New Mexico SAT Math Performance Level Descriptors

Introduction

This document contains performance level descriptors (PLDs) in math based on SAT Math test data. Each descriptor represents a composite of student performance at one (or more) of several score bands on the Math Test, and the framework is correlated with empirically derived test benchmarks for college and career readiness and success as well as the New Mexico-adopted Common Core State Standards.

Each PLD focuses on the performance of **borderline** students. For example, the PLD for Performance Level 2 describes the skills and knowledge of students who demonstrate the minimal understanding and answered the minimum number of questions required to be classified at that level.

Because Performance Level 1 is at the bottom of the range, a full performance level descriptor is not needed, as the beginning of the range of scores for Performance Level 1 is the lowest section score available, 200.

Each PLD has the following components:

- A general statement broadly defining demonstrated achievement at the borderline of each level in relation to college and career readiness and success
- A series of indicators representing borderline student performance at that level

Math Performance Level 1

Students have not achieved Performance Level 2 and may demonstrate a basic understanding of and ability to apply the math skills and knowledge needed for college readiness and achievement relative to the assessed New Mexico-adopted Common Core State Standards. These students may be able to solve some problems that require applying simple strategies to basic areas of math but without an understanding of the reasoning behind the strategies and did not demonstrate achievement consistent with Performance Level 2.

Math Performance Level 2 Performance Level Descriptor

Students at the borderline of Performance Level 2 demonstrate an incomplete understanding of and ability to apply the math skills and knowledge needed for college readiness and achievement relative to the assessed New Mexico-adopted Common Core State Standards. These students are able to solve problems that call for simple strategies and reasoning accurately applied to basic areas of math.

In addition to the knowledge and skills in Performance Level 1, **borderline** students who just barely demonstrate they are Performance Level 2 are likely able to:

- Use ratios to solve problems in simple contexts.
- Use proportions to solve problems in simple contexts.
- Use rates to solve problems in simple contexts.
- Analyze and interpret univariate data represented with frequency tables, histograms, dot plots, and box plots.
- Analyze and interpret data represented in a simple scatterplot.
- Given a relationship between two quantities, read and interpret a graph modeling the relationship.
- Solve a real-world mathematical problem that can be modeled by a simple linear function.
- Identify a linear equation in two variables that represents a context.
- Identify equivalent algebraic expressions using the distributive property and/or combining like terms.

Math Performance Level 3 Performance Level Descriptor

Students at the borderline of Performance Level 3 demonstrate an adequate understanding of and ability to apply the math skills and knowledge needed for college readiness and achievement relative to the assessed New Mexico-adopted Common Core State Standards. These students are able to solve problems that call for effective use of strategies and accurate reasoning in different areas of math.

In addition to the knowledge and skills in Performance Levels 1 and 2, **borderline** students who just barely demonstrate they are Performance Level 3 are likely able to:

- Use ratios to solve multistep problems in simple contexts.
- Use proportions to solve multistep problems in simple contexts.
- Use rates to solve multistep problems in simple contexts.
- Solve problems involving unit conversion within measurement systems.
- Use percentages to solve problems in simple contexts.
- Given a univariate data set, calculate measures of center (mean, median) and spread (range) in a familiar setting.
- Analyze and interpret data represented in a scatterplot that is presented in a less familiar context.
- Identify and apply a linear function to solve a problem in a context.
- Make connections between two representations (table, algebraic, or graph) of a linear function.
- Make connections between a table, an algebraic representation, or a graph of a simple linear equation in two variables, deriving one from the other.
- Write an equation for a line given two points on the line or one point and the slope of the line.
- Solve a simple system of two linear equations in two variables.
- Given a linear function and an input value, calculate the output value.
- Make strategic use of algebraic structure and the properties of operations to identify and create equivalent expressions.
- Add, subtract, and multiply simple polynomials.
- Make connections between two representations (table, algebraic, or graph) of a quadratic or exponential function.
- Solve a real-world mathematical problem 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.
- Given a geometric figure, select the correct area or volume formula and calculate the specified value.

Math Performance Level 4 Performance Level Descriptor

Students at the borderline of Performance Level 4 demonstrate a thorough understanding of and ability to apply the math skills and knowledge needed for college readiness and achievement relative to the assessed New Mexico-adopted Common Core State Standards. These students are able to solve problems that call for a range of strategies, accurate and insightful reasoning, and connecting different areas of math.

In addition to the knowledge and skills in Performance Levels 1, 2 and 3, **borderline** students who just barely demonstrate they are Performance Level 4 are likely able to:

- Use ratios to solve problems in less familiar contexts.
- Use proportions to solve problems in less familiar contexts.
- Use rates to solve problems in less familiar contexts.
- Use percentages to solve multistep problems in simple contexts.
- Given a univariate data set, calculate measures of center (mean, median) and spread (range) in a less familiar setting.
- Given a univariate data set, calculate or interpret standard deviation in context.
- Analyze and interpret data represented in a complex scatterplot that is presented in a less familiar context.
- Identify and apply a linear function that represents an unfamiliar context.
- Interpret a linear function that represents a context.
- Interpret the graph of a linear function in a simple context.
- Interpret a linear equation in two variables.
- Make connections between two representations (table, algebraic, or graph) of a complex linear equation in two variables, deriving one from the other.
- Write an equation for a line given one point on the line and a parallel or perpendicular line.
- Solve a real-world mathematical problem that can be modeled by a system of two linear equations in two variables.
- Make connections between an algebraic representation and a graph of a system of linear equations in two variables, deriving one from the other.
- Solve a complex system of two linear equations in two variables.
- Factor polynomials.
- Use structure and reasoning to solve simple rational, radical, quadratic, exponential, polynomial, and absolute value equations in one variable.
- 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.
- Given the graph of $y = f(x)$, understand that the solutions to $f(x) = 0$ correspond to x-intercepts of the graph and $f(0)$ corresponds to the y-intercept of the graph.
- Make connections between input-output pairs and points on a nonlinear graph.
- Make connections between two representations (table, algebraic, or graph) of an absolute value, rational, radical, or polynomial function.
- Use function notation to represent and interpret input/output pairs in terms of a context.