help program

Teaching Math To English Language Learners

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Teacher's Guide

Alignment to Colorado Standards

Version 3.1.2

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HELP Program
Alignment to Colorado Model Content Standards

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TABLE I:
Alignment to Colorado Model Content Standards for Mathematics Grades 5 – 8
Standards mapped to HELP Lessons

Model Content Standard	*What students know and are able to do includes:*	HELP Lesson
Standard 1 Students develop number sense and use numbers and number relationships in problem-solving situations and communicate the reasoning used in solving these problems.	(1.1) Demonstrating meanings for integers, rational numbers, percents, exponents, square roots and pi (π) using physical materials and technology in problem-solving situations	NMS Lesson 1 – Rational Numbers, Number Sets, and Signs NMS Lesson 2 – Fractions: Concepts and Representations NMS Lesson 3 – Working with Fractions NMS Lesson 4 – Decimals and Percents NMS Lesson 10 – Irrational Numbers, Roots, and Pythagorean Theorem
	(1.2) Reading, writing and ordering integers, rational numbers and common irrational numbers such as $\sqrt{2}$, $\sqrt{5}$, and π	NMS Lesson 1 – Rational Numbers, Number Sets, and Signs NMS Lesson 2 – Fractions: Concepts and Representations NMS Lesson 10 – Irrational Numbers, Roots, & Pythagorean Theorem
	(1.3) Applying number theory concepts (for example, primes, factors, multiples) to represent numbers in various ways	NMS Lesson 3 – Working with Fractions
	(1.4) Using the relationships among fractions, decimals, and percents, including the concepts of ratio and proportion, in problem-solving situations	NMS Lesson 5 – Ratios and Proportions NMS Lesson 6 – Scale
	(1.5) Developing, testing, and explaining conjectures about properties of integers and rational numbers	NMS Lesson 2 – Fractions: Concepts and Representations NMS Lesson 8 – Field Properties NMS Lesson 9 – Using Properties and Order of Operations to Evaluate Expressions
	(1.6) Using number sense to estimate and justify the reasonableness of solutions to problems involving integers, rational numbers, and common irrational numbers such as $\sqrt{2}$, $\sqrt{5}$, and π	NMS Lesson 10 – Irrational Numbers, Roots, & Pythagorean Theorem NMS Lesson 12 – Estimation and Rounding

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TABLE I: Alignment to Colorado Model Content Standards for Mathematics Grades 5 – 8
Standards mapped to HELP Lessons *(continued)*

Model Content Standard	*What students know and are able to do includes:*	HELP Lesson
Standard 2 Students use algebraic methods to explore, model, and describe patterns and functions involving numbers, shapes, data, and graphs in problem-solving situations and communicate the reasoning used in solving these problems.	(2.1) Representing, describing, and analyzing patterns and relationships using tables, graphs, verbal rules, and standard algebraic notation	AtoZ Lesson 1 – Interpreting Graphs AtoZ Lesson 2 – Variables AtoZ Lesson 3 – Patterns and Equations AtoZ Lesson 4 – Relationships AtoZ Lesson 6 – Understanding Functions (direct and indirect functions) AtoZ Lesson 12 – Graphing in the Coordinate Plane
	(2.2) Describing patterns using variables, expressions, equations, and inequalities in problem-solving situations	AtoZ Lesson 3 – Patterns and Equations AtoZ Lesson 5 – Combining Like Terms AtoZ Lesson 7 – Linear and Nonlinear Functions AtoZ Lesson 11 – Inequalities
	(2.3) Analyzing functional relationships to explain how a change in one quantity results in a change in another (for example, how the area of a circle changes as the radius increases, or how a person's height changes over time)	AtoZ Lesson 4 – Relationships AtoZ Lesson 6 – Understanding Functions (direct and indirect functions) AtoZ Lesson 9 – Proportional and Non-Proportional Relationships
	(2.4) Distinguishing between linear and nonlinear functions through informal investigations	AtoZ Lesson 7 – Linear and Nonlinear Functions AtoZ Lesson 8 – Graphing Linear Equations
	(2.5) Solving simple linear equations in problem-solving situations using a variety of methods (informal, formal, graphical) and a variety of tools (physical materials, calculators, computers)	AtoZ Lesson 5 – Combining Like Terms AtoZ Lesson 8 – Graphing Linear Equations AtoZ Lesson 10 – Algebraic Expressions Involving Powers

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TABLE I: Alignment to Colorado Model Content Standards for Mathematics Grades 5 – 8
Standards mapped to HELP Lessons *(continued)*

