CollegeBoard

College Board SAT® Suite of Assessments Webinar

Math Domains Webinar

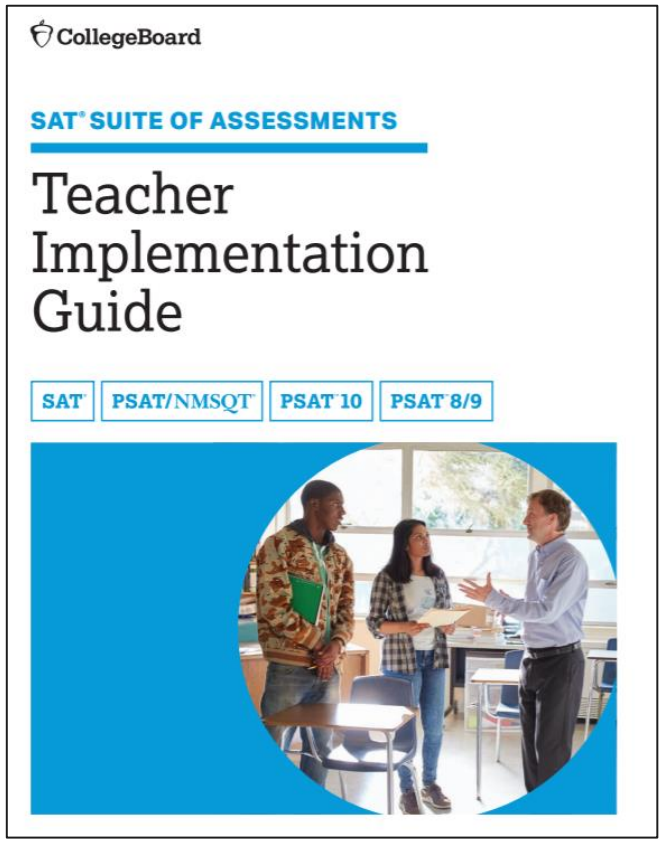
February 1-5, 2021

Agenda

Here's what we'll cover today:

- Math Subscores on the SAT® Suite of Assessments
- Skill Progression
- SAT® Suite Question Bank
- Instructional Strategies for the Math Test

Essential Prerequisites for College and Career Readiness

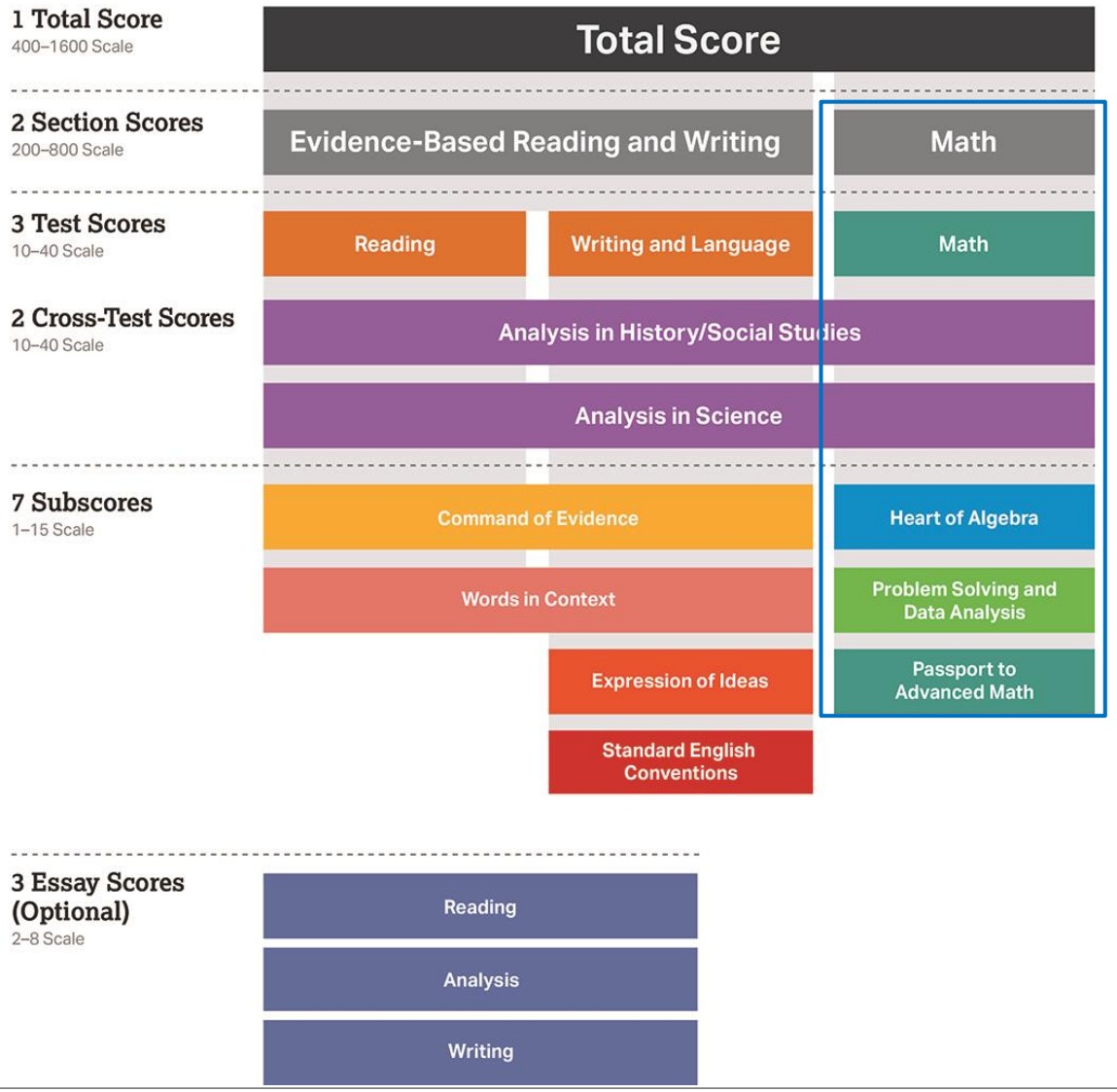


The College Board has concluded that students must be able to

- read, analyze, and use reasoning to comprehend challenging literary and informational texts, including texts about science and history/social studies topics, to demonstrate and expand their knowledge and understanding;
- revise and edit extended texts across a range of academic and career-related subjects for expression of ideas and show facility with a core set of grammar, usage, and punctuation conventions;
- show command of a focused but powerful set of knowledge, skills, and understandings in math and solve problems situated in science, social studies, and career-related contexts;
- make careful and deliberate use of evidence as they read and write;
- demonstrate skill in analyzing data, including data represented graphically in tables, graphs, charts, and the like, in reading, writing, and math contexts; and
- reveal an understanding of words in context and how word choice helps shape meaning and tone.

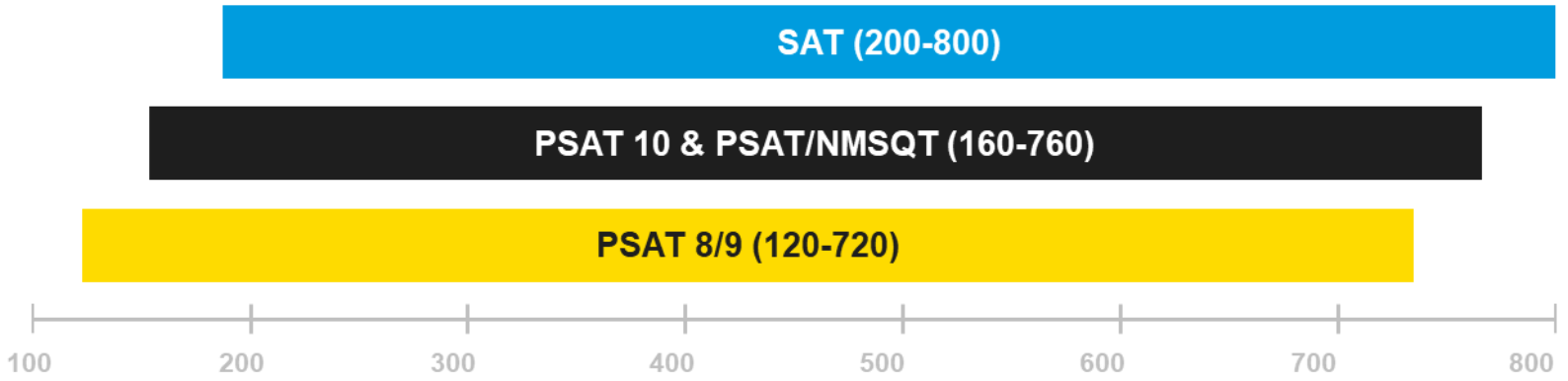
https://collegereadiness.collegeboard.org/pdf/redesigned-sat-k12-teacher-implementation-guide.pdf

Understanding SAT® Scores

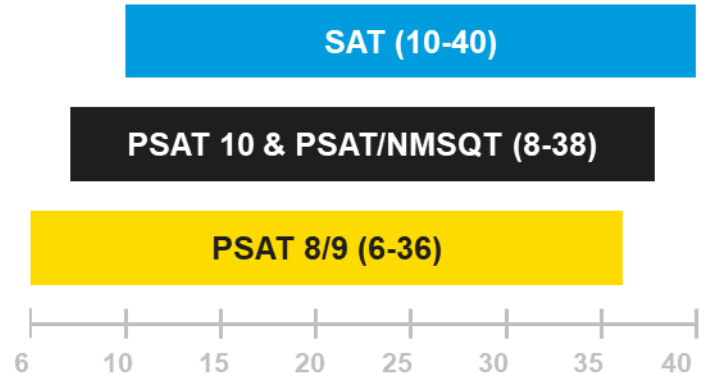


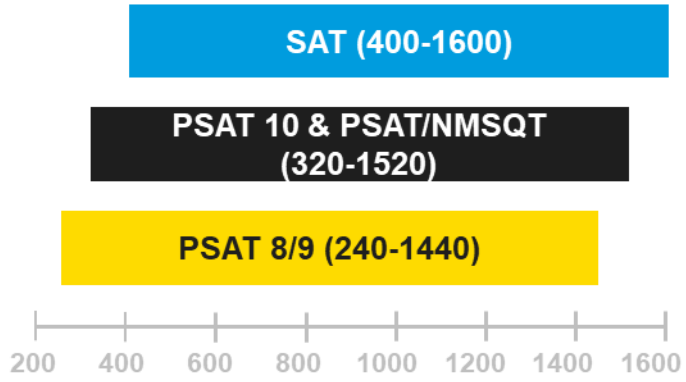
Monitor Progress Over Time

Section Scores are placed on a vertical scale.



The same concept holds true for the **Test, Cross-Test Scores,** and **Total Score**.





Math That Matters Most

Students will engage in three key areas that contribute most to college readiness:

- Problem solving and data analysis
- Mastery of linear equations and systems
- Manipulation of more complex equations

SAT® Math Test Features

Calculator/No-Calculator portions

Focus on application, conceptual understanding, and procedural skill and fluency

Multiple question types

Multistep problems

Question sets

Math Test Information

The overall aim of the SAT® Math Test is to assess fluency with, understanding of, and ability to apply the mathematical concepts that are most strongly prerequisite for and useful across a wide range of college majors and careers.

