advanced math Nonlinear functions
2. Write arithmetic and geometric sequences both recursively and with an explicit formula, use them to model situations, and translate between the two forms.	
Build new functions from existing functions	
3. Identify the effect on the graph of replacing $f(x)$ by $f(x) + k$, $k f(x)$, $f(kx)$, and $f(x + k)$ for specific values of k (both positive and negative); find the value of k given the graphs. Experiment with cases and illustrate an explanation of the effects on the graph using technology.	
4. Find inverse functions. a. Solve an equation of the form $f(x) = c$ for a simple function f that has an inverse and write an expression for the inverse.	

Michigan High School Math Standards: Functions		PSAT 8/9 Math Test
F-LE Linear, Quadratic, and Exponential Models		
	Construct and compare linear, quadratic, and exponential models and solve problems	
	1. Distinguish between situations that can be modeled with linear functions and with exponential functions. a. Prove that linear functions grow by equal differences over equal intervals, and that exponential functions grow by equal factors over equal intervals. b. Recognize situations in which one quantity changes at a constant rate per unit interval relative to another. c. Recognize situations in which a quantity grows or decays by a constant percent rate per unit interval relative to another.	
	2. Construct linear and exponential functions, including arithmetic and geometric sequences, given a graph, a description of a relationship, or two input-output pairs (include reading these from a table).	Heart of algebra Linear functions Passport to advanced math Nonlinear functions
	3. Observe using graphs and tables that a quantity increasing exponentially eventually exceeds a quantity increasing linearly, quadratically, or (more generally) as a polynomial function.	
	4. For exponential models, express as a logarithm the solution to $ab^{ct} = d$ where a, c, and d are numbers and the base b is 2, 10, or e; evaluate the logarithm using technology.	
	Interpret expressions for functions in terms of the situation they model	
	5. Interpret the parameters in a linear or exponential function in terms of a context.	Heart of algebra Linear functions Passport to advanced math Nonlinear functions
F-TF Trigonometric Functions		
	Extend the domain of trigonometric functions using the unit circle	
	1. Understand radian measure of an angle as the length of the arc on the unit circle subtended by the angle.	
	2. Explain how the unit circle in the coordinate plane enables the extension of trigonometric functions to all real numbers, interpreted as radian measures of angles traversed counterclockwise around the unit circle.	
	Model periodic phenomena with trigonometric functions	
	5. Choose trigonometric functions to model periodic phenomena with specified amplitude, frequency, and midline.	
	Prove and apply trigonometric identities	
	8. Prove the Pythagorean identity $\sin^2(\theta) + \cos^2(\theta) = 1$ and use it to find $\sin(\theta)$, $\cos(\theta)$, or $\tan(\theta)$ given $\sin(\theta)$, $\cos(\theta)$, or $\tan(\theta)$ and	

Michigan High School Math Standards: Functions		PSAT 8/9 Math Test
	the quadrant of the angle.	

Michigan High School Math Standards: Modeling	PSAT 8/9 Math Test
Modeling Standards: Modeling is best interpreted not as a collection of isolated topics but rather in relation to other standards. Making mathematical models is a Standard for Mathematical Practice, and specific modeling standards appear throughout the high school standards indicated by a star symbol.	An emphasis on modeling is apparent throughout the redesigned PSAT 8/9 Math Test. See for example Problem solving and data analysis Percentages

