GLENCOE CORRELATION

ALGEBRA 1: INTEGRATION • APPLICATIONS • CONNECTIONS

NEW MEXICO

Mathematics Performance Standards

Grades 5–8

STANDARDS	LESSON REFERENCES
CONTENT STANDARD 1: UNIFYING CONCEPTS AND PROCESSES STUDENTS WILL UNDERSTAND AND USE MATHEMATICS IN PROBLEM SOLVING	
A. Differentiate among problem-solving approaches to investigate and understand mathematical content.	
1. Use a variety of reasoning processes to investigate and understand the mathematical content of given problems, and explain which strategies are more efficient than others for certain types of problems. This can be demonstrated by:	
• choosing an appropriate method to investigate a problem,	2-9, 3-3, 4-3, 7-4, 9-1, 11-2, 11-4, 13-6
• describing the process of mathematical thinking through oral or written presentation, and	2-6, 2-8, 7-4
• determining the reasonableness of the solution.	2-9, 3-3, 4-3, 5-6, 7-4, 8-2, 8-4, 9-1, 9-5, 11-2
B. Formulate problems from community mathematical situations.	
1. Find examples of numerical and geometric concepts to interpret the environment and culture of their community or state.	*Long-Term Project* Chapter 2
2. Describe each example in a variety of ways (e.g., orally, in writing, in pictures, in graphs and tables, with concrete materials, and/or algebraic notation).	*Long-Term Project* Chapter 2
3. Conduct an investigation or project that applies mathematics to assist in solving a community-based situation.	*Long-Term Project* Chapter 2
C. Develop and apply strategies to solve a wide variety of problems with an emphasis on multi-step and non-routine problems.	
1. Classify each of a set of problems as single- or multi-step, and organize the information given in each problem in list, table, or graph form as a strategy for solving the problem.	3-1, 3-2, 3-3, 3-5, 8-2, 8-4, 10-3, 12-6, 13-6
D. Verify and interpret results with respect to the original problem situation.	
1. Check to see that the solution of a problem is reasonable, and demonstrate why it is reasonable through models and/or manipulatives.	3-1A, 3-8A, 10-4

STANDARDS		LESSON REFERENCES
E.	***Use manipulatives, calculators, and computers, and other tools, as appropriate, in order to strengthen mathematical thinking, understanding, and power to build upon foundational concepts.***	
1.	Use appropriate tools (e.g., manipulatives, calculators, and computers) to observe and explore mathematical properties and relationships from numeric, algebraic, and geometric perspectives.	6-3, 9-4A, 16-3A
F.	***Generalize solutions and strategies to new problem situations.***	
1.	Adapt previously used solutions and strategies to new problem situations by using pictures and physical models.	4-2, 4-3
2.	Adapt previously used solutions and strategies to new problem situations by making conjectures, gathering evidence, and building an argument to support mathematical concepts.	3-3, 3-5, 4-2, 4-5, 7-3, 7-4, 7-6, 8-4, 9-3, 9-7
CONTENT STANDARD 2: UNIFYING CONCEPTS AND PROCESSES STUDENTS WILL UNDERSTAND AND USE MATHEMATICS IN COMMUNICATION		
A.	***Interpret and explain personal mathematical thinking to make conjectures and convincing arguments.***	
1.	Use language to communicate mathematical ideas.	2-6, 3-6, 4-5, 7-5
2.	Reach agreement about word meanings and recognize the importance of commonly shared definitions.	1-1, 2-9, 3-3, 3-4, 3-7, 4-1 4-2, 6-6, 11-1, 12-1
3.	Write about mathematical ideas in journals.	3-7, 7-5, 12-3
B.	***Use drawings, discussion, reading, writing, and listening to access, learn, and communicate mathematical ideas.***	
1.	Through discussion and writing, explore deeper understanding of concepts and principles.	2-6, 3-6, 7-8, 13-1, 13-5
C.	***Create and use a variety of media and methods to communicate mathematical concepts, thoughts, and problem solutions including charts, slides, graphs, maps, drawings, pictures, sound recordings, video, e-mail, and others.***	
1.	Use current technology to explore concepts, make conjectures, validate solutions, and convince other people.	5-2A, 5-4A, 6-5A, 7-7B, 7-8A, 8-1A, 11-1A, 11-4A, 12-1B, 13-2B
D.	***Represent mathematical ideas through the use of learning tools such as manipulatives, calculators, and computers.***	
1.	Use calculators and computers to compute rapidly and to graph relationships instantly.	5-3A, 5-7A, 6-5A, 7-8A, 8-1A, 11-1A, 11-1B, 11-4A, 12-1B
2.	Using calculators, systematically change one variable and observe what happens to a related variable.	6-5A, 11-1B