Total Questions on the SAT® Math Test: 58 questions

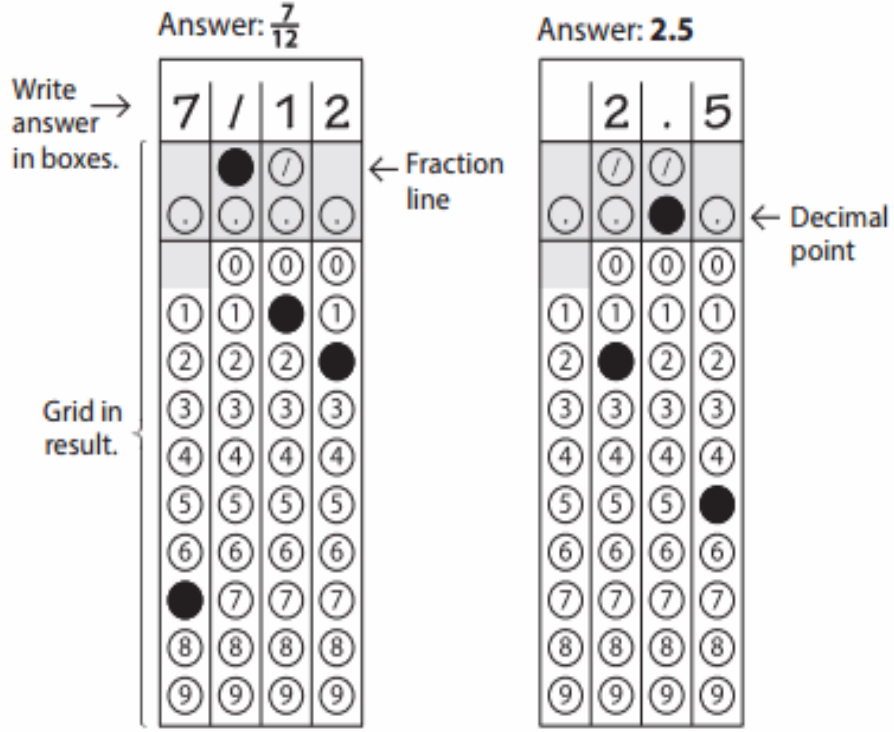
- Multiple Choice (45 questions)
- Student-Produced Response (13 questions)

Calculator and No-Calculator Portions

- The Calculator portion
  - gives insight into students' capacity to use appropriate tools strategically.
  - includes more complex modeling and reasoning questions.
  - includes questions in which the calculator could be a deterrent to expedience.
  - allows students to use handheld or built-in calculator tool.
- The No-Calculator portion
  - allows the SAT® Suite to assess fluencies valued by postsecondary instructors and includes conceptual questions for which a calculator will not be helpful.

Student-Produced Response Questions

- The answer to each student-produced response question is a number (fraction, decimal, or positive integer) that will be entered on the answer sheet into a grid.
- Students may also enter a fraction line or a decimal point.

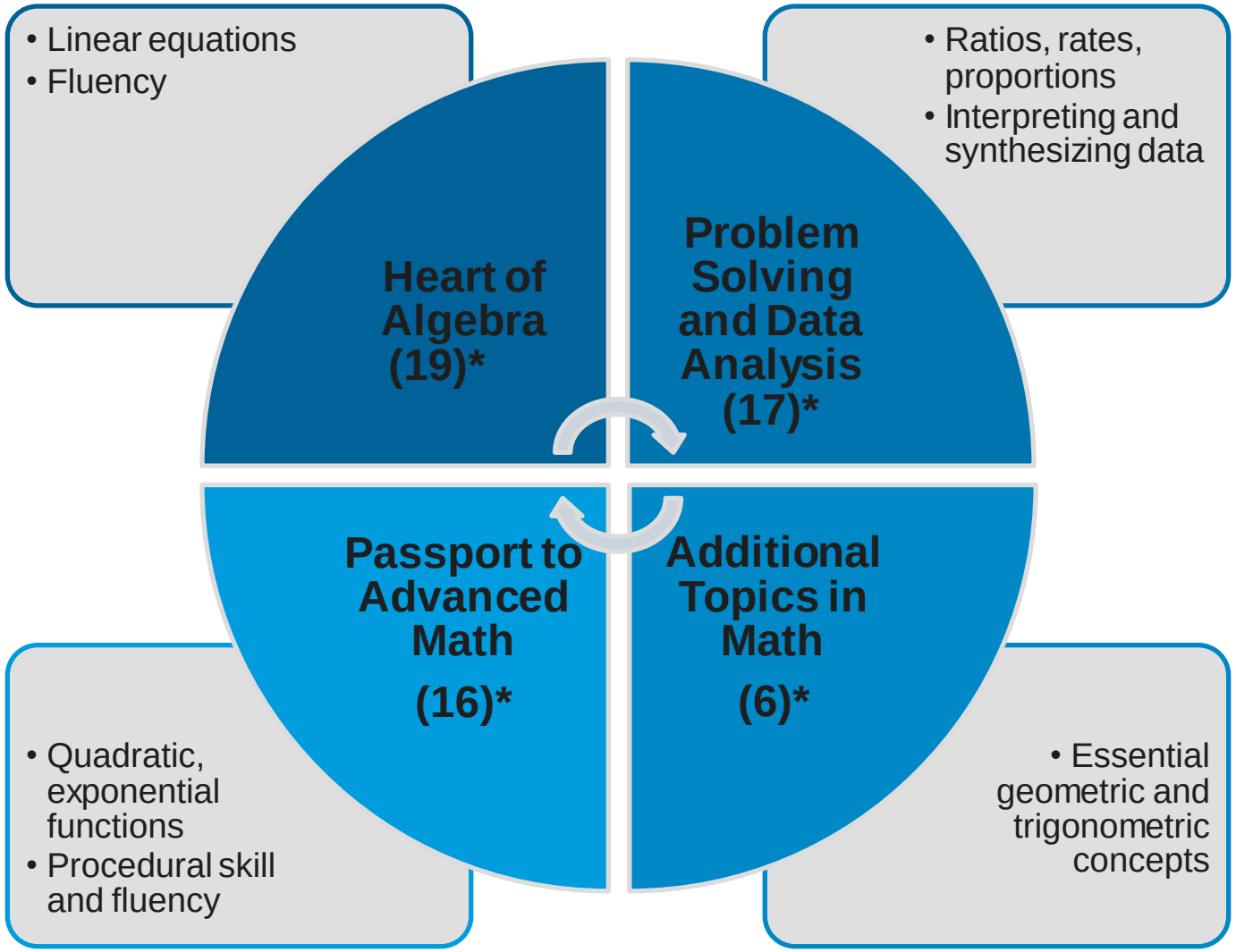


Math Test High-Level Blueprint

Question Types	SAT	PSAT 10	PSAT 8/9
Total Questions	58	48	38
Multiple Choice	45	40	31
Student-Produced Response	13	8	7
Contribution of Questions to Subscores			
Heart of Algebra	19	16	16
Problem Solving and Data Analysis	17	16	16
Passport to Advanced Math	16	14	6
Additional Topics in Math*	6	2	0
Contribution of Questions to Cross-Test Scores			
Analysis in Science	8	7	6
Analysis in History/Social Studies	8	7	6

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

Math Test Domains



* *Represents the number of questions in this domain*

Heart of Algebra

What is Heart of Algebra?

Algebra is the language of high school mathematics.

The Heart of Algebra domain includes the following:

- Analyzing and fluently solving equations and systems of equations
- Creating expressions, equations, and inequalities to represent relationships between quantities and to solve problems
- Rearranging and interpreting formulas

Heart of Algebra (Calculator)

When a scientist dives in salt water to a depth of 9 feet below the surface, the pressure due to the atmosphere and surrounding water is 18.7 pounds per square inch. As the scientist descends, the pressure increases linearly. At a depth of 14 feet, the pressure is 20.9 pounds per square inch. If the pressure increases at a constant rate as the scientist's depth below the surface increases, which of the following linear models best describes the pressure p in pounds per square inch at a depth of d feet below the surface?

A) $p = 0.44d + 0.77$

B) $p = 0.44d + 14.74$

C) $p = 2.2d - 1.1$

D) $p = 2.2d - 9.9$

Heart of Algebra: Answer Explanation

Choice B is correct. To determine the linear model, one can first determine the rate at which the pressure due to the atmosphere and surrounding water is increasing as the depth of the diver increases. Calculating this gives

$$\frac{20.9 - 18.7}{14.9} = \frac{2.2}{5} = 0.44$$

Then one needs to determine the pressure due to the atmosphere; that is, the pressure when the diver is at a depth of 0. Solving the equation $18.7 = 0.44 (9) + b$ gives $b = 14.74$. Therefore, the model that can be used to relate the pressure and the depth is $p = 0.44 d + 14.74$.

Problem Solving and Data Analysis

What Is Problem Solving and Data Analysis?

- Quantitative Reasoning
- Analysis of Data
  - Ratios
  - Percentages
  - Proportional reasoning

In Problem Solving and Data Analysis, students will encounter an important feature of the SAT® Suite of Assessments: **multipart questions.**

- Students can do more sustained thinking and explore situations in greater depth if asked more than one question about a given scenario.
- Students will generally see longer problems in their postsecondary work.
- Students will be asked to describe relationships shown graphically.

Problem Solving and Data Analysis: Sample Question (Calculator)

A typical image taken of the surface of Mars by a camera is 11.2 gigabits in size. A tracking station on Earth can receive data from the spacecraft at a data rate of 3 megabits per second for a maximum of 11 hours each day. If 1 gigabit equals 1,024 megabits, what is the maximum number of typical images that the tracking station could receive from the camera each day?

A) 3

B) 10

C) 56

D) 144

Problem Solving and Data Analysis: Answer Explanation

Choice B is correct. The tracking station can receive 118,800 megabits each day $\left(\frac{3\text{ megabits}}{1\text{second}} \times \frac{60\text{seconds}}{1\text{minute}} \times \frac{60\text{minutes}}{1\text{hour}} \times 11\text{hours}\right)$, which is about 116 gigabits each day $\left(\frac{118,800}{1,024}\right)$.

If each image is 11.2 gigabits, then the number of images that can be received each day is $\frac{116}{11.2} \approx 10.4$. Since the question asks for the maximum number of typical images, rounding the answer down to 10 is appropriate because the tracking station will not receive a complete 11^{th} image in one day.

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Passport to Advanced Math

What is Passport to Advanced Math?

Problems in Passport to Advanced Math will cover topics that have great relevance and utility for college and career work:

- Understanding the structure of expressions
- Analyzing, manipulating, and rewriting expressions
- Reasoning with more complex equations
- Interpreting and building functions

Students will

- create and solve quadratic and exponential problems.
- create and solve radical and rational equations.
- solve systems of equations.
- understand the relationship between zeros and factors of polynomials.

Passport to Advanced Math: Sample Question

The function f is defined by $f(x) = 2x^3 + 3x^2 + cx + 8$, where c is a constant. In the xy-plane, the graph of f intersects the x-axis at the three points $(-4, 0)$, $(\frac{1}{2}, 0)$, and $(p, 0)$. What is the value of c?

A) –18

B) –2

C) 2

D) 10

Passport to Advanced Math: Answer Explanation

Choice A is correct. The given zeros can be used to set up an equation to solve for c. Substituting -4 for x and 0 for y yields $-4c = 72$, or $c = -18$.

Alternatively, since -4, $\frac{1}{2}$, and p are zeros of the polynomial function

$f(x) = 2x^3 + 3x^2 + cx + 8$, it follows that $f(x) = (2x - 1)(x + 4)(x - p)$.

Were this polynomial multiplied out, the constant term would be

$(-1)(4)(-p) = 4p$. (We can see this without performing the full expansion.)