Model Content Standard	*What students know and are able to do includes:*	HELP Lesson
Standard 3 Students use data collection and analysis, statistics, and probability in problem-solving situations and communicate the reasoning used in solving these problems.	(3.1) Reading and constructing displays of data using appropriate techniques (for example, line graphs, circle graphs, scatter plots, box plots, stem-and-leaf plots) and appropriate technology	How Likely! Lesson 1 – Data Collection and Organization How Likely! Lesson 2 – Representing Data
	(3.2) Displaying and using measures of central tendency, such as mean, median, and mode, and measures of variability, such as range and quartiles	How Likely! Lesson 3 – Central Tendency
	(3.3) Evaluating arguments that are based on statistical claims	How Likely! Lesson 7 – Evaluate Predictions and Conclusions Based on Data Analysis
	(3.4) Formulating hypotheses, drawing conclusions, and making convincing arguments based on data analysis	How Likely! Lesson 4 – Interpret Data
	(3.5) Determining probabilities through experiments or simulations	How Likely! Lesson 5 – Probability (simple events and compound events) How Likely! Lesson 6 – Estimate the Probability of Future Events and Design Probability Experiments
	(3.6) Making predictions and comparing results using both experimental and theoretical probability drawn from real-world problems	How Likely! Lesson 6 – Estimate the Probability of Future Events and Design Probability Experiments How Likely! Lesson 8 – Experimental Results vs. Mathematical Probability
	(3.7) Using counting strategies to determine all the possible outcomes from an experiment (for example, the number of ways students can line up to have their picture taken)	How Likely! Lesson 8 – Experimental Results vs. Mathematical Probability

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TABLE I: Alignment to Colorado Model Content Standards for Mathematics Grades 5 – 8
Standards mapped to HELP Lessons *(continued)*

Model Content Standard	*What students know and are able to do includes:*	HELP Lesson
Standard 4 Students use geometric concepts, properties, and relationships in problem-solving situations and communicate the reasoning used in solving these problems.	(4.1) Constructing two- and three-dimensional models using a variety of materials and tools	Go Figure Lesson 2 – Polygons Go Figure Lesson 3 – Triangles Go Figure Lesson 4 – Solid Figures
	(4.2) Describing, analyzing, and reasoning informally about the properties (for example, parallelism, perpendicularity, congruence) of two- and three-dimensional figures	Go Figure Lesson 1 – Lines and Angles Go Figure Lesson 2 – Polygons Go Figure Lesson 3 – Triangles Go Figure Lesson 4 – Solid Figures Go Figure Lesson 6 – Circles Go Figure Lesson 8 – Symmetry Go Figure Lesson 9 – Similar and Congruent Figures
	(4.3) Applying the concepts of ratio, proportion, and similarity in problem-solving situations	Go Figure Lesson 9 – Similar and Congruent Figures
	(4.4) Solving problems using coordinate geometry	Go Figure Lesson 10 – Coordinate Geometry Go Figure Lesson 11 – Transformations
	(4.5) Solving problems involving perimeter and area in two dimensions, and involving surface area and volume in three dimensions	Go Figure Lesson 5 – Perimeter and Area Go Figure Lesson 7 – Volume and Surface Area
	(4.6) Transforming geometric figures using reflections, translations, and rotations to explore congruence	Go Figure Lesson 11 – Transformations

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TABLE I: Alignment to Colorado Model Content Standards for Mathematics Grades 5 – 8
Standards mapped to HELP Lessons *(continued)*

Model Content Standard	*What students know and are able to do includes:*	HELP Lesson
Standard 5 Students use a variety of tools and techniques to measure, apply the results in problem-solving situations, and communicate the reasoning used in solving these problems.	(5.1) Estimating, using, and describing measures of distance, perimeter, area, volume, capacity, weight, mass, and angle comparison	Go Figure Lesson 5 – Perimeter and Area Go Figure Lesson 7 – Volume and Surface Area
	(5.2) Estimating, making, and using direct and indirect measurements to describe and make comparisons	Go Figure Lesson 7 – Volume and Surface Area
	(5.3) Reading and interpreting various scales including those based on number lines, graphs, and maps	NMS Lesson 6 – Scale Go Figure Lesson 11 – Transformations AtoZ Lesson 1 – Interpreting Graphs How Likely! Lesson 4 – Interpret Data How Likely! Lesson 7 – Evaluate Predictions and Conclusions Based on Data Analysis How Likely! Lesson 8 – Experimental Results vs. Mathematical Probability
	(5.4) Developing and using formulas and procedures to solve problems involving measurement	NMS Lesson 6 – Scale Go Figure Lesson 12 – Pythagorean Theorem
	(5.5) Describing how a change in an object's linear dimensions affects its perimeter, area, and volume	Go Figure Lesson 5 – Perimeter and Area Go Figure Lesson 7 – Volume and Surface Area
	(5.6) Selecting and using appropriate units and tools to measure to the degree of accuracy required in a particular problem-solving situation	NMS Lesson 11 – Scientific Notation: Very Large and Very Small Numbers Go Figure Lesson 7 – Volume and Surface Area How Likely! Lesson 4 – Interpret Data How Likely! Lesson 7 – Evaluate Predictions and Conclusions Based on Data Analysis How Likely! Lesson 8 – Experimental Results vs. Mathematical Probability

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TABLE I: Alignment to Colorado Model Content Standards for Mathematics Grades 5 – 8
Standards mapped to HELP Lessons *(continued)*

