



How to Use
PSAT/NMSQT[®]
Results to Improve
Your School's
Performance
Through Pre-AP[®]
Professional
Development[™]

**(Mathematics
Skills)**

**Coordinating the PSAT/NMSQT
Summary of Answers and Skills
(SOAS) Report and Your Teachers'
Professional Development Needs.**

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How to use this document

This document is designed to make explicit the relationship of skills measured by the PSAT/NMSQT® and particular teaching strategies found in various Pre-AP® Professional Development workshops. Pre-AP is PSAT/NMSQT professional development.

Begin by obtaining your PSAT/NMSQT Summary of Answers and Skills (SOAS) report at collegeboard.com/reports (pictured below). The SOAS allows you to analyze aggregate test question information and makes it easy to take a closer look at the level of your students' academic skills when they took the PSAT/NMSQT. The report compares the performance of your students to a comparable group of students in your state and the nation. One special feature of the SOAS is the aggregate skills data based on your students' performance on the PSAT/NMSQT. Provided for each test section, the Analysis of Performance on Skills shows your students' academic strengths and areas in need of improvement. Any skills in which your students performed below (to the left of) the Nation or State should probably be reviewed. For individual skills (represented by a letter and a number, M04, CR04, or W4, for example) that need to be strengthened, **use the grid at the end of this document to determine which Pre-AP workshops address the skill**

areas. The grid should also prove helpful in determining skill combinations that need to be strengthened, and workshops that address these combinations. Use the suggestions to determine workshop solutions for your school or district's teacher professional development needs. For help with these determinations, or to bring this professional development to your site, consult your College Board regional office.

Pre-AP Professional Development (Pre-AP) is a suite of K–12 professional development resources and services. The purpose of Pre-AP is to equip all middle and high school teachers with the strategies and tools they need to engage their students in active, high-level learning, thereby ensuring that every middle and high school student develops the skills, habits of mind, and concepts needed to succeed in college.

For more information on **PSAT/NMSQT Skills**, please visit collegeboard.com/psat.

For more information on **Pre-AP Professional Development**, or to search for a workshop or conference near you, visit apcentral.collegeboard.com.

For recommended workshop sequences for your school, please contact your regional office.

SAMPLE SCHOOL (00000)
SATURDAY FORM: CLASS OF 2006

PSAT/NMSQT SUMMARY OF ANSWERS AND SKILLS 2004

**PSAT/
NMSQT®**

SUMMARY OF ANSWERS AND SKILLS PSAT/NMSQT SOAS REPORT 2004

SAMPLE SCHOOL (00000) CLASS OF 2006

This online SOAS Report details the performance of 242 students from the 11th grade. This report provides a closer look at the level of your students' skills when they took the PSAT/NMSQT this past October. The comparative information can give you valuable insights into your students' performance and assist in identifying curriculum needs to address academic weaknesses that may have been identified through this assessment.

This report keeps the focus on student skills as it analyzes answers across each grade of students, providing insights into how well students are understanding and applying the skills taught in your curriculum. When shared with teachers, especially as a companion to the Student Data on Disk (comprehensive data, including the responses of each student to every question, that can be shared with teachers at a classroom level), this report can inform the instructional needs within the classroom.

What Is Included?

This report is divided into three sections representing the academic areas tested: Critical Reading (pages 2–6), Math Reasoning (pages 7–11), and Writing Skills (pages 12–16). Within each area, the information is shared from three different perspectives: an analysis of correct answers; an analysis of incorrect answers; and a comparative analysis of skills.

These analyses will include comparisons with the nation's performance, the state's performance and a comparable group's performance. (Comparable group is a statistically created group—virtual group—that illustrates your group's expected performance on each question. As a result, it makes it easy for you to identify areas where your students performed above, or below, what would have been expected of a group with your school's performance profile.)

PSAT/NMSQT® Mathematics Questions:

The primary aim of the mathematics section is to assess how well students understand mathematics: Can they apply what they already know to new situations and use what they know to solve nonroutine problems?