Since it is given that this value is 8, it follows that $4p = 8$ or rather, $p = 2$. Substituting 2 for p in the polynomial function yields

$f(x) = (2x - 1)(x + 4)(x - 2)$, and after multiplying the factors, one finds that the coefficient of the x term, or the value of c, is -18.

Additional Topics in Math

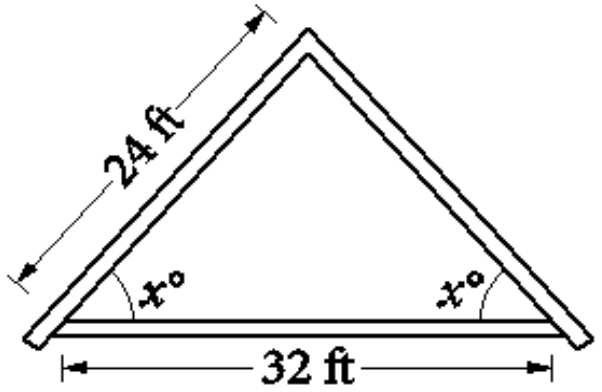
What is Additional Topics in Math?

The SAT® will require the geometric and trigonometric knowledge most relevant to postsecondary education and careers:

- **Geometry**
  - Analysis
  - Problem solving
- **Trigonometry**
  - Sine
  - Cosine
  - Tangent
- **Pythagorean Theorem**

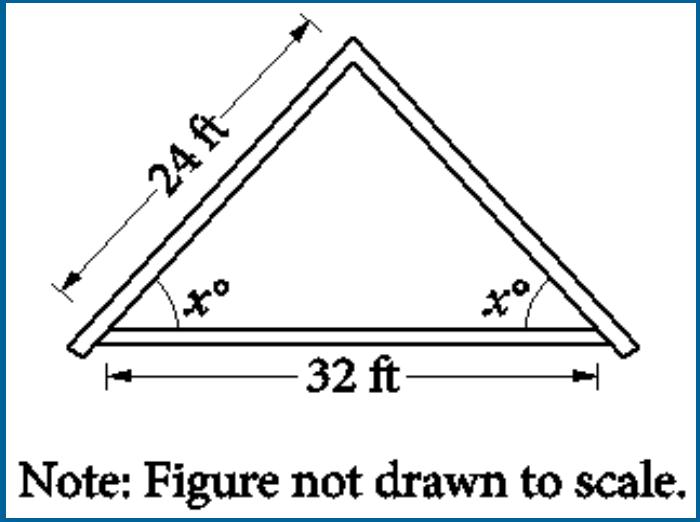
Additional Topics in Math: Sample Question (Calculator)

An architect drew the sketch below while designing a house roof. The dimensions shown are for the interior of the triangle.



Note: Figure not drawn to scale.

What is the value of cos x?

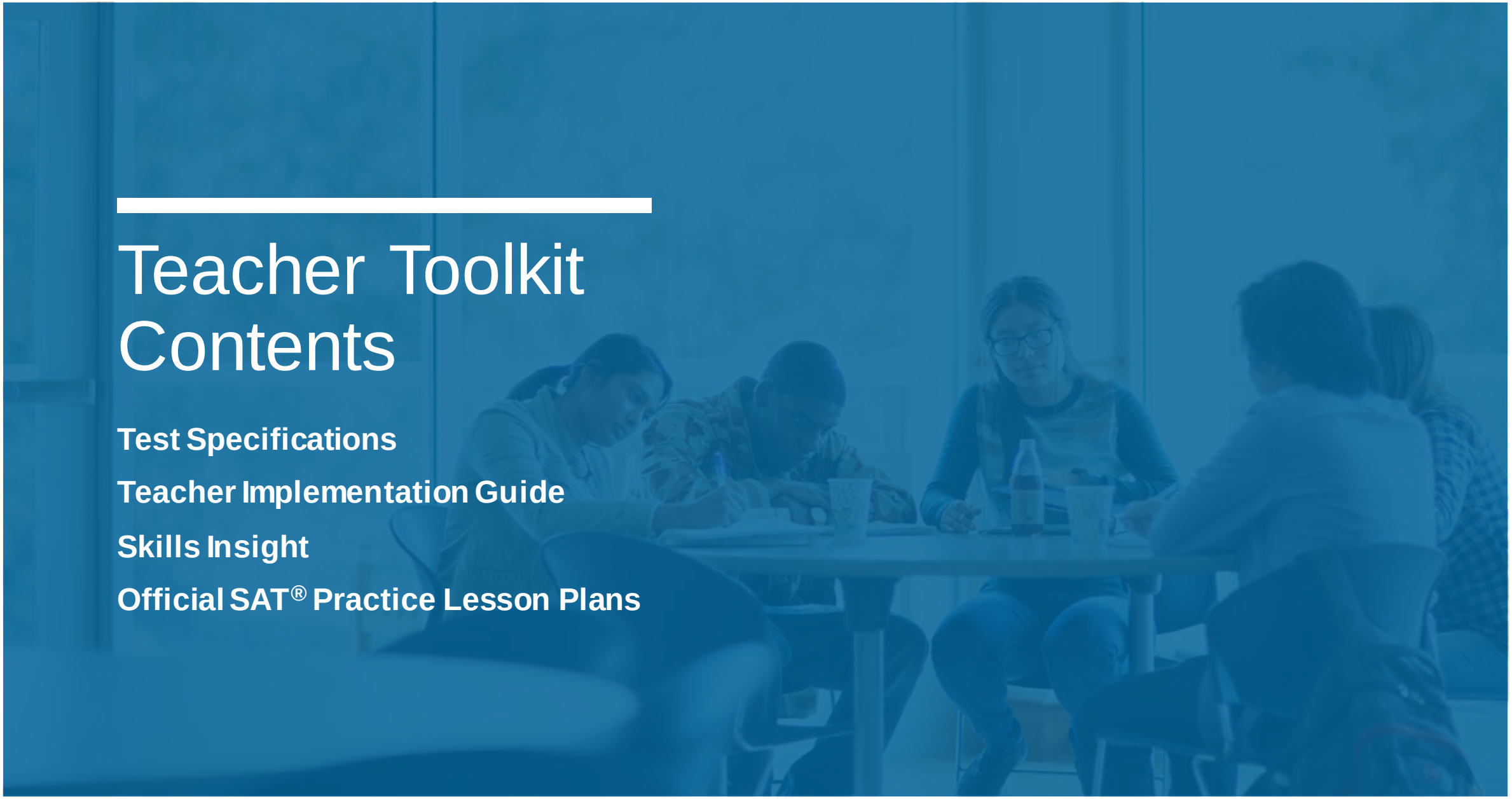


Additional Topics in Math: Answer Explanation

What is the value of cos *x*?

This problem requires students to make use of properties of triangles to solve a problem.

Because the triangle is isosceles, constructing a perpendicular line from the top vertex to the opposite side will bisect the base and create two smaller right triangles. In a right triangle, the cosine of an acute angle is equal to the length of the side adjacent to the angle divided by the length of the hypotenuse. This gives $\cos x = \frac{16}{24}$, which can be simplified to $\cos x = \frac{2}{3}$.



Teacher Toolkit Contents

Test Specifications

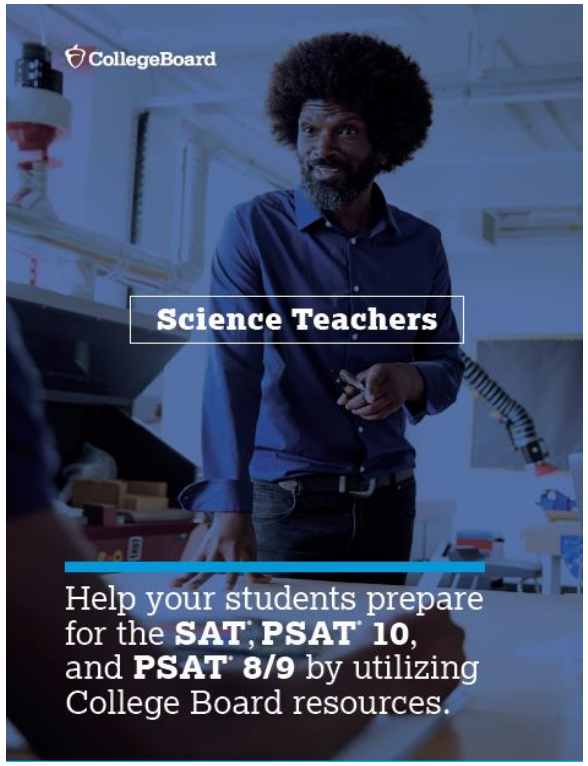
Teacher Implementation Guide

Skills Insight

Official SAT® Practice Lesson Plans

The Teacher Toolkit

https://www.isbe.net/Pages/sat-psat.aspx



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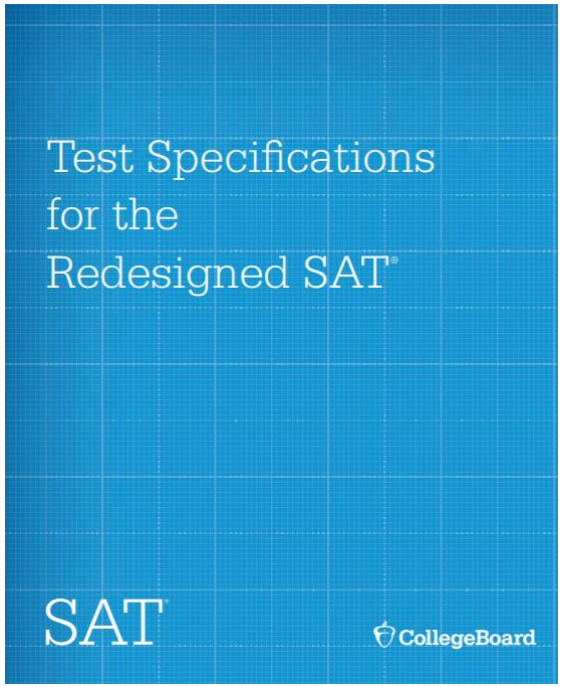
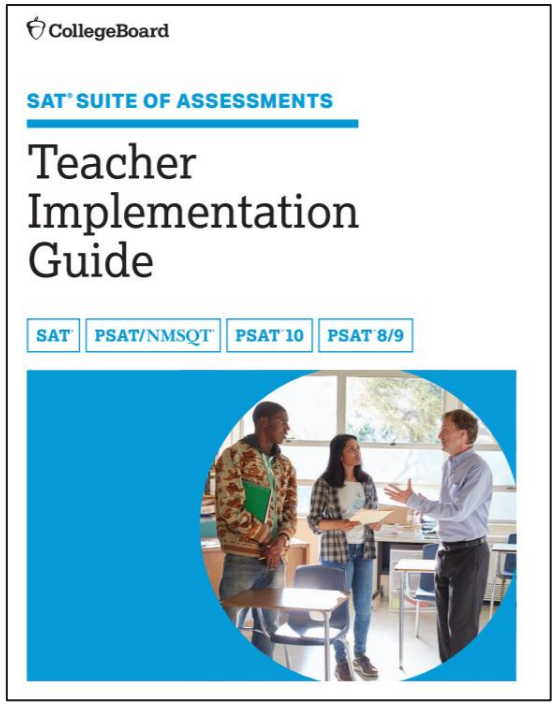
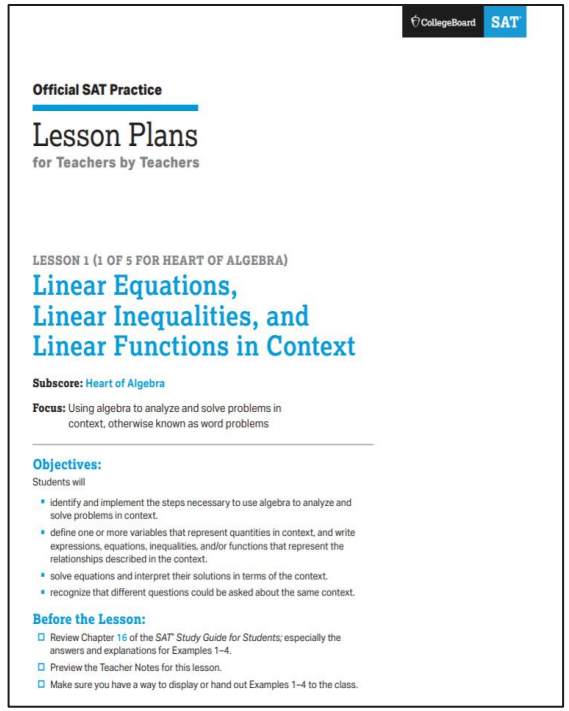