STANDARDS		LESSON REFERENCES
E.	***Describe the value of mathematical notation and its role in the development of mathematical ideas.***	
1.	Explain the interaction of mathematics with other school subjects.	4-4, 4-5, 4-8
2.	Integrate math into situations which give its symbols and processes practical meaning.	4-1, 4-2, 4-3, 4-5
CONTENT STANDARD 3: UNIFYING CONCEPTS AND PROCESSES STUDENTS WILL UNDERSTAND AND USE MATHEMATICS IN REASONING		
A.	***Identify and apply deductive and inductive reasoning to mathematical problems.***	
1.	Describe objects or processes accurately.	3-4, 3-7, 4-2, 6-6
2.	Elaborate on their properties, similarities, differences, and relationships.	3-4, 3-7, 4-2, 6-6
B.	***Use a variety of reasoning processes to explain mathematical thinking and to solve problems.***	
1.	With a triangle, "tile" a plane using copies of the triangle to determine characteristics of other triangles.	See Glencoe's *Geometry: Integration • Applications • Connections* Lesson 10-2.
C.	***Verify results to justify and validate thinking.***	
1.	Give counter-examples to show why certain solutions may not work.	1-5, 10-3
2.	Solve problems using proportional reasoning.	4-1, 4-2, 4-4, 4-5
D.	***Construct and evaluate mathematical arguments and conjectures.***	
1.	Given a mathematical solution, determine its reasonableness.	2-9, 3-3, 4-1, 4-3, 4-4, 4-5, 4-7, 6-4, 7-1, 7-2, 8-2
CONTENT STANDARD 4: UNIFYING CONCEPTS AND PROCESSES STUDENTS WILL UNDERSTAND AND USE MATHEMATICAL CONNECTIONS		
A.	***Use mathematical processes and concepts to summarize complex ideas.***	
1.	Use statistics to make conclusions about problems of social equity.	1-4, 2-2, 6-3
2.	Use perspective, proportion, and golden ratio in art and design.	4-1
B.	***Describe how mathematics is integrated throughout the school and surrounding environment.***	
1.	Discuss examples of mathematical connections to other content areas.	2-2, 3-7
2.	Use statistics to explain connections between school and community.	1-4, 2-2, 3-7, 6-3
C.	***Use mathematical foundations as a basis for more complex mathematics.***	
1.	Develop a knowledge of surface area in order to understand fractions and proportions.	See Glencoe's *Algebra 1: Integration • Application • Connections, Volume 1* pages A24-A25.

STANDARDS		LESSON REFERENCES
2.	Explore the relationships among counting, multiplication, and exponents.	1-1
D.	***Apply mathematical thinking and modeling to solve problems in other curriculum areas such as employability, health education, social studies, visual and performing arts, physical education, language arts, and science.***	
1.	Study maps to learn about scaling and its relationship to similarity, ratio, and proportion.	See Glencoe's *Algebra 1: Integrations • Applications • Connections, Volume 1* Page A18.
E.	***Describe the role of mathematics in our culture and society.***	
1.	Use connected mathematics problems in probability and statistics (e.g., handshake problem) to extend discussion to the world around them.	1-4, 3-7, 4-6
CONTENT STANDARD 5: NUMBER AND OPERATION CONCEPTS STUDENTS WILL UNDERSTAND AND USE NUMBERS AND NUMBER RELATIONSHIPS		
A.	***Represent and use numbers in a variety of equivalent forms including integers, fractions, decimals, percents, exponents, and scientific notation.***	
1.	Translate among equivalent forms of numbers including integers, fractions, decimals, percents, exponents, and scientific notation as appropriate for a given situation.	1-1, 2-8, 4-4, 9-2, 9-3
B.	***Expand number sense to include integers and rational numbers.***	
1.	Use pictures, physical objects, calculators, and computers to illustrate and explore examples of integers and rational numbers in real-world situations.	2-9, 4-2, 4-3, 4-5, 7-4, 9-6, 9-7, 13-1
C.	***Apply the relationships among fractions, decimals, and percents to ratios and proportion.***	
1.	Investigate and describe examples of percents, ratios, and proportions in problem-based situations.	4-1, 4-2, 4-3, 4-4, 4-5
D.	***Represent numerical relationships in one- and two-dimensional graphs.***	
1.	Explore one- and two-dimensional graphs of actual situations and describe the numerical relationships they illustrate.	1-4, 1-9, 5-2, 5-3, 5-4, 6-3, 11-1