Model Content Standard	*What students know and are able to do includes:*	HELP Lesson
Standard 6 Students link concepts and procedures as they develop and use computational techniques, including estimation, mental arithmetic, paper-and-pencil, calculators, and computers, in problem-solving situations and communicate the reasoning used in solving these problems.	(6.1) Using models to explain how ratios, proportions, and percents can be used to solve real-world problems	NMS Lesson 4 – Decimals and Percents NMS Lesson 5 – Ratios and Proportions NMS Lesson 6 – Scale NMS Lesson 7 – Similar Figures NMS Lesson 12 – Estimation and Rounding AtoZ Lesson 9 – Proportional and Non-Proportional Relationships
	(6.2) Constructing, using, and explaining procedures to compute and estimate with whole numbers, fractions, decimals, and integers	NMS Lesson 1 – Rational Numbers, Number Sets, and Signs NMS Lesson 2 – Fractions: Concepts and Representations NMS Lesson 3 – Working with Fractions NMS Lesson 4 – Decimals and Percents
	(6.3) Developing, applying, and explaining a variety of different estimation strategies in problem-solving situations, and explaining why an estimate may be acceptable in place of an exact answer	NMS Lesson 11 – Scientific Notation: Very Large and Very Small Numbers NMS Lesson 12 – Estimation and Rounding How Likely! Lesson 2 – Representing Data
	(6.4) Selecting and using appropriate methods for computing with commonly used fractions and decimals, percents, and integers in problem-solving situations from among mental arithmetic, estimation, paper-and-pencil, calculator, and computer methods, and determining whether the results are reasonable	NMS Lesson 2 – Fractions: Concepts and Representations NMS Lesson 12 – Estimation and Rounding Go Figure Lesson 7 – Volume and Surface Area How Likely! Lesson 6 – Estimate the Probability of Future Events and Design Probability Experiments How Likely! Lesson 8 – Experimental Results vs. Mathematical Probability

TABLE II:
Alignment of HELP *Numbers Make Sense* (Number Relationships & Operations) to Colorado Model Content Standards for Mathematics Grades 5 – 8

Numbers Make Sense Lesson	Model Content Standard	*What students know and are able to do includes:*
Lesson 1 **Rational Numbers, Number Sets, and Signs**	**Standard 1** Students develop number sense and use numbers and number relationships in problem-solving situations and communicate the reasoning used in solving these problems.	(1.1) Demonstrating meanings for integers, rational numbers, percents, exponents, square roots and pi (π) using physical materials and technology in problem-solving situations
		(1.2) Reading, writing and ordering integers, rational numbers and common irrational numbers such as $\sqrt{2}$, $\sqrt{5}$, and π
	Standard 6 Students link concepts and procedures as they develop and use computational techniques, including estimation, mental arithmetic, paper-and-pencil, calculators, and computers, in problem-solving situations and communicate the reasoning used in solving these problems.	(6.2) Constructing, using, and explaining procedures to compute and estimate with whole numbers, fractions, decimals, and integers
Lesson 2 **Fractions: Concepts and Representations** *(continued)*	**Standard 1** Students develop number sense and use numbers and number relationships in problem-solving situations and communicate the reasoning used in solving these problems.	(1.1) Demonstrating meanings for integers, rational numbers, percents, exponents, square roots and pi (π) using physical materials and technology in problem-solving situations
		(1.2) Reading, writing and ordering integers, rational numbers and common irrational numbers such as $\sqrt{2}$, $\sqrt{5}$, and π
		(1.5) Developing, testing, and explaining conjectures about properties of integers and rational numbers

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TABLE II: Alignment of HELP *Numbers Make Sense* (Number Relationships & Operations) to Colorado Model Content Standards for Mathematics Grades 5 – 8 *(continued)*

Numbers Make Sense Lesson	Model Content Standard	*What students know and are able to do includes:*
Lesson 2 **Fractions: Concepts and Representations** *(continued)*	**Standard 6** Students link concepts and procedures as they develop and use computational techniques, including estimation, mental arithmetic, paper-and-pencil, calculators, and computers, in problem-solving situations and communicate the reasoning used in solving these problems.	(6.2) Constructing, using, and explaining procedures to compute and estimate with whole numbers, fractions, decimals, and integers
		(6.4) Selecting and using appropriate methods for computing with commonly used fractions and decimals, percents, and integers in problem-solving situations from among mental arithmetic, estimation, paper-and-pencil, calculator, and computer methods, and determining whether the results are reasonable
Lesson 3 **Working with Fractions**	**Standard 1** Students develop number sense and use numbers and number relationships in problem-solving situations and communicate the reasoning used in solving these problems.	(1.1) Demonstrating meanings for integers, rational numbers, percents, exponents, square roots and pi (π) using physical materials and technology in problem-solving situations
		(1.3) Applying number theory concepts (for example, primes, factors, multiples) to represent numbers in various ways
	Standard 6 Students link concepts and procedures as they develop and use computational techniques, including estimation, mental arithmetic, paper-and-pencil, calculators, and computers, in problem-solving situations and communicate the reasoning used in solving these problems.	(6.2) Constructing, using, and explaining procedures to compute and estimate with whole numbers, fractions, decimals, and integers
Lesson 4 **Decimals and Percents**	**Standard 1** Students develop number sense and use numbers and number relationships in problem-solving situations and communicate the reasoning used in solving these problems.	(1.1) Demonstrating meanings for integers, rational numbers, percents, exponents, square roots and pi (π) using physical materials and technology in problem-solving situations
	Standard 6 Students link concepts and procedures as they develop and use computational techniques, including estimation, mental arithmetic, paper-and-pencil, calculators, and computers, in problem-solving situations and communicate the reasoning used in solving these problems.	(6.1) Using models to explain how ratios, proportions, and percents can be used to solve real-world problems
		(6.2) Constructing, using, and explaining procedures to compute and estimate with whole numbers, fractions, decimals, and integers

