



Alignment Document  
State of Georgia and Aventa Learning

**Math 8**

Strand	Common Curriculum Goal	Standard	Lesson Name
M8N Students will understand the numeric and geometric meaning of square root, apply properties of integer exponents and use scientific notation.	M8N1 Students will understand different representations of numbers including square roots, exponents, and scientific notation.	M8N1.a Find square roots of perfect squares.	<b>Lesson 33</b> Square Roots and Irrational Numbers
		M8N1.b Recognize the (positive) square root of a number as a length of a side of a square with a given area.	<b>Lesson 34</b> Pythagorean Theorem
		M8N1.c Recognize square roots as points and as lengths on a number line.	<b>Lesson 33</b> Square Roots and Irrational Numbers
		M8N1.d Understand that the square root of 0 is 0 and that every positive number has two square roots that are opposite in sign.	<b>Lesson 33</b> Square Roots and Irrational Numbers
		M8N1.e Recognize and use the radical symbol to denote the positive square root of a positive number.	<b>Lesson 33</b> Square Roots and Irrational Numbers
		M8N1.f Estimate square roots of positive numbers.	<b>Lesson 33</b> Square Roots and Irrational Numbers
		M8N1.g Simplify, add, subtract, multiply, and divide expressions containing square roots.	<b>Lesson 33</b> Square Roots and Irrational Numbers
		M8N1.h Distinguish between rational and irrational numbers.	<b>Lesson 33</b> Square Roots and Irrational Numbers
		M8N1.i Simplify expressions containing integer exponents.	<b>Lesson 6</b> Exponents, <b>Lesson 33</b> Square Roots and Irrational Numbers
		M8N1.j Express and use numbers in scientific notation.	<b>Lesson 7</b> Scientific Notation
		M8N1.k Use appropriate technologies to solve problems involving square roots, exponents, and scientific notation.	<b>Lesson 6</b> Exponents, <b>Lesson 7</b> Scientific Notation, <b>Lesson 33</b> Square Roots and Irrational Numbers



Alignment Document  
State of Georgia and Aventa Learning

**Math 8**

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M8G Students will use and apply geometric properties of plane figures, including congruence and the Pythagorean theorem.	M8G1 Students will understand and apply the properties of parallel and perpendicular lines and understand the meaning of congruence.	M8G1.a Investigate characteristics of parallel and perpendicular lines both algebraically and geometrically.	<b>Lesson 25</b> Angles
		M8G1.b Apply properties of angle pairs formed by parallel lines cut by a transversal.	<b>Lesson 25</b> Angles
		M8G1.c Understand the properties of the ratio of segments of parallel lines cut by one or more transversals.	
		M8G1.d Understand the meaning of congruence: that all corresponding angles are congruent and all corresponding sides are congruent.	<b>Lesson 25</b> Angles, <b>Lesson 32</b> Triangles and Triangular Prisms
	M8G2 Students will understand and use the Pythagorean theorem.	M8G2.a Apply properties of right triangles, including the Pythagorean theorem.	<b>Lesson 34</b> Pythagorean Theorem
		M8G2.b Recognize and interpret the Pythagorean theorem as a statement about areas of squares on the sides of a right triangle.	<b>Lesson 34</b> Pythagorean Theorem
M8A Students will use linear algebra to represent, analyze and solve problems. They will use equations, tables, and graphs to investigate linear relations and functions, paying particular attention to slope as a rate of change.	M8A1 Students will use algebra to represent, analyze, and solve problems.	M8A1.a Represent a given situation using algebraic expressions or equations in one variable.	<b>Lesson 13</b> Solving Multi Step Equations, <b>Lesson 14</b> Solving Multi Step Inequalities
		M8A1.b Simplify and evaluate algebraic expressions.	<b>Lesson 2</b> Variables and Expressions