STANDARDS		LESSON REFERENCES
CONTENT STANDARD 6: NUMBER AND OPERATION CONCEPTS STUDENTS WILL UNDERSTAND AND USE NUMBER SYSTEMS AND NUMBER THEORY		
A.	***Explain why other sets of numbers are needed in addition to whole numbers.***	
1.	Identify and describe examples of fractions, decimals, integers, and rational numbers in problem-based situations.	2-4, 2-8, 9-3
B.	***Use order relations for whole numbers, fractions, decimals, integers, and rational numbers.***	
1.	Order and compare whole numbers, fractions, decimals, integers, and rational numbers.	2-4
2.	Describe the effects of operations on the size and order of numbers.	2-4
C.	***Extend basic arithmetic operations to fractions, decimals, integers, and rational numbers and demonstrate the relationships among them.***	
1.	Apply the computation of fractions, decimals, integers, and rational numbers.	1-3, 1-6, 1-8, 2-3, 4-1, 4-4, 4-5, 4-7, 9-3, 13-1
2.	Express composite numbers as the product of the prime factors.	10-1
3.	Find and describe examples of proportions.	4-1, 4-2, 4-4
D.	***Apply number theory concepts such as primes, factors, and multiples in mathematical problem situations inside and outside the school environment.***	
1.	Use a number line to illustrate and represent relationships of prime and composite numbers.	10-1
CONTENT STANDARD 7: NUMBER AND OPERATION CONCEPTS STUDENTS WILL UNDERSTAND AND USE COMPUTATION AND ESTIMATION		
A.	***Solve problems through computation with whole numbers, fractions, decimals, rational and irrational numbers.***	
1.	Use a variety of computational methods to show proficiency in addition, subtraction, multiplication, and division of fractions, decimals, integers, and rational numbers.	1-3, 2-1, 2-3, 2-5, 2-6, 2-7, 9-3
B.	***Develop, analyze, and explain methods for solving problems.***	
1.	Use a variety of processes to investigate and understand the mathematical content of given problems, and explain which strategies are more efficient.	2-9, 3-3
C.	***Select and use an appropriate method for computing from various processes including mental arithmetic, paper and pencil, calculators, and technology.***	
1.	Select an appropriate strategy from various computational methods.	2-3, 2-4, 2-7, 10-1
2.	Use estimation as a first step in all calculations, especially when using calculators.	2-5, 2-6, 4-5, 9-3

STANDARDS		LESSON REFERENCES
D.	***Use computation, estimation, and proportions to solve problems.***	
1.	Compute, estimate, and solve proportional problems.	4-1, 4-2, 4-4, 4-8
2.	Make and read scale drawings.	4-1
E.	***Develop, analyze, and explain procedures for computation and techniques for estimation.***	
1.	Apply and explain various estimation techniques, such as rounding and comparison, when computing fractions and decimals.	2-8, 4-5, 11-2, 13-1
2.	Use and explain proportional reasoning to solve problems.	4-1, 4-2, 4-4, 4-8
3.	Apply computation in probability and geometry.	3-4, 4-2, 6-6, 6-7, 7-5, 13-1, 13-5
F.	***Use estimates to check the reasonableness of results.***	
1.	Estimate the sum, difference, product, and quotient when computing with fractions, decimals, and integers in order to check the reasonableness of solutions.	2-5, 2-6, 4-5, 9-3
2.	Question accuracy of results when using calculators and when measuring.	4-3
CONTENT STANDARD 8: GEOMETRY AND MEASUREMENT CONCEPTS STUDENTS WILL HAVE A FOUNDATION IN GEOMETRIC CONCEPTS		
A.	***Identify, describe, compare, and classify geometric figures.***	
1.	Describe relationships among geometric figures in terms of congruence, similarity, or parallel sides.	4-2
B.	***Explore transformations of geometric figures.***	
1.	Demonstrate, using objects or illustrations, the effects of flips, turns, slides, and enlargements.	See Glencoe's *Geometry: Integration • Applications • Connections* Lesson 13-6.
C.	***Visualize and represent geometric figures with special attention to developing spatial sense.***	
1.	Demonstrate the geometric concepts of symmetry, reflection, congruency, parallelism, and perpendicularity.	6-6, 11-1
2.	Transfer from three-dimensional to two-dimensional representations and vice versa, using model building, paper folding, and other activities.	2-9
3.	Measure and construct angles and other geometric figures.	3-4
D.	***Represent and solve problems using geometric models.***	
1.	Estimate and then calculate circumference, volume, and surface area.	1-3, 2-9, 9-6, 9-7, 10-3