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TABLE II: Alignment of HELP *Numbers Make Sense* (Number Relationships & Operations) to Colorado Model Content Standards for Mathematics Grades 5 – 8 *(continued)*

Numbers Make Sense Lesson	Model Content Standard	*What students know and are able to do includes:*
Lesson 5 **Ratios and Proportions**	**Standard 1** Students develop number sense and use numbers and number relationships in problem-solving situations and communicate the reasoning used in solving these problems.	(1.4) Using the relationships among fractions, decimals, and percents, including the concepts of ratio and proportion, in problem-solving situations
	Standard 6 Students link concepts and procedures as they develop and use computational techniques, including estimation, mental arithmetic, paper-and-pencil, calculators, and computers, in problem-solving situations and communicate the reasoning used in solving these problems.	(6.1) Using models to explain how ratios, proportions, and percents can be used to solve real-world problems
Lesson 6 **Scale**	**Standard 1** Students develop number sense and use numbers and number relationships in problem-solving situations and communicate the reasoning used in solving these problems.	(1.4) Using the relationships among fractions, decimals, and percents, including the concepts of ratio and proportion, in problem-solving situations
	Standard 5 Students use a variety of tools and techniques to measure, apply the results in problem-solving situations, and communicate the reasoning used in solving these problems.	(5.3) Reading and interpreting various scales including those based on number lines, graphs, and maps
		(5.4) Developing and using formulas and procedures to solve problems involving measurement
	Standard 6 Students link concepts and procedures as they develop and use computational techniques, including estimation, mental arithmetic, paper-and-pencil, calculators, and computers, in problem-solving situations and communicate the reasoning used in solving these problems.	(6.1) Using models to explain how ratios, proportions, and percents can be used to solve real-world problems

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TABLE II: Alignment of HELP *Numbers Make Sense* (Number Relationships & Operations) to Colorado Model Content Standards for Mathematics Grades 5 – 8 *(continued)*

Numbers Make Sense Lesson	Model Content Standard	*What students know and are able to do includes:*
Lesson 7 **Similar Figures**	**Standard 6** Students link concepts and procedures as they develop and use computational techniques, including estimation, mental arithmetic, paper-and-pencil, calculators, and computers, in problem-solving situations and communicate the reasoning used in solving these problems.	(6.1) Using models to explain how ratios, proportions, and percents can be used to solve real-world problems
Lesson 8 **Field Properties**	**Standard 1** Students develop number sense and use numbers and number relationships in problem-solving situations and communicate the reasoning used in solving these problems.	(1.5) Developing, testing, and explaining conjectures about properties of integers and rational numbers
Lesson 9 **Using Properties and Order of Operations to Evaluate Expressions**	**Standard 1** Students develop number sense and use numbers and number relationships in problem-solving situations and communicate the reasoning used in solving these problems.	(1.5) Developing, testing, and explaining conjectures about properties of integers and rational numbers
Lesson 10 **Irrational Numbers, Roots, and Pythagorean Theorem**	**Standard 1** Students develop number sense and use numbers and number relationships in problem-solving situations and communicate the reasoning used in solving these problems.	(1.1) Demonstrating meanings for integers, rational numbers, percents, exponents, square roots and pi (π) using physical materials and technology in problem-solving situations
		(1.2) Reading, writing and ordering integers, rational numbers and common irrational numbers such as $\sqrt{2}$, $\sqrt{5}$, and π
		(1.6) Using number sense to estimate and justify the reasonableness of solutions to problems involving integers, rational numbers, and common irrational numbers such as $\sqrt{2}$, $\sqrt{5}$, and π

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TABLE II: Alignment of HELP *Numbers Make Sense* (Number Relationships & Operations) to Colorado Model Content Standards for Mathematics Grades 5 – 8 *(continued)*

