Indiana Formative (Interim) Assessment Grant
Assessment Program Evaluation Protocol

Assessment data provides valuable knowledge for student support and educational decision making when that data is valid, reliable, and reflective of required content. Indiana requires vendors to submit evidence of validity prior to approving assessment programs for purchase with state funds.

This rubric is used to evaluate programs submitted for approval under Indiana's Formative Assessment Grant beginning School Year 2022-2023. Six criteria are considered:

1. **Interim/Benchmark Assessment Program**: Assesses English/Language Arts and/or Mathematics.
2. **Construct Coherence**: Aligns to the breadth and depth of Indiana Academic Standards as applicable and employs strong test development processes.
3. **Comparability and Reliability**: Provides a reliable measure across forms and administrations.
4. **Fairness and Accessibility**: Provides a fair and accessible measure for all students.
5. **Consequences and Uses**: Provides data to differentiate instruction for students and to inform educational decision-making.
6. **Predictive Measures**: Provides data to predict student performance on Indiana's statewide accountability assessment.

The Requestor must follow the process outlined in the *Indiana Formative Assessment Grant Program Approval Process* to submit evidence for consideration. To receive approval, the Requestor must pass all criteria labeled in the rubric as Pass/Fail. Strong responses receive "Adequate" determinations for all other criteria within the rubric. Programs may receive approval with one or two "Incomplete" or "Lacking" criteria based on the determination of the review committee.

The rubric is adapted from SCILLSS: *Strengthening Claims-based Interpretations and Uses of Local and Large-scale Science Assessment Scores Project (SCILLSS). (2017). Ensuring Rigor in Local Assessment Systems: A Self-Evaluation Protocol. Lincoln, NE: Nebraska Department of Education.*

Assessment Program Name: Click here to enter text.
Assessment Program Vendor: Click here to enter text.
Assessment Program Content Areas: Click here to enter text.
Assessment Program Grade Levels Serviced: Click here to enter text.
Contact Name: Click here to enter text. **Email**: Click here to enter text. **Phone**: Click here to enter text.
Contact Name: Click here to enter text. **Email**: Click here to enter text. **Phone**: Click here to enter text.

IDOE Contact: Click here to enter text. **Email**: Click here to enter text. **Phone**: Click here to enter text.
Reviewer Group: Click here to enter text.
Review Begin Date: Click here to enter text. **Review Completion Date**: Click here to enter text.

Final Status: ☐ **Approved** ☐ **Not Approved**
Approval Notes: Click here to enter text.

Criterion 1: Interim/Benchmark Assessment Program
The assessment program provides data to measure content knowledge and skills for English/Language Arts and/or Mathematics.

Research Questions	**Evidence Required**	**Expectations for Acceptability**
Is the submitted product an assessment program?	The Requestor must provide evidence of the degree to which the program is an assessment.	The program must consist of interim, benchmark, or similar assessments. Curricula (or "lesson-based" programs) will not be approved.
Does the program assess English/Language Arts and/or Mathematics?	The Requestor must submit evidence of any proficiency or growth indicators provided as well as the content areas assessed.	The program must measure student achievement and/or growth related to performance on Indiana Academic Standards over the course of the school year. The assessment program must provide (at a minimum) either a proficiency indicator or a growth indicator for content as delineated in Indiana Academic Standards (IAS).
Adequacy of Evidence: ☐Pass ☐Fail Committee Comments:		

Criterion 2: Construct Coherence (Alignment, Test Development, Scoring)
The assessment aligns to the breadth and depth of Indiana Academic Standards and employs strong test development processes which support valid scores.

Alignment Requirement Instructions: The assessment program vendor must select **one** of the three alignment options (labeled below and marked with an asterisk) and clearly label their submitted documentation with the alignment option selected. Only one option may be selected for each submission. If assessment program vendors wish to use different alignment options for different grade level bands, the vendor must submit the grade level bands separately for review and approval.

Alignment Option 1		
Research Questions	**Evidence Required**	**Expectations for Acceptability**
<u>Alignment Option: Full (Grades K-10)*</u> Does the assessment measure the breadth and depth of Indiana Academic Standards? What evidence shows that the assessment is sufficiently rigorous?	The Requestor must provide a formal alignment study verifying the degree of the assessment's alignment to Indiana Academic Standards. The alignment study must: • Use a research-based process; • Be completed by a third party (external rather than internal); • Provide evidence of the degree to which the assessments measure the breadth and depth of Indiana Academic Standards. The third-party alignment study must include data revealing the levels of rigor assessed across each content area and grade level.	A third party must complete the study. A panel of experts is expected to review item alignment across grade levels/content areas. While current educators are not required for inclusion in the panel of experts, it is preferred. The alignment study must show that a minimum of 85% of Indiana Academic Standards are assessed at each grade level for each content area. For example, grade 4 mathematics assessments must assess a minimum of 85% of all of the grade 4 mathematics standards. Sets of standards cannot be excluded, with the one exception of speaking and listening standards for English/Language Arts. For fixed form assessments, alignment should be verified from test forms. Independent assignment of metadata must be completed and compared to internal metadata. Independent metadata assignments must confirm internal metadata at a reasonably high rate. For computer adaptive tests (CATs), alignment should be verified from a representative sample of test events. Independent assignment of metadata must be completed and compared to internal metadata. Independent metadata assignments must confirm internal metadata at a reasonably high rate. For item bank approvals (where districts and schools create their own interim assessments using quality items and systems purchased from a vendor), alignment should be verified from a representative sample of the item bank. The vendor must also provide instructions for schools which support creation of test blueprints which measure the breadth and depth of Indiana Academic Standards to the required 85%. Independent assignment of metadata must be

		completed and compared to internal metadata. Independent metadata assignments must confirm internal metadata at a reasonably high rate For interim, benchmark, or similar assessments, measurement of 85% (or more) of Indiana Academic Standards (alignment) can be demonstrated by combining test events across administrations if students are intended to participate in multiple test events over the course of the school year. If this method is utilized, it must be stated within the submitted documentation, and details regarding the number of administrations required to reach alignment expectations must be included. A correlation guide or crosswalk does not provide the same level of information that an alignment study provides and therefore will not be accepted. Varying levels of rigor should be measured across each test form, in accordance with the requirements of Indiana Academic Standards. Assessments which do not measure beyond DOK 2 (or similar indicator on a different rigor matrix) will not be accepted.
Adequacy of Evidence: ☐Pass ☐Fail ☐Option Not Selected Committee Comments:		