Alignment Document  
State of Georgia and Aventa Learning

**Math 8**

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		M8A1.c Solve algebraic equations in one variable, including equations involving absolute values.	<b>Lesson 13</b> Solving Multi Step Equations, <b>Lesson 14</b> Solving Multi Step Inequalities, <b>Lesson 18</b> Transforming Formulas
		M8A1.d Solve equations involving several variables for one variable in terms of the others.	<b>Lesson 18</b> Transforming Formulas, <b>Lesson 23</b> Graphing Linear Equations
		M8A1.e Interpret solutions in problem contexts.	<b>Lesson 10</b> Ratios, Proportions and Percents, <b>Lesson 11</b> Similarity and Scale, <b>Lesson 12</b> Percent and Equations, <b>Lesson 15</b> Interest, <b>Lesson 18</b> Transforming Formulas
	M8A2 Students will understand and graph inequalities in one variable.	M8A2.a Represent a given situation using an inequality in one variable.	<b>Lesson 5</b> Inequalities, <b>Lesson 14</b> Solving Multi-Step Inequalities
		M8A2.b Use the properties of inequality to solve inequalities.	<b>Lesson 5</b> Inequalities, <b>Lesson 14</b> Solving Multi-Step Inequalities
		M8A2.c Graph the solution of an inequality on a number line.	<b>Lesson 5</b> Inequalities
		M8A2.d Interpret solutions in problem contexts.	<b>Lesson 5</b> Inequalities, <b>Lesson 14</b> Solving Multi-Step Inequalities
	M8A3 Students will understand relations and linear functions.	M8A3.a Recognize a relation as a correspondence between varying quantities.	<b>Lesson 22</b> Functions
		M8A3.b Recognize a function as a correspondence between inputs and outputs where the output for each input must be unique.	<b>Lesson 22</b> Functions, <b>Lesson 23</b> Graphing Linear Equations
		M8A3.c Distinguish between relations that are functions and those that are not functions.	<b>Lesson 22</b> Functions
		M8A3.d Recognize functions in a variety of representations and a variety of contexts.	<b>Lesson 4</b> Equations, <b>Lesson 3</b> Properties of Numbers, <b>Lesson 13</b> Solving Multi Step Equations
		M8A3.e Use tables to describe sequences recursively and with a formula in closed form.	<b>Lesson 16</b> Arithmetic and Geometric Sequences, <b>Lesson 22</b> Functions, <b>Lesson 23</b> Graphing Linear Equations



Alignment Document  
State of Georgia and Aventa Learning

**Math 8**

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		M8A3.f Understand and recognize arithmetic sequences as linear functions with whole number input values.	<b>Lesson 16</b> Arithmetic and Geometric Sequences, <b>Lesson 22</b> Functions
		M8A3.g Interpret the constant difference in an arithmetic sequence as the slope of the associated linear function.	<b>Lesson 23</b> Graphing Linear Equations
		M8A3.h Identify relations and functions as linear or nonlinear.	<b>Lesson 22</b> Functions
		M8A3.i Translate among verbal, tabular, graphic, and algebraic representations of functions.	<b>Lesson 22</b> Functions, <b>Lesson 23</b> Graphing Linear Equations
	M8A4 Students will graph and analyze graphs of linear equations and inequalities.	M8A4.a Interpret slope as a rate of change.	<b>Lesson 23</b> Graphing Linear Equations
		M8A4.b Determine the meaning of the slope and y-intercept in a given situation.	<b>Lesson 23</b> Graphing Linear Equations
		M8A4.c Graph equations of the form $y = mx + b$ .	<b>Lesson 23</b> Graphing Linear Equations
		M8A4.d Graph equations of the form $ax + by = c$ .	<b>Lesson 23</b> Graphing Linear Equations
		M8A4.e Graph the solution set of a linear inequality, identifying whether the solution set is an open or a closed half-plane.	<b>Lesson 5</b> Inequalities
		M8A4.f Determine the equation of a line given a graph, numerical information that defines the line, or a context involving a linear relationship.	<b>Lesson 23</b> Graphing Linear Equations
		M8A4.g Solve problems involving linear relationships.	<b>Lesson 23</b> Graphing Linear Equations
	M8A5 Students will understand systems of linear equations and inequalities and use them to solve problems.	M8A5.a Given a problem context, write an appropriate system of linear equations or inequalities.	In the context of proportions being set up as "if then:" <b>Lesson 11 Similarity and Scale, Lesson 29 Measurement Systems</b>