Test Specifications for the SAT



Teacher Implementation Guide

Skills Insight



Official SAT Practice Lesson Plans

Curriculum Review Worksheets

https://www.isbe.net/Pages/sat-psat.aspx

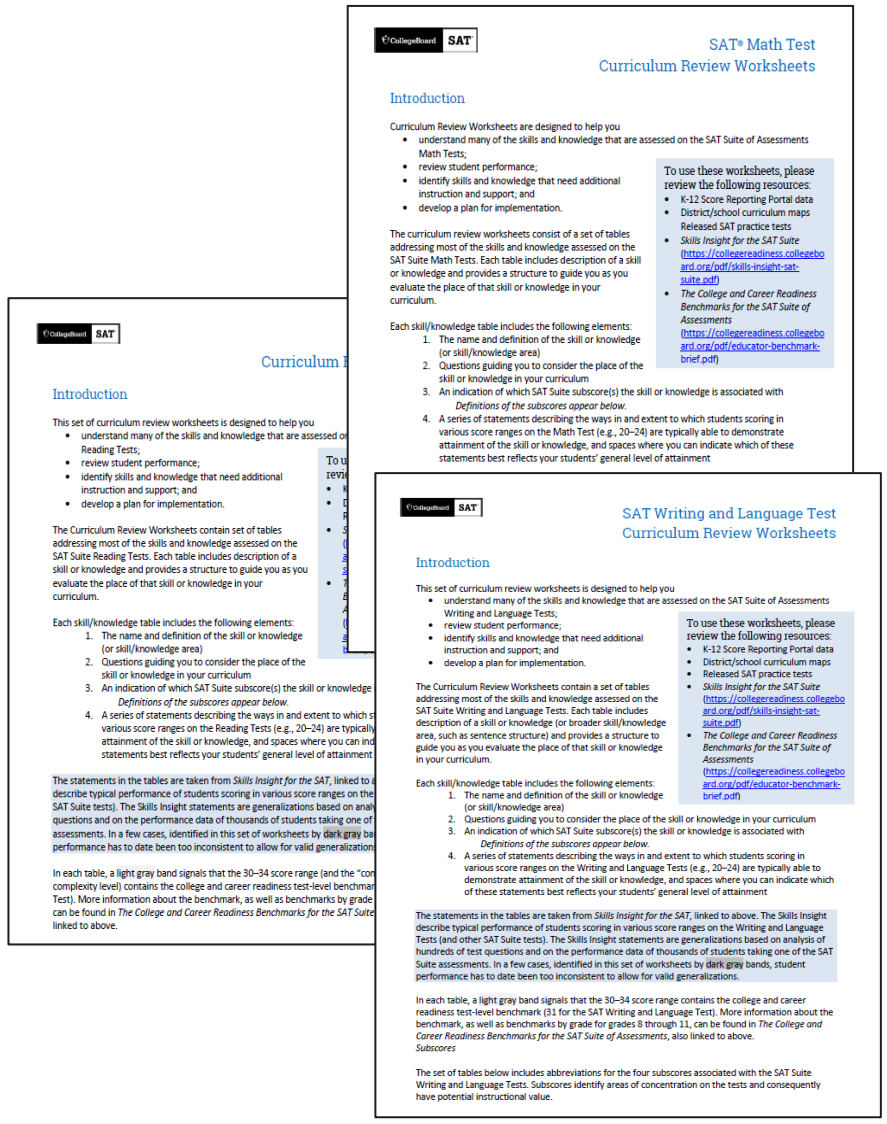
The Curriculum Review Worksheets are designed to help teachers

- understand many of the skills and knowledge that are assessed on the PSAT™ 8/9, PSAT™ 10, and SAT®;
- review student performance;
- identify skills and knowledge that need additional instruction and support; and
- develop a plan for implementation.

The Curriculum Review Worksheets contain sets of tables addressing most of the skills and knowledge assessed on the PSAT™ 8/9, PSAT™ 10, and SAT® (Reading, Writing and Language, and Math Tests).

Each table includes a description of a skill or knowledge and provides a structure to guide educators to evaluate the placement of that skill or knowledge within the curriculum.

To request the full version of the curriculum worksheets for Reading, Writing and Language, and Math, please email ILSAT@collegeboard.org.



Math Folder

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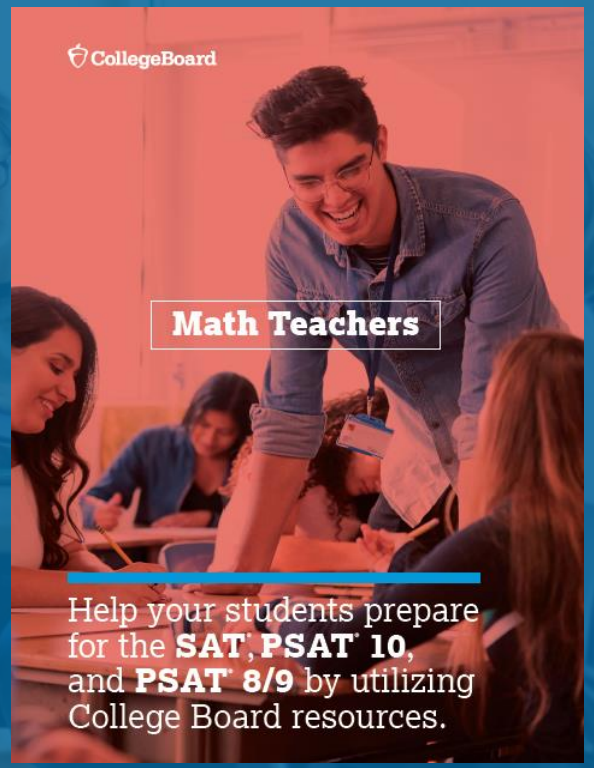
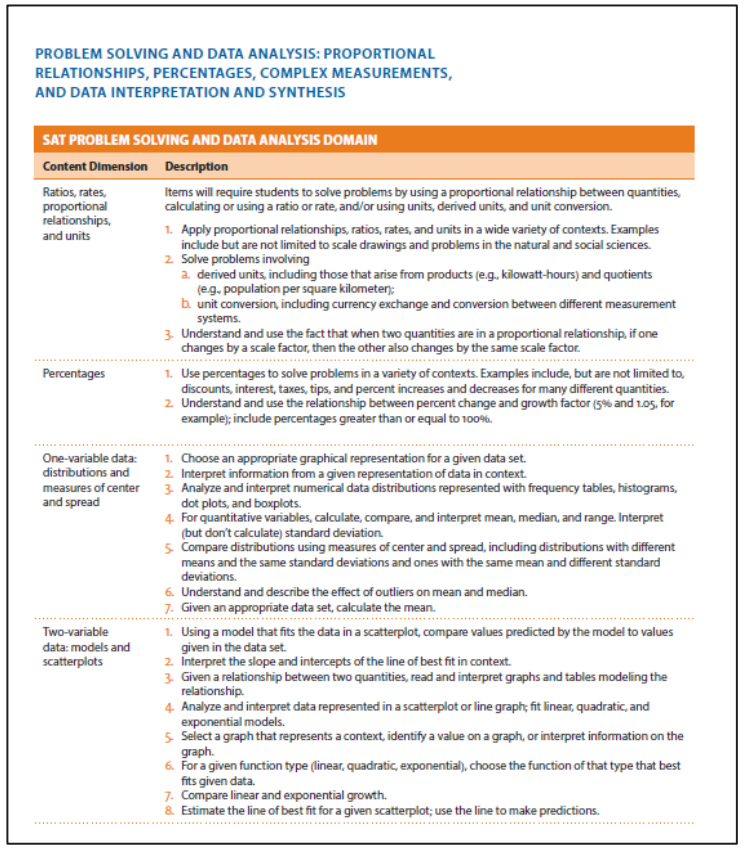


Math Folder Resources

Test Specifications



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.

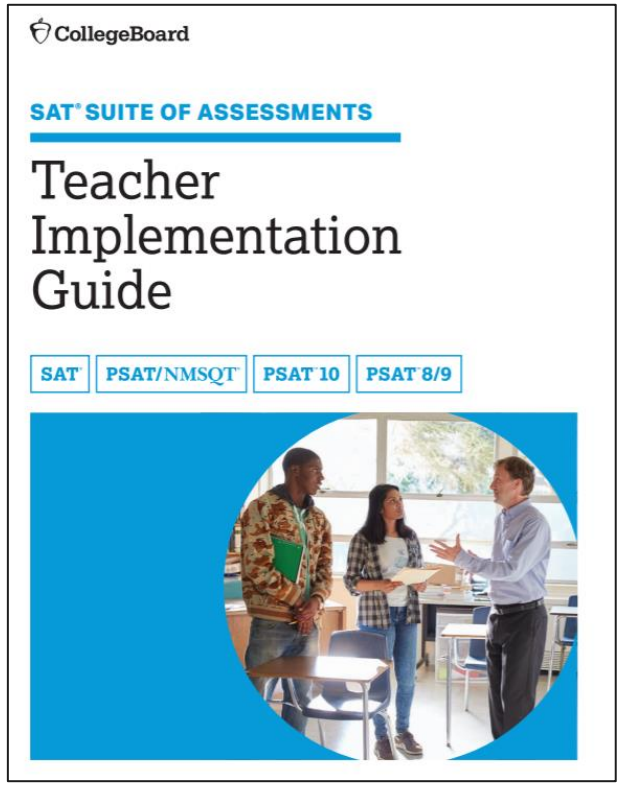
Here's how to get the most out of the resources included in the Math folder:

Step 1: Review the SAT Math Test Specifications in a department meeting. Talk with your colleagues about each skill/knowledge listed. Discuss the following questions:

- Are there any skills or knowledge that aren't included in your Math curriculum?
- Which five skills will your students apply effectively on the SAT®?
- Which three skills will your students struggle with on the SAT®?