The following mathematics concepts are covered in the PSAT/NMSQT:

Number and Operations

- Arithmetic word problems
- Percent
- Prime numbers
- Ratio and proportion
- Logical reasoning
- Sets (union, intersection, elements)
- Properties of integers (even, odd, etc.)
- Divisibility
- Counting techniques
- Sequences and series (including exponential growth)
- Elementary number theory

Algebra and Functions

- Properties of exponents (including rational exponents)
- Algebraic word problems
- Substitution
- Absolute value
- Rational and radical equations
- Equations of lines
- Direct and inverse variation
- Basic concepts of algebraic functions
- Newly defined symbols based on commonly used operations
- Solutions of linear equations and inequalities
- Quadratic equations
- Simplifying algebraic expressions

Geometry and Measurement

- Area and perimeter of a polygon
- Area and circumference of a circle
- Volume of a box, cube, and cylinder
- Pythagorean theorem and special properties of isosceles, equilateral, and right triangles
- Properties of parallel and perpendicular lines
- Coordinate geometry
- Geometric visualization
- Slope
- Similarity

Data Analysis, Statistics, and Probability

- Data interpretation
- Statistics (mean, median, and mode)
- Probability

Pre-AP® Workshops

1. Pre-AP: Topics for AP Vertical Teams® in Mathematics

This workshop addresses the following PSAT/NMSQT mathematics skills:

- Using
 - Basic concepts and operations in arithmetic problem solving (M1)
 - Basic algebraic concepts and operations to solve problems (M5)
 - Logical reasoning (M8)
- Recognizing logical keywords (M10)
- Creating either figures or algebraic equations, inequalities, or expressions to help solve problems (M4)
- Making connections among mathematical topics (M6)
- Organizing and managing information to solve multistep problems (M7)

2. Pre-AP: Advanced Topics for AP Vertical Teams in Mathematics—Assessment

This workshop addresses the following PSAT/NMSQT mathematics skills:

- Using
 - Basic concepts and operations in arithmetic problem solving (M1)
 - Basic algebraic concepts and operations to solve problems (M5)
 - Logical reasoning (M8)
 - Answer choices to help solve the problem (M11)
- Understanding geometry and coordinate geometry (M2)
- Dealing with probability, basic statistics, charts, and graphs (M3)
- Recognizing logical keywords (M10)
- Creating either figures or algebraic equations, inequalities, or expressions to help solve problems (M4)
- Making connections among mathematical topics (M6)
- Organizing and managing information to solve multistep problems (M7)

3. Pre-AP: Strategies in Mathematics—Accumulation

This workshop addresses the following PSAT/NMSQT mathematics skills:

- Using
 - Basic concepts and operations in arithmetic problem solving (M1)
 - Basic algebraic concepts and operations to solve problems (M5)
- Recognizing logical keywords (M10)
- Understanding geometry and coordinate geometry (M2)
- Creating either figures or algebraic equations, inequalities, or expressions to help solve problems (M4)
- Making connections among mathematical topics (M6)
- Organizing and managing information to solve multistep problems (M7)

4. Pre-AP: Strategies in Mathematics—Analyzing and Describing Data

This workshop addresses the following PSAT/NMSQT mathematics skills:

- Using
 - Basic concepts and operations in arithmetic problem solving (M1)
 - Basic algebraic concepts and operations to solve problems (M5)
- Recognizing
 - Patterns and equivalent forms (M9)
 - Logical keywords (M10)
- Dealing with probability, basic statistics, charts, and graphs (M3)
- Creating either figures or algebraic equations, inequalities, or expressions to help solve problems (M4)
- Making connections among mathematical topics (M6)
- Organizing and managing information to solve multistep problems (M7)

5. Pre-AP: Strategies in Mathematics—Chance, Variation, and Probability

This workshop addresses the following PSAT/NMSQT mathematics skills:

- Using
 - Basic concepts and operations in arithmetic problem solving (M1)
 - Basic algebraic concepts and operations to solve problems (M5)
- Dealing with probability, basic statistics, charts, and graphs (M3)
- Recognizing logical keywords (M10)
- Creating either figures or algebraic equations, inequalities, or expressions to help solve problems (M4)
- Making connections among mathematical topics (M6)
- Organizing and managing information to solve multistep problems (M7)

6. Pre-AP: Strategies in Mathematics—Functions

This workshop addresses the following PSAT/NMSQT mathematics skills:

- Using
 - Basic concepts and operations in arithmetic problem solving (M1)
 - Basic algebraic concepts and operations to solve problems (M5)
- Recognizing logical keywords (M10)
- Creating either figures or algebraic equations, inequalities, or expressions to help solve problems (M4)
- Making connections among mathematical topics (M6)
- Organizing and managing information to solve multistep problems (M7)

7. Pre-AP: Strategies in Mathematics— Helping Students Learn Mathematics Through Problem Solving

This workshop addresses the following PSAT/NMSQT mathematics skills:

- Using
 - Basic concepts and operations in arithmetic problem solving (M1)
 - Basic algebraic concepts and operations to solve problems (M5)
 - Logical reasoning (M8)
- Recognizing
 - Patterns and equivalent forms (M9)
 - Logical keywords (M10)
- Understanding geometry and coordinate geometry (M2)
- Dealing with probability, basic statistics, charts, and graphs (M3)
- Creating either figures or algebraic equations, inequalities, or expressions to help solve problems (M4)
- Making connections among mathematical topics (M6)
- Organizing and managing information to solve multistep problems (M7)

