

## Title Fundamentals of Algebra

<b>Unit:</b>		<b>Equivalent Forms of Numbers</b>					
<b>Big Ideas:</b>		Transpose numbers from one format to another. Represent numbers on a number line.					
<b>Unit Essential Questions:</b>		How can numbers be represented in different forms?					
Concept & Pacing	Pa Core Standard	Key Vocabulary	Essential Questions	Competencies (skills, knowledge, abilities)	Mini-Lessons/Activities	Instructional Materials	Assessments
<b>Fractions to/from Decimals - 4 days</b>	<a href="#">M08.A-N.1.1.2</a>	Decimal Fraction Repeating decimal	How can decimal values be represented as fractions and vice versa?	Convert a terminating or repeating decimal into a rational number (limit repeating decimals to thousandths) and vice versa.	<a href="#">Mathematics Assessment Project - Translating between repeating decimals and fractions</a>  <a href="#">Fractions, Decimals, and Models on Desmos</a>	CDT Exact path Delta Math Gimkit	Ticket-out CDT
<b>Decimal to/from Percent - 2 days</b>		Percent	How can decimal values be represented by percents and vice versa?	Convert a terminating or repeating decimal into a percent and vice versa.	<a href="#">Battery - Percents, Decimals, Fractions on Desmos</a>	Exact path Delta Math Gimkit	Ticket-out Quiz (Sections 1.1 and 1.2)
<b>Scientific Notation to/from Standard Form - 4 days</b>	<a href="#">M08.B-E.1.1.3</a>	Standard notation Scientific notation	How can very large and very small numbers be written in standard form and scientific form?	Estimate very large or very small quantities by using numbers expressed in the form of a single digit times an integer power of 10 and express how many times larger or smaller one number is than another. Example: Estimate the population of the United States as $3 \times 10^8$ and the population of the world as $7 \times 10^9$ and determine that the world population is more than 20 times larger than the United States' population.	<a href="#">Mathematics Assessment Project - Estimating length using scientific notation</a>  <a href="#">Scientific Notation on Desmos</a>  <a href="#">Scientific Notation Teach and Practice on Desmos</a> - could be shortened and last several slides used in operations	Exact path Delta Math Gimkit	Ticket-out Quiz
<b>Roots and Powers - 4 days</b>	<a href="#">M06.B-E.1.1.1</a> <a href="#">M08.B-E.1.1.1</a> <a href="#">M08.B-E.1.1.2</a>	Powers Exponents	How are roots and powers related?	Write and evaluate numerical expressions involving whole-number exponents. Apply one or more properties of integer exponents to generate equivalent numerical expressions without a calculator (with final answers expressed in exponential form with positive exponents). Use square root and cube root symbols to represent solutions to equations of the form $x^2 = p$ and $x^3 = p$ , where $p$ is a positive rational number. Evaluate square roots of perfect squares (up to and including $12^2$ ) and cube roots of perfect cubes (up to and including $5^3$ ) without a calculator.	<a href="#">PBS LearningMedia Exponents and Radicals - Targeted Math Instruction</a>  <a href="#">Exponents on Desmos</a>  <a href="#">Square Dance - Square Roots on Desmos</a>  <a href="#">Perfect Blue and Purple (Squares and Cubes) on Desmos</a>	Exact path Delta Math Gimkit	Ticket-out
<b>Square Roots to Decimal - 2 days</b>		Square roots	How can square roots be estimated?		<a href="#">Understanding and Estimating Square Roots on Desmos</a>	Exact path Delta Math Gimkit	Ticket-out Quiz (Sections 1.4 & 1.5)