Michigan High School Math Standards: Geometry		PSAT 8/9 Math Test
G-CO Congruence		
	Experiment with transformations in the plane	
	1. Know precise definitions of angle, circle, perpendicular line, parallel line, and line segment, based on the undefined notions of point, line, distance along a line, and distance around a circular arc.	
	2. Represent transformations in the plane using, e.g., transparencies and geometry software; describe transformations as functions that take points in the plane as inputs and give other points as outputs. Compare transformations that preserve distance and angle to those that do not (e.g., translation versus horizontal stretch).	
	3. Given a rectangle, parallelogram, trapezoid, or regular polygon, describe the rotations and reflections that carry it onto itself.	
	4. Develop definitions of rotations, reflections, and translations in terms of angles, circles, perpendicular lines, parallel lines, and line segments.	
	5. Given a geometric figure and a rotation, reflection, or translation, draw the transformed figure using, e.g., graph paper, tracing paper, or geometry software. Specify a sequence of transformations that will carry a given figure onto another.	
	Understand congruence in terms of rigid motions	
	6. Use geometric descriptions of rigid motions to transform figures and to predict the effect of a given rigid motion on a given figure; given two figures, use the definition of congruence in terms of rigid motions to decide if they are congruent.	
	7. Use the definition of congruence in terms of rigid motions to show that two triangles are congruent if and only if corresponding pairs of sides and corresponding pairs of angles are congruent.	

Michigan High School Math Standards: Geometry		PSAT 8/9 Math Test
	8. Explain how the criteria for triangle congruence (ASA, SAS, and SSS) follow from the definition of congruence in terms of rigid motions.	
	Prove geometric theorems	
	9. Prove theorems about lines and angles.	
	10. Prove theorems about triangles.	
	11. Prove theorems about parallelograms.	
	Make geometric constructions	
	12. Make formal geometric constructions with a variety of tools and methods (compass and straightedge, string, reflective devices, paper folding, dynamic geometric software, etc.).	
	13. Construct an equilateral triangle, a square, and a regular hexagon inscribed in a circle.	
G-SRT Similarity, Right Triangles, and Trigonometry		
	Understand similarity in terms of similarity transformations	
	1. Verify experimentally the properties of dilations given by a center and a scale factor: a. A dilation takes a line not passing through the center of the dilation to a parallel line, and leaves a line passing through the center unchanged. b. The dilation of a line segment is longer or shorter in the ratio given by the scale factor.	
	2. Given two figures, use the definition of similarity in terms of similarity transformations to decide if they are similar; explain using similarity transformations the meaning of similarity for triangles as the equality of all corresponding pairs of angles and the proportionality of all corresponding pairs of sides.	
	3. Use the properties of similarity transformations to establish the AA criterion for two triangles to be similar.	
	Prove theorems involving similarity	
	4. Prove theorems about triangles.	
	5. Use congruence and similarity criteria for triangles to solve problems and to prove relationships in geometric figures.	
	Define trigonometric ratios and solve problems involving right triangles	
	6. Understand that by similarity, side ratios in right triangles are properties of the angles in the triangle, leading to definitions of trigonometric ratios for acute angles.	
	7. Explain and use the relationship between the sine and cosine of complementary angles.	
	8. Use trigonometric ratios and the Pythagorean Theorem to solve right triangles in applied problems.	

Michigan High School Math Standards: Geometry		PSAT 8/9 Math Test
G-C Circles		
	Understand and apply theorems about circles	
	1. Prove that all circles are similar.	
	2. Identify and describe relationships among inscribed angles, radii, and chords.	
	3. Construct the inscribed and circumscribed circles of a triangle, and prove properties of angles for a quadrilateral inscribed in a circle.	
	Find arc lengths and areas of sectors of circle	
	5. Derive using similarity the fact that the length of the arc intercepted by an angle is proportional to the radius, and define the radian measure of the angle as the constant of proportionality; derive the formula for the area of a sector.	
G-GPE Expressing Geometric Properties with Equations		
	Translate between the geometric description and the equation for a conic section	
	1. Derive the equation of a circle of given center and radius using the Pythagorean Theorem; complete the square to find the center and radius of a circle given by an equation.	
	2. Derive the equation of a parabola given a focus and directrix.	
	Use coordinates to prove simple geometric theorems algebraically	
	4. Use coordinates to prove simple geometric theorems algebraically.	
	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).	Heart of algebra Linear equations in two variables
	6. Find the point on a directed line segment between two given points that partitions the segment in a given ratio.	
	7. Use coordinates to compute perimeters of polygons and areas of triangles and rectangles, e.g., using the distance formula.	
G-GMD Geometric Measurement and Dimension		
	Explain volume formulas and use them to solve problems	
	1. Give an informal argument for the formulas for the circumference of a circle, area of a circle, volume of a cylinder, pyramid, and cone.	
	3. Use volume formulas for cylinders, pyramids, cones, and spheres to solve problems.	
	Visualize relationships between two-dimensional and three-dimensional objects	
	4. Identify the shapes of two-dimensional cross-sections of three-dimensional objects, and identify three-dimensional objects generated by rotations of two-dimensional objects.	

