**Detailed Breakdown of Math Common Core Standards on the SAT**

The SAT math sections align with the Common Core State Standards (CCSS). Below is a detailed analysis of the specific standards tested, organized by grade level, subject, the recommended order of instruction, and additional details on review standards, supplementary standards, timelines, and power standard designation.

**Grade 6**

**Subject:** Ratios and Proportions

* **CCSS.MATH.CONTENT.6.RP.A.1**: Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities.
  + **Topics:** Basic ratio concepts, equivalent ratios, and introductory problem-solving.
  + **Review Standards:** None explicitly; introduces foundational concepts.
  + **Supplementary Standards:** CCSS.MATH.CONTENT.7.RP.A.2 (proportional relationships in grade 7).
  + **Timeline:** Taught in grade 6, reinforced in grade 7.
  + **Power Standard:** Yes, foundational for future ratio and proportion problems.

**Subject:** Statistics and Probability

* **CCSS.MATH.CONTENT.6.SP.B.4**: Display numerical data in plots on a number line, including dot plots, histograms, and box plots.
  + **Topics:** Interpreting and creating data plots, understanding measures of center and spread.
  + **Review Standards:** CCSS.MATH.CONTENT.6.SP.A.1 (statistical questions).
  + **Supplementary Standards:** CCSS.MATH.CONTENT.7.SP.B.4 (using measures of center and variability).
  + **Timeline:** Introduced in grade 6, built upon in grade 7.
  + **Power Standard:** No, but provides foundational skills for data interpretation.

**Grade 7**

**Subject:** Ratios and Proportions

* **CCSS.MATH.CONTENT.7.RP.A.2**: Recognize and represent proportional relationships between quantities.
  + **Topics:** Solving ratio problems, understanding direct and inverse proportions, graphing proportional relationships.
  + **Review Standards:** CCSS.MATH.CONTENT.6.RP.A.1 (basic ratio concepts).
  + **Supplementary Standards:** CCSS.MATH.CONTENT.8.EE.B.5 (graphing proportional relationships).
  + **Timeline:** Core instruction in grade 7, reinforced in grade 8.
  + **Power Standard:** Yes, critical for proportional reasoning and algebraic relationships.

**Subject:** Expressions and Equations

* **CCSS.MATH.CONTENT.7.EE.B.4**: Use variables to solve multi-step real-world problems.
  + **Topics:** Solving equations with variables on both sides, understanding inequalities.
  + **Review Standards:** CCSS.MATH.CONTENT.6.EE.B.7 (simple equations).
  + **Supplementary Standards:** CCSS.MATH.CONTENT.8.EE.C.7 (solving linear equations in grade 8).
  + **Timeline:** Taught in grade 7, expanded in grade 8.
  + **Power Standard:** Yes, essential for linear equation and inequality problem-solving.

**Grade 8**

**Subject:** Expressions and Equations

* **CCSS.MATH.CONTENT.8.EE.C.7**: Solve linear equations in one variable.
  + **Topics:** One-variable equations, absolute value equations, understanding no solution/infinite solutions.
  + **Review Standards:** CCSS.MATH.CONTENT.7.EE.B.4 (solving simpler equations in grade 7).
  + **Supplementary Standards:** CCSS.MATH.CONTENT.HSA.REI.B.3 (solving linear equations in Algebra I).
  + **Timeline:** Core instruction in grade 8, reinforced in grade 9.
  + **Power Standard:** Yes, foundational for algebraic problem-solving.
* **CCSS.MATH.CONTENT.8.EE.C.8**: Analyze and solve pairs of simultaneous linear equations.
  + **Topics:** Graphical and algebraic solutions to systems of equations.
  + **Review Standards:** CCSS.MATH.CONTENT.7.EE.B.4 (multi-step equations).
  + **Supplementary Standards:** CCSS.MATH.CONTENT.HSA.REI.C.6 (systems of equations in Algebra I).
  + **Timeline:** Introduced in grade 8, reinforced in grade 9.
  + **Power Standard:** Yes, critical for Heart of Algebra topics on the SAT.

**Subject:** Functions

* **CCSS.MATH.CONTENT.8.F.A.1**: Understand that a function is a rule that assigns to each input exactly one output.
  + **Topics:** Identifying and interpreting functions.
  + **Review Standards:** CCSS.MATH.CONTENT.7.RP.A.2 (proportional relationships).
  + **Supplementary Standards:** CCSS.MATH.CONTENT.HSF.IF.A.1 (interpreting functions in Algebra I).
  + **Timeline:** Introduced in grade 8, expanded in grade 9.
  + **Power Standard:** Yes, fundamental for understanding advanced functions.

**Subject:** Statistics and Probability

* **CCSS.MATH.CONTENT.8.SP.A.1**: Construct and interpret scatter plots for bivariate measurement data.
  + **Topics:** Identifying trends, fitting lines to data.
  + **Review Standards:** CCSS.MATH.CONTENT.6.SP.B.4 (data plots).
  + **Supplementary Standards:** CCSS.MATH.CONTENT.HSS.ID.B.6 (scatter plots and correlation in Algebra II).
  + **Timeline:** Core instruction in grade 8, reinforced in Algebra I and II.
  + **Power Standard:** Yes, frequently tested in SAT data analysis.