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<b>Numbers (All Formats) on Number Lines - 4 days</b>	<a href="#">M06.A-N.3.1.3</a> <a href="#">M08.A-N.1.1.5</a>	Number line	How can numbers be represented on a number line?	Locate and plot integers and other rational numbers on a horizontal or vertical number line; locate and plot pairs of integers and other rational numbers on a coordinate plane. Locate/identify rational and irrational numbers at their approximate locations on a number line.	<a href="#">Placing Rational Numbers on a Number Line</a> on Desmos  <a href="#">Ordering Fractions on a Number Line on Desmos</a>	Exact path Delta Math	Ticket-out Quiz
<b>Comparing Numbers - 3 days</b>	<a href="#">M06.A-N.3.2.1</a>		How can numbers in various formats be compared?	Write, interpret, and explain statements of order for rational numbers in real-world contexts.	<a href="#">Comparing Whole Numbers on Desmos</a>  <a href="#">Comparing Irrational Numbers on Desmos</a>  <a href="#">Scientific Notation on Desmos</a> - last 4 slides	Exact path Delta Math	Ticket-out
<b>Unit Review and Assessment - 2 days</b>	All of above			All of above			Chapter assessment

Unit Total - 31 days (with CDT and exact path (1/week)

Cumulative Total - 31 days

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<b>Unit:</b>		<b>Operations with Numbers of all Forms</b>					
<b>Big Ideas:</b>		Add, subtract, multiply, and divide whole numbers, integers, decimals, percents, fractions, and value in scientific notation.					
<b>Unit Essential Questions:</b>		How are operations on numbers in various formats computed?					
Concept & Pacing	Pa Core Standard	Key Vocabulary	Essential Questions	Competencies (skills, knowledge, abilities)	Mini-Lessons/Activities	Instructional Materials	Assessments
<b>Operations with Whole Numbers - 4 days</b>	M06.A-N.2.1.1	Whole number Operations	How are basic operations computed with whole numbers?	Solve problems involving operations (+, -, ×, and ÷) with whole numbers, decimals (through thousandths), straight computation, or word problems.	<a href="#">Mathematics Assessment Project - Representing the Laws of Arithmetic</a> <a href="#">Adding Whole Numbers on Desmos</a> <a href="#">Biggest, Smallest, Closest on Desmos</a>	Exact path Delta Math Gimkit	Ticket-out Quiz
<b>Operations with Integers (including on a Number Line) - 4 days</b>	<a href="#">M07.A-N.1.1.2</a>	Integer	How can a number line be used in calculating the sums and differences of integers?	Represent addition and subtraction on a horizontal or vertical number line.	<a href="#">The Postman Always Rings Twice</a> <a href="#">Wallflowers</a> <a href="#">Integer Mixed Practice on Desmos</a>	Exact path Delta Math Gimkit	Ticket-out Quiz
<b>Operations with Decimals - 4 days</b>	<a href="#">M07.B-E.2.1.1</a>		How are sums, differences, products, and quotients of decimals computed?	Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate.	<a href="#">The Decimal Challenge on Desmos</a>	Exact path Delta Math Gimkit	Ticket-out Quiz
<b>Operations with Percents - 4 days</b>			How are operations conducted with percents?		<a href="#">Percents on Desmos</a>	Exact path Delta Math	Ticket-out Quiz
<b>Operations with Scientific Notation - 4 days</b>	<a href="#">M08.B-E.1.1.4</a>		How does scientific notation make arithmetic with large and small numbers easier?	Perform operations with numbers expressed in scientific notation, including problems where both decimal and scientific notation are used. Express answers in scientific notation and choose units of appropriate size for measurements of very large or very small quantities (e.g., use millimeters per year for seafloor spreading). Interpret scientific notation that has been generated by technology (e.g., interpret 4.7EE9 displayed on a calculator as $4.7 \times 10^9$ ).	<a href="#">Adding and Subtracting with Scientific Notation on Desmos</a> <a href="#">Scientific Notation Teach and Practice on Desmos</a> - last several slides involve division	Exact path Delta Math Gimkit	Ticket-out Quiz
<b>Operations with Fractions - 4 days</b>	<a href="#">M06.A-N.1.1.1</a>		How is arithmetic conducted with fractions?	Interpret and compute quotients of fractions (including mixed numbers), and solve word problems involving division of fractions by fractions.	<a href="#">Candy Bars: Adding Fractions</a> <a href="#">Brownies: Multiplying Fractions</a> <a href="#">Beef Jerky: Dividing Fractions</a>	Exact path Delta Math Gimkit	Ticket-out Quiz
<b>Order of Operations - 4 days</b>	<a href="#">M05.B-O.1.1.1</a>	Order of Operations	What is the appropriate order of operations?	Use multiple grouping symbols (parentheses, brackets, or braces) in numerical expressions and evaluate expressions containing these symbols.	<a href="#">4-Digit Problem</a>	Exact path Delta Math Gimkit	Ticket-out Quiz