Alignment Option 2		
Research Questions	**Evidence Required**	**Expectations for Acceptability**
<u>Alignment Option: Literacy/Numeracy (Grades K-2)*</u> Does the assessment measure the breadth and depth of Indiana Academic Standards related to numeracy and/or literacy in grades K-2? What evidence shows that the assessment is sufficiently rigorous?	The Requestor must provide a formal alignment study verifying the degree of the assessment's alignment to Indiana Academic Standards for literacy and numeracy, as defined in Appendix A (literacy) and Appendix B (numeracy). The alignment study must: • Use a research-based process; • Be completed by a third party (external rather than internal); • Provide evidence of the degree to which the assessments measure the breadth and depth of the identified Indiana Academic Standards. The third-party alignment study must include data reveling the levels of rigor assessed across each content area and grade level.	A third party must complete the study. A panel of experts is expected to review item alignment across grade levels/content areas. While current educators are not required for inclusion in the panel of experts, it is preferred. The alignment study must show that a minimum of 85% of Indiana Academic Standards as listed in Appendix A (for literacy assessments) and Appendix B (for numeracy assessments) are measured. No listed standard may be excluded from the study. For fixed form assessments, alignment should be verified from test forms. Independent assignment of metadata must be completed and compared to internal metadata. Independent metadata assignments must confirm internal metadata at a reasonably high rate. For computer adaptive tests (CATs), alignment should be verified from a representative sample of test events. Independent assignment of metadata must be completed and compared to internal metadata. Independent metadata assignments must confirm internal metadata at a reasonably high rate. For interim, benchmark, or similar assessments, measurement of 85% (or more) of Indiana Academic Standards (alignment) can be demonstrated by combining test events across administrations if students are intended to participate in multiple test events over the course of the school year. If this method is utilized, it must be stated within the submitted documentation, and details regarding the number of administrations required to reach alignment expectations must be included. For item bank approvals (where districts and schools create their own interim assessments using quality items and systems purchased from a vendor), alignment should be verified from a representative sample of the item bank. The vendor must also provide instructions for schools which support creation of test blueprints which measure the breadth and depth of the identified Indiana Academic Standards to the required 85%. Independent assignment of metadata must be completed and compared to internal metadata. Independent metadata assignments must confirm internal metadata at a reasonably high rate.

		A correlation guide or crosswalk does not provide the same level of information that an alignment study provides and therefore will not be accepted. Varying levels of rigor should be measured across each test form, in accordance with the requirements of Indiana Academic Standards.
	The Requestor must provide access to documentation (e.g., a link to or screenshot of the public-facing website) that the assessment receives a "convincing" or "partially convincing" rating for accuracy, reliability, and validity by the National Center on Intensive Intervention.	The committee will review the live National Center on Intensive Intervention portal to confirm ratings. If ratings are new and not published, documentation from the National Center on Intensive Intervention which confirms final ratings can be accepted. Documentation may not be more than three years old.
	For assessments which measure literacy, the Requestor must submit documentation that the assessment screens for phonological and phonetic awareness, sound symbol recognition, alphabet knowledge, decoding skills, rapid naming skills, and encoding skills.	Evidence may include test blueprints or test design documents which convey portions of tests dedicated to these concepts. Evidence may be provided through the third-party alignment study or as an internal confirmation (third-party confirmation is not required for this research question).
Adequacy of Evidence: ☐Pass ☐Fail ☐Option Not Selected Committee Comments:		

Alignment Option 3		
Research Questions	**Evidence Required**	**Expectations for Acceptability**
<u>Alignment Option: College Entrance Exam (Grades 8-10)*</u> Does the assessment measure the breadth and depth of Indiana Academic Standards as assessed on Indiana's college entrance exam? What evidence shows that the assessment is sufficiently rigorous?	The Requestor must provide a formal alignment study verifying the degree of the assessment's alignment to Indiana's selected nationally recognized college entrance exam for high school accountability. The alignment study must: • Use a research-based process; • Be completed by a third party (external rather than internal); • Provide evidence of the degree to which the assessments measure the breadth and depth of standards measured on the college entrance exam (based on the published test blueprint provided in Appendix C) are sufficiently measured. The third-party alignment study must include data reveling the levels of rigor assessed.	A third party must complete the study. A panel of experts is expected to review item alignment across grade levels/content areas. While current educators are not required for inclusion in the panel of experts, it is preferred. The alignment study must show that a minimum of 85% of Indiana Academic Standards are assessed at each grade level for each content area. For example, grade 4 mathematics assessments must assess a minimum of 85% of all of the grade 4 mathematics standards. Sets of standards cannot be excluded, with the one exception of speaking and listening standards for English/Language Arts. For fixed form assessments, alignment should be verified from test forms. Independent assignment of metadata must be completed and compared to internal metadata. Independent metadata assignments must confirm internal metadata at a reasonably high rate. For computer adaptive tests (CATs), alignment should be verified from a representative sample of test events. Independent assignment of metadata must be completed and compared to internal metadata. Independent metadata assignments must confirm internal metadata at a reasonably high rate. For interim, benchmark, or similar assessments, measurement of 85% (or more) of Indiana Academic Standards (alignment) can be demonstrated by combining test events across administrations if students are intended to participate in multiple test events over the course of the school year. If this method is utilized, it must be stated within the submitted documentation, and details regarding the number of administrations required to reach alignment expectations must be included. For item bank approvals (where districts and schools create their own interim assessments using quality items and systems purchased from a vendor), alignment should be verified from a representative sample of the item bank. The vendor must also provide instructions for schools which support creation of test blueprints which measure the breadth and depth of standards measured on the college entrance exam to the required 85%. Independent assignment of metadata must be completed and compared to internal

		metadata. Independent metadata assignments must confirm internal metadata at a reasonably high rate. A correlation guide or crosswalk does not provide the same level of information that an alignment study provides and therefore will not be accepted. Varying levels of rigor should be measured across each test form, in accordance with the requirements of Indiana Academic Standards.
Adequacy of Evidence: ☐Pass ☐Fail ☐Option Not Selected Committee Comments:		

(Criterion 2 Continued) Test Development Requirement Instructions: All assessment programs must address the research questions related to test development regardless of their selected alignment type.

Test Development		
Research Questions	**Evidence Required**	**Expectations for Acceptability**
What is the overall process used for test development?	The Requestor must provide a technical report detailing the test development process.	The assessment should be constructed using a research-based method that focuses on the measurement of the intended construct.
Who was involved in the test development process (e.g., roles, expertise, geographic location)?	The Requestor must provide evidence of stakeholder involvement in test development. Examples may include narrative briefs on the creation of test design documents (such as blueprints and item specifications) and inclusion of stakeholders in item development and/or item review.	Appropriate stakeholders (including content experts, psychometricians, assessment experts, and educators) were involved in the test development process.
What criteria are used to create/accept items for use on the assessment, and what quality controls are in place to ensure only high-quality items are administered?	The Requestor must provide documentation detailing the item development process. Documentation should provide an overview of any steps related to item development, item review, and item field test/data review.	Appropriate stakeholders who provide a wide variety of perspective and expertise are included in the item development process. Accessibility and linguistic complexity (as related to universal design) are considered during the item development process. Criteria are in place to ensure only high-quality items are utilized on the assessment. Examples may include quality control checklists utilized during item development or item specifications. Processes (including content and fairness reviews for test items and field test/data review for all items) are in place to ensure only high-quality items are administered on operational test forms.
Adequacy of Evidence: ☐Adequate ☐Incomplete ☐Lacking Committee Comments:		

(Criterion 2 Continued) Scoring Requirement Instructions: All assessment programs must address the research questions related to scoring regardless of their selected alignment type.