**Grade 9 (Algebra I)**

**Subject:** Heart of Algebra

* **CCSS.MATH.CONTENT.HSA.CED.A.1**: Create equations and inequalities in one variable and use them to solve problems.
  + **Topics:** Writing and solving linear equations, translating word problems into algebraic expressions.
  + **Review Standards:** CCSS.MATH.CONTENT.8.EE.C.7 (solving linear equations in grade 8).
  + **Supplementary Standards:** CCSS.MATH.CONTENT.HSA.CED.A.3 (representing constraints).
  + **Timeline:** Core instruction in Algebra I, foundational for SAT.
  + **Power Standard:** Yes, essential for solving real-world algebra problems.
* **CCSS.MATH.CONTENT.HSA.REI.B.3**: Solve linear equations and inequalities in one variable, including those with coefficients represented by letters.
  + **Topics:** Multi-step equations, absolute value equations, and complex inequalities.
  + **Review Standards:** CCSS.MATH.CONTENT.8.EE.C.7.
  + **Supplementary Standards:** CCSS.MATH.CONTENT.HSA.REI.A.1 (reasoning in solving equations).
  + **Timeline:** Core instruction in Algebra I.
  + **Power Standard:** Yes, frequently tested on the SAT.

**Subject:** Problem Solving and Data Analysis

* **CCSS.MATH.CONTENT.HSN.Q.A.1**: Use units to solve problems and interpret the meaning of quantities.
  + **Topics:** Unit conversions, dimensional analysis, and interpreting rates.
  + **Review Standards:** CCSS.MATH.CONTENT.7.RP.A.2 (ratios and rates).
  + **Supplementary Standards:** CCSS.MATH.CONTENT.HSN.Q.A.2 (defining appropriate quantities).
  + **Timeline:** Core instruction in Algebra I, reinforced in later courses.
  + **Power Standard:** Yes, critical for SAT real-world math questions.

**Grade 10 (Geometry)**

**Subject:** Geometry

* **CCSS.MATH.CONTENT.HSG.GPE.B.4**: Use coordinates to prove simple geometric theorems algebraically.
  + **Topics:** Distance and midpoint formulas, proving relationships between lines.
  + **Review Standards:** CCSS.MATH.CONTENT.8.G.B.8 (Pythagorean theorem).
  + **Supplementary Standards:** CCSS.MATH.CONTENT.HSG.GPE.B.7 (using coordinates for polygons).
  + **Timeline:** Taught in Geometry, reinforced in Algebra II.
  + **Power Standard:** Yes, important for geometry questions on the SAT.

**Subject:** Trigonometry

* **CCSS.MATH.CONTENT.HSG.SRT.C.6**: Understand that by similarity, side ratios in right triangles are properties of the angles in the triangle.
  + **Topics:** Sine, cosine, tangent, and solving right triangle problems.
  + **Review Standards:** CCSS.MATH.CONTENT.8.G.B.6 (similar triangles).
  + **Supplementary Standards:** CCSS.MATH.CONTENT.HSG.SRT.C.8 (using trigonometric ratios).
  + **Timeline:** Taught in Geometry, expanded in Algebra II.
  + **Power Standard:** Yes, foundational for trigonometry on the SAT.

**Grade 11 (Algebra II)**

**Subject:** Passport to Advanced Math

* **CCSS.MATH.CONTENT.HSA.SSE.A.1**: Interpret expressions that represent a quantity in terms of its context.
  + **Topics:** Quadratic and exponential expressions, growth models, and contextual problem-solving.
  + **Review Standards:** CCSS.MATH.CONTENT.HSA.SSE.B.3 (rewriting expressions).
  + **Supplementary Standards:** CCSS.MATH.CONTENT.HSF.IF.C.7 (analyzing functions).
  + **Timeline:** Core instruction in Algebra II.
  + **Power Standard:** Yes, essential for advanced SAT algebra.
* **CCSS.MATH.CONTENT.HSF.IF.C.8**: Write a function defined by an expression in different forms to reveal properties of the function.
  + **Topics:** Completing the square, vertex form, and properties of quadratic functions.
  + **Review Standards:** CCSS.MATH.CONTENT.8.F.A.2 (comparing properties of functions).
  + **Supplementary Standards:** CCSS.MATH.CONTENT.HSF.BF.A.1 (building functions).
  + **Timeline:** Core instruction in Algebra II.
  + **Power Standard:** Yes, fundamental for SAT math success.

**Subject:** Problem Solving and Data Analysis

* **CCSS.MATH.CONTENT.HSS.ID.B.6**: Represent data on two quantitative variables and describe how the variables are related.
  + **Topics:** Scatterplots, correlation, and linear regression.
  + **Review Standards:** CCSS.MATH.CONTENT.8.SP.A.1 (scatterplots).
  + **Supplementary Standards:** CCSS.MATH.CONTENT.HSS.ID.C.7 (interpreting slope and intercept).
  + **Timeline:** Core instruction in Algebra II.
  + **Power Standard:** Yes, essential for SAT data analysis.

**Instructional Order and Emphasis**

1. **Foundational Skills (Grades 6-8):** Focus on ratios, proportions, and basic algebraic reasoning.
2. **Algebra I (Grade 9):** Build linear equation and inequality-solving skills.
3. **Geometry (Grade 10):** Emphasize geometric reasoning and introductory trigonometry.
4. **Algebra II (Grade 11):** Advance to complex equations, functions, and data analysis.

This structured progression ensures that students develop the foundational skills necessary for success on the SAT and in college-level math.