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<b>Unit Review and Assessment - 2 days</b>	All of above			All of above			Chapter assessment
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Unit Total - 38 days (with exact path)

Cumulative Total - 69 days

**Title Fundamentals of Algebra**

<b>Unit:</b>		<b>Solving Equations</b>					
<b>Big Ideas:</b>		Compute the solution to one-variable equations using single and multiple inverse operations.					
<b>Unit Essential Questions:</b>		How are inverse operations used to determine the value of an unknown?					
Concept & Pacing	Pa Core Standard	Key Vocabulary	Essential Questions	Competencies (skills, knowledge, abilities)	Mini-Lessons/Activities	Instructional Materials	Assessments
<b>One-step Equations - 4 days</b>		Equation	How is an inverse operation used to solve one-step equations?		<a href="#">Thinking of a Number</a> <a href="#">Solving One Step Equations on Desmos</a> <a href="#">One Step Equations on Desmos</a> <a href="#">Solve Me Mobiles</a> - demonstrates the idea of balancing	Exact path Delta Math Gimkit	Ticket-out Quiz
<b>Applications of One-Step Equations - 4 days</b>	<a href="#">M06.B-E.2.1.3</a>		How can real-world situations be represented by a one-variable equation?	Solve real-world and mathematical problems by writing and solving equations of the form $x + p = q$ and $px = q$ for cases in which $p$ , $q$ , and $x$ are all non-negative rational numbers.		Exact path	Ticket-out Quiz
<b>Two-Step Equations - 4 days</b>			How are inverse operations used to solve two-step equations?		<a href="#">Two-step Equations on Desmos</a> - balance hangars	Exact path Delta Math Gimkit	Ticket-out Quiz
<b>Applications of Two-Step Equations - 4 days</b>	<a href="#">M07.B-E.2.2.1</a> <a href="#">M08.B-E.3.1.2</a>		How can real-world situations be represented by a one-variable equation?	Solve word problems leading to equations of the form $px + q = r$ and $p(x + q) = r$ , where $p$ , $q$ , and $r$ are specific rational numbers. Solve linear equations that have rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms.	<a href="#">Pig Pen</a> <a href="#">Hippity-Hoppity</a> <a href="#">PLIX on CK12</a>	Exact path	Ticket-out Quiz
<b>Rates, Ratios, and Proportions - 4 days</b>	<a href="#">M06.A-R.1.1.2</a> <a href="#">M06.A-R.1.1.4</a> <a href="#">M07.A-R.1.1.2</a> <a href="#">M07.A-R.1.1.3</a>	Rate Ratio Proportion	How can situations be represented by unit rates?	Find the unit rate $a/b$ associated with a ratio $a:b$ (with $b \neq 0$ ) and use rate language in the context of a ratio relationship. Solve unit rate problems including those involving unit pricing and constant speed. Determine whether two quantities are proportionally related (e.g., by testing for equivalent ratios in a table, graphing on a coordinate plane and observing whether the graph is a straight line through the origin). Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships.	<a href="#">How Big is Barbie</a> <a href="#">Marcellus the Giant on Desmos</a> - introduces proportional <a href="#">Click Battle on Desmos</a> - intro to unit rate <a href="#">Take a Hike on Desmos</a> - shows rates on graphs	Exact path Delta Math Gimkit	Ticket-out Quiz