Scoring		
Research Questions	**Evidence Required**	**Expectations for Acceptability**
How are scores for individual test items combined for a total score?	The Requestor must provide a technical report detailing the method for providing total test scores. The technical report should provide arguments related to the degree to which total scores are a valid reflection of content knowledge and skill.	A research-based scoring method must be applied to the assessment to return a valid "total score." This total score should be meaningfully connected to the content standards. Total scores provided should be scaled. Additional scores related to student proficiency may be provided in different ways. The total score must be a valid reflection of student knowledge and skills.
Are quality controls in place to verify that scoring specifications are applied correctly to items and test events?	The Requestor must provide documentation showing any quality controls in place that ensure automated scoring of items and calculation of total scores are correct and reliable. If the assessment includes handscored items, the Requestor must provide evidence of training provided to handscorers and documentation of any systems which ensure scores for these items are reliable.	Quality controls should exist to confirm that machine scoring occurs accurately and total scores are correctly calculated and reported. A variety of systems are acceptable. Examples may include system checks or internal replications of data sets. If the assessment includes items handscored by the assessment vendor, scorers must be qualified and must receive training which supports accurate, reliable scoring. Quality control measures must be in place to monitor reliability of handscores (for example, validity papers embedded in handscoring sets or percent of items which are second-scored). If the assessment includes items handscored by classroom teachers, teachers must receive training which supports accurate, reliable scoring. Quality control measures are recommended to monitor the reliability of handscores by educators (for example, score audits).
How were item rubrics created? What differences in student responses do the rubrics account for?	If there are open-ended items on the assessment, the Requestor must provide documentation on the method of scoring (automated or handscored) as well as how rubrics were originally defined. If no open-ended items occur, the Requestor should state this in the application.	Scoring rubrics must be used for the scoring of open-ended items to ensure objectivity. Training materials must accompany the rubrics (e.g., annotated examples of scored responses, practice responses, validity papers, etc.). An overview of the rubrics and training materials should be presented (specific examples are not required).
Adequacy of Evidence: ☐Adequate ☐Incomplete ☐Lacking Committee Comments:		

Criterion 3: Comparability and Reliability
The assessment provides a reliable measure across forms and administrations.

Research Questions	Evidence Required	Expectations for Acceptability
Does the assessment support reliable scores over time and across forms? Is the assessment administered in a standardized format to ensure comparability across different testing sites? Does the assessment administration protect against various types of cheating to ensure scores accurately reflect student knowledge and skills?	The Requestor must provide evidence showing the degree to which scoring is comparable and reliable across various forms and administrations as applicable. For assessments in grades kindergarten through two which measure foundational literacy or numeracy and are seeking approval through Alignment Option 2, the Requestor must provide documentation that the assessment receives a "convincing" or "partially convincing" rating for accuracy, reliability, and validity by the National Center on Intensive Intervention. The Requestor must provide documentation showing the degree to which the assessment is secure and any protections in place to prevent cheating.	Processes must be in place that ensure the consistency of score results across different forms and over time (if applicable). Examples in include the use of stable test blueprints, computer adaptive algorithms, and test specifications. Protocols and processes must be in place that address standardization of test administration. Examples may include defined test windows, test administration manuals, instructions for test administrators or school administrators regarding administration of assessments, and/or test security information. For item bank approvals (where districts and schools create their own interim assessments using quality items and systems purchased from a vendor), the evidence must include guidance provided to schools which supports their understanding of comparability as they create their own forms. Strong responses will discuss use of test blueprints and stable design across forms and administrations so that scores can be meaningfully compared. For assessments in grades kindergarten through two submitting reliability document from the National Center or Intensive Intervention, the committee will review the live National Center on Intensive Intervention portal to confirm ratings. If ratings are new and not published, documentation from the National Center on Intensive Intervention which confirms final ratings can be accepted. Documentation may not be more than three years old.
Adequacy of Evidence: ☐Adequate ☐Incomplete ☐Lacking Committee Comments:		

Criterion 4: Fairness and Accessibility
The assessment provides a fair and accessible measure for all students.

Research Questions	Evidence Required	Expectations for Acceptability
What procedures ensure items were created without bias and are fair for all students?	The Requestor must provide a narrative describing the item development and data review processes.	Items must be developed with processes to ensure fairness and accessibility. Strong processes include stakeholder review, use of universal design (especially in graphics), review of linguistic complexity, and avoidance of multi-meaning words in item stems. Data reviews should be used to ensure to check differential item functioning and exclude any items which are inherently biased against a specific student population.
Can all students (including students with disabilities and English learners) access the assessment and show what they know? What accommodations and/or supports are offered during testing?	The Requestor must provide evidence that all students can access the test content. The Requestor must provide a list of any tools or supports available to all students during the assessment. The Requestor must provide a list of accommodations and supports for students with disabilities and English learners.	Appropriate accommodations and supports must be available for a variety of student populations. Student accommodations must be provided during testing either by the assessment program or by the local school. Strong responses explain how necessary accommodations and universally provided tools and supports are accessed during test administration. Providers should address any access for specific subpopulations (including students with significant cognitive disabilities, students in Spanish emersion programs, and students who are blind or visually impaired) within this section as applicable.
Adequacy of Evidence: ☐Adequate ☐Incomplete ☐Lacking Committee Comments:		

Criterion 5: Consequences and Uses
The assessment provides data to differentiate instruction based on performance on Indiana Academic Standards and to inform educational decision-making.

Research Questions	Evidence Required	Expectations for Acceptability
How are the scores from the assessment intended to be used?	The Requestor should articulate the intended purpose(s) and uses(s) of the assessment scores.	Intended purposes and uses of scores should match test design.
Are scores and reports useful for educators and parents to inform educational decision-making?	The Requestor must provide evidence of reports generated through the delivery of the assessment. The Requestor must provide examples of training/resources that support educators in connecting provided data with educational action. The Requestor must provide any interpretive guides (or similar materials) for educators and parents. The Requestor may provide examples of instructional resources or other tools that support differentiated instruction, if available.	Reports must provide data regarding student achievement (proficiency) of Indiana Academic Standards following each administration. Reports may provide data regarding student growth following each administration. The assessment must provide a timely analysis of student performance. Reports must be available at the student level, class level, and school level at a minimum. Strong responses support aggregation of data for subpopulations of students.
Adequacy of Evidence: ☐Pass ☐Fail Committee Comments:		

Criterion 6: Predictive Measure
The assessment provides data to predict student performance on Indiana's statewide accountability assessment. This criterion is applicable for grades 3-8 assessments only.

Note for schools: If interim assessment data is used by educators to inform instruction and remediation, interim assessments as a predictive measure should more consistently under-predict student performance. Predictive measures are highly impacted by the way that data is used in a school or corporation. Interim/formative assessment information should decrease the relationship between formative performance and summative performance because this information should be used to remediate.