STANDARDS		LESSON REFERENCES
E.	***Apply geometric properties and relationships to the world.***	
1.	Use similar triangles to determine the distance across a street, stream, or canyon.	4-2
F.	***Use geometry as a means of describing the physical world.***	
1.	Investigate geometric patterns including painted stripe patterns, wall paper patterns, and fractals to describe attributes such as symmetry and proportion.	1-2
CONTENT STANDARD 9: GEOMETRY AND MEASUREMENT CONCEPTS STUDENTS WILL UNDERSTAND AND USE MEASUREMENT		
A.	***Define the characteristics of perimeter, area, volume, angle measure, capacity, weight, and mass.***	
1.	Given a shoe box and lid, measure the perimeter, area, and angles of the lid and the volume, weight, and mass of the box.	2-9
B.	***Select appropriate units and tools to measure to the degree of accuracy required in particular problems.***	
1.	Given a list of measurements, identify the appropriate units for each defined example.	2-9
C.	***Estimate, make, and use measurements to describe and compare.***	
1.	Construct a three-inch cube of paper and estimate how many cubes would be needed to completely fill the classroom.	See Glencoe's *Geometry: Integration • Applications • Connections* Lesson 11-5.
2.	Predict the results of combining, subdividing, and changing shapes.	9-6
D.	***Use formulas and procedures for determining measures to solve problems.***	
1.	Apply formulas to solve the following: in a square garden plot of 100 square feet, how long are the rows?	
2.	Use the Pythagorean relationship to solve problems.	13-1, 13-5
E.	***Describe the structure and use of different systems of measurement.***	
1.	Convert measurement units within the U.S. customary and within the metric system.	See Glencoe's *Algebra 1: Integration • Applications • Connections, Volume 1* pages A16-A17.
CONTENT STANDARD 10: STATISTICS AND PROBABILITY CONCEPTS STUDENTS WILL UNDERSTAND AND USE STATISTICS		
A.	***Collect, organize, and describe data systematically.***	
1.	Survey the class for the total number of shoes in their households, organize the data by shoe type, and display the results in a chart or graph.	Pages 190-191, 200, 227, 269, 302, 314

STANDARDS		LESSON REFERENCES
B.	***Construct, read, and interpret tables, charts, and graphs.***	
1.	Analyze data sets with respect to frequency and distribution.	1-4, 2-2, 6-3, 7-7
2.	Describe measures of central tendency and dispersion in actual data sets.	3-7, 5-7
C.	***Make inferences and convincing arguments based on data analysis.***	
1.	Using the data collected in Performance Standard 10A, determine whether casual shoes or dress shoes are preferred.	Pages 190-191, 200, 227, 269, 302, 314
D.	***Evaluate arguments that are based on data analysis.***	
1.	Support the inference in Performance Standard 10 C using the data collected.	Pages 190-191, 200, 227, 269, 302, 314
E.	***Show how statistical methods are an important and powerful means for making decisions.***	
1.	Identify valid and invalid uses of statistics.	1-4
CONTENT STANDARD 11: STATISTICS AND PROBABILITY CONCEPTS STUDENTS WILL UNDERSTAND AND USE PROBABILITY		
A.	***Model situations by devising and carrying out experiments or simulations to determine probabilities.***	
1.	Model the following problem using two groups of colored tiles in a paper bag: There are six blue and six white socks in a drawer. Without looking at the socks, how many would you have to pick to be sure that you had at least one of each color?	4-6, 7-5
B.	***Use probability models to compare experimental results to mathematical expectations.***	
1.	Use a spinner twenty times and record the results. Compare the results to mathematical probability.	4-6, 7-5
C.	***Interpret probability ratios as percents and decimals.***	
1.	Express the results from Performance Standard 11 B as a percent and as a decimal.	4-6, 7-5
D.	***Make predictions that are based on experimental or theoretical probabilities.***	
1.	Predict the result of a series of trials once the probability for one trial is known.	4-6, 7-5
2.	Use a variety of counting techniques such as trees, permutations, and combinations to determine the number of ways an event can occur.	7-5