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<b>Unit Review and Assessment - 2 days</b>	All of above			All of above			Chapter assessment
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Unit Total - 31 days (with exact path)

Cumulative Total - 100 days

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<b>Unit:</b>		<b>Solving Inequalities</b>					
<b>Big Ideas:</b>		Compute the solution to one-variable inequalities using single and multiple inverse operations. Represent the solution to one-variable inequalities on a number line.					
<b>Unit Essential Questions:</b>		How are inverse operations used to determine the value of an unknown in an inequality?					
Concept & Pacing	Pa Core Standard	Key Vocabulary	Essential Questions	Competencies (skills, knowledge, abilities)	Mini-Lessons/Activities	Instructional Materials	Assessments
<b>Check/Test Solutions to One-Variable Inequalities - 4 days</b>	<a href="#">M06.B-E.2.1.1</a>	Solution Inequality	What does it mean for a value to be a solution to an inequality?	Use substitution to determine whether a given number in a specified set makes an equation or inequality true.	<a href="#">Red Dot - Green Dot</a>  <a href="#">Simple and 2-step Inequalities Review on Desmos</a> - use a little over several sections		Ticket-out Quiz
<b>One-Step Inequalities - 4 days</b>			How is an inverse operation used to solve one-step inequalities?		<a href="#">One-Variable Inequalities on Desmos</a> - use a little over several sections  <a href="#">One Variable Inequalities on Desmos</a>  <a href="#">Maze - Version 1</a> <a href="#">Maze - Version 2</a>		Ticket-out Quiz
<b>Applications of One-Step Inequalities - 4 days</b>	<a href="#">M06.B-E.2.1.4</a>		How can real-world situations be represented by a one-variable inequality?	Write an inequality of the form $x > c$ or $x < c$ to represent a constraint or condition in a real-world or mathematical problem and/or represent solutions of such inequalities on number lines.			Ticket-out Quiz
<b>Two-Step Inequalities - 4 days</b>			How are inverse operations used to solve two-step inequalities?		<a href="#">Two-Step Cut &amp; Paste</a>  <a href="#">two-step task cards</a>		Ticket-out Quiz
<b>Applications of Two-Step Inequalities - 4 days</b>	<a href="#">M07.B-E.2.2.2</a>		How can real-world situations be represented by a one-variable inequality?	Solve word problems leading to inequalities of the form $px + q > r$ or $px + q < r$ , where $p$ , $q$ , and $r$ are specific rational numbers, and graph the solution set of the inequality.	<a href="#">Inequality Park on Desmos</a>		Ticket-out Quiz
<b>Unit Review and Assessment - 2 days</b>	All of above			All of above			Chapter assessment