Research Questions	**Evidence Required**	**Expectations for Acceptability**
Can test scores/results provide predictive measures for student performance on Indiana's ILEARN assessment for students in grades 3-8?	The Requestor must provide a formal predictive study showing how the assessment predicts student performance on ILEARN, Indiana's statewide summative assessment for grades 3-8. Predictive study results should be available to Indiana schools upon request.	The predictive study may be completed internally but must be confirmed by a third party. The study must clearly describe the intervals considered. The predictive study may indicate predictive measures for assessments taken at different times (example: 1st quarter versus 3rd quarter). Sample size (n) must be greater than or equal to 1500 and should closely represent student characteristics and distribution of characteristics across Indiana. **Preferred**: The predictive study should indicate the probability of students achieving different proficiency levels on ILEARN based on their interim assessment score. For example, students scoring 250-275 are 80% likely to achieve At Proficiency and 20% likely to achieve Approaching Proficiency on ILEARN. **Alternative:** Other research-based predictive models may be used. Assessment products without data from Indiana may use models that link available data but may NOT simply provide a linking study.
Adequacy of Evidence: ☐Pass ☐Fail Committee Comments:		

Appendix A

Indiana Academic Standards Required for Alignment of Grades Kindergarten through Two Assessments Measuring Literacy

Indiana's Formative Assessment Grant Standards required for alignment to receive approval for a kindergarten through grade 2 assessment focusing on literacy (dyslexia screener).		
Grade	**Standard**	**Language**
K	K.RF.2.1	Demonstrate understanding that print moves from left to right across the page and from top to bottom.
K	K.RF.2.2	Recognize that written words are made up of sequences of letters
K	K.RF.2.3	Recognize that words are combined to form sentences.
K	K.RF.2.4	Identify and name all uppercase (capital) and lowercase letters of the alphabet.
K	K.RF.3.1	Identify and produce rhyming words.
K	K.RF.3.2	Orally pronounce, blend, and segment words into syllables.
K	K.RF.3.3	Orally blend the onset (the initial sound) and the rime (the vowel and ending sound) in words.
K	K.RF.3.4	Tell the order of sounds heard in words with two or three phonemes, and identify the beginning, middle (medial) and final sounds.
K	K.RF.3.5	Add, delete, or substitute sounds to change one-syllable words.
K	K.RF.4.1	Use letter-sound knowledge to decode the sound of each consonant (e.g., dog = /d/ /g/; soap = /s/ /p/).
K	K.RF.4.2	Blend consonant-vowel-consonant (CVC) sounds to make words.
K	K.RF.4.3	Recognize the long and short sounds for the five major vowels.
K	K.RF.4.4	Read common high-frequency words by sight (e.g., a, my).
K	K.RF.4.5	Identify similarities and differences in words (e.g., word endings, onset and rime) when spoken or written.
K	K.RF.5	Orally read emergent-reader texts, maintaining an appropriate pace and using self-correcting strategies while reading.
K	K.W.6.2	K.W.6.2c Spelling – Spelling simple words phonetically, drawing on phonemic awareness.
Grade	**Standard**	**Language**
1	1.RF.2.1	Students are expected to build upon and continue applying concepts learned previously. K.RF.2.1 Demonstrate understanding that print moves from left to right across the page and from top to bottom.
1	1.RF.2.2	Students are expected to build upon and continue applying concepts learned previously. F.2.2 Recognize that written words are made up of sequences of letters.

1	1.RF.3.1	Produce rhyming words.
1	1.RF.3.2	Blend sounds, including consonant blends, to produce single- and multi-syllable words.
1	1.RF.3.3	Orally blend sounds in words.
1	1.RF.3.4	Distinguish beginning, middle (medial), and final sounds in single-syllable words.
1	1.RF.3.5	Segment the individual sounds in one-syllable words.
1	1.RF.4.1	Use letter-sound knowledge of single consonants (hard and soft sounds), short and long vowels, consonant blends and digraphs, vowel teams (e.g., ai) and digraphs, and r-controlled vowels to decode phonetically regular words (e.g., cat, go, black, boat, her), independent of context.
1	1.RF.4.2	Decode one-syllable words in the major syllable patterns (CVC, CVr, V, VV, VCe), independent of context.
1	1.RF.4.3	Apply knowledge of final –e and common vowel teams (vowel digraphs) for representing long vowel sounds.
1	1.RF.4.4	Recognize and read common and irregularly spelled high-frequency words by sight (e.g., have, said). Further guidance for support will be provided in the Literacy Framework.
1	1.RF.4.5	Read words in common word families (e.g., -at, -ate).
1	1.RF.4.6	Read grade appropriate root words and affixes including plurals, verb tense, comparatives (e.g., look, -ed, -ing, -s, -er, -est), and simple compound words (e.g., cupcake) and contractions (e.g., isn't).
1	1.RF.5	Orally read grade-level appropriate or higher texts smoothly and accurately, with expression that connotes comprehension at the independent level.
1	1.RV.2.4	Recognize and use frequently occurring affixes, and roots and their inflections, as clues to the meaning of an unknown word.
1	1.W.6.2	2.W.6.2c Spelling – a. Spelling unknown words phonetically, drawing on phonemic awareness and spelling conventions. b. Correctly spelling words with common spelling patterns. c. Correctly spelling common irregularly-spelled, grade-appropriate high-frequency words.
Grade	**Standard**	**Language**
2	2.RF.2.1	Students are expected to build upon and continue applying concepts learned previously. K.RF.2.1 Demonstrate understanding that print moves from left to right across the page and from top to bottom.
2	2.RF.2.2	Students are expected to build upon and continue applying concepts learned previously. K.RF.2.2 Recognize that written words are made up of sequences of letters.
2	2.RF.2.3	Students are expected to build upon and continue applying concepts learned previously. 1.RF.2.3 Recognize the components of a sentence (e.g., capitalization, first word, ending punctuation).
2	2.RF.2.4	Students are expected to build upon and continue applying concepts learned previously. 1.RF.2.4 Learn and apply knowledge of alphabetical order.
2	2.RF.3.1	Students are expected to build upon and continue applying concepts learned previously. 1.RF.3.1 Identify and produce rhyming words.
2	2.RF.3.2	Students are expected to build upon and continue applying concepts learned previously. 1.RF.3.2 Blend sounds, including consonant blends, to produce single- and multi-syllable words.

2	2.RF.3.3	Students are expected to build upon and continue applying concepts learned previously. 1.RF.3.3 Add, delete, or substitute sounds to change single-syllable words.
2	2.RF.3.4	Students are expected to build upon and continue applying concepts learned previously. 1.RF.3.4 Distinguish beginning, middle (medial), and final sounds in single-syllable words.
2	2.RF.3.5	Students are expected to build upon and continue applying concepts learned previously. 1.RF.3.5 Segment the individual sounds in one-syllable words.
2	2.RF.4.1	Students are expected to build upon and continue applying concepts learned previously. 1.RF.4.1 Use letter-sound knowledge of single consonants (hard and soft sounds), short and long vowels, consonant blends and digraphs, vowel teams (e.g., ai) and digraphs, and r-controlled vowels to decode phonetically regular words (e.g., cat, go, black, boat, her), independent of contex
2	2.RF.4.2	Use knowledge of the six major syllable patterns (CVC, CVr, V, VV, VCe, Cle) to decode two-syllable words, independent of context.
2	2.RF.4.3	Apply knowledge of short and long vowels (including vowel teams) when reading regularly spelled one-syllable words.
2	2.RF.4.4	Recognize and read common and irregularly spelled high-frequency words and abbreviations by sight (e.g., through, tough; Jan., Fri.). Further guidance for support will be provided in the Literacy Framework.
2	2.RF.4.5	Know and use common word families when reading unfamiliar words (e.g., -ale, -est, -ine, -ock). Further guidance for support will be provided in the Literacy Framework.
2	2.RF.4.6	Read multisyllabic words composed of roots, prefixes, and suffixes; read contractions, possessives (e.g., kitten's, sisters'), and compound words. Further guidance for support will be provided in the Literacy Framework
2	2.RF.5	Orally read grade-level appropriate or higher texts smoothly and accurately, with expression that connotes comprehension at the independent level.
2	2.RV.2.4	Use a known root word as a clue to the meaning of an unknown word with the same root, and identify when a common affix is added to a known word
2	2.W.6.2	2.W.6.2c Spelling – a. Correctly spelling words with short and long vowel sounds, r-controlled vowels, and consonant-blend patterns. b. Generalizing learned spelling patterns (e.g., word families) when writing words. c. Correctly spelling common irregularly-spelled grade-appropriate high frequency words.

