**ETS PRAXIS.**

# Study Resources for the *Praxis*® Elementary Education: Mathematics Test (5003)

The links below allow you to connect content topics on this *Praxis*® test directly to free Khan Academy study resources.

| *Praxis* Elementary Education: Mathematics (5003) Content Topics | Study Resources |
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| **I. Numbers and Operations** | **Lesson** |
| A.   **Understands the place value system** | |
| 1.   Writes numbers using base-10 numerals, number names, and expanded form <br> 2.   Composes and decomposes multi-digit numbers <br> 3.   Given a digit, identifies the place the digit is in and its value in that place <br> 4.   Recognizes that a digit in one place represents ten times what it represents in the place to its right and one-tenth what it represents in the place to its left, and extends this recognition to several places to the right or left <br> 5.   Uses whole-number exponents to denote powers of 10 <br> 6.   Rounds multi-digit numbers to any place value | Praxis Math: Naming and ordering numbers <br> Pre-algebra: Arithmetic properties |
| B.   **Understands operations and properties of rational numbers** | Praxis Math: Rational number operations <br> Praxis Math: Naming and ordering numbers <br> Arithmetic |
| 1.   Solves multistep mathematical and real-world problems using addition, subtraction, multiplication, and division of rational numbers | Algebra basics: Foundations <br> Pre-algebra: Fractions <br> Pre-algebra: Decimals |
| 2.   Understands various strategies and algorithms used to perform operations on rational numbers | Pre-algebra: Fractions <br> Pre-algebra: Decimals |

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| 3. | Recognizes concepts of rational numbers and their operations | Pre-algebra: Arithmetic properties<br>Pre-algebra: Fractions<br>Pre-algebra: Decimals |
| 4. | Solves problems using the order of operations, including problems involving whole number exponents | Algebra basics: Expressions with exponents |
| 5. | Identifies properties of operations (e.g., commutative, associative, distributive) and uses them to solve problems | Pre-algebra: Arithmetic properties |
| 6. | Represents rational numbers and their operations in different ways | Pre-algebra: Fractions<br>Pre-algebra: Decimals |
| 7. | Compares, classifies, and orders rational numbers | Pre-algebra: Arithmetic properties<br>Pre-algebra: Fractions<br>Pre-algebra: Decimals |
| 8. | Converts between fractions, decimals, and percents | Pre-algebra: Decimals<br>Pre-algebra: Ratios, rates, proportions |
| **C.** | **Understands proportional relationships and percents** | Praxis Math: Ratios and proportions<br>Praxis Math: Percentages<br>Praxis Math: Rates |
| 1. | Applies the concepts of ratios and unit rates to describe relationships between two quantities | Pre-algebra: Ratios, rates, proportions |
| 2. | Understands percent as a rate per 100 | Pre-algebra: Ratios, rates, proportions |
| 3. | Solves unit-rate problems | Pre-algebra: Ratios, rates, proportions |
| 4. | Uses proportional relationships to solve ratio and percent problems | Pre-algebra: Ratios, rates, proportions<br>Algebra basics: Writing & solving proportions |
| **D.** | **Knows how to use basic concepts of number theory** | Praxis Math: Number concepts |
| 1. | Identifies and uses prime and composite numbers | Pre-algebra: Factors and multiples |
| 2. | Finds factors and multiples of numbers | Pre-algebra: Factors and multiples |