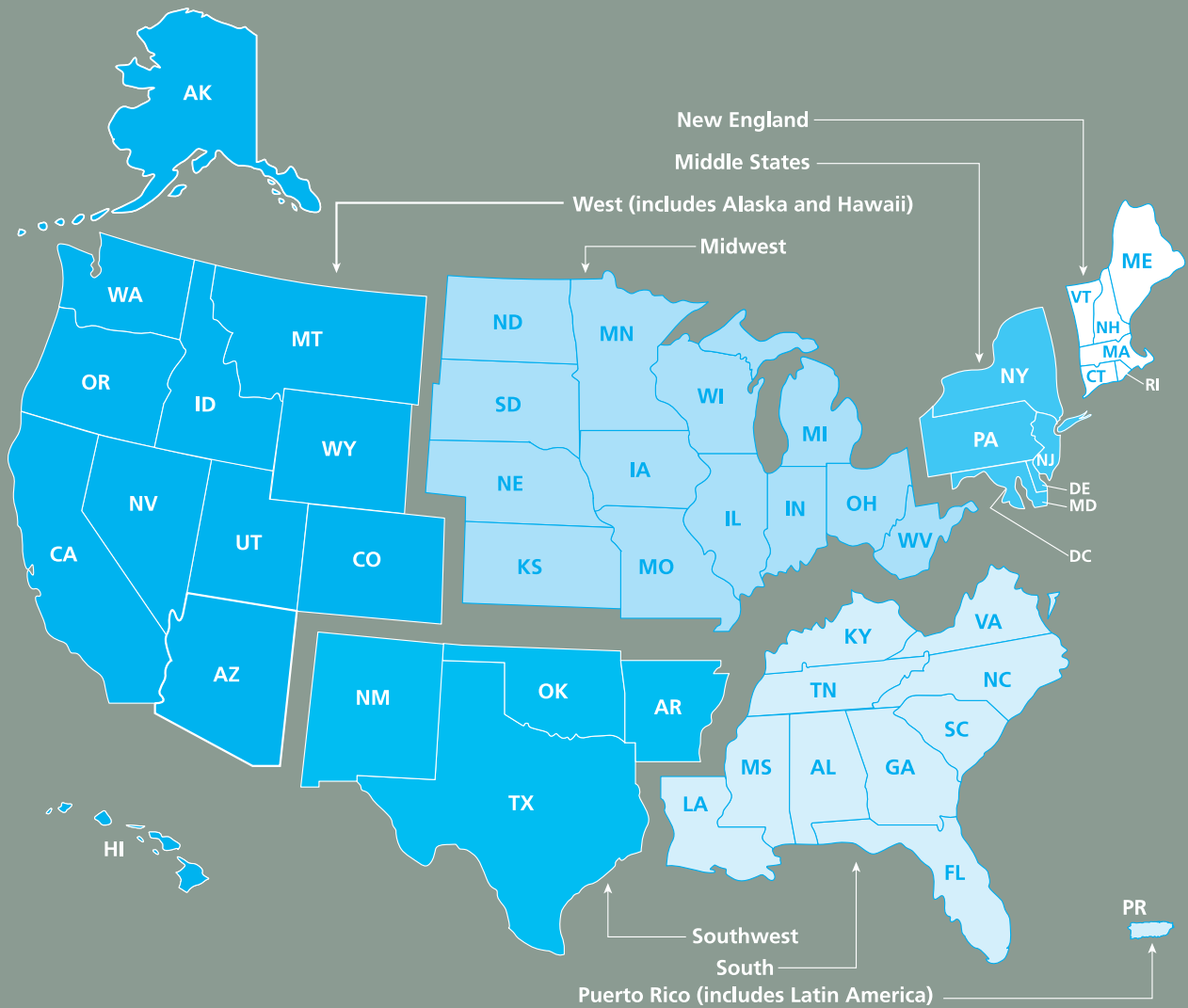
8. Pre-AP: Strategies in Mathematics—Rate

This workshop addresses the following PSAT/NMSQT mathematics skills:

- Using
 - Basic concepts and operations in arithmetic problem solving (M1)
 - Basic algebraic concepts and operations to solve problems (M5)
- Recognizing
 - Patterns and equivalent forms (M9)
 - Logical keywords (M10)
- Understanding geometry and coordinate geometry (M2)
- Dealing with probability, basic statistics, charts, and graphs (M3)
- Creating either figures or algebraic equations, inequalities, or expressions to help solve problems (M4)
- Making connections among mathematical topics (M6)
- Organizing and managing information to solve multistep problems (M7)