Appendix B

Indiana Academic Standards Required for Alignment of Grades Kindergarten through Two Assessments Measuring Numeracy

Indiana's Formative Assessment Grant Standards required for alignment to receive approval for a kindergarten through grade 2 assessment focusing on numeracy.		
Grade	**Standard**	**Language**
K	K.NS.1	Count to at least 100 by ones and tens and count on by one from any number.
K	K.NS.2	Write whole numbers from zero to 20 and recognize number words from zero to 10. Represent a number of objects with a written numeral zero to 20 (with zero representing a count of no objects)
K	K.NS.3	Find the number that is one more than or one less than any whole number up to 20.
K	K.NS.4	Say the number names in standard order when counting objects, pairing each object with one and only one number name and each number name with one and only one object. Understand that the last number describes the number of objects counted and that the number of objects is the same regardless of their arrangement or the order in which they were counted.
K	K.NS.5	Count up to 20 objects arranged in a line, a rectangular array, or a circle. Count up to 10 objects in a scattered configuration. Count out the number of objects, given a number from one to 20.
K	K.NS.6	Recognize sets of one to 10 objects in patterned arrangements and tell how many without counting.
K	K.NS.7	Identify whether the number of objects in one group is greater than, less than, or equal to the number of objects in another group (e.g. by using matching and counting strategies).
K	K.NS.8	Compare the values of two numbers from 1 to 20 presented as written numerals.
K	K.NS.9	Correctly use the words for comparison, including: one and many; none, some and all; more and less; most and least; and equal to, more than and less than.
K	K.NS.10	Separate sets of 10 or fewer objects into equal groups.
K	K.NS.11	Develop initial understandings of place value and the base 10 number system by showing equivalent forms of whole numbers from 10 to 20 as groups of tens and ones using objects and drawings.
K	K.CA.1	Use objects, drawings, mental images, sounds, etc., to represent addition and subtraction within 10.
K	K.CA.2	Solve real-world problems that involve addition and subtraction within 10 (e.g., by using objects or drawings to represent the problem).
K	K.CA.3	Use objects, drawings, etc., to decompose numbers less than or equal to 10 into pairs in more than one way, and record each decomposition with a drawing or an equation (e.g., 5 = 2 + 3 and 5 = 4 + 1). [In Kindergarten, students should see equations and be encouraged to trace them, however, writing equations is not required.]
K	K.CA.4	Find the number that makes 10 when added to the given number for any number from one to nine (e.g., by using objects or drawings), and record the answer with a drawing or an equation.
K	K.CA.5	Create, extend, and give an appropriate rule for simple repeating and growing patterns with numbers and shapes.

K	K.M.1	Make direct comparisons of the length, capacity, weight, and temperature of objects, and recognize which object is shorter, longer, taller, lighter, heavier, warmer, cooler, or holds more.
K	K.M.2	Understand concepts of time, including: morning, afternoon, evening, today, yesterday, tomorrow, day, week, month, and year. Understand that clocks and calendars are tools that measure time.
Grade	**Standard**	**Language**
1	1.NS.1	Count to at least 120 by ones, fives, and tens from any given number. In this range, read and write numerals and represent a number of objects with a written numeral.
1	1.NS.2	Understand that 10 can be thought of as a group of ten ones — called a “ten." Understand that the numbers from 11 to 19 are composed of a ten and one, two, three, four, five, six, seven, eight, or nine ones. Understand that the numbers 10, 20, 30, 40, 50, 60, 70, 80, 90 refer to one, two, three, four, five, six, seven, eight, or nine tens (and 0 ones).
1	1.NS.3	Match the ordinal numbers first, second, third, etc., with an ordered set up to 10 items.
1	1.NS.4	Use place value understanding to compare two two-digit numbers based on meanings of the tens and ones digits, recording the results of comparisons with the symbols >, =, and
1	1.NS.5	Find mentally ten more or ten less than a given two-digit number without having to count, and explain the thinking process used to get the answer.
1	1.NS.6	Show equivalent forms of whole numbers as groups of tens and ones, and understand that the individual digits of a two-digit number represent amounts of tens and ones.
1	1.CA.1	Demonstrate fluency with addition facts and the corresponding subtraction facts within 20. Use strategies such as counting on; making ten (e.g., 8 + 6 = 8 + 2 + 4 = 10 + 4 = 14); decomposing a number leading to a 10 (e.g., 13 – 4 = 13 – 3 – 1 = 10 – 1 = 9); using the relationship between addition and subtraction (e.g., knowing that 8 + 4 = 12, one knows 12 – 8 = 4); and creating equivalent but easier or known sums (e.g., adding 6 + 7 by creating the known equivalent 6 + 6 + 1 = 12 + 1 = 13). Understand the role of 0 in addition and subtraction.
1	1.CA.2	Solve real-world problems involving addition and subtraction within 20 in situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all parts of the addition or subtraction problem (e.g., by using objects, drawings, and equations with a symbol for the unknown number to represent the problem).
1	1.CA.3	Create a real-world problem to represent a given equation involving addition and subtraction within 20.
1	1.CA.4	Create a real-world problem to represent a given equation involving addition and subtraction within 20.
1	1.CA.5	Add within 100, including adding a two-digit number and a one-digit number, and adding a two-digit number and a multiple of 10, using models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; describe the strategy and explain the reasoning used. Understand that in adding two-digit numbers, one adds tens and tens, ones and ones, and that sometimes it is necessary to compose a ten.
1	1.CA.6	Understand the meaning of the equal sign, and determine if equations involving addition and subtraction are true or false (e.g., Which of the following equations are true and which are false? 6 = 6, 7 = 8 – 1, 5 + 2 = 2 + 5, 4 + 1 = 5 + 2).
1	1.CA.7	Create, extend, and give an appropriate rule for number patterns using addition within 100.
1	1.M.1	Use direct comparison or a nonstandard unit to compare and order objects according to length, area, capacity, weight, and temperature.