Numbers Make Sense Lesson	Model Content Standard	*What students know and are able to do includes:*
Lesson 11 **Scientific Notation: Very Large and Very Small Numbers**	**Standard 5** Students use a variety of tools and techniques to measure, apply the results in problem-solving situations, and communicate the reasoning used in solving these problems.	(5.6) Selecting and using appropriate units and tools to measure to the degree of accuracy required in a particular problem-solving situation
	Standard 6 Students link concepts and procedures as they develop and use computational techniques, including estimation, mental arithmetic, paper-and-pencil, calculators, and computers, in problem-solving situations and communicate the reasoning used in solving these problems.	(6.3) Developing, applying, and explaining a variety of different estimation strategies in problem-solving situations, and explaining why an estimate may be acceptable in place of an exact answer
Lesson 12 **Estimation and Rounding**	**Standard 1** Students develop number sense and use numbers and number relationships in problem-solving situations and communicate the reasoning used in solving these problems.	(1.6) Using number sense to estimate and justify the reasonableness of solutions to problems involving integers, rational numbers, and common irrational numbers such as $\sqrt{2}$, $\sqrt{5}$, and π
	Standard 6 Students link concepts and procedures as they develop and use computational techniques, including estimation, mental arithmetic, paper-and-pencil, calculators, and computers, in problem-solving situations and communicate the reasoning used in solving these problems.	(6.1) Using models to explain how ratios, proportions, and percents can be used to solve real-world problems
		(6.3) Developing, applying, and explaining a variety of different estimation strategies in problem-solving situations, and explaining why an estimate may be acceptable in place of an exact answer
		(6.4) Selecting and using appropriate methods for computing with commonly used fractions and decimals, percents, and integers in problem-solving situations from among mental arithmetic, estimation, paper-and-pencil, calculator, and computer methods, and determining whether the results are reasonable

Click on a Lesson name to open it in your browser

TABLE III:
Alignment of HELP *From ABC to XYZ* (Algebra) to Colorado Model Content Standards for Mathematics Grades 5 – 8

From ABC to XYZ Lesson	Model Content Standard	*What students know and are able to do includes:*
Lesson 1 **Interpreting Graphs**	**Standard 2** Students use algebraic methods to explore, model, and describe patterns and functions involving numbers, shapes, data, and graphs in problem-solving situations and communicate the reasoning used in solving these problems.	(2.1) Representing, describing, and analyzing patterns and relationships using tables, graphs, verbal rules, and standard algebraic notation
	Standard 5 Students use a variety of tools and techniques to measure, apply the results in problem-solving situations, and communicate the reasoning used in solving these problems.	(5.3) Reading and interpreting various scales including those based on number lines, graphs, and maps
Lesson 2 **Variables**	**Standard 2** Students use algebraic methods to explore, model, and describe patterns and functions involving numbers, shapes, data, and graphs in problem-solving situations and communicate the reasoning used in solving these problems.	(2.1) Representing, describing, and analyzing patterns and relationships using tables, graphs, verbal rules, and standard algebraic notation
Lesson 3 **Patterns and Equations**	**Standard 2** Students use algebraic methods to explore, model, and describe patterns and functions involving numbers, shapes, data, and graphs in problem-solving situations and communicate the reasoning used in solving these problems.	(2.1) Representing, describing, and analyzing patterns and relationships using tables, graphs, verbal rules, and standard algebraic notation
		(2.2) Describing patterns using variables, expressions, equations, and inequalities in problem-solving situations
Lesson 4 **Relationships**	**Standard 2** Students use algebraic methods to explore, model, and describe patterns and functions involving numbers, shapes, data, and graphs in problem-solving situations and communicate the reasoning used in solving these problems.	(2.1) Representing, describing, and analyzing patterns and relationships using tables, graphs, verbal rules, and standard algebraic notation
		(2.3) Analyzing functional relationships to explain how a change in one quantity results in a change in another (for example, how the area of a circle changes as the radius increases, or how a person's height changes over time)

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Click on a Lesson name to open it in your browser

TABLE III: Alignment of HELP *From ABC to XYZ* (Algebra) to Colorado Model Content Standards for Mathematics Grades 5 – 8 *(continued)*

From ABC to XYZ Lesson	Model Content Standard	*What students know and are able to do includes:*
Lesson 5 **Combining Like Terms**	**Standard 2** Students use algebraic methods to explore, model, and describe patterns and functions involving numbers, shapes, data, and graphs in problem-solving situations and communicate the reasoning used in solving these problems.	(2.2) Describing patterns using variables, expressions, equations, and inequalities in problem-solving situations
		(2.5) Solving simple linear equations in problem-solving situations using a variety of methods (informal, formal, graphical) and a variety of tools (physical materials, calculators, computers)
Lesson 6 **Understanding Functions (direct and indirect functions)**	**Standard 2** Students use algebraic methods to explore, model, and describe patterns and functions involving numbers, shapes, data, and graphs in problem-solving situations and communicate the reasoning used in solving these problems.	(2.1) Representing, describing, and analyzing patterns and relationships using tables, graphs, verbal rules, and standard algebraic notation
		(2.3) Analyzing functional relationships to explain how a change in one quantity results in a change in another (for example, how the area of a circle changes as the radius increases, or how a person's height changes over time)
Lesson 7 **Linear and Nonlinear Functions**	**Standard 2** Students use algebraic methods to explore, model, and describe patterns and functions involving numbers, shapes, data, and graphs in problem-solving situations and communicate the reasoning used in solving these problems.	(2.2) Describing patterns using variables, expressions, equations, and inequalities in problem-solving situations
		(2.4) Distinguishing between linear and nonlinear functions through informal investigations
Lesson 8 **Graphing Linear Equations**	**Standard 2** Students use algebraic methods to explore, model, and describe patterns and functions involving numbers, shapes, data, and graphs in problem-solving situations and communicate the reasoning used in solving these problems.	(2.4) Distinguishing between linear and nonlinear functions through informal investigations
		(2.5) Solving simple linear equations in problem-solving situations using a variety of methods (informal, formal, graphical) and a variety of tools (physical materials, calculators, computers)