Unit Total - 22 days

Cumulative Total - 99 days

## Title Fundamentals of Algebra

<b>Unit:</b>		<b>Coordinate Geometry</b>					
<b>Big Ideas:</b>		Plot points on a coordinate plane including in applications. Transform shapes on coordinate planes.					
<b>Unit Essential Questions:</b>		How are coordinates used to locate points and shapes? How are shapes transformed on the coordinate plane?					
Concept & Pacing	Pa Core Standard	Key Vocabulary	Essential Questions	Competencies (skills, knowledge, abilities)	Mini-Lessons/Activities	Instructional Materials	Assessments
<b>Plotting Points - 4 days</b>	<a href="#">M05.C-G.1.1.1</a>	Coordinate Plane Coordinates x-axis y-axis Origin	How are ordered pairs plotted on a coordinate plane?	Identify parts of the coordinate plane (x-axis, y-axis, and the origin) and the ordered pair (x-coordinate and y-coordinate). Limit the coordinate plane to quadrant I.	<a href="#">The Coordinate Plane and Plotting Points on Desmos</a> - good intro activity  <a href="#">The (Awesome) Coordinate Plane Activity on Desmos</a>		Ticket-out Quiz
<b>Applications of Plotting Points - 4 days</b>	<a href="#">M06.A-N.3.2.3</a>		How can ordered pairs represent location?	Solve real-world and mathematical problems by plotting points in all four quadrants of the coordinate plane. Include use of coordinates and absolute value to find distances between points with the same first coordinate or the same second coordinate.	<a href="#">Distance on a Coordinate Plane Desmos</a>		Ticket-out Quiz
<b>Lengths and Area of Shapes on a Coordinate Plane - 4 days</b>	<a href="#">M06.C-G.1.1.4</a>		How can lengths be determined from coordinate points?	Given coordinates for the vertices of a polygon in the plane, use the coordinates to find side lengths and area of the polygon (limited to triangles and special quadrilaterals).	<a href="#">Polygons on a Coordinate Plane Desmos</a>		Ticket-out Quiz
<b>Transformations - 4 days</b>	<a href="#">M08.C-G.1.1.1</a> <a href="#">M08.C-G.1.1.2</a> <a href="#">M08.C-G.1.1.4</a>	Transformation	How can transformations to shapes be identified when using a coordinate plane?	Identify and apply properties of rotations, reflections, and translations. Example: Angle measures are preserved in rotations, reflections, and translations. Given two congruent figures, describe a sequence of transformations that exhibits the congruence between them. Given two similar two-dimensional figures, describe a sequence of transformations that exhibits the similarity between them.	<a href="#">Geo Translation of Points Intro on Desmos</a>  <a href="#">Translate Shapes on Desmos</a>  <a href="#">Introduction to Rotations on Desmos</a>  <a href="#">Reflections on Desmos</a>  <a href="#">Transformations Performance Task Desmos</a>		Ticket-out Quiz
<b>Unit Review and Assessment - 2 days</b>	All of above			All of above			Chapter assessment

Unit Total - 18 days

Cumulative Total - 117 days



**Title Fundamentals of Algebra**

<b>Unit:</b>	<b>Linear Relations</b>						
<b>Big Ideas:</b>	Apply concepts of rate of change. Recognize linear vs non-linear relationships.						
<b>Unit Essential Questions:</b>	How are relationships represented by rates of change and functions?						
<b>Concept &amp; Pacing</b>	<b>Pa Core Standard</b>	<b>Key Vocabulary</b>	<b>Essential Questions</b>	<b>Competencies (skills, knowledge, abilities)</b>	<b>Mini-Lessons/Activities</b>	<b>Instructional Materials</b>	<b>Assessments</b>
<b>Rate of Change - 4 days</b>	<a href="#">M06.A-R.1.1.3</a>	Rate of change	How can rates of change be used to determine unknown values in a relationship?	Construct tables of equivalent ratios relating quantities with whole-number measurements, find missing values in the tables, and/or plot the pairs of values on the coordinate plane. Use tables to compare ratios.	<a href="#">m&amp;m Count and Crunch</a>  <a href="#">Staircases and Ramps</a>		Ticket-out Quiz
<b>Applying Rate of Change to Interpret Points - 4 days</b>	<a href="#">M07.A-R.1.1.5</a>		How are rates of change interpreted and applied to points?	Explain what a point (x, y) on the graph of a proportional relationship means in terms of the situation, with special attention to the points (0, 0) and (1, r), where r is the unit rate.			Ticket-out Quiz
<b>Non-Linear vs. Linear Relations - 4 days</b>	<a href="#">M08.B-F.1.1.3</a>	Non-linear Linear	How can linear and non-linear relations be recognized?	Interpret the equation $y = mx + b$ as defining a linear function whose graph is a straight line; give examples of functions that are not linear.			Ticket-out Quiz
<b>Linear Functions - 4 days</b>	<a href="#">M08.B-F.2.1.1</a>		How can situations be modeled with a linear function?	Construct a function to model a linear relationship between two quantities. Determine the rate of change and initial value of the function from a description of a relationship or from two (x, y) values, including reading these from a table or from a graph. Interpret the rate of change and initial value of a linear function in terms of the situation it models and in terms of its graph or a table of values.	<a href="#">Rising Water</a>  <a href="#">NBA Jam Rate of Change on Desmos</a>		Ticket-out Quiz
<b>Unit Review and Assessment - 2 days</b>	All of above			All of above			Chapter assessment