Math Folder Resources

Teacher Implementation Guide

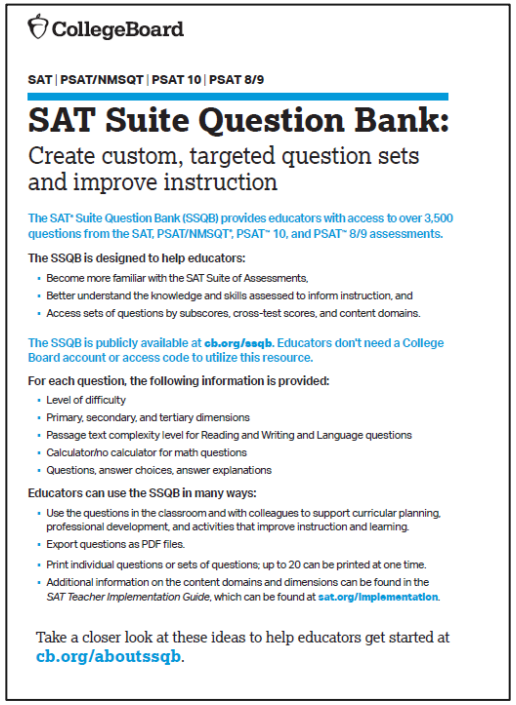


Step 2: Review practice questions to see how skills are assessed on the SAT®. Practice questions included in the Teacher Implementation Guide identify the specific test content that is assessed, making it easy to connect questions with the skills in the test specifications.

More practice questions are available at sat.org/practice. Besides the eight SAT practice tests, you can review answer explanations and scoring guides to clarify the skills being assessed.

Math Folder and Using the SAT® Suite Question Bank

https://satsuitequestionbank.collegeboard.org



CollegeBoard

SAT | PSAT/NMSQT | PSAT 10 | PSAT 8/9

SAT Suite Question Bank:

Create custom, targeted question sets and improve instruction

The SAT® Suite Question Bank (SSQB) provides educators with access to over 3,500 questions from the SAT, PSAT/NMSQT®, PSAT™ 10, and PSAT™ 8/9 assessments.

The SSQB is designed to help educators:

- Become more familiar with the SAT Suite of Assessments,
- Better understand the knowledge and skills assessed to inform instruction, and
- Access sets of questions by subscores, cross-test scores, and content domains.

The SSQB is publicly available at **cb.org/ssqb**. Educators don't need a College Board account or access code to utilize this resource.

For each question, the following information is provided:

- Level of difficulty
- Primary, secondary, and tertiary dimensions
- Passage text complexity level for Reading and Writing and Language questions
- Calculator/no calculator for math questions
- Questions, answer choices, answer explanations

Educators can use the SSQB in many ways:

- Use the questions in the classroom and with colleagues to support curricular planning, professional development, and activities that improve instruction and learning.
- Export questions as PDF files.
- Print individual questions or sets of questions; up to 20 can be printed at one time.
- Additional information on the content domains and dimensions can be found in the *SAT Teacher Implementation Guide*, which can be found at **sat.org/implementation**.

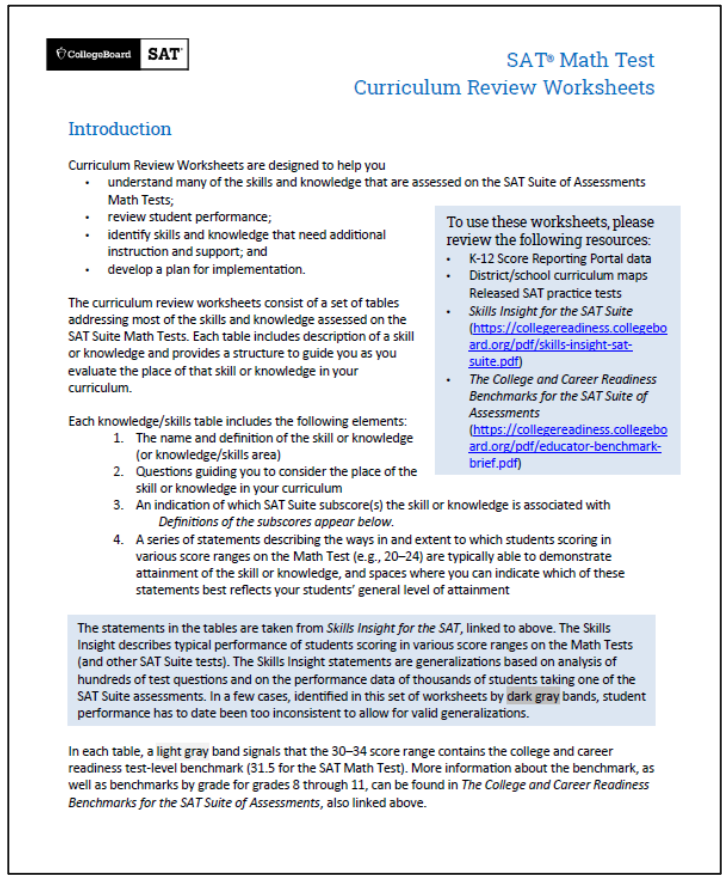
Take a closer look at these ideas to help educators get started at **cb.org/aboutssqb**.

Step 3: Review your school's score data in the K-12 Score Reporting Portal. The perfect way to get started with these skills is to see where your students are strong and where they need improvement.

- Review the *Instructional Planning Report*. Note average test scores, cross-test scores, and subscores.
- Use the SAT Suite Question Bank to find questions that align to the Math Test, specifically to the subscores:
  - Heart of Algebra
  - Problem-Solving Data Analysis
  - Passport to Advanced Math

Math Folder Resources

Curriculum Review Worksheets



CollegeBoard SAT

SAT® Math Test
Curriculum Review Worksheets

Introduction

Curriculum Review Worksheets are designed to help you

- understand many of the skills and knowledge that are assessed on the SAT Suite of Assessments Math Tests;
- review student performance;
- identify skills and knowledge that need additional instruction and support; and
- develop a plan for implementation.

The curriculum review worksheets consist of a set of tables addressing most of the skills and knowledge assessed on the SAT Suite Math Tests. Each table includes description of a skill or knowledge and provides a structure to guide you as you evaluate the place of that skill or knowledge in your curriculum.

To use these worksheets, please review the following resources:

- K-12 Score Reporting Portal data
- District/school curriculum maps
- Released SAT practice tests
- *Skills Insight for the SAT Suite* (https://collegereadiness.collegeboard.org/pdf/skills-insight-sat-suite.pdf)
- *The College and Career Readiness Benchmarks for the SAT Suite of Assessments* (https://collegereadiness.collegeboard.org/pdf/educator-benchmark-brief.pdf)

Each knowledge/skills table includes the following elements:

1. The name and definition of the skill or knowledge (or knowledge/skills area)
2. Questions guiding you to consider the place of the skill or knowledge in your curriculum
3. An indication of which SAT Suite subscore(s) the skill or knowledge is associated with
   Definitions of the subscores appear below.
4. A series of statements describing the ways in and extent to which students scoring in various score ranges on the Math Test (e.g., 20–24) are typically able to demonstrate attainment of the skill or knowledge, and spaces where you can indicate which of these statements best reflects your students' general level of attainment

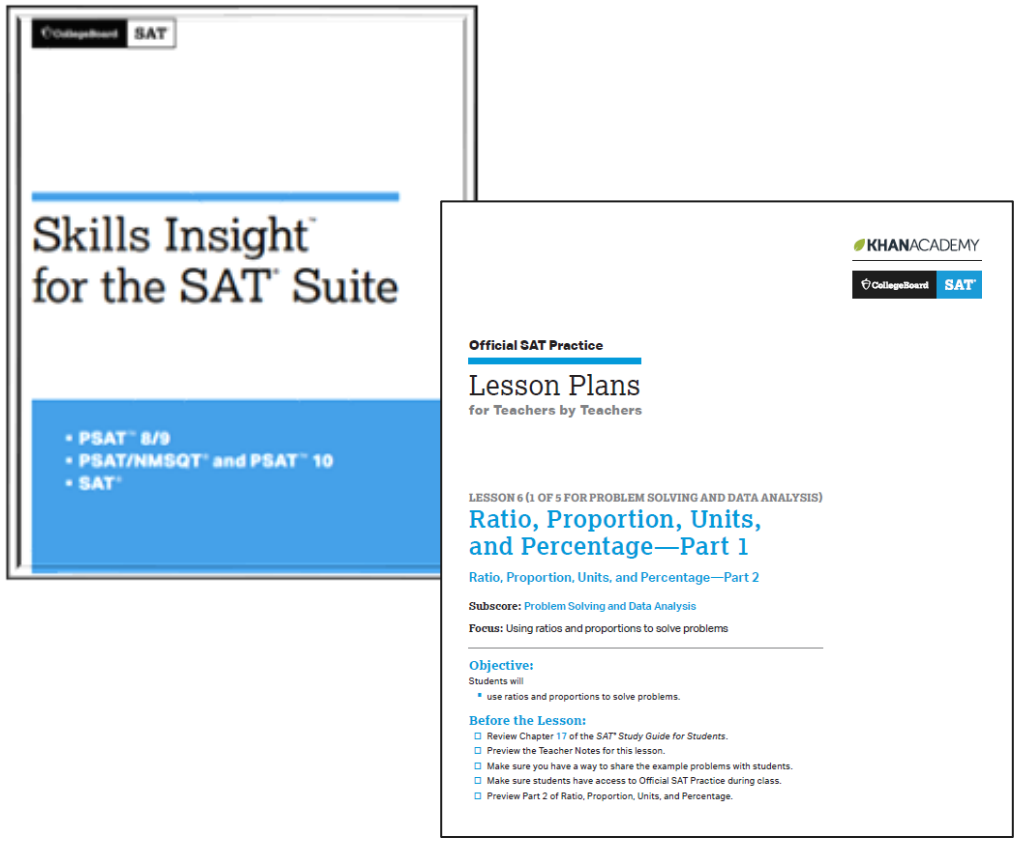
The statements in the tables are taken from *Skills Insight for the SAT*, linked to above. The Skills Insight describes typical performance of students scoring in various score ranges on the Math Tests (and other SAT Suite tests). The Skills Insight statements are generalizations based on analysis of hundreds of test questions and on the performance data of thousands of students taking one of the SAT Suite assessments. In a few cases, identified in this set of worksheets by dark gray bands, student performance has to date been too inconsistent to allow for valid generalizations.

In each table, a light gray band signals that the 30–34 score range contains the college and career readiness test-level benchmark (31.5 for the SAT Math Test). More information about the benchmark, as well as benchmarks by grade for grades 8 through 11, can be found in *The College and Career Readiness Benchmarks for the SAT Suite of Assessments*, also linked above.

Step 4: Work through the Curriculum Review Worksheets with your colleagues. You've already reviewed the mean test scores for your school. Now see the level of performance your students demonstrate in each domain. Read through the skills at each level, and identify where they're included (or not included) in the curriculum to highlight adjustments your department may need to make.