Michigan High School Math Standards: Geometry		PSAT 8/9 Math Test
G-MG Modeling with Geometry		
	Apply geometric concepts in modeling situations	
	1. Use geometric shapes, their measures, and their properties to describe objects (e.g., modeling a tree trunk or a human torso as a cylinder).	
	2. Apply concepts of density based on area and volume in modeling situations (e.g., persons per square mile, BTUs per cubic foot).	Problem solving and data analysis Ratios, rates, proportional relationships, and units
	3. Apply geometric methods to solve design problems (e.g., designing an object or structure to satisfy physical constraints or minimize cost; working with typographic grid systems based on ratios).	

Michigan High School Math Standards: Statistics and Probability		PSAT 8/9 Math Test
S-ID Interpreting Categorical and Quantitative Data		
	Summarize, represent, and interpret data on a single count or measurement variable	
	1. Represent data with plots on the real number line (dot plots, histograms, and box plots).	Problem solving and data analysis One variable data: Distributions and measures of center and spread
	2. Use statistics appropriate to the shape of the data distribution to compare center (median, mean) and spread (interquartile range, standard deviation) of two or more different data sets.	Problem solving and data analysis One variable data: Distributions and measures of center and spread
	3. Interpret differences in shape, center, and spread in the context of the data sets, accounting for possible effects of extreme data points (outliers).	Problem solving and data analysis One variable data: Distributions and measures of center and spread
	4. Use the mean and standard deviation of a data set to fit it to a normal distribution and to estimate population percentages. Recognize that there are data sets for which such a procedure is not appropriate. Use calculators, spreadsheets, and tables to estimate areas under the normal curve.	
	Summarize, represent, and interpret data on two categorical and quantitative variables	

	Michigan High School Math Standards: Statistics and Probability	PSAT 8/9 Math Test
	5. Summarize categorical data for two categories in two-way frequency tables. Interpret relative frequencies in the context of the data (including joint, marginal, and conditional relative frequencies). Recognize possible associations and trends in the data.	Problem solving and data analysis Probability and conditional probability
	6. Represent data on two quantitative variables on a scatter plot, and describe how the variables are related. a. Fit a function to the data; use functions fitted to data to solve problems in the context of the data. b. Informally assess the fit of a function by plotting and analyzing residuals. c. Fit a linear function for a scatter plot that suggests a linear association.	Problem solving and data analysis Two variable data: Models and scatterplots
	Interpret linear models	
	7. Interpret the slope (rate of change) and the intercept (constant term) of a linear model in the context of the data.	Problem solving and data analysis Two variable data: Models and scatterplots Heart of algebra Linear equations in two variables
	8. Compute (using technology) and interpret the correlation coefficient of a linear fit.	
	9. Distinguish between correlation and causation.	
S-IC Making Inferences and Justifying Conclusions		
	Understand and evaluate random processes underlying statistical experiments	
	1. Understand statistics as a process for making inferences about population parameters based on a random sample from that population.	
	2. Decide if a specified model is consistent with results from a given data-generating process, e.g., using simulation.	
	Make inferences and justify conclusions from sample surveys, experiments, and observational studies	
	3. Recognize the purposes of and differences among sample surveys, experiments, and observational studies; explain how randomization relates to each.	
	4. Use data from a sample survey to estimate a population mean or proportion; develop a margin of error through the use of simulation models for random sampling.	
	5. Use data from a randomized experiment to compare two treatments; use simulations to decide if differences between parameters are significant.	