Unit Total - 18 days

Cumulative Total - 135 days

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<b>Unit:</b>		<b>Data Analysis</b>					
<b>Big Ideas:</b>		Represent data sets numerically with values of center and spread as well as graphically. Recognize patterns among data and data sets that were gathered randomly.					
<b>Unit Essential Questions:</b>							
<b>Concept &amp; Pacing</b>	<b>Pa Core Standard</b>	<b>Key Vocabulary</b>	<b>Essential Questions</b>	<b>Competencies (skills, knowledge, abilities)</b>	<b>Mini-Lessons/Activities</b>	<b>Instructional Materials</b>	<b>Assessments</b>
<b>Measures of Center - 4 days</b>	<a href="#">M06.D-S.1.1.2</a>	Mean Median Mode	How can a data set be represented by a measure of central tendency?	Determine quantitative measures of center (e.g., median, mean, mode) and variability (e.g., range, interquartile range, mean absolute deviation).	<a href="#">Don't Break my Stride</a>  <a href="#">Cool Shoes</a>  <a href="#">Measures of Central Tendency on Desmos</a> - good for intro and closer		Ticket-out Quiz
<b>Measures of Spread - 4 days</b>	<a href="#">M06.D-S.1.1.2</a>	Range Interquartile range	What does a measure of spread tell us about a data set?	Determine quantitative measures of center (e.g., median, mean, mode) and variability (e.g., range, interquartile range, mean absolute deviation).	<a href="#">Quartiles and Interquartile Range/Box Plots on Desmos</a> - can be shortened or save boxplots for next lesson		Ticket-out Quiz
<b>Displays of Data - 4 days</b>	<a href="#">M06.D-S.1.1.1</a>	Line plot Histogram Box-and-whisker plot	What are different ways that data sets are displayed and how are appropriate displays determined?	Display numerical data in plots on a number line, including line plots, histograms, and box-and-whisker plots.	<a href="#">Data Displays on Desmos</a> - histograms and dotplots		Ticket-out Quiz
<b>Patterns - 4 days</b>	<a href="#">M06.D-S.1.1.3</a>	Pattern	What does a pattern say about a data set and what happens when a value deviates from the pattern?	Describe any overall pattern and any deviations from the overall pattern with reference to the context in which the data were gathered.			Ticket-out Quiz
<b>Sampling - 4 days</b>	<a href="#">M07.D-S.1.1.1</a>	Random Sampling	What does it mean to gather data randomly?	Determine whether a sample is a random sample given a real-world situation.			Ticket-out Quiz
<b>Unit Review and Assessment - 2 days</b>	All of above			All of above			Chapter assessment

Unit Total - 22 days

Cumulative Total - 157 days

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<b>Unit:</b>		Probability					
<b>Big Ideas:</b>							
<b>Unit Essential Questions:</b>							
Concept & Pacing	Pa Core Standard	Key Vocabulary	Essential Questions	Competencies (skills, knowledge, abilities)	Mini-Lessons/Activities	Instructional Materials	Assessments
Likelihood - 4 days	<a href="#">M07.D-S.3.1.1</a>		How likely is it that an event will occur?	Predict or determine whether some outcomes are certain, more likely, less likely, equally likely, or impossible (i.e., a probability near 0 indicates an unlikely event, a probability around 1/2 indicates an event that is neither unlikely nor likely, and a probability near 1 indicates a likely event).			Ticket-out Quiz
Probability of Simple Events - 4 days	<a href="#">M07.D-S.3.2.2</a>		How is the probability of a simple event calculated?	Find the probability of a simple event, including the probability of a simple event not occurring.	<a href="#">Playing with a Full Deck</a>		Ticket-out Quiz
Unit Review and Assessment - 2 days							Ticket-out Quiz

Unit Total - 10 days

Cumulative Total - 167 days