

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.

<i>Praxis</i> Elementary Education: Mathematics (5003) Content Topics	S t u d y R e s o u r c e s
I. Numbers and Operations	L e s s o n
A. Understands the place value system	
1. Writes numbers using base-10 numerals, number names, and expanded form	Praxis Math: Naming and ordering numbers Pre-algebra: Arithmetic properties
2. Composes and decomposes multi-digit numbers	

Praxis Elementary Education: Mathematics (5003) Content Topics	S t u d y R e s o u r c e s
3. Given a digit, identifies the place the digit is in and its value in that place	
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	
5. Uses whole-number exponents to denote powers of 10	
6. Rounds multi-digit numbers to any place value	
B. Understands operations and properties of rational numbers	Praxis Math: Rational number operations Praxis Math: Naming and ordering numbers Arithmetic

Praxis Elementary Education: Mathematics (5003) Content Topics	S t u d y R e s o u r c e s
1. Solves multistep mathematical and real-world problems using addition, subtraction, multiplication, and division of rational numbers	Algebra basics: Foundations Pre-algebra: Fractions Pre-algebra: Decimals
2. Understands various strategies and algorithms used to perform operations on rational numbers	Pre-algebra: Fractions Pre-algebra: Decimals
3. Recognizes concepts of rational numbers and their operations	Pre-algebra: Arithmetic properties Pre-algebra: Fractions 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 Pre-algebra: Decimals

Praxis Elementary Education: Mathematics (5003) Content Topics	S t u d y R e s o u r c e s
7. Compares, classifies, and orders rational numbers	Pre-algebra: Arithmetic properties Pre-algebra: Fractions Pre-algebra: Decimals
8. Converts between fractions, decimals, and percents	Pre-algebra: Decimals Pre-algebra: Ratios, rates, proportions
C. Understands proportional relationships and percents	Praxis Math: Ratios and proportions Praxis Math: Percentages 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 Algebra basics: Writing & solving proportions

Praxis Elementary Education: Mathematics (5003) Content Topics	S t u d y R e s o u r c e s
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
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

Praxis Elementary Education: Mathematics (5003) Content Topics	S t u d y R e s o u r c e s
A. Knows how to evaluate and manipulate algebraic expressions, equations, and formulas	Praxis Math: Algebraic properties Praxis Math: Equivalent expressions Praxis Math: Creating expressions and equations Praxis Math: Algebraic word problems Praxis Math: Quadratic equations
1. Differentiates between algebraic expressions and equations	6th grade: Variables and expressions Pre-algebra: Equations, expressions, and inequalities Algebra basics: Algebraic expressions
2. Adds and subtracts linear algebraic expressions	6th grade: Variables and expressions 7th grade: Expressions, equations, & inequalities Pre-algebra: Equations, expressions, and inequalities Algebra basics: Algebraic expressions
3. Uses the distributive property to generate equivalent linear algebraic expressions	6th grade: Variables and expressions 7th grade: Expressions, equations, & inequalities Pre-algebra: Equations, expressions, and inequalities Algebra basics: Algebraic expressions

Praxis Elementary Education: Mathematics (5003) Content Topics	S t u d y R e s o u r c e s
4. Evaluates simple algebraic expressions (i.e., one variable, binomial) for given values of variables	6th grade: Variables and expressions 7th grade: Expressions, equations, & inequalities Pre-algebra: Equations, expressions, and inequalities Algebra basics: Algebraic expressions Algebra basics: Quadratics and polynomials
5. Uses mathematical terms to identify parts of expressions and describe expressions	6th grade: Variables and expressions Pre-algebra: Equations, expressions, and inequalities
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 7th grade: Expressions, equations, & inequalities Pre-algebra: Equations, expressions, and inequalities Algebra basics: Algebraic expressions
7. Uses formulas to determine unknown quantities	8th grade: Linear equations and functions Pre-algebra: Equations, expressions, and inequalities

Praxis Elementary Education: Mathematics (5003) Content Topics	S t u d y R e s o u r c e s
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 Praxis Math: Linear equations Praxis Math: Quadratic equations
1. Solves multistep one-variable linear equations and inequalities	7th grade: Expressions, equations, & inequalities Pre-algebra: Equations, expressions, and inequalities 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 Pre-algebra: Equations, expressions, and inequalities Algebra basics: Linear equations and inequalities
3. Uses linear relationships represented by equations, tables, and graphs to solve problems	7th grade: Expressions, equations, & inequalities 8th grade: Linear equations and functions Pre-algebra: Equations, expressions, and inequalities Algebra basics: Graphing lines and slope

Praxis Elementary Education: Mathematics (5003) Content Topics	S t u d y R e s o u r c e s
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
A. Understands how to classify one-, two-, and three-dimensional figures	Praxis Math: Properties of shapes Praxis Math: Angles Praxis Math: Congruence and similarity Praxis Math: Circles

Praxis Elementary Education: Mathematics (5003) Content Topics	S t u d y R e s o u r c e s
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 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 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 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

Praxis Elementary Education: Mathematics (5003) Content Topics	S t u d y R e s o u r c e s
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 5th grade: Coordinate plane
2. Solves problems by plotting points and drawing polygons in the coordinate plane	Basic geometry: Coordinate plane 6th grade: Polygons on the coordinate plane
D. Knows how to solve problems involving measurement	Praxis Math: Unit reasoning

Praxis Elementary Education: Mathematics (5003) Content Topics	S t u d y R e s o u r c e s
1. Solves problems involving elapsed time, money, length, volume, and mass	2nd grade: Measurement, data, and geometry 3rd grade: Measurement 4th grade Units of measurement 5th grade: Converting units of measure
2. Measures and compares lengths of objects using standard tools	1st grade: Measurement, data, and geometry 2nd grade: Measurement, data, and geometry 4th grade Units of measurement 5th grade: Converting units of measure
3. Knows relative sizes of United States customary units and metric units	3rd grade: Measurement 4th grade Units of measurement 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 5th grade: Converting units of measure

Praxis Elementary Education: Mathematics (5003) Content Topics	S t u d y R e s o u r c e s
E. Is familiar with basic statistical concepts	Praxis Math: Data representations Praxis Math: Center and spread Pre-algebra: Reading and interpreting data
1. Identifies statistical questions	6th grade: Data and statistics 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 Statistics and probability: Summarizing quantitative data
4. Determines how changes in data affect measures of center or range	6th grade: Data and statistics Statistics and probability: Summarizing quantitative data
5. Describes a set of data (e.g., overall patterns, outliers)	6th grade: Data and statistics Statistics and probability: Summarizing quantitative data

Praxis Elementary Education: Mathematics (5003) Content Topics	S t u d y R e s o u r c e s
F. Knows how to represent and interpret data presented in various forms	Praxis Math: Data representations Pre-algebra: Reading and interpreting data
1. Interprets various displays of data (e.g., box plots, histograms, scatterplots)	6th grade: Data and statistics 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 Statistics and probability: Analyzing categorical data Statistics and probability: Displaying and comparing quantitative data
3. Chooses appropriate graphs to display data	6th grade: Data and statistics Statistics and probability: Analyzing categorical data Statistics and probability: Displaying and comparing quantitative data
G. Is familiar with how to interpret the probability of events	

Praxis Elementary Education: Mathematics (5003) Content Topics	S t u d y R e s o u r c e s
1. Interprets probabilities relative to likelihood of occurrence	7th grade: Statistics and probability Statistics and probability: Probability Praxis Math: Probability