STANDARDS		LESSON REFERENCES
E.	***Identify multiple uses for probability inside and outside the school environment.***	
1.	Determine the probability of a correct answer from a blind guess on a multiple choice test with five possible answers.	4-6, 7-5
CONTENT STANDARD 12: FUNCTIONS AND ALGEBRA CONCEPTS STUDENTS WILL UNDERSTAND AND USE PATTERNS AND FUNCTIONS		
A.	***Describe, extend, analyze, and create a wide variety of patterns.***	
1.	Given the first six Fibonacci numbers, describe the pattern, and extend it to the next number.	1-2
2.	Create similar patterns.	1-2, 5-6, 11-4
B.	***Describe and represent relationships with tables, graphs, and rules.***	
1.	Given data, complete a pattern, graph the data on a coordinate plane, and explain the necessary operations on x to get y.	5-6, 11-4
C.	***Analyze functional relationships to explain how a change in one quantity results in a change in another.***	
1.	Use graphs, data tables, and equations to examine functions.	5-3, 5-4, 5-5, 5-6, 11-1, 11-2, 11-4
D.	***Use patterns and functions to represent and solve problems.***	
1.	Interpret or create situations that fit given graphs.	1-9
CONTENT STANDARD 13: FUNCTIONS AND ALGEBRA CONCEPTS STUDENTS WILL UNDERSTAND AND APPLY ALGEBRAIC CONCEPTS		
A.	***Examine the relationships among variables, expressions, and equations.***	
1.	Distinguish the differences between expressions and equations.	1-1, 1-5
2.	Use a variable as a place holder for a specific unknown or as a representative of a range of values.	1-1, 1-3, 1-5
B.	***Represent situations and number patterns with tables, graphs, rules, and equations.***	
1.	Generalize number patterns to model observed physical patterns.	1-2
C.	***Analyze tables, graphs, and equations to identify properties and relationships.***	
1.	Given x and y values in tables, compare the changes in the tables and graph the results.	5-6
D.	***Solve linear equations with confidence using concrete, informal, and formal methods.***	
1.	Evaluate algebraic expressions and formulas for given values of the variable.	1-3, 1-5, 2-3
2.	Represent and describe solutions to linear equations.	5-4, 6-5

STANDARDS		LESSON REFERENCES
E.	***Investigate inequalities and nonlinear equations informally.***	
1.	Draw the following inequality on a number line: $x < 2$.	2-8
2.	For the equation, $y = \frac{1}{x}$, explore what happens to y when x changes.	See Glencoe's *Geometry: Integration • Applications • Connections* Lesson 8-8.
3.	Solve linear inequalities which represent real-world problems.	7-1, 7-2, 7-3, 7-4
F.	***Apply algebraic methods to solve a variety of mathematical problems inside and outside the school environment.***	
1.	Use a proportion to change a recipe to serve additional people.	4-1
2.	Solve problems using algebraic expressions with methods such as substitution, formulas, and equivalent forms.	1-3, 1-5, 2-3