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TABLE III: Alignment of HELP *From ABC to XYZ* (Algebra) to Colorado Model Content Standards for Mathematics Grades 5 – 8 *(continued)*

From ABC to XYZ Lesson	Model Content Standard	*What students know and are able to do includes:*
Lesson 9 **Proportional and Non-Proportional Relationships**	**Standard 2** Students use algebraic methods to explore, model, and describe patterns and functions involving numbers, shapes, data, and graphs in problem-solving situations and communicate the reasoning used in solving these problems.	(2.3) Analyzing functional relationships to explain how a change in one quantity results in a change in another (for example, how the area of a circle changes as the radius increases, or how a person's height changes over time)
	Standard 6 Students link concepts and procedures as they develop and use computational techniques, including estimation, mental arithmetic, paper-and-pencil, calculators, and computers, in problem-solving situations and communicate the reasoning used in solving these problems.	(6.1) Using models to explain how ratios, proportions, and percents can be used to solve real-world problems
Lesson 10 **Algebraic Expressions Involving Powers**	**Standard 2** Students use algebraic methods to explore, model, and describe patterns and functions involving numbers, shapes, data, and graphs in problem-solving situations and communicate the reasoning used in solving these problems.	(2.5) Solving simple linear equations in problem-solving situations using a variety of methods (informal, formal, graphical) and a variety of tools (physical materials, calculators, computers)
Lesson 11 **Inequalities**	**Standard 2** Students use algebraic methods to explore, model, and describe patterns and functions involving numbers, shapes, data, and graphs in problem-solving situations and communicate the reasoning used in solving these problems.	(2.2) Describing patterns using variables, expressions, equations, and inequalities in problem-solving situations
Lesson 12 **Graphing in the Coordinate Plane**	**Standard 2** Students use algebraic methods to explore, model, and describe patterns and functions involving numbers, shapes, data, and graphs in problem-solving situations and communicate the reasoning used in solving these problems.	(2.1) Representing, describing, and analyzing patterns and relationships using tables, graphs, verbal rules, and standard algebraic notation

Click on a Lesson name to open it in your browser

TABLE IV:
Alignment of HELP *Go Figure* (Geometry) to Colorado Model Content Standards for Mathematics Grades 5 – 8

Go Figure Lesson	Model Content Standard	*What students know and are able to do includes:*
Lesson 1 **Lines and Angles**	**Standard 4** Students use geometric concepts, properties, and relationships in problem-solving situations and communicate the reasoning used in solving these problems.	(4.2) Describing, analyzing, and reasoning informally about the properties (for example, parallelism, perpendicularity, congruence) of two- and three-dimensional figures
Lesson 2 **Polygons**	**Standard 4** Students use geometric concepts, properties, and relationships in problem-solving situations and communicate the reasoning used in solving these problems.	(4.1) Constructing two- and three-dimensional models using a variety of materials and tools
		(4.2) Describing, analyzing, and reasoning informally about the properties (for example, parallelism, perpendicularity, congruence) of two- and three-dimensional figures
Lesson 3 **Triangles**	**Standard 4** Students use geometric concepts, properties, and relationships in problem-solving situations and communicate the reasoning used in solving these problems.	(4.1) Constructing two- and three-dimensional models using a variety of materials and tools
		(4.2) Describing, analyzing, and reasoning informally about the properties (for example, parallelism, perpendicularity, congruence) of two- and three-dimensional figures
Lesson 4 **Solid Figures**	**Standard 4** Students use geometric concepts, properties, and relationships in problem-solving situations and communicate the reasoning used in solving these problems.	(4.1) Constructing two- and three-dimensional models using a variety of materials and tools
		(4.2) Describing, analyzing, and reasoning informally about the properties (for example, parallelism, perpendicularity, congruence) of two- and three-dimensional figures

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TABLE IV: Alignment of HELP *Go Figure* (Geometry) to Colorado Model Content Standards for Mathematics Grades 5 – 8 *(continued)*