K-12 PROFESSIONAL DEVELOPMENT WORKSHOPS									
PSAT/NMSQT STANDARD	Pre-AP: Topics for AP Teams in Mathematics	Pre-AP: Advanced Topics for AP Vertical Teams in Mathematics—Assessment	Pre-AP: Strategies in Mathematics—Accumulation	Pre-AP: Strategies in Mathematics—Analyzing and Describing Data	Pre-AP: Strategies in Mathematics—Chance, Variation, and Probability	Pre-AP: Strategies in Mathematics—Functions	Pre-AP: Strategies in Mathematics—Helping Students Learn Through Problem Solving	Pre-AP: Strategies in Mathematics—Rate	PSAT/NMSQT: "How To Improve" Advice for Students; Workshops(s) on the left with checkmark provide additional strategies for teachers.
M1 Using basic concepts and operations in arithmetic problem solving	✓	✓	✓	✓	✓	✓	✓	✓	Practice solving problems involving positive and negative integers, fractions, decimals, ratio, percent, exponents, square roots, place value, and digits. Also practice solving problems involving odd and even integers, prime numbers, multiples, divisibility, and remainders.
M2 Understanding geometry and coordinate geometry	✓	✓	✓	✓	✓	✓	✓	✓	Review geometry units in your textbook involving perimeter, area, volume, circumference, angles, lines, slope. Familiarize yourself with the formulas given at the beginning of mathematics sections of the test.
M3 Dealing with probability, basic statistics, charts, and graphs	✓	✓	✓	✓	✓	✓	✓	✓	Practice solving problems that involve basic probability, basic counting, and finding the average (arithmetic mean), median, and mode. Look for charts and graphs in newspapers and magazines, and practice interpreting the data in them.
M4 Creating either figures or algebraic equations, inequalities, or expressions to help solve problems	✓	✓	✓	✓	✓	✓	✓	✓	Practice solving problems by drawing or visualizing figures to help you understand the problem. Practice developing equations, inequalities, or expressions from verbal descriptions, figures, or numerical data.
M5 Using basic algebraic concepts and operations to solve problems	✓	✓	✓	✓	✓	✓	✓	✓	Review algebraic concepts and rules, such as those involving substitution, exponents, solving equations and inequalities, and combining algebraic expressions.
M6 Making connections among mathematical topics	✓	✓	✓	✓	✓	✓	✓	✓	Practice problems that require combining skills acquired in different mathematics courses, such as problems that use combinations of arithmetic, algebra, and geometry.
M7 Organizing and managing information to solve multistep problems	✓	✓	✓	✓	✓	✓	✓	✓	Write down your steps in solving the problem. Monitor the steps as you go along, keeping in mind what the question is asking.
M8 Using logical reasoning	✓	✓	✓	✓	✓	✓	✓	✓	Practice solving problems in which you must consider different possible cases. Make adjustments in your solution strategy when things aren't going as well as they should. It may help to look at the problem from different perspectives. Solving problems that require you to justify your answer may help you develop this skill.
M9 Recognizing patterns and equivalent forms	✓	✓	✓	✓	✓	✓	✓	✓	Try recognizing a pattern by considering a simpler case. Try rewriting or rearranging the given expressions in a different form.

K-12 PROFESSIONAL DEVELOPMENT WORKSHOPS									
PSAT/NMSQT STANDARD	Pre-AP: Topics for AP Vertical Teams in Mathematics	Pre-AP: Advanced Topics for AP Vertical Teams in Mathematics—Assessment	Pre-AP: Strategies in Mathematics—Accumulation	Pre-AP: Strategies in Mathematics—Analyzing and Describing Data	Pre-AP: Strategies in Mathematics—Chance, Variation, and Probability	Pre-AP: Strategies in Mathematics—Functions	Pre-AP: Strategies in Mathematics—Helping Students Learn Through Problem Solving	Pre-AP: Strategies in Mathematics—Rate	PSAT/NMSQT: "How To Improve" Advice for Students; Workshops(s) on the left with checkmark provide additional strategies for teachers.
	MATHEMATICS SKILLS								
M10 Recognizing logical keywords	✓	✓	✓	✓	✓	✓	✓	✓	Pay attention to keywords, such as "not," "at least," "at most," "must be," "could be," "possible," and "different." These words determine the meaning of the question and therefore must be understood to correctly solve the problem.
M11 Using answer choices to help solve the problem		✓							Looking at the answer choices may help you understand the problem. Sometimes the choices can help identify a strategy for solving the problem.



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