1	1.M.2	Tell and write time to the nearest half-hour and relate time to events (before/after, shorter/longer) using analog clocks. Understand how to read hours and minutes using digital clocks.
1	1.M.3	Identify the value of a penny, nickel, dime, and a collection of pennies, nickels, and dimes.
Grade	**Standard**	**Language**
2	2.NS.1	Count by ones, twos, fives, tens, and hundreds up to at least 1,000 from any given number.
2	2.NS.2	Read and write whole numbers up to 1,000. Use words, models, standard form and expanded form to represent and show equivalent forms of whole numbers up to 1,000.
2	2.NS.3	Plot and compare whole numbers up to 1,000 on a number line.
2	2.NS.4	Match the ordinal numbers first, second, third, etc., with an ordered set up to 30 items.
2	2.NS.5	Determine whether a group of objects (up to 20) has an odd or even number of members (e.g., by placing that number of objects in two groups of the same size and recognizing that for even numbers no object will be left over and for odd numbers one object will be left over, or by pairing objects or counting them by 2s).
2	2.NS.6	Understand that the three digits of a three-digit number represent amounts of hundreds, tens, and ones (e.g., 706 equals 7 hundreds, 0 tens, and 6 ones). Understand that 100 can be thought of as a group of ten tens - called a “hundred.” Understand that the numbers 100, 200, 300, 400, 500, 600, 700, 800, 900 refer to one, two, three, four, five, six, seven, eight, or nine hundreds (and 0 tens and 0 ones).
2	2.NS.7	Use place value understanding to compare two three-digit numbers based on meanings of the hundreds, tens, and ones digits, using >, =, and < symbols to record the results of comparisons.
2	2.CA.1	Add and subtract fluently within 100.
2	2.CA.2	Solve real-world problems involving addition and subtraction within 100 in situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all parts of the addition or subtraction problem (e.g., by using drawings and equations with a symbol for the unknown number to represent the problem). Use estimation to decide whether answers are reasonable in addition problems.
2	2.CA.3	Solve real-world problems involving addition and subtraction within 100 in situations involving lengths that are given in the same units (e.g., by using drawings, such as drawings of rulers, and equations with a symbol for the unknown number to represent the problem).
2	2.CA.4	Add and subtract within 1000, using models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; describe the strategy and explain the reasoning used. Understand that in adding or subtracting three-digit numbers, one adds or subtracts hundreds and hundreds, tens and tens, ones and ones, and that sometimes it is necessary to compose or decompose tens or hundreds.
2	2.CA.5	Use addition to find the total number of objects arranged in rectangular arrays with up to 5 rows and up to 5 columns; write an equation to express the total as a sum of equal groups.

2	2.CA.6	Show that the order in which two numbers are added (commutative property) and how the numbers are grouped in addition (associative property) will not change the sum. These properties can be used to show that numbers can be added in any order.
2	2.CA.7	Create, extend, and give an appropriate rule for number patterns using addition and subtraction within 1000.
2	2.M.1	Describe the relationships among inch, foot, and yard. Describe the relationship between centimeter and meter
2	2.M.2	Estimate and measure the length of an object by selecting and using appropriate tools, such as rulers, yardsticks, meter sticks, and measuring tapes to the nearest inch, foot, yard, centimeter and meter.
2	2.M.3	Understand that the length of an object does not change regardless of the units used. Measure the length of an object twice using length units of different lengths for the two measurements. Describe how the two measurements relate to the size of the unit chosen.
2	2.M.4	Estimate and measure volume (capacity) using cups and pints.
2	2.M.5	Tell and write time to the nearest five minutes from analog clocks, using a.m. and p.m. Solve real-world problems involving addition and subtraction of time intervals on the hour or half hour.
2	2.M.6	Describe relationships of time, including: seconds in a minute; minutes in an hour; hours in a day; days in a week; and days, weeks, and months in a year.
2	2.M.7	Find the value of a collection of pennies, nickels, dimes, quarters and dollars.

Appendix C

Indiana's selected college entrance exam test blueprints, excerpted from the full blueprints and specifications published by the test vendor at this link: https://collegereadiness.collegeboard.org/pdf/test-specifications-redesigned-sat-1.pdf. Indiana does not administer the optional essay component; therefore, alignment studies are not required to include the optional Essay within the results.

Test Summary

The following tables provide a synopsis of key content dimensions of the SAT Reading Test.

SAT READING TEST CONTENT SPECIFICATIONS

	NUMBER	PERCENTAGE OF TEST
Time Allotted	65 minutes	
Passage Word Count	3,250 words total from 4 single passages and 1 pair; 500–750 words per passage or paired set	
Total Questions	52 questions	100%
Multiple Choice (4 options)		100%
Passage Based		100%
Contribution of Items to Subscores and Scores (Percentages do not add up to 100%.)		
Words in Context (Across Reading and Writing and Language Tests)	10 questions	19%
Command of Evidence (Across Reading and Writing and Language Tests)	10 questions	19%
Analysis in History/Social Studies (Across Math, Reading, and Writing and Language Tests)	21 questions (all history/social studies questions)	40%
Analysis in Science (Across Math, Reading, and Writing and Language Tests)	21 questions (all science questions)	40%
Passage Contents		
U.S. and World Literature	1 passage; 10 questions	20%
History/Social Studies	2 passages, or 1 passage and 1 pair; 10–11 questions each	40%
Science	2 passages, or 1 passage and 1 pair; 10–11 questions each	40%
Graphics		
	1–2 graphics in 1 History/Social Studies and in 1 Science passage	
Text and Graphical Complexity		
Text Complexity	A specified range from grades 9–10 to postsecondary entry across 4 passages and 1 pair	
Graphical Data Representations (tables, graphs, charts, etc.)	Somewhat challenging to challenging (moderate to moderately high data density, few to several variables, moderately challenging to moderately complex interactions)	

SAT READING DOMAIN

Content Dimension	Description
Text Complexity	The passages/pair on the SAT Reading Test represent a specified range of text complexities from grades 9–10 to postsecondary entry.
Information and Ideas	These questions focus on the informational content of text.
Reading closely	These questions focus on the explicit and implicit meaning of text and on extrapolating beyond the information and ideas in a 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.
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).
Interpreting words and phrases in context	The student will determine the meaning of words and phrases in context.
Rhetoric	These questions focus on the rhetorical analysis of 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 text structure	These questions focus on the overall structure of a text and on the relationship between a particular part of a text and the whole text.
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).
Analyzing arguments	These questions focus on analyzing arguments for their content and structure.
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.
Synthesis	These questions focus on synthesizing multiple sources of information.
Analyzing multiple texts	The student will synthesize information and ideas from paired texts. (Note: All of the skills listed above may be tested with either single or paired passages.)
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.

Test Summary

The following tables provide a synopsis of key content dimensions of the Writing and Language Test.