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ALGEBRA 1: INTEGRATION • APPLICATIONS • CONNECTIONS

NEW MEXICO

Mathematics Performance Standards

Grades 9–12

STANDARDS		LESSON REFERENCES
CONTENT STANDARD 1: UNIFYING CONCEPTS AND PROCESSES STUDENTS WILL UNDERSTAND AND USE MATHEMATICS IN PROBLEM SOLVING		
A.	***Analyze problem-solving approaches to investigate and understand mathematical content.***	
1.	Clarify the strategy involved in solving given problems by breaking complex problems into simpler parts.	3-3, 8-2, 8-5, 13-6
2.	Adapt previously used strategies to new problems.	3-3, 3-4, 3-5, 4-5, 7-3, 7-8, 8-4, 8-5, 10-6
B.	***Formulate problems from global mathematical situations.***	
1.	Identify mathematical implications of real-world situations.	1-9, 8-5
2.	Formulate appropriate problems involving these situations.	1-9, 8-5
3.	Apply previously developed strategies to solve these problems.	1-9, 8-5
C.	***Select the best strategies to solve a wide variety of problems in diverse contexts.***	
1.	Use a variety of mathematical models such as tables, graphs, and algebraic expressions to represent real-world problems.	5-2, 5-3, 5-4, 6-5, 8-2, 8-5, 11-1
2.	Apply a variety of reasoning processes to solve problems.	3-3, 5-1, 6-3, 7-4, 8-2, 9-1, 10-3, 13-6
3.	Evaluate the validity of arguments and the efficiency of chosen strategies.	4-4, 4-5
D.	***Verify and interpret results with respect to the original problem situation.***	
1.	Check to see that the solution of a problem is reasonable, and justify the solution verbally or in writing.	3-1, 3-3, 4-1, 4-3, 4-4, 4-5, 4-7, 7-1, 8-2, 13-3
E.	***Use manipulatives, calculators, computers, and other tools, as appropriate, in order to strengthen mathematical thinking, understanding, and power to build upon foundational concepts.***	
1.	Use appropriate tools (e.g., manipulatives, calculators, and computers) to demonstrate mathematical properties and relationships from numeric, algebraic, and geometric perspectives.	3-1A, 4-4, 5-4A, 6-5A, 7-8A, 9-6A, 9-7A 11-1A, 11-1B

STANDARDS		LESSON REFERENCES
F.	***Analyze solutions and strategies for use in mathematical modeling.***	
1.	Describe and analyze mathematical situations in a variety of ways including orally, pictorially, graphically, in writing, and with concrete materials and algebraic expressions.	3-3, 4-2, 4-3, 4-7, 7-4, 7-6, 8-1, 9-6A
CONTENT STANDARD 2: UNIFYING CONCEPTS AND PROCESSES STUDENTS WILL UNDERSTAND AND USE MATHEMATICS IN COMMUNICATION		
A.	***Analyze personal mathematical thinking for validity and applicability to specific problems.***	
1.	Decide how mathematics would be an aid in solving a real-life problem.	1-9, 8-5
2.	Determine the best method of solution (graph, formula, logic, etc.)	1-9, 8-5
B.	***Use drawings, discussion, reading, writing, and listening to access, learn, and communicate mathematical ideas.***	
1.	Express mathematical ideas in an easy-to-understand format such as drawing, discussing, listening, reading, and writing, etc., using appropriate vocabulary and notation.	1-5, 2-8, 3-3, 4-4, 5-4, 6-5, 7-1
2.	Ask clarifying and extending questions about mathematical ideas.	1-9, 8-5
C.	***Select the most economical and illustrative method to communicate mathematical concepts, thoughts and problem solutions including mathematical notation, charts, slides, graphs, maps, drawings, pictures, sound recordings, video, e-mail, and others.***	
1.	Discern among the many modes of communication of mathematics to choose the most easy-to-understand, effective, or economical method.	1-9, 8-5
D.	***Analyze mathematical ideas through the use of learning tools such as manipulatives, calculators, and computers.***	
1.	Use manipulatives as an aid to understanding the meaning of a problem and to suggest a mode of solution.	2-3A, 2-8A, 3-1A, 3-3A, 6-1A, 9-5A, 9-7A, 10-2A, 10-3A, 13-1A
2.	Learn to use computers and graphing calculators to simulate situations, analyze data, and solve complicated problems in an effective way.	5-4A, 5-7A, 6-5A, 7-8A, 8-1A, 11-1A, 11-1B, 11-4A, 12-1B, 13-2B
E.	***Describe the economy, power, and elegance of mathematical notation and its role in the development of mathematical ideas.***	
1.	Demonstrate that translating a real-life problem to a mathematical equation results in an easier and organized method of solution.	3-3, 4-1, 4-2, 4-3, 4-4, 4-7, 6-4, 8-2, 8-4, 11-5