Math Folder Resources

Skills Insight
Official SAT® Practice Lesson Plans

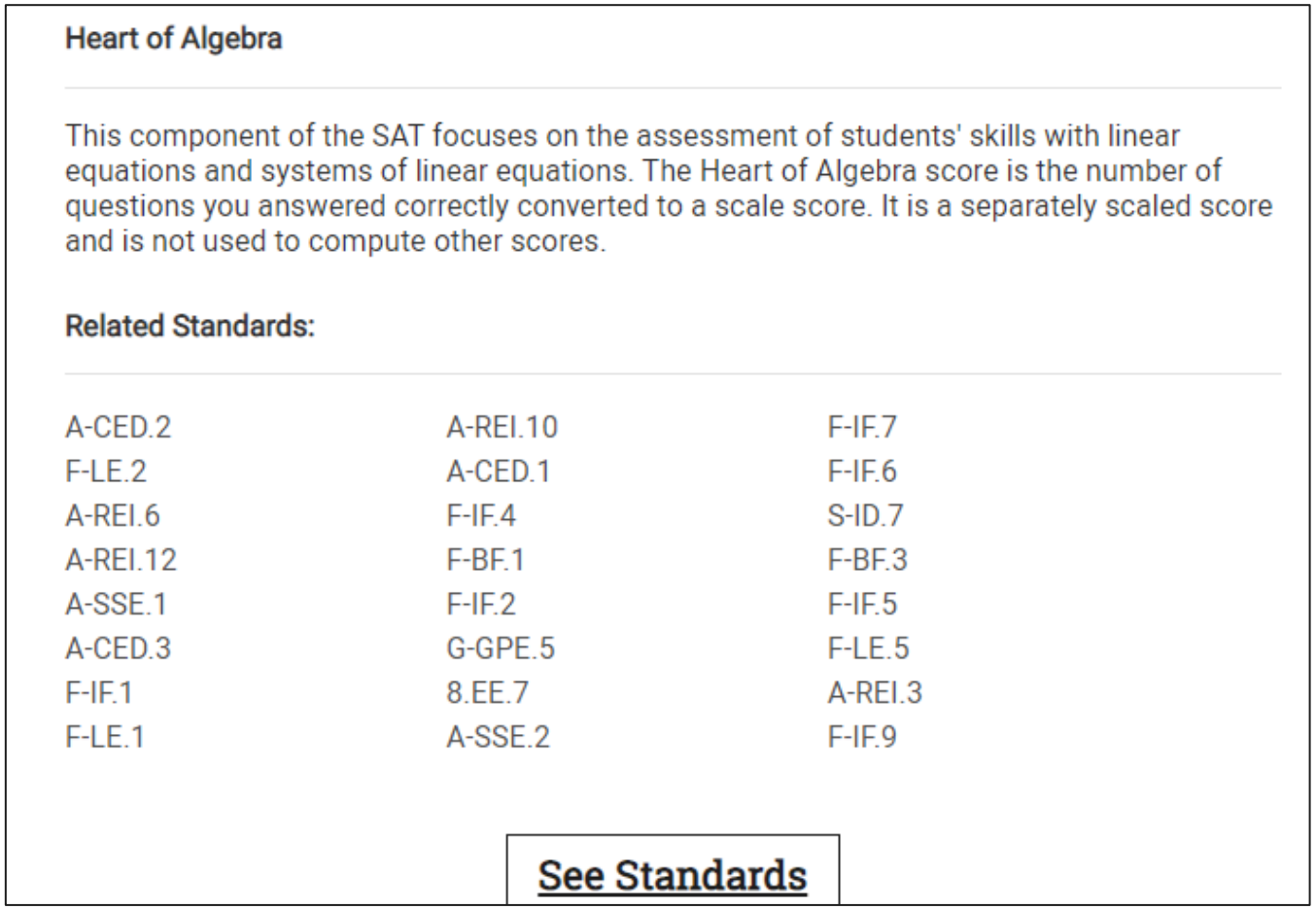


Step 5: Review sample lessons and strategies. Check Skills Insight for the SAT Suite to investigate the Suggestions for Improvement to advance to the next score range, and include some of them in your lessons. Review Official SAT Practice Lesson Plans, which use resources such as Official SAT Practice on Khan Academy® to foster a classroom experience that leads to independent practice. In addition, the Teacher Implementation Guide suggests instructional strategies to include in your lessons. Used with your expertise, these sample lessons and strategies can enhance your teaching practice.

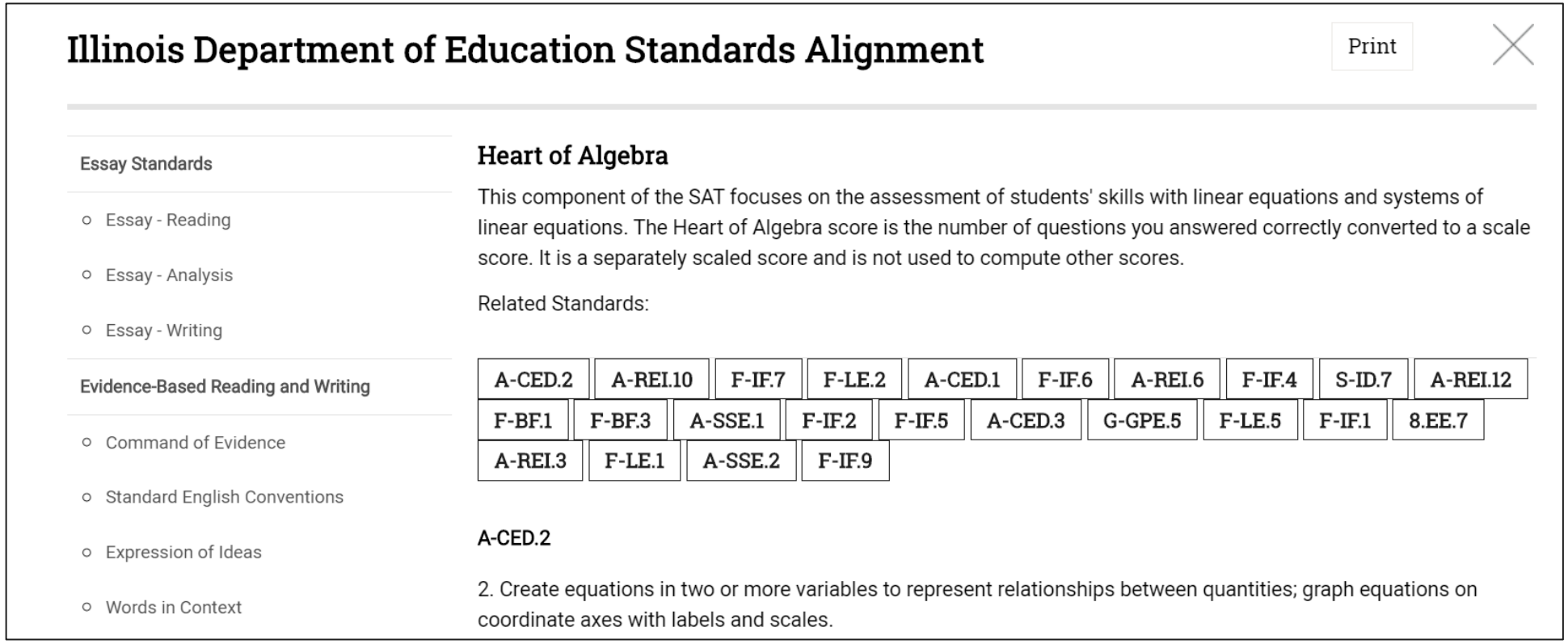
Step 6: Continue to measure student progress. You've already noted the current mean scores on the SAT Suite of Assessments. As you include questions in your formative and summative assessments, track student progress.

Math & Illinois Priority Standard Alignment

Subscores and the Illinois Learning Standards



Subscores and the Illinois Learning Standards



Subscores and the Illinois Learning Standards

A-REI.3

3. Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.

F-LE.1

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.

A-SSE.2

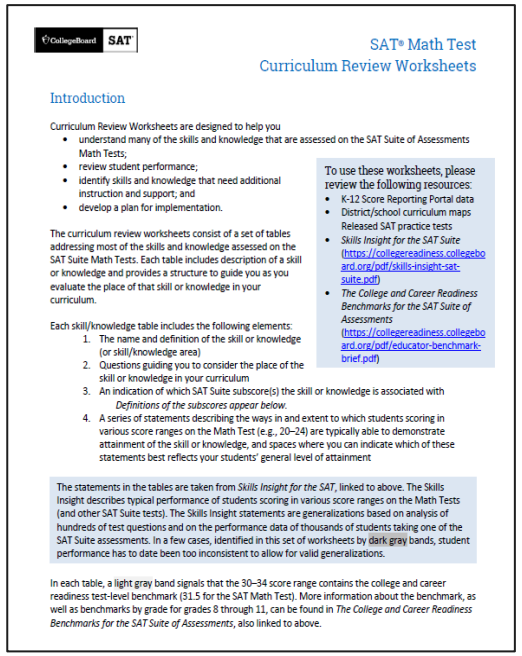
2. Use the structure of an expression to identify ways to rewrite it.

Heart of Algebra and Illinois Priority Standard Alignment

https://www.isbe.net/Documents/Illinois-Priority-Learning-Standards-2020-21.pdf

Subscore & Illinois Priority Standard Alignment

Heart of Algebra



CollegeBoard SAT

SAT® Math Test
Curriculum Review Worksheets

Introduction

Curriculum Review Worksheets are designed to help you

- understand many of the skills and knowledge that are assessed on the SAT Suite of Assessments Math Tests;
- review student performance;
- identify skills and knowledge that need additional instruction and support; and
- develop a plan for implementation.

The curriculum review worksheets consist of a set of tables addressing most of the skills and knowledge assessed on the SAT Suite Math Tests. Each table includes description of a skill or knowledge and provides a structure to guide you as you evaluate the place of that skill or knowledge in your curriculum.

To use these worksheets, please review the following resources:

- K-12 Score Reporting Portal data
- District/school curriculum maps
- Released SAT practice tests
- *Skills Insight for the SAT Suite* (https://collegereadiness.collegeboard.org/pdf/skills-insight-sat-suite.pdf)
- *The College and Career Readiness Benchmarks for the SAT Suite of Assessments* (https://collegereadiness.collegeboard.org/pdf/educator-benchmark-brief.pdf)

Each skill/knowledge table includes the following elements:

1. The name and definition of the skill or knowledge (or skill/knowledge area)
2. Questions guiding you to consider the place of the skill or knowledge in your curriculum
3. An indication of which SAT Suite subscore(s) the skill or knowledge is associated with
   Definitions of the subscores appear below.
4. A series of statements describing the ways in and extent to which students scoring in various score ranges on the Math Test (e.g., 20–24) are typically able to demonstrate attainment of the skill or knowledge, and spaces where you can indicate which of these statements best reflects your students' general level of attainment

The statements in the tables are taken from *Skills Insight for the SAT*, linked to above. The Skills Insight describes typical performance of students scoring in various score ranges on the Math Tests (and other SAT Suite tests). The Skills Insight statements are generalizations based on analysis of hundreds of test questions and on the performance data of thousands of students taking one of the SAT Suite assessments. In a few cases, identified in this set of worksheets by dark gray bands, student performance has to date been too inconsistent to allow for valid generalizations.

In each table, a light gray band signals that the 30–34 score range contains the college and career readiness test-level benchmark (31.5 for the SAT Math Test). More information about the benchmark, as well as benchmarks by grade for grades 8 through 11, can be found in *The College and Career Readiness Benchmarks for the SAT Suite of Assessments*, also linked to above.

Subscore: Heart of Algebra

Heart of Algebra assesses students' ability to analyze, fluently solve, and create linear equations and inequalities. Students will also be expected to analyze and fluently solve equations and systems of equations using multiple techniques.