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| **E. Knows a variety of strategies to determine the reasonableness of results** | Praxis Math: Pre-algebra word problems |
| 1. Recognizes the reasonableness of results within the context of a given problem | |
| 2. Uses mental math, estimation, and rounding strategies to solve problems and determine reasonableness of results | |
| **II. Algebraic Thinking** | **Lesson** |
| **A. Knows how to evaluate and manipulate algebraic expressions, equations, and formulas** | Praxis Math: Algebraic properties<br>Praxis Math: Equivalent expressions<br>Praxis Math: Creating expressions and equations<br>Praxis Math: Algebraic word problems<br>Praxis Math: Quadratic equations |
| 1. Differentiates between algebraic expressions and equations | 6th grade: Variables and expressions<br>Pre-algebra: Equations, expressions, and inequalities<br>Algebra basics: Algebraic expressions |
| 2. Adds and subtracts linear algebraic expressions | 6th grade: Variables and expressions<br>7th grade: Expressions, equations, & inequalities<br>Pre-algebra: Equations, expressions, and inequalities<br>Algebra basics: Algebraic expressions |
| 3. Uses the distributive property to generate equivalent linear algebraic expressions | 6th grade: Variables and expressions<br>7th grade: Expressions, equations, & inequalities<br>Pre-algebra: Equations, expressions, and inequalities<br>Algebra basics: Algebraic expressions |
| 4. Evaluates simple algebraic expressions (i.e., one variable, binomial) for given values of variables | 6th grade: Variables and expressions<br>7th grade: Expressions, equations, & inequalities<br>Pre-algebra: Equations, expressions, and inequalities<br>Algebra basics: Algebraic expressions<br>Algebra basics: Quadratics and polynomials |
| 5. Uses mathematical terms to identify parts of expressions and describe expressions | 6th grade: Variables and expressions<br>Pre-algebra: Equations, expressions, and inequalities |

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| 6. Translates between verbal statements and algebraic expressions or equations (e.g., the phrase "the number of cookies Joe has is equal to twice the number of cookies Sue has" can be represented by the equation $j = 2s$) | 6th grade: Variables and expressions<br>7th grade: Expressions, equations, & inequalities<br>Pre-algebra: Equations, expressions, and inequalities<br>Algebra basics: Algebraic expressions |
| 7. Uses formulas to determine unknown quantities | 8th grade: Linear equations and functions<br>Pre-algebra: Equations, expressions, and inequalities |
| 8. Differentiates between dependent and independent variables in formulas | Pre-algebra: Equations, expressions, and inequalities |
| **B. Understands the meanings of the solutions to linear equations and inequalities** | Praxis Math: Solution procedures<br>Praxis Math: Linear equations<br>Praxis Math: Quadratic equations |
| 1. Solves multistep one-variable linear equations and inequalities | 7th grade: Expressions, equations, & inequalities<br>Pre-algebra: Equations, expressions, and inequalities<br>Algebra basics: Linear equations and inequalities |
| 2. Interprets solutions of multistep one-variable linear equations and inequalities (e.g., graphs the solution on a number line, states constraints on a situation) | 7th grade: Expressions, equations, & inequalities<br>Pre-algebra: Equations, expressions, and inequalities<br>Algebra basics: Linear equations and inequalities |
| 3. Uses linear relationships represented by equations, tables, and graphs to solve problems | 7th grade: Expressions, equations, & inequalities<br>8th grade: Linear equations and functions<br>Pre-algebra: Equations, expressions, and inequalities<br>Algebra basics: Graphing lines and slope |
| **C. Knows how to recognize and represent patterns (e.g., number, shape)** | Algebra I: Sequences |
| 1. Identifies, extends, describes, or generates number and shape patterns | Pre-algebra: Number patterns |
| 2. Makes conjectures, predictions, or generalizations based on patterns | |
| 3. Identifies relationships between the corresponding terms of two numerical patterns (e.g., find a rule for a function table) | |