STANDARDS		LESSON REFERENCES
2.	Use appropriate notation for mathematics.	1-5, 2-3, 2-4, 2-8, 7-4, 7-6, 13-2, 13-3, 13-4
F.	***Read presentations of mathematics with understanding.***	
1.	Be aware of how mathematics is presented in everyday publications.	2-1, 3-7
2.	Interpret results of graphs, statistics, etc. in daily news.	3-7
3.	Verify or refute implications and conclusions presented in news publications.	3-7
CONTENT STANDARD 3: UNIFYING CONCEPTS AND PROCESSES STUDENTS WILL UNDERSTAND AND USE MATHEMATICS IN REASONING		
A.	***Develop and test conjectures and mathematical arguments.***	
1.	Brainstorm, in a cooperative setting, possible conjectures and modes of solution to a mathematical problem.	1-9, 8-5
2.	Give pros and cons to test the validity and/or usefulness of such conjectures and methods of solutions.	1-9, 8-5
B.	***Evaluate reasoning strategies to select the most appropriate reasoning method to solve a given problem.***	
1.	Know several possible problem-solving strategies such as guess and check, develop a pattern, form an equation, etc.	3-3
2.	Analyze and choose the best of these strategies for the particular problem.	3-3, 5-1, 6-3, 7-4, 8-2, 9-1, 10-3, 13-6
C.	***Judge the validity of mathematical arguments.***	
1.	Give a counterexample to demonstrate an invalid mathematical argument or reasons to substantiate logical valid arguments.	1-5, 10-3
D.	***Construct and evaluate logical arguments.***	
1.	Given an assumption, develop a logical sequence of arguments leading to a valid conclusion or solution to a problem (statement/reasons proof, informal proof, and algebraic steps).	1-6, 1-8
E.	***Formulate counterexamples to understand mathematical reasoning.***	
1.	Give a counterexample and explain why it demonstrates that a mathematical argument was invalid and led to a false conclusion.	1-5, 10-3

STANDARDS		LESSON REFERENCES
CONTENT STANDARD 4: UNIFYING CONCEPTS AND PROCESSES STUDENTS WILL UNDERSTAND AND USE MATHEMATICAL CONNECTIONS		
A.	***Relate mathematical procedures in one representation to procedures in equivalent representations.***	
1.	Given a representation of a problem or data (e.g., pictorial, graph, and equation), represent it using another of these methods.	2-2, 5-4, 6-3, 6-5, 7-8, 8-1
B.	***Compare and contrast equivalent representations of the same concept.***	
1.	Given several different methods of representing a problem or data, students will be able to identify which representations are more useful for identifying certain information.	1-4, 3-7
2.	Discuss which representations are easiest to read, more economical in terms of time, give more information, etc.	1-4, 2-2, 7-7
C.	***Assess the relationship among mathematical topics.***	
1.	Use material learned in one math course or section of a course to solve problems in another area of mathematics (e.g., to solve geometry problems, students must be able to solve algebraic equations).	3-4, 4-2, 4-3, 6-6, 6-7, 13-1, 13-5
D.	***Incorporate the use of technology into the application of mathematical reasoning and problem solving to other disciplines.***	
1.	Use graphing calculators and/or computers in the analysis of results of experiments or population data that are important in other fields of study.	*Long-Term Investigation* Chapter 4
E.	***Evaluate mathematical solutions for problems in daily life and in the greater society.***	
1.	Examine the validity and usefulness of mathematics solutions being offered to problems in everyday life (e.g., environmental issues, health issues, etc.).	*Long-Term Investigation* Chapters 4, 10
CONTENT STANDARD 5: NUMBER AND OPERATION CONCEPTS STUDENTS WILL UNDERSTAND AND USE NUMBERS AND NUMBER RELATIONSHIPS		
A.	***Extend number sense skills to include irrational numbers.***	
1.	Use models, such as number lines and Venn diagrams, to show similarities and differences among real numbers.	2-1, 2-8
B.	***Apply number-sense skills within the real number system.***	
1.	Compare and order members of the real number system.	2-1, 2-4, 2-8