Alignment Document  
State of Georgia and Aventa Learning

**Math 8**

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		M8A5.b Solve systems of equations graphically and algebraically, using technology as appropriate.	In the context of proportions being set up as "if then:" <b>Lesson 11 Similarity and Scale, Lesson 29 Measurement Systems</b>
		M8A5.c Graph the solution set of a system of linear inequalities in two variables.	
		M8A5.d Interpret solutions in problem contexts.	In the context of proportions being set up as "if then:" <b>Lesson 11 Similarity and Scale, Lesson 29 Measurement Systems</b>
M8D Students will use and understand set theory and simple counting techniques; determine the theoretical probability of simple events; and make inferences from data, particularly data that can be modeled by linear functions.	M8D1 Students will apply basic concepts of set theory.	M8D1.a Demonstrate relationships among sets through use of Venn diagrams.	<b>Lesson 24</b> Polygons
		M8D1.b Determine subsets, complements, intersection and union of sets.	<b>Lesson 19</b> Probability
		M8D1.c Use set notation to denote elements of a set.	<b>Lesson 19</b> Probability, <b>Lesson 20</b> Counting Theory
	M8D2 Students will determine the number of outcomes related to a given event.	M8D2.a Use tree diagrams to find the number of outcomes.	<b>Lesson 20</b> Counting Theory
		M8D2.b Apply the addition and multiplication principles of counting.	<b>Lesson 20</b> Counting Theory
	M8D3 Students will use the basic laws of probability.	M8D3.a Find the probability of simple independent events.	<b>Lesson 19</b> Probability, <b>Lesson 20</b> Counting Theory
		M8D3.b Find the probability of compound independent events.	<b>Lesson 20</b> Counting Theory



Alignment Document  
State of Georgia and Aventa Learning

**Math 8**

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	M8D4 Students will organize, interpret, and make inferences from statistical data	M8D4.a Gather data that can be modeled with a linear function.	<b>Lesson 22</b> Functions, <b>Lesson 23</b> Graphing Linear Equations
		M8D4.b Estimate and determine a line of best fit from a scatter plot.	
M8P The following process standards are essential to mastering each of the mathematics content standards. They emphasize critical dimensions of the mathematical proficiency that all students need.	M8P1 Students will solve problems (using appropriate technology).	M8P1.a Build new mathematical knowledge through problem solving.	<b>Lesson 10</b> Ratios, Proportions and Percents, <b>Lesson 11</b> Similarity and Scale, <b>Lesson 24</b> Polygons, <b>Lesson 26</b> Circles and Pi, <b>Lesson 28</b> Parallelograms, <b>Lesson 29</b> Measurement Systems, <b>Lesson 30</b> Surface Area, <b>Lesson 31</b> Volume
		M8P1.b Solve problems that arise in mathematics and in other contexts.	<b>Lesson 7</b> Scientific Notation, <b>Lesson 10</b> Ratios, Proportions and Percents, <b>Lesson 11</b> Similarity and Scale, <b>Lesson 12</b> Percent and Equations, <b>Lesson 15</b> Interest, <b>Lesson 18</b> Transforming Formulas, <b>Lesson 29</b> Measurement Systems
		M8P1.c Apply and adapt a variety of appropriate strategies to solve problems.	<b>Lesson 10</b> Ratios, Proportions and Percents, <b>Lesson 20</b> Counting Theory, <b>Lesson 35</b> Descriptive Statistics
		M8P1.d Monitor and reflect on the process of mathematical problem solving.	<b>Lesson 10</b> Ratios, Proportions and Percents, <b>Lesson 13</b> Solving Multi Step Equations, <b>Lesson 14</b> Solving Multi Step Inequalities, <b>Lesson 34</b> Pythagorean Theorem