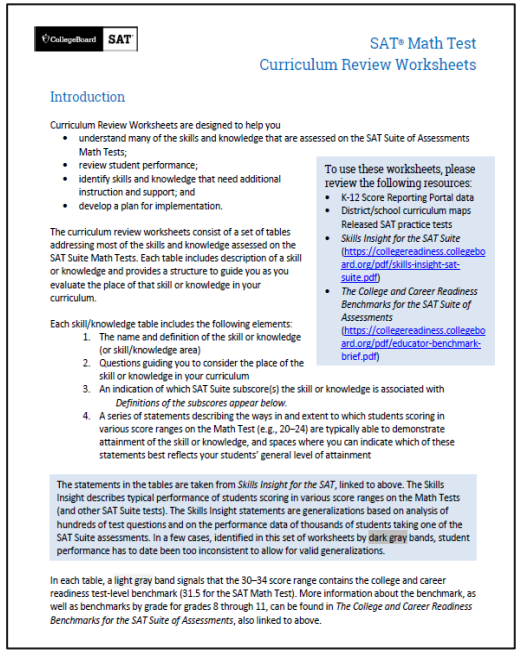
- To assess full command of the material, these problems will vary significantly in form and appearance.
- Problems may be straightforward fluency exercises or may pose challenges of strategy or understanding, such as interpreting the interplay between graphical and algebraic representations or solving as a process of reasoning.
- Students will be required to demonstrate both procedural skill and a deeper understanding of the concepts that undergird linear equations and functions to successfully exhibit a command of the Heart of Algebra.

Illinois Priority Learning Standard: A-REI.3

Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.

Subscore & Illinois Priority Standard Alignment

Heart of Algebra



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Illinois Priority Learning Standard: A-REI.3

Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.

Score Range	Subscore	Skill
15–19	HOA	Create a simple expression in one variable that represents a context. Evaluate a one-variable expression by substituting a value for the variable.
20–24	HOA	Create an expression or equation in one variable that models a context.
25–29	HOA	Solve a linear equation in one variable. Interpret a term from a linear equation in one variable in the form $ax + b = c$.
30–34	HOA	Determine the conditions under which a linear equation in one variable has no solution, one solution, or infinitely many solutions. Solve a linear equation in one variable that requires computation with fractions or decimals.
35–40	HOA	Create and solve a linear equation in one variable representing a context utilizing insight to identify the correct coefficients and constants in the equation. Make connections between different representations of linear equations in one variable; these representations often include symbolic representations, which may contain a variable constant.

Subscore & Illinois Priority Standard Alignment

Heart of Algebra

https://collegereadiness.collegeboard.org/pdf/skills-insight-sat-suite.pdf

Illinois Priority Learning Standard: A-REI.3
Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.

Score Range:15-19
Skill: Evaluate a one-variable expression by substituting a value for the variable.

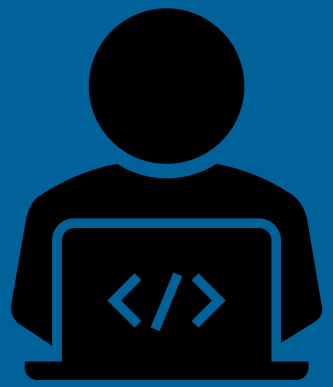
Suggested Improvement:
When reading a real-world problem, identify multiple quantities that vary and develop a linear equation or a linear function that defines their relationship.

Score Range: 20–24
Skill: Solve a linear equation in one variable.

Score Range: 25-29
Skill: Interpret a term from a linear equation in one variable in the form $ax + b = c$.

CollegeBoard

Accessing and Utilizing the SAT® Suite Question Bank

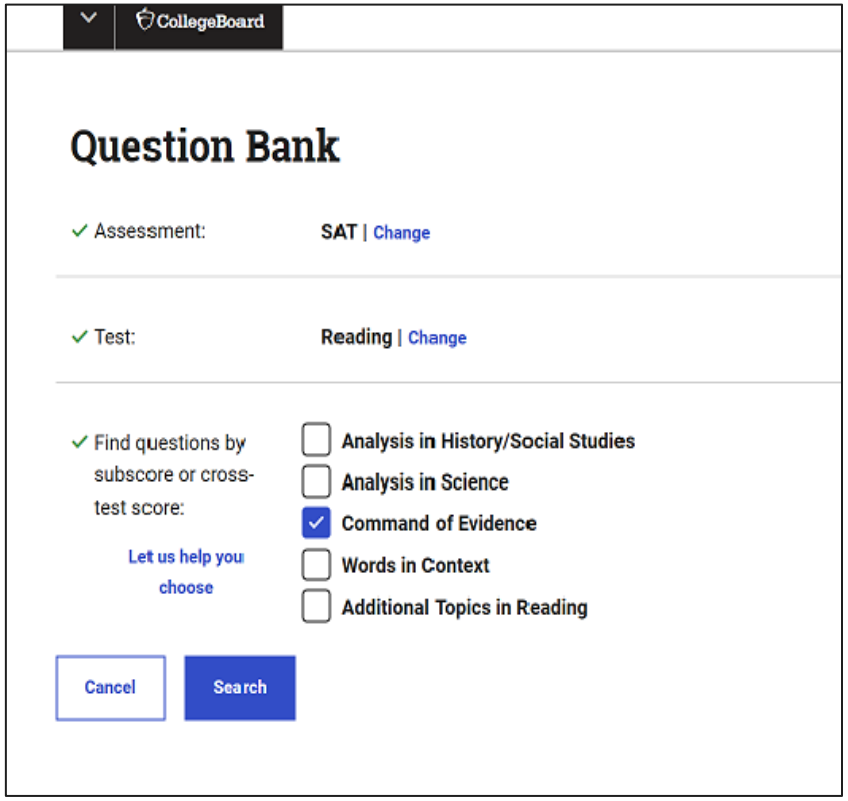


The SAT® Suite Question Bank May Be Accessed at https://satsuitequestionbank.collegeboard.org.

Open to the Public

No College Board Account or Access Code Required

How to Create a Question Set within the SAT® Suite Question Bank



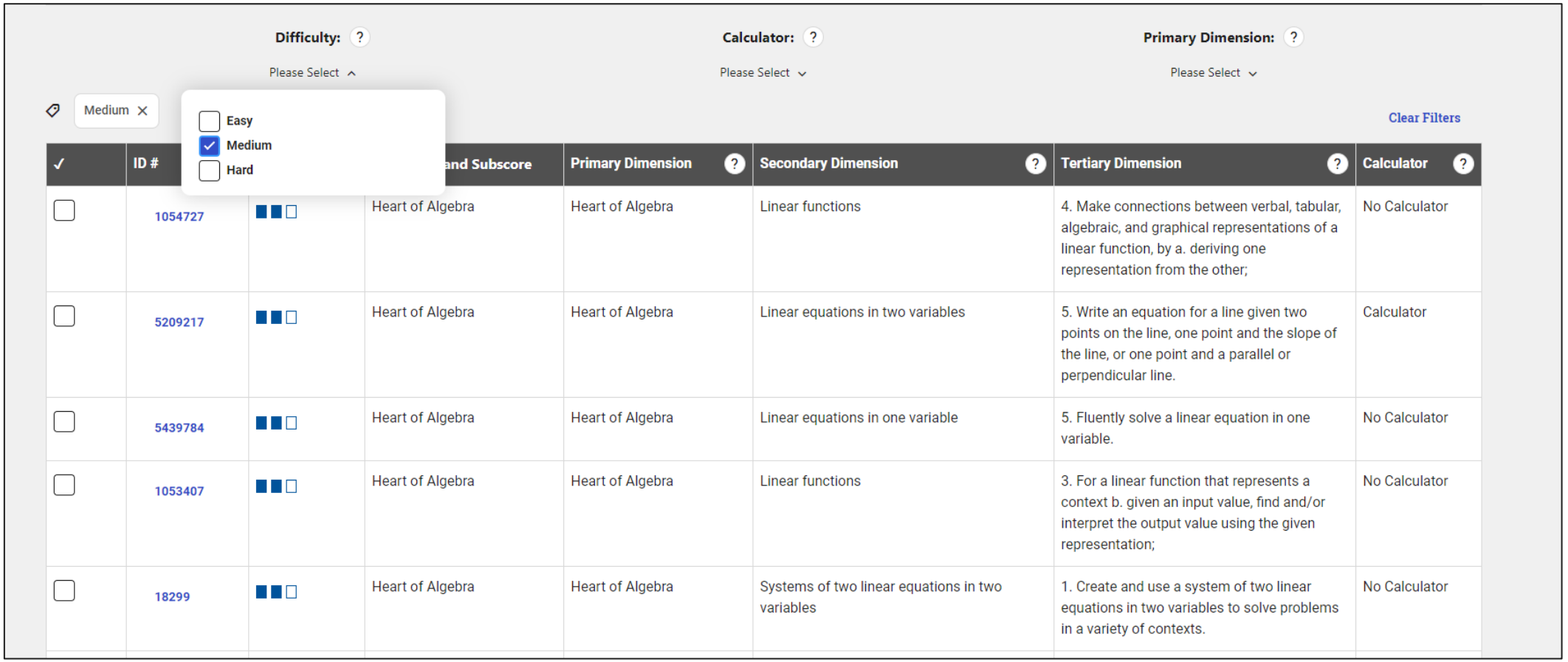
Go to https://satsuitequestionbank.collegeboard.org

To create a question set:

- Use the filters to narrow the list.
- Select question IDs to view question content.
- Check boxes to create the set (up to 20 questions).
- Select the “Export PDF” button.
- Choose to print questions with or without the correct answers and explanations.

Filters: Level of Difficulty

Questions are classified as easy, medium, or hard and are based on student performance.



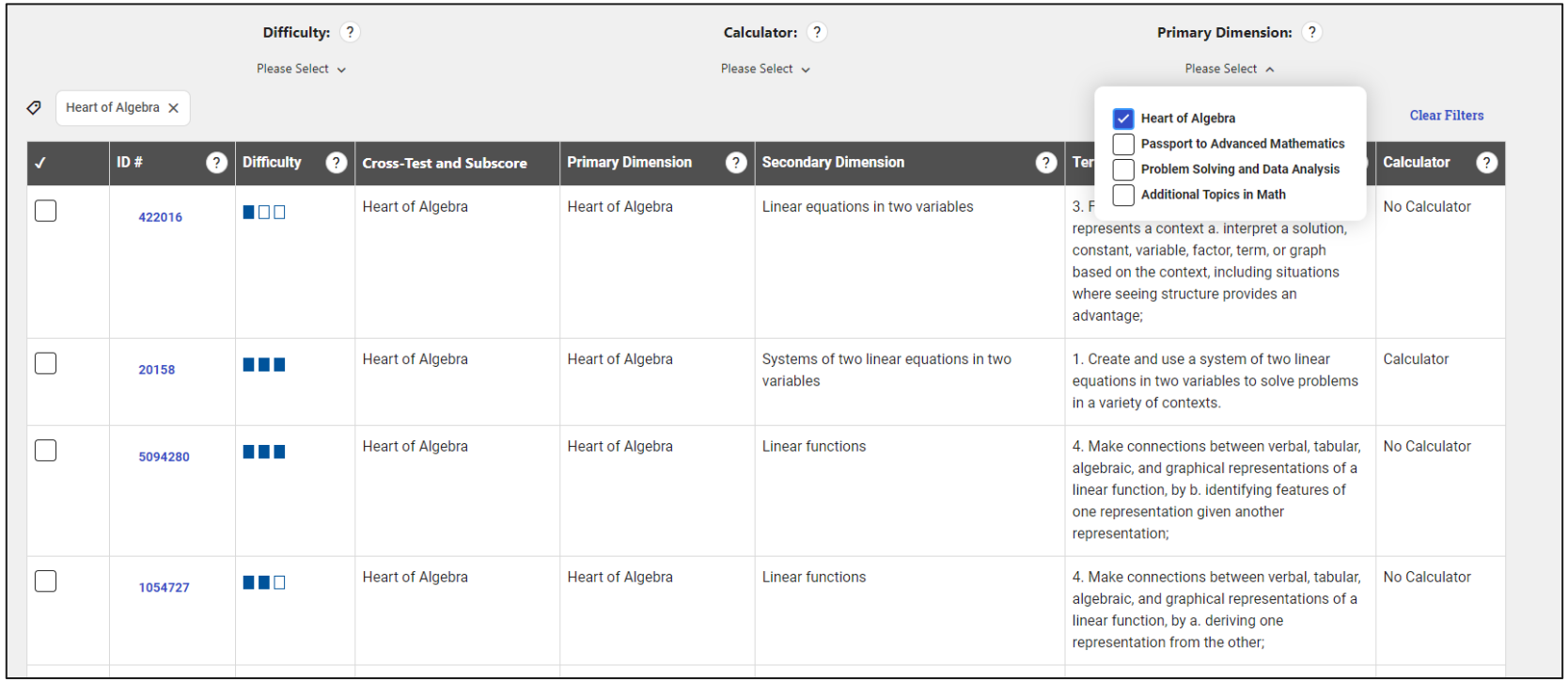
✓	ID #		and Subscore	Primary Dimension	Secondary Dimension	Tertiary Dimension	Calculator
☐	1054727	■■□	Heart of Algebra	Heart of Algebra	Linear functions	4. Make connections between verbal, tabular, algebraic, and graphical representations of a linear function, by a. deriving one representation from the other;	No Calculator
☐	5209217	■■□	Heart of Algebra	Heart of Algebra	Linear equations in two variables	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.	Calculator
☐	5439784	■■□	Heart of Algebra	Heart of Algebra	Linear equations in one variable	5. Fluently solve a linear equation in one variable.	No Calculator
☐	1053407	■■□	Heart of Algebra	Heart of Algebra	Linear functions	3. For a linear function that represents a context b. given an input value, find and/or interpret the output value using the given representation;	No Calculator
☐	18299	■■□	Heart of Algebra	Heart of Algebra	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.	No Calculator