Michigan High School Math Standards: Statistics and Probability	PSAT 8/9 Math Test
6. Evaluate reports based on data.	
S-CP Conditional Probability and the Rules of Probability	
Understand independence and conditional probability and use them to interpret data	
1. Describe events as subsets of a sample space (the set of outcomes) using characteristics (or categories) of the outcomes, or as unions, intersections, or complements of other events ("or," "and," "not").	
2. Understand that two events *A* and *B* are independent if the probability of *A* and *B* occurring together is the product of their probabilities, and use this characterization to determine if they are independent.	
3. Understand the conditional probability of *A* given *B* as *P*(*A* and *B*)/*P*(*B*), and interpret independence of *A* and *B* as saying that the conditional probability of *A* given *B* is the same as the probability of *A*, and the conditional probability of *B* given *A* is the same as the probability of *B*.	
4. Construct and interpret two-way frequency tables of data when two categories are associated with each object being classified. Use the two-way table as a sample space to decide if events are independent and to approximate conditional probabilities.	
5. Recognize and explain the concepts of conditional probability and independence in everyday language and everyday situations.	
Use the rules of probability to compute probabilities of compound events in a uniform probability model	
6. Find the conditional probability of *A* given *B* as the fraction of *B*'s outcomes that also belong to *A*, and interpret the answer in terms of the model.	
7. Apply the Addition Rule, *P*(*A* or *B*) = *P*(*A*) + *P*(*B*) – *P*(*A* and *B*), and interpret the answer in terms of the model.	

Table 38: PSAT 8/9 Math Test Alignment: PSAT 8/9 to MI

The following table details the PSAT 8/9-Michigan alignment using PSAT 8/9 content specifications as the organizing principle. In the interest of brevity, the Michigan standards in the right-hand column are presented in their abbreviated form (consistent with how they are numbered and lettered in Michigan standards documents).

PSAT 8/9 Math Test	Michigan Math Standards
PSAT 8/9 HEART OF ALGEBRA	
Linear equations in one variable	
• Create and use linear equations in one variable to solve problems in a variety of contexts. • Create a linear equation in one variable, and when in context interpret solutions in terms of the context. • Solve a linear equation in one variable making strategic use of algebraic structure. • For a linear equation in one variable, o interpret a constant, variable, factor or term in a context; • Fluently solve a linear equation in one variable.	6.EE.A.2a 6.EE.A.2b 6.EE.A.2c 6-EE.B.5 6-EE.B.6 6-EE.B.7 6-EE.C.9 7-EE.B.3 7-EE.B.4a 7-EE.B.4b 8-EE.C.7a 8-EE.C.7b A-CED.A.1 A-REI.B.3
Linear functions	
• Create and use linear functions to solve problems in a variety of contexts. • Create a linear function to model a relationship between two quantities. • For a linear function that represents a context a. interpret the meaning of an input/output pair, constant, variable, factor, or term based on the context, including situations where seeing structure provides an advantage; b. given an input value, find and/or interpret the output value using the given representation; c. given an output value, find and/or interpret the input value using the given representation, if it exists. • Make connections between verbal, tabular, algebraic, and graphical representations of a linear function, by a. deriving one representation from the other; b. identifying features of one representation given another representation; c. determining how a graph is affected by a change to its equation.	6.EE.A.2a 6.EE.A.2b 6.EE.A.2c 6-EE.B.6 6-EE.B.7 6-EE.C.9 7-EE.A.2 7-EE.B.3 7-EE.B.4a 7-EE.B.4b 8-EE-B.5 8-EE.B.6 8-F.A.1 8-F.A.2 8-F.A.3 8-F.B.4 8-F.B.5