STANDARDS		LESSON REFERENCES
C.	***Apply ratios, proportions and percents in more complex mathematical situations.***	
1.	Investigate and describe the application of ratios, proportions, and percents in real-world situations.	4-1, 4-2, 4-3, 4-4, 4-5
D.	***Analyze and interpret numerical relationships in one- and two-dimensional graphs, both manually and using tools such as graphing calculators and computers.***	
1.	Graph and use such tools as graphing calculators and computers to analyze and interpret relationships.	5-2A, 5-4A, 5-7A, 6-5A, 7-8A, 8-1A, 11-1A, 11-1B, 11-4A, 12-1B
CONTENT STANDARD 6: NUMBER AND OPERATION CONCEPTS STUDENTS WILL UNDERSTAND AND USE NUMBER SYSTEMS AND NUMBER THEORY		
A.	***Use order relations within the real number system.***	
1.	Order and compare whole numbers, fractions, decimals, integers, and rational and irrational numbers.	2-1, 2-4, 2-8
B.	***Apply number theory concepts to a variety of problem situations.***	
1.	Apply mathematical thinking using a variety of tools to demonstrate concepts, such as order, primes, factors, and multiples.	2-4, 2-5, 10-1, 12-6
C.	***Identify how seemingly different mathematical situations may be essentially the same (for example, the intersection of two lines is the same as the solution to a system of linear equations).***	
1.	Compare, translate, extend, and represent numbers in various forms such as decimal, fraction, scientific notation, patterns, graphs, charts, and tables.	1-1, 2-4, 2-8, 4-4, 5-2, 5-3, 9-3
D.	***Compare and contrast the real number system and its various subsystems with regard to structural characteristics.***	
1.	Explain how a number system differs from a set of numbers.	2-1
E.	***Develop and analyze algorithms.***	
1.	Explain the four basic arithmetic operations.	1-1, 1-3, 1-6
2.	Describe which field properties hold for each of a variety of subsets of real numbers such as odd numbers, even numbers, prime numbers, composite numbers, powers of 2, factors of a given number, squares, and square roots.	2-8

STANDARDS		LESSON REFERENCES
CONTENT STANDARD 7: NUMBER AND OPERATION CONCEPTS STUDENTS WILL UNDERSTAND AND USE COMPUTATION AND ESTIMATION		
A.	***Develop, analyze, and explain methods for solving a variety of problem situations.***	
1.	Clarify and express orally, in writing, or by project simulation the mathematical thinking involved in solving given problems.	2-9, 3-3, 3-4
B.	***Extend solutions of problems to formulate predictions.***	
1.	Compare, translate, extend, and represent numbers in various forms such as decimal, fraction, scientific notation, patterns, graphs, charts, and tables.	1-1, 2-4, 2-8, 4-4, 5-2, 5-3, 9-3
2.	Solve an application involving optimal production and marketing decisions.	8-5, 11-2
C.	***Justify the reasonableness of solutions and predictions.***	
1.	Use estimation as a first step in all calculations, especially when using calculators.	2-5, 2-6, 4-5, 9-3
2.	Evaluate relationships between key components and the original problem situation to determine the reasonableness of solutions and predictions.	3-3, 4-3, 4-4, 4-5, 6-4, 7-2, 8-2, 9-5, 10-6, 12-8
CONTENT STANDARD 8: GEOMETRY AND MEASUREMENT CONCEPTS STUDENTS WILL HAVE A FOUNDATION IN GEOMETRIC CONCEPTS		
A.	***Interpret and draw three-dimensional objects.***	
1.	Use top, front, and side views to create accurate and complete representations of three-dimensional objects.	1-4, 9-2
B.	***Deduce properties of figures using transformations and using coordinates.***	
1.	Draw geometric figures on a coordinate plane.	6-6, 6-7, 13-5
C.	***Classify figures in terms of congruence and similarity and apply these relationships.***	
1.	Explain why triangles are similar or congruent.	4-2
2.	Apply congruence and similarity to other polygons.	See Glencoe's *Geometry: Integration • Applications • Connections* Lesson 7-2.
D.	***Represent problem situations with geometric models and apply properties of figures.***	
1.	Apply right triangle trigonometry to solve a problem.