| III. Geometry and Measurement, Data, Statistics, and Probability | Lesson |
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| A.   Understands how to classify one-, two-, and three-dimensional figures | Praxis Math: Properties of shapes<br>Praxis Math: Angles<br>Praxis Math: Congruence and similarity<br>Praxis Math: Circles |
| 1.   Uses definitions to identify lines, rays, line segments, parallel lines, and perpendicular lines | Basic geometry: Lines |
| 2.   Classifies angles based on their measure | Basic geometry: Angles<br>Basic geometry: Shapes |
| 3.   Composes and decomposes two- and three-dimensional shapes | Basic geometry: Shapes |
| 4.   Uses attributes to classify or draw polygons and solids | Basic geometry: Shapes<br>Basic geometry: Transformations, congruence, and similarity |
| B.   Knows how to solve problems involving perimeter, area, surface area, and volume | Praxis Math: Perimeter, area, and volume<br>Pre-algebra: Measurement |
| 1.   Represents three-dimensional figures with nets | Basic geometry: Volume and surface area |
| 2.   Uses nets that are made of rectangles and triangles to determine the surface area of three-dimensional figures | Basic geometry: Volume and surface area |
| 3.   Finds the area and perimeter of polygons, including those with fractional side lengths | Basic geometry: Area and perimeter |
| 4.   Finds the volume and surface area of right rectangular prisms, including those with fractional edge lengths | Basic geometry: Volume and surface area |
| 5.   Determines how changes to dimensions change area and volume | Basic geometry: Volume and surface area |
| C.   Knows the components of the coordinate plane and how to graph ordered pairs on the plane | |
| 1.   Identifies the x-axis, the y-axis, the origin, and the four quadrants in the coordinate plane | Basic geometry: Coordinate plane<br>5th grade: Coordinate plane |

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| | 2. Solves problems by plotting points and drawing polygons in the coordinate plane | Basic geometry: Coordinate plane<br>6th grade: Polygons on the coordinate plane |
| **D.** | **Knows how to solve problems involving measurement** | Praxis Math: Unit reasoning |
| | 1. Solves problems involving elapsed time, money, length, volume, and mass | 2nd grade: Measurement, data, and geometry<br>3rd grade: Measurement<br>4th grade Units of measurement<br>5th grade: Converting units of measure |
| | 2. Measures and compares lengths of objects using standard tools | 1st grade: Measurement, data, and geometry<br>2nd grade: Measurement, data, and geometry<br>4th grade Units of measurement<br>5th grade: Converting units of measure |
| | 3. Knows relative sizes of United States customary units and metric units | 3rd grade: Measurement<br>4th grade Units of measurement<br>5th grade: Converting units of measure |
| | 4. Converts units within both the United States customary system and the metric system | 4th grade Units of measurement<br>5th grade: Converting units of measure |
| **E.** | **Is familiar with basic statistical concepts** | Praxis Math: Data representations<br>Praxis Math: Center and spread<br>Pre-algebra: Reading and interpreting data |
| | 1. Identifies statistical questions | 6th grade: Data and statistics<br>Statistics and probability: Study design |
| | 2. Solves problems involving measures of center (mean, median, mode) and range | 6th grade: Data and statistics |
| | 3. Recognizes which measure of center best describes a set of data | 6th grade: Data and statistics<br>Statistics and probability: Summarizing quantitative data |
| | 4. Determines how changes in data affect measures of center or range | 6th grade: Data and statistics<br>Statistics and probability: Summarizing quantitative data |

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| 5. Describes a set of data (e.g., overall patterns, outliers) | 6th grade: Data and statistics<br>Statistics and probability: Summarizing quantitative data |
| **F. Knows how to represent and interpret data presented in various forms** | Praxis Math: Data representations<br>Pre-algebra: Reading and interpreting data |
| 1. Interprets various displays of data (e.g., box plots, histograms, scatterplots) | 6th grade: Data and statistics<br>Statistics and probability: Analyzing categorical data |
| 2. Identifies, constructs, and completes graphs that correctly represent given data (e.g., circle graphs, bar graphs, line graphs, histograms, scatterplots, double bar graphs, double line graphs, box plots, and line plots/dot plots) | 6th grade: Data and statistics<br>Statistics and probability: Analyzing categorical data<br>Statistics and probability: Displaying and comparing quantitative data |
| 3. Chooses appropriate graphs to display data | 6th grade: Data and statistics<br>Statistics and probability: Analyzing categorical data<br>Statistics and probability: Displaying and comparing quantitative data |
| **G. Is familiar with how to interpret the probability of events** | |
| 1. Interprets probabilities relative to likelihood of occurrence | 7th grade: Statistics and probability<br>Statistics and probability: Probability<br>Praxis Math: Probability |