Go Figure Lesson	Model Content Standard	*What students know and are able to do includes:*
Lesson 5 **Perimeter and Area**	**Standard 4** Students use geometric concepts, properties, and relationships in problem-solving situations and communicate the reasoning used in solving these problems.	(4.5) Solving problems involving perimeter and area in two dimensions, and involving surface area and volume in three dimensions
	Standard 5 Students use a variety of tools and techniques to measure, apply the results in problem-solving situations, and communicate the reasoning used in solving these problems.	(5.1) Estimating, using, and describing measures of distance, perimeter, area, volume, capacity, weight, mass, and angle comparison
		(5.5) Describing how a change in an object's linear dimensions affects its perimeter, area, and volume
Lesson 6 **Circles**	**Standard 4** Students use geometric concepts, properties, and relationships in problem-solving situations and communicate the reasoning used in solving these problems.	(4.2) Describing, analyzing, and reasoning informally about the properties (for example, parallelism, perpendicularity, congruence) of two- and three-dimensional figures

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TABLE IV: Alignment of HELP *Go Figure* (Geometry) to Colorado Model Content Standards for Mathematics Grades 5 – 8 *(continued)*

Go Figure Lesson	Model Content Standard	*What students know and are able to do includes:*
Lesson 7 **Volume and Surface Area**	**Standard 4** Students use geometric concepts, properties, and relationships in problem-solving situations and communicate the reasoning used in solving these problems.	(4.5) Solving problems involving perimeter and area in two dimensions, and involving surface area and volume in three dimensions
	Standard 5 Students use a variety of tools and techniques to measure, apply the results in problem-solving situations, and communicate the reasoning used in solving these problems.	(5.1) Estimating, using, and describing measures of distance, perimeter, area, volume, capacity, weight, mass, and angle comparison
		(5.2) Estimating, making, and using direct and indirect measurements to describe and make comparisons
		(5.5) Describing how a change in an object's linear dimensions affects its perimeter, area, and volume
		(5.6) Selecting and using appropriate units and tools to measure to the degree of accuracy required in a particular problem-solving situation
	Standard 6 Students link concepts and procedures as they develop and use computational techniques, including estimation, mental arithmetic, paper-and-pencil, calculators, and computers, in problem-solving situations and communicate the reasoning used in solving these problems.	(6.4) Selecting and using appropriate methods for computing with commonly used fractions and decimals, percents, and integers in problem-solving situations from among mental arithmetic, estimation, paper-and-pencil, calculator, and computer methods, and determining whether the results are reasonable
Lesson 8 **Symmetry**	**Standard 4** Students use geometric concepts, properties, and relationships in problem-solving situations and communicate the reasoning used in solving these problems.	(4.2) Describing, analyzing, and reasoning informally about the properties (for example, parallelism, perpendicularity, congruence) of two- and three-dimensional figures

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TABLE IV: Alignment of HELP *Go Figure* (Geometry) to Colorado Model Content Standards for Mathematics Grades 5 – 8 *(continued)*

Go Figure Lesson	Model Content Standard	*What students know and are able to do includes:*
Lesson 9 **Similar and Congruent Figures**	**Standard 4** Students use geometric concepts, properties, and relationships in problem-solving situations and communicate the reasoning used in solving these problems.	(4.2) Describing, analyzing, and reasoning informally about the properties (for example, parallelism, perpendicularity, congruence) of two- and three-dimensional figures
		(4.3) Applying the concepts of ratio, proportion, and similarity in problem-solving situations
Lesson 10 **Coordinate Geometry**	**Standard 4** Students use geometric concepts, properties, and relationships in problem-solving situations and communicate the reasoning used in solving these problems.	(4.4) Solving problems using coordinate geometry
Lesson 11 **Transformations**	**Standard 4** Students use geometric concepts, properties, and relationships in problem-solving situations and communicate the reasoning used in solving these problems.	(4.4) Solving problems using coordinate geometry
		(4.6) Transforming geometric figures using reflections, translations, and rotations to explore congruence
	Standard 5 Students use a variety of tools and techniques to measure, apply the results in problem-solving situations, and communicate the reasoning used in solving these problems.	(5.3) Reading and interpreting various scales including those based on number lines, graphs, and maps
Lesson 12 **Pythagorean Theorem**	**Standard 5** Students use a variety of tools and techniques to measure, apply the results in problem-solving situations, and communicate the reasoning used in solving these problems.	(5.4) Developing and using formulas and procedures to solve problems involving measurement

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TABLE V:
Alignment of HELP *How Likely!* (Data Analysis & Probability) to Colorado Model Content Standards for Mathematics Grades 5 – 8