Alignment Document  
State of Georgia and Aventa Learning

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	M8P2 Students will reason and evaluate mathematical arguments.	M8P2.a Recognize reasoning and proof as fundamental aspects of mathematics.	<b>Lesson 19</b> Probability, <b>Lesson 20</b> Counting Theory, <b>Lesson 35</b> Descriptive Statistics, <b>Lesson 36</b> Inferential Statistics
		M8P2.b Make and investigate mathematical conjectures.	<b>Lesson 35</b> Descriptive Statistics, <b>Lesson 36</b> Inferential Statistics
		M8P2.c Develop and evaluate mathematical arguments and proofs.	<b>Lesson 20</b> Counting Theory, <b>Lesson 35</b> Descriptive Statistics, <b>Lesson 36</b> Inferential Statistics
		M8P2.d Select and use various types of reasoning and methods of proof.	<b>Lesson 19</b> Probability, <b>Lesson 20</b> Counting Theory, <b>Lesson 35</b> Descriptive Statistics, <b>Lesson 36</b> Inferential Statistics
	M8P3 Students will communicate mathematically.	M8P3.a Organize and consolidate their mathematical thinking through communication.	<b>Lesson 17</b> Data Analysis, <b>Lesson 35</b> Descriptive Statistics
		M8P3.b Communicate their mathematical thinking coherently and clearly to peers, teachers, and others.	<b>Lesson 17</b> Data Analysis, <b>Lesson 35</b> Descriptive Statistics
		M8P3.c Analyze and evaluate the mathematical thinking and strategies of others.	<b>Lesson 35</b> Descriptive Statistics, <b>Lesson 36</b> Inferential Statistics
		M8P3.d Use the language of mathematics to express mathematical ideas precisely.	<b>Lesson 2</b> Variables and Expressions
	M8P4 Students will make connections among mathematical ideas and to other disciplines.	M8P4.a Recognize and use connections among mathematical ideas.	<b>Lesson 10</b> Ratios, Proportions and Percents, <b>Lesson 11</b> Similarity and Scale, <b>Lesson 18</b> Transforming Formulas, <b>Lesson 29</b> Measurement Systems
		M8P4.b Understand how mathematical ideas interconnect and build on one another to produce a coherent whole.	<b>Lesson 10</b> Ratios, Proportions and Percents, <b>Lesson 11</b> Similarity and Scale, <b>Lesson 13</b> Solving Multi Step Equations, <b>Lesson 14</b> Solving Multi Step Inequalities



Alignment Document  
State of Georgia and Aventa Learning

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		M8P4.c Recognize and apply mathematics in contexts outside of mathematics.	<b>Lesson 7</b> Scientific Notation, <b>Lesson 10</b> Ratios, Proportions and Percents, <b>Lesson 11</b> Similarity and Scale, <b>Lesson 12</b> Percent and Equations, <b>Lesson 15</b> Interest, <b>Lesson 17</b> Data Analysis, <b>Lesson 18</b> Transforming Formulas, <b>Lesson 19</b> Probability
	M8P5 Students will represent mathematics in multiple ways.	M8P5.a Create and use representations to organize, record, and communicate mathematical ideas.	<b>Lesson 17</b> Data Analysis, <b>Lesson 35</b> Descriptive Statistics, <b>Lesson 36</b> Inferential Statistics
		M8P5.b Select, apply, and translate among mathematical representations to solve problems.	<b>Lesson 17</b> Data Analysis, <b>Lesson 35</b> Descriptive Statistics, <b>Lesson 36</b> Inferential Statistics
		M8P5.c Use representations to model and interpret physical, social, and mathematical phenomena.	<b>Lesson 28</b> Parallelograms, <b>Lesson 30</b> Surface Area, <b>Lesson 31</b> Volume, <b>Lesson 32</b> Triangles and Triangular Prisms