Dimensions

Primary Dimensions: broad categories of the skills and knowledge measured by each test

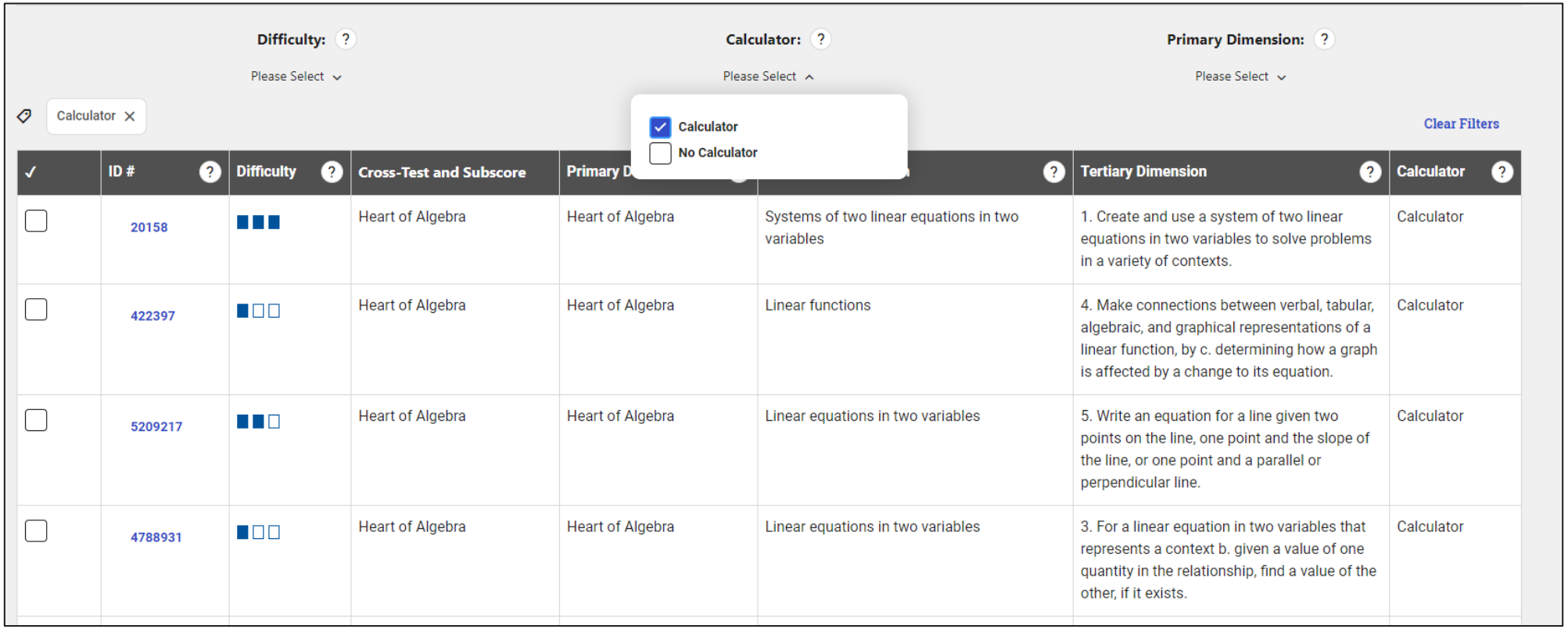
Secondary Dimensions: subcategories of each primary dimension

Tertiary Dimensions: categories of each secondary dimension



✓	ID #	Difficulty	Cross-Test and Subscore	Primary Dimension	Secondary Dimension	Ter	Calculator
☐	422016	■□□	Heart of Algebra	Heart of Algebra	Linear equations in two variables	3. F represents a context a. interpret a solution, constant, variable, factor, term, or graph based on the context, including situations where seeing structure provides an advantage;	No Calculator
☐	20158	■■■	Heart of Algebra	Heart of Algebra	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.	Calculator
☐	5094280	■■■	Heart of Algebra	Heart of Algebra	Linear functions	4. Make connections between verbal, tabular, algebraic, and graphical representations of a linear function, by b. identifying features of one representation given another representation;	No Calculator
☐	1054727	■■□	Heart of Algebra	Heart of Algebra	Linear functions	4. Make connections between verbal, tabular, algebraic, and graphical representations of a linear function, by a. deriving one representation from the other;	No Calculator

Calculator and No-Calculator



✓	ID #	Difficulty	Cross-Test and Subscore	Primary D		Tertiary Dimension	Calculator
☐	20158	■■■	Heart of Algebra	Heart of Algebra	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.	Calculator
☐	422397	■□□	Heart of Algebra	Heart of Algebra	Linear functions	4. Make connections between verbal, tabular, algebraic, and graphical representations of a linear function, by c. determining how a graph is affected by a change to its equation.	Calculator
☐	5209217	■■□	Heart of Algebra	Heart of Algebra	Linear equations in two variables	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.	Calculator
☐	4788931	■□□	Heart of Algebra	Heart of Algebra	Linear equations in two variables	3. For a linear equation in two variables that represents a context b. given a value of one quantity in the relationship, find a value of the other, if it exists.	Calculator

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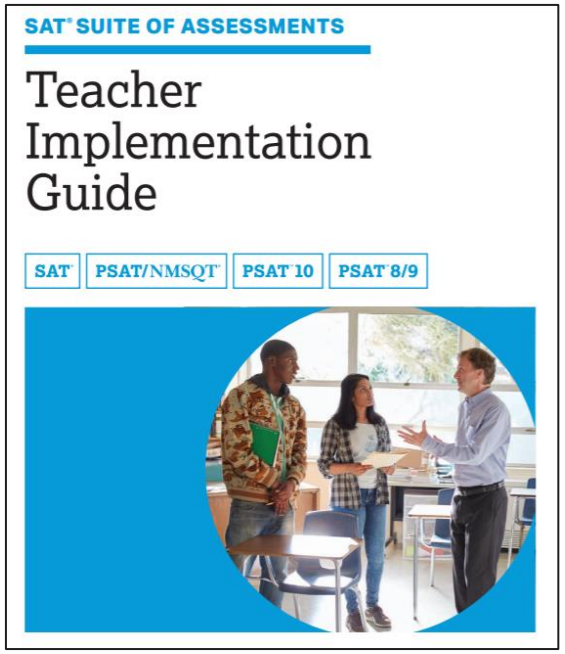
Connecting the Math Test with Classroom Instruction

General Math Strategies

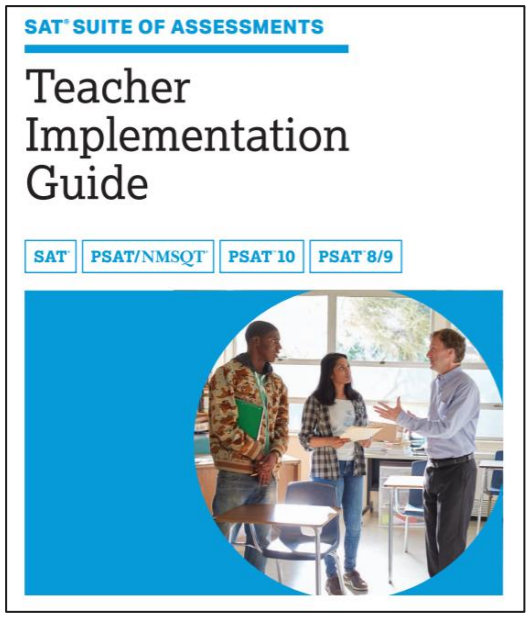


https://collegereadiness.collegeboard.org/pdf/redesigned-sat-k12-teacher-implementation-guide.pdf

Instructional Strategies for Math:

- Ensure that students practice solving multistep problems.
- Encourage students to express quantitative relationships in meaningful words and sentences to support their arguments and conjectures.
- Separate students into small working groups. Ask them to discuss how to arrive at solutions.
- Vary the types of problems in assignments so that students aren't always using the same strategy to find solutions.
- Assign students math problems or create classroom-based assessments that do not allow the use of a calculator.
- Develop interest and facility in math by providing frequent opportunities for students to interpret and apply mathematical skills and concepts in real-world contexts, particularly in the sciences and social studies.

Math: Skill-Building Strategies



https://collegereadiness.collegeboard.org/pdf/redesigned-sat-k12-teacher-implementation-guide.pdf

Skill-Building Strategies for Math:

- Provide students with explanations and/or equations that incorrectly describe a graph and ask them to identify errors.
- Ask students to create pictures, tables, graphs, lists, models, and/or verbal expressions to interpret text and/or data to help them arrive at a solution.
- Ask students to solve problems that require multiple steps to arrive at the solution.
- Facilitate discussions in which students communicate their own thinking and critique the reasoning of others as they work toward a solution.
- Ask open-ended questions.
- Direct students' attention to real-world situations to provide context for the problem.
- Organize information to present data and answer a question or show a problem solution.
- Use "Guess and Check" to explore different ways to solve a problem when other strategies for solving are not obvious.

Next Steps

Teacher Toolkit

- Review the SAT Teacher Implementation Guide: https://collegereadiness.collegeboard.org/pdf/redesigned-sat-k12-teacher-implementation-guide.pdf
- Contact ILSAT@collegeboard.org to request the full version of the curriculum worksheets for Reading, Writing and Language, and Math.

Visit the SAT® Suite Question Bank

- Access the SAT® Suite Question Bank at https://satsuitequestionbank.collegeboard.org.
- Determine the best use of the readily available 3,500 questions.

Please email questions or comments about this presentation to ILSAT@collegeboard.org.

Thank You

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