How Likely! Lesson	Model Content Standard	*What students know and are able to do includes:*
Lesson 1 **Data Collection and Organization**	**Standard 3** Students use data collection and analysis, statistics, and probability in problem-solving situations and communicate the reasoning used in solving these problems.	(3.1) Reading and constructing displays of data using appropriate techniques (for example, line graphs, circle graphs, scatter plots, box plots, stem-and-leaf plots) and appropriate technology
Lesson 2 **Representing Data**	**Standard 3** Students use data collection and analysis, statistics, and probability in problem-solving situations and communicate the reasoning used in solving these problems.	(3.1) Reading and constructing displays of data using appropriate techniques (for example, line graphs, circle graphs, scatter plots, box plots, stem-and-leaf plots) and appropriate technology
	Standard 6 Students link concepts and procedures as they develop and use computational techniques, including estimation, mental arithmetic, paper-and-pencil, calculators, and computers, in problem-solving situations and communicate the reasoning used in solving these problems.	(6.3) Developing, applying, and explaining a variety of different estimation strategies in problem-solving situations, and explaining why an estimate may be acceptable in place of an exact answer
Lesson 3 **Central Tendency** *(double lesson)*	**Standard 3** Students use data collection and analysis, statistics, and probability in problem-solving situations and communicate the reasoning used in solving these problems.	(3.2) Displaying and using measures of central tendency, such as mean, median, and mode, and measures of variability, such as range and quartiles
Lesson 4 **Interpret Data** *(double lesson)*	**Standard 3** Students use data collection and analysis, statistics, and probability in problem-solving situations and communicate the reasoning used in solving these problems.	(3.4) Formulating hypotheses, drawing conclusions, and making convincing arguments based on data analysis
	Standard 5 Students use a variety of tools and techniques to measure, apply the results in problem-solving situations, and communicate the reasoning used in solving these problems.	(5.3) Reading and interpreting various scales including those based on number lines, graphs, and maps
		(5.6) Selecting and using appropriate units and tools to measure to the degree of accuracy required in a particular problem-solving situation

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TABLE V: Alignment of HELP *How Likely!* (Data Analysis & Probability) to Colorado Model Content Standards for Mathematics Grades 5 – 8 *(continued)*

How Likely! Lesson	Model Content Standard	*What students know and are able to do includes:*
Lesson 5 **Probability (simple events and compound events)** *(double lesson)*	**Standard 3** Students use data collection and analysis, statistics, and probability in problem-solving situations and communicate the reasoning used in solving these problems.	(3.5) Determining probabilities through experiments or simulations
Lesson 6 **Estimate the Probability of Future Events and Design Probability Experiments** *(double lesson)*	**Standard 3** Students use data collection and analysis, statistics, and probability in problem-solving situations and communicate the reasoning used in solving these problems.	(3.5) Determining probabilities through experiments or simulations
		(3.6) Making predictions and comparing results using both experimental and theoretical probability drawn from real-world problems
	Standard 6 Students link concepts and procedures as they develop and use computational techniques, including estimation, mental arithmetic, paper-and-pencil, calculators, and computers, in problem-solving situations and communicate the reasoning used in solving these problems.	(6.4) Selecting and using appropriate methods for computing with commonly used fractions and decimals, percents, and integers in problem-solving situations from among mental arithmetic, estimation, paper-and-pencil, calculator, and computer methods, and determining whether the results are reasonable
Lesson 7 **Evaluate Predictions and Conclusions Based on Data Analysis**	**Standard 3** Students use data collection and analysis, statistics, and probability in problem-solving situations and communicate the reasoning used in solving these problems.	(3.3) Evaluating arguments that are based on statistical claims
	Standard 5 Students use a variety of tools and techniques to measure, apply the results in problem-solving situations, and communicate the reasoning used in solving these problems.	(5.3) Reading and interpreting various scales including those based on number lines, graphs, and maps
		(5.6) Selecting and using appropriate units and tools to measure to the degree of accuracy required in a particular problem-solving situation

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TABLE V: Alignment of HELP *How Likely!* (Data Analysis & Probability) to Colorado Model Content Standards for Mathematics Grades 5 – 8 *(continued)*

How Likely! Lesson	Model Content Standard	*What students know and are able to do includes:*
Lesson 8 **Experimental Results vs. Mathematical Probability**	**Standard 3** Students use data collection and analysis, statistics, and probability in problem-solving situations and communicate the reasoning used in solving these problems.	(3.6) Making predictions and comparing results using both experimental and theoretical probability drawn from real-world problems
		(3.7) Using counting strategies to determine all the possible outcomes from an experiment (for example, the number of ways students can line up to have their picture taken)
	Standard 5 Students use a variety of tools and techniques to measure, apply the results in problem-solving situations, and communicate the reasoning used in solving these problems.	(5.3) Reading and interpreting various scales including those based on number lines, graphs, and maps
		(5.6) Selecting and using appropriate units and tools to measure to the degree of accuracy required in a particular problem-solving situation
	Standard 6 Students link concepts and procedures as they develop and use computational techniques, including estimation, mental arithmetic, paper-and-pencil, calculators, and computers, in problem-solving situations and communicate the reasoning used in solving these problems.	(6.4) Selecting and using appropriate methods for computing with commonly used fractions and decimals, percents, and integers in problem-solving situations from among mental arithmetic, estimation, paper-and-pencil, calculator, and computer methods, and determining whether the results are reasonable

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