	PSAT 8/9 Math Test	Michigan Math Standards
	• Write the rule for a linear function given two input/output pairs or one input/output pair and the rate of change.	A-SSE.A.1a A-SSE.A.1b A-SSE.A.2 F-BF.A.1a A-CED.A.2 F-IF.A.1 F-IF.A.2 F-IF.B.4 F-IF.C.7a F-IF.C.8b F-IF.C.9 F-LE.A.2 F-LE.B.5
	Linear equations in two variables	
	• Create and use a linear equation in two variables to solve problems in a variety of contexts. • Create a linear equation in two variables to model a constraint or condition on two quantities. • For a linear equation in two variables that represents a context o interpret a solution, constant, variable, factor, or term based on the context, including situations where seeing structure provides an advantage; o given a value of one quantity in the relationship, find a value of the other, if it exists. • Make connections between tabular, algebraic, and graphical representations of a linear equation in two variables by o deriving one representation from the other; o identifying features of one representation given the other representation; o determining how a graph is affected by a change to its equation. • Write an equation for a line given two points on the line, one point and the slope of the line, or one point and a parallel or perpendicular line.	6-EE.A.3 6-EE.B.5 6-EE.B.6 6-EE.B.7 6-EE.C.9 7-EE.B.3 7-EE.B.4a 7-EE.B.4b 8-EE-B.5 8-EE.B.6 A-SSE.A.1 A-SSE.A.2 A-CED.A.3 A-REI.D.10 G-GPE.B.5 S-ID.C.7
	Systems of two linear equations in two variables	

PSAT 8/9 Math Test	Michigan Math Standards
• Create and use a system of two linear equations in two variables to solve problems in a variety of contexts. • Create a system of linear equations in two variables, and when in context interpret solutions in terms of the context. • Make connections between tabular, algebraic, and graphical representations of the system by deriving one representation from the other. • Solve a system of two linear equations in two variables making strategic use of algebraic structure. • For a system of linear equations in two variables, o interpret a solution, constant, variable, factor, or term based on the context, including situations where seeing structure provides an advantage; • Fluently solve a system of linear equations in two variables.	6-EE.B.5 6-EE.B.6 6-EE.B.7 6-EE.C.9 7-EE.B.3 7-EE.B.4a 7-EE.B.4b 8-EE.C.8 A.REI.C.6
Linear inequalities in one or two variables	
• Create and use linear inequalities in two variable to solve problems in a variety of contexts. • Create linear inequalities in one or two variables, and when in context interpret the solutions in terms of the context. • For linear inequalities in one or two variables, interpret a constant, variable, factor, or term, including situations where seeing structure provides an advantage. • Given a linear inequality interpret a point in the solution set.	6-EE.B.5 6-EE.B.6 6-EE.B.7 6-EE.B.8 6-EE.C.9 7-EE.B.3 7-EE.B.4a 7-EE.B.4b A-CED.A.1 A-CED.A.3 A-REI.B.3
PSAT 8/9 PROBLEM SOLVING AND DATA ANALYSIS	
Ratios, rates, proportional relationships, and units	
Items will requires students to solve problems by using a proportional relationship between quantities, calculating or using a ratio or rate, and/or using units, derived units, and unit conversion. • Apply proportional relationships, ratios, rates and units in a wide variety of contexts. Examples include but are not limited to scale drawings and problems in the natural and social sciences. • Solve problems involving o derived units including those that arise from quotients (e.g., population per square kilometer) o unit conversion including currency exchange and conversion between different measurement systems. • Understand and use the fact that when two quantities are in a proportional relationship, if one changes by a scale factor, then	6-RP.A.1 6-RP.A.2 6-RP.A.3b 6-RP.A.3c 6-RP.A.3d 7-RP.A.1 7-RP.A.2b 7-RP.A.3 7-G.A.1 A-REI.B.3 N-Q.A.1 G-MG.A.2