SAT WRITING AND LANGUAGE TEST CONTENT SPECIFICATIONS		
	NUMBER	**PERCENTAGE OF TEST**
Time Allotted	35 minutes	
Passage Word Count	1700 words total from 4 passages; 400–450 words per passage	
Total Questions	44 questions	100%
Multiple Choice (4 options)		100%
Passage Based		100%
Contribution of Items to Subscores and Scores (Percentages do not add up to 100%.)		
Expression of Ideas	24 questions	55%
Standard English Conventions	20 questions	45%
Words in Context (Across Reading and Writing and Language Tests)	8 questions (2 questions per passage)	18%
Command of Evidence (Across Reading and Writing and Language Tests)	8 questions (2 questions per passage)	18%
Analysis in History/Social Studies (Across Math, Reading, and Writing and Language Tests)	6 questions (all Expression of Ideas questions in history/social studies)	14%
Analysis in Science (Across Math, Reading, and Writing and Language Tests)	6 questions (all Expression of Ideas questions in science)	14%
Passage Contents		
Careers	1 passage; 11 questions	25%
History/Social Studies	1 passage; 11 questions	25%
Humanities	1 passage; 11 questions	25%
Science	1 passage; 11 questions	25%
Graphics		
	1 or more graphics in 1 or more sets of questions	
Text Types		
Argument	1–2 passages	25%–50%
Informative/Explanatory Text	1–2 passages	25%–50%
Nonfiction Narrative	1 passage	25%
Text and Graphical Complexity		
Text Complexity	A specified range from grades 9–10 to postsecondary entry across 4 passages	
Graphical Data Representations (tables, charts, graphs, etc.)	Basic to somewhat challenging (low to moderate data density, few variables, simple to moderately challenging interactions)	

SAT WRITING AND LANGUAGE DOMAIN	
Content Dimension	**Description**
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	These questions focus on revision of text for topic development, accuracy (consistency between text and graphic[s]), logic, cohesion, and rhetorically effective use of language.
Development	These questions focus on revising text in relation to rhetorical purpose. (Prior knowledge of the topic is not assessed, though consistency of the material within a passage may be.)
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.
Organization	These questions focus on revision of text to improve the logic and cohesion of text at the sentence, paragraph, and whole-text levels.
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 and to ensure that transition words, phrases, or sentences are used effectively to connect information and ideas.
Effective language use	These questions focus on revision of text to improve the use of language to accomplish particular rhetorical purposes.
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.
Standard English Conventions	These questions focus on editing text to ensure conformity to the conventions of Standard Written English sentence structure, usage, and punctuation.
Sentence structure	These questions focus on editing text to correct problems in sentence formation and inappropriate shifts in construction within and between sentences.
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).

SAT WRITING AND LANGUAGE DOMAIN	
Content Dimension	**Description**
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 person and number	The student will recognize and correct inappropriate shifts in pronoun person and number within and between sentences.
Conventions of Usage	These questions focus on editing text to ensure conformity to the conventions of Standard Written English usage.
Pronouns	These questions focus on the proper use of pronouns.
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.
Agreement	These questions focus on ensuring grammatical agreement.
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.
Conventions of Punctuation	These questions focus on editing text to ensure conformity to the conventions of Standard Written English punctuation.
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.

Test Summary

The following table summarizes the key content dimensions of the redesigned SAT's Math Test.

SAT MATH TEST CONTENT SPECIFICATIONS		
Time Allotted	80 minutes	
Calculator Portion (38 questions)	55 minutes	
No-Calculator Portion (20 questions)	25 minutes	
	NUMBER	PERCENTAGE OF TEST
Total Items	58 questions	100%
Multiple Choice (MC, 4 options)	45 questions	78%
Student-Produced Response (SPR — grid-in)	13 questions	22%
Contribution of Items to Subscores		
Heart of Algebra	19 questions	33%
Analyzing and fluently solving linear equations and systems of linear equations		
Creating linear equations and inequalities to represent relationships between quantities and to solve problems		
Understanding and using the relationship between linear equations and inequalities and their graphs to solve problems		
Problem Solving and Data Analysis	17 questions	29%
Creating and analyzing relationships using ratios, proportional relationships, percentages, and units		
Representing and analyzing quantitative data		
Finding and applying probabilities in context		
Passport to Advanced Math	16 questions	28%
Identifying and creating equivalent algebraic expressions		
Creating, analyzing, and fluently solving quadratic and other nonlinear equations		

SAT MATH TEST CONTENT SPECIFICATIONS

Creating, using, and graphing exponential, quadratic, and other nonlinear functions		
Additional Topics in Math*	6 questions	10%
Solving problems related to area and volume		
Applying definitions and theorems related to lines, angles, triangles, and circles		
Working with right triangles, the unit circle, and trigonometric functions		
Contribution of Items to Cross-Test Scores		
Analysis in Science	8 questions	14%
Analysis in History/Social Studies	8 questions	14%

*Questions under Additional Topics in Math contribute to the total Math Test score but do not contribute to a subscore within the Math Test.

CALCULATOR PORTION

	Number of Questions	% of Test
Total Questions	**38**	**100%**
Multiple Choice (MC)	30	79%
Student-Produced Response (SPR — grid-in)	8	21%
Content Categories	**38**	**100%**
Heart of Algebra	11	29%
Problem Solving and Data Analysis	17	45%
Passport to Advanced Math	7	18%
Additional Topics in Math	3	8%
Time Allocated	55 minutes	

NO-CALCULATOR PORTION

	Number of Questions	% of Test
Total Questions	**20**	**100%**
Multiple Choice (MC)	15	75%
Student-Produced Response (SPR — grid-in)	5	25%
Content Categories	**20**	**100%**
Heart of Algebra	8	40%
Passport to Advanced Math	9	45%
Additional Topics in Math	3	15%
Time Allocated	25 minutes	

HEART OF ALGEBRA: LINEAR EQUATIONS AND FUNCTIONS

SAT HEART OF ALGEBRA DOMAIN	
Content Dimension	**Description**
Linear equations in one variable	1. Create and use linear equations in one variable to solve problems in a variety of contexts. 2. Create a linear equation in one variable, and when in context interpret solutions in terms of the context. 3. Solve a linear equation in one variable, making strategic use of algebraic structure. 4. For a linear equation in one variable, a. interpret a constant, variable, factor, or term in a context; b. determine the conditions under which the equation has no solution, a unique solution, or infinitely many solutions. 5. Fluently solve a linear equation in one variable.
Linear functions	Algebraically, a linear function can be defined by a linear expression in one variable or by a linear equation in two variables. In the first case, the variable is the input and the value of the expression is the output. In the second case, one of the variables is designated as the input and determines a unique value of the other variable, which is the output. 1. Create and use linear functions to solve problems in a variety of contexts. 2. Create a linear function to model a relationship between two quantities. 3. 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. 4. 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. 5. Write the rule for a linear function given two input/output pairs or one input/output pair and the rate of change.
Linear equations in two variables	A linear equation in two variables can be used to represent a constraint or condition on two-variable quantities in situations where neither of the variables is regarded as an input or an output. A linear equation can also be used to represent a straight line in the coordinate plane. 1. Create and use a linear equation in two variables to solve problems in a variety of contexts. 2. Create a linear equation in two variables to model a constraint or condition on two quantities. 3. For a linear equation in two variables that represents a context, a. interpret a solution, constant, variable, factor, or term based on the context, including situations where seeing structure provides an advantage; b. given a value of one quantity in the relationship, find a value of the other, if it exists. 4. Make connections between tabular, algebraic, and graphical representations of a linear equation in two variables by a. deriving one representation from the other; b. identifying features of one representation given the other representation; c. determining how a graph is affected by a change to its equation. 5. 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.