	PSAT 8/9 Math Test	Michigan Math Standards
	the other also changes by the same scale factor.	
	Percentages	
	• Use percentages to solve problems in a variety of contexts. Examples include, but are not limited to, discounts, interest, taxes, tips, and percent increases and decreases for many different quantities. • Understand and use the relationship between percent change and growth factor (5% and 1.05, for example); include percentages greater than or equal to 100%.	6.RP.A.3c 7-RP.A.3 Modeling
	One variable data: Distributions and measures of center and spread	
	• Choose an appropriate graphical representation for a given data set. • Interpret information from a given representation of data in context. • Analyze and interpret numerical data distributions represented with frequency tables, histograms, dot plots, and boxplots. • For quantitative variables, calculate, compare, and interpret mean, median, and range. • Compare distributions using measures of center and spread, including distributions with different means and the same standard deviations. • Understand and describe the effect of outliers on mean and median. • Given an appropriate data set, calculate the mean.	6-SP.A.2 6-SP.A.3 6-SP.B.4 6-SP.B.5a 6-SP.B.5b 6-SP.B.5c 7-SP.B.3 7-SP.B.4 S-ID.A.1 S-ID.A.2 S-ID.A.3 F-IF.C.7
	Two-variable data: Models and scatterplots	
	• Using a model that fits the data in a scatterplot, compare values predicted by the model to values given in the data set. • Interpret the slope and intercepts of the line of best fit in context. • Given a relationship between two quantities, read and interpret graphs and tables modeling the relationship. • Analyze and interpret data represented in a scatterplot or line graph; fit linear models.	8-SP.A.1 8-SP.A.2 8-SP.A.3 A-REI.B.3 S-ID.B.6a S-ID.B.6c S-ID.C.7

	PSAT 8/9 Math Test	Michigan Math Standards
	• Select a graph that represents a context, identify a value on a graph, or interpret information on the graph. • Estimate the line of best fit for a given scatterplot; use the line to make predictions.	
	Probability and conditional probability	
	Use one- and two-way tables, tree diagrams, area models, and other representations to find relative frequency, probabilities, and conditional probabilities. • Compute and interpret probability and conditional probability in simple contexts.	7-SP.C.5 7-SP.C.6 7-SP.C.7a 7-SP.C.7b 7-SP.C.8a 7-SP.C.8b S-ID.B.5
	Inference from sample statistics and margin of error	
	• Use sample mean and sample proportion to estimate population mean and population proportion.	7-SP.A.1 7-SP.A.2
PSAT 8/9 PASSPORT TO ADVANCED MATH		
	Equivalent expressions	
	• Make strategic use of algebraic structure and the properties of operations to identify and create equivalent expressions, including factoring polynomials. • Fluently add, subtract, and multiply polynomials.	6-EE.A.4 7-EE.A.1 8-EE.A.1 8-EE.A.2 A-SSE.A.1a A-SSE.A.2 A-APR.A.1
	Nonlinear equations in one variable and systems of equations in two variables	
	• Make strategic use of algebraic structure, the properties of operations, and reasoning about equality to o solve quadratic equations in one variable presented in a wide variety of forms o solve systems of linear and nonlinear equations in two variables, including relating the solutions to the graphs of the equations in the system. • Given a nonlinear equation in one variable that represents a context, interpret a solution, constant, variable, factor, or term based on the context, including situations where seeing	A-SSE.A.1 A-SSE.A.2 A-CED.A.4 A-REI.B.4b A.REI.C.7

	PSAT 8/9 Math Test	Michigan Math Standards
	structure provides an advantage. • Given an equation or formula in two or more variables that represents a context, view it as an equation in a single variable of interest where the other variables are parameters and solve for the variable of interest. • Fluently solve quadratic equations in one variable, written as a quadratic expression in standard form equal to zero, where using the quadratic formula or completing the square is the most efficient method for solving the equation.	
	Nonlinear functions	
	• For a quadratic or exponential function, o use function notation to represent and interpret input/output pairs in terms of a context and points on the graph; o for a function that represents a context, interpret the meaning of an input/output pair, constant, variable, factor, or term based on the context, including situations where seeing structure provides an advantage; o make connections between tabular, algebraic, and graphical representations of the function, by i. given one representation, selecting another representation; ii. identifying features of one representation given the another representation	7-EE.A.2 8-F.A.1 8-F.A. 8-F.B.5 A-SSE.A.1 A-SSE.A.2 A-SSE.B.3 A-REI.D.10 F-IF.A.1 F-IF.A.2 F-IF.B.4 F-IF.C.7 F-IF.C.8b F-IF.C.9 F-BF.A.1 F-LE.A.2 F-LE.B.5