SAT HEART OF ALGEBRA DOMAIN	
Content Dimension	**Description**
Systems of two linear equations in two variables	1. Create and use a system of two linear equations in two variables to solve problems in a variety of contexts. 2. Create a system of linear equations in two variables, and when in context interpret solutions in terms of the context. 3. Make connections between tabular, algebraic, and graphical representations of the system by deriving one representation from the other. 4. Solve a system of two linear equations in two variables, making strategic use of algebraic structure. 5. For a system of linear equations in two variables, a. interpret a solution, constant, variable, factor, or term based on the context, including situations where seeing structure provides an advantage; b. determine the conditions under which the system has no solution, a unique solution, or infinitely many solutions. 6. Fluently solve a system of linear equations in two variables.
Linear inequalities in one or two variables	1. Create and use linear inequalities in one or two variables to solve problems in a variety of contexts. 2. Create linear inequalities in one or two variables, and when in context interpret the solutions in terms of the context. 3. For linear inequalities in one or two variables, interpret a constant, variable, factor, or term, including situations where seeing structure provides an advantage. 4. Make connections between tabular, algebraic, and graphical representations of linear inequalities in one or two variables by deriving one from the other. 5. Given a linear inequality or system of linear inequalities, interpret a point in the solution set.

PROBLEM SOLVING AND DATA ANALYSIS: PROPORTIONAL RELATIONSHIPS, PERCENTAGES, COMPLEX MEASUREMENTS, AND DATA INTERPRETATION AND SYNTHESIS

SAT PROBLEM SOLVING AND DATA ANALYSIS DOMAIN	
Content Dimension	**Description**
Ratios, rates, proportional relationships, and units	Items will require 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. 1. 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. 2. Solve problems involving a. derived units, including those that arise from products (e.g., kilowatt-hours) and quotients (e.g., population per square kilometer); b. unit conversion, including currency exchange and conversion between different measurement systems. 3. 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.
Percentages	1. 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. 2. 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%.
One-variable data: distributions and measures of center and spread	1. Choose an appropriate graphical representation for a given data set. 2. Interpret information from a given representation of data in context. 3. Analyze and interpret numerical data distributions represented with frequency tables, histograms, dot plots, and boxplots. 4. For quantitative variables, calculate, compare, and interpret mean, median, and range. Interpret (but don't calculate) standard deviation. 5. 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. 6. Understand and describe the effect of outliers on mean and median. 7. Given an appropriate data set, calculate the mean.
Two-variable data: models and scatterplots	1. Using a model that fits the data in a scatterplot, compare values predicted by the model to values given in the data set. 2. Interpret the slope and intercepts of the line of best fit in context. 3. Given a relationship between two quantities, read and interpret graphs and tables modeling the relationship. 4. Analyze and interpret data represented in a scatterplot or line graph; fit linear, quadratic, and exponential models. 5. Select a graph that represents a context, identify a value on a graph, or interpret information on the graph. 6. For a given function type (linear, quadratic, exponential), choose the function of that type that best fits given data. 7. Compare linear and exponential growth. 8. Estimate the line of best fit for a given scatterplot; use the line to make predictions.

SAT PROBLEM SOLVING AND DATA ANALYSIS DOMAIN	
Content Dimension	**Description**
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. 1. Compute and interpret probability and conditional probability in simple contexts. 2. Understand formulas for probability and conditional probability in terms of frequency.
Inference from sample statistics and margin of error	1. Use sample mean and sample proportion to estimate population mean and population proportion. Utilize, but do not calculate, margin of error. 2. Interpret margin of error; understand that a larger sample size generally leads to a smaller margin of error.
Evaluating statistical claims: observational studies and experiments	1. With random samples, describe which population the results can be extended to. 2. Given a description of a study with or without random assignment, determine whether there is evidence for a causal relationship. 3. Understand why random assignment provides evidence for a causal relationship. 4. Understand why a result can be extended only to the population from which the sample was selected.

PASSPORT TO ADVANCED MATH: ANALYZING ADVANCED EXPRESSIONS

SAT PASSPORT TO ADVANCED MATH DOMAIN	
Content Dimension	**Description**
Equivalent expressions	1. Make strategic use of algebraic structure and the properties of operations to identify and create equivalent expressions, including a. rewriting simple rational expressions; b. rewriting expressions with rational exponents and radicals; c. factoring polynomials. 2. Fluently add, subtract, and multiply polynomials.
Nonlinear equations in one variable and systems of equations in two variables	1. Make strategic use of algebraic structure, the properties of operations, and reasoning about equality to a. 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, one real solution, or two real solutions; b. solve simple rational and radical equations in one variable; c. 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); d. solve polynomial equations in one variable that are written in factored form; e. solve linear absolute value equations in one variable; f. solve systems of linear and nonlinear equations in two variables, including relating the solutions to the graphs of the equations in the system. 2. 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. 3. 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. 4. 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.

SAT PASSPORT TO ADVANCED MATH DOMAIN	
Content Dimension	**Description**
Nonlinear functions	1. Create and use quadratic or exponential functions to solve problems in a variety of contexts. 2. For a quadratic or exponential function, a. identify or create an appropriate function to model a relationship between quantities; b. use function notation to represent and interpret input/output pairs in terms of a context and points on the graph; c. 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; d. 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; e. 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 another representation, including maximum and minimum values of the function; iii. determining how a graph is affected by a change to its equation, including a vertical shift or scaling of the graph. 3. For a factorable or factored polynomial or simple rational function, a. use function notation to represent and interpret input/output pairs in terms of a context and points on the graph; b. 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; c. identify the graph given an algebraic representation of the function and an algebraic representation given the graph (with or without a context).

ADDITIONAL TOPICS IN MATH

SAT ADDITIONAL TOPICS IN MATH DOMAIN	
Content Dimension	**Description**
Area and volume	1. 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. a. 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. b. Demonstrate procedural fluency by selecting the correct area or volume formula and correctly calculating a specified value.
Lines, angles, and triangles	1. Use concepts and theorems relating to congruence and similarity of triangles to solve problems. 2. Determine which statements may be required to prove certain relationships or to satisfy a given theorem. 3. Apply knowledge that changing by a scale factor of k changes all lengths by a factor of k, but angle measures remain unchanged. 4. Know and directly apply relevant theorems such as a. the vertical angle theorem; b. triangle similarity and congruence criteria; c. triangle angle sum theorem; d. the relationship of angles formed when a transversal cuts parallel lines.
Right triangles and trigonometry	1. Solve problems in a variety of contexts using a. the Pythagorean theorem; b. right triangle trigonometry; c. properties of special right triangles. 2. Use similarity to calculate values of sine, cosine, and tangent. 3. Understand that when given one side length and one acute angle measure in a right triangle, the remaining values can be determined. 4. Solve problems using the relationship between sine and cosine of complementary angles. 5. Fluently apply properties of special right triangles to determine side lengths and calculate trigonometric ratios of 30, 45, and 60 degrees.
Circles	1. 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. 2. Solve problems using a. radian measure; b. trigonometric ratios in the unit circle. 3. Create an equation to represent a circle in the xy-plane. 4. Describe how a. a change to the equation representing a circle in the xy-plane affects the graph of the circle; b. a change in the graph of the circle affects the equation of the circle. 5. Understand that the ordered pairs that satisfy an equation of the form $(x - h)^2 + (y - k)^2 = r^2$ form a circle when plotted in the xy-plane. 6. Convert between angle measures in degrees and radians. 7. 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.
Complex numbers	1. Apply knowledge and understanding of the complex number system to add, subtract, multiply, and divide with complex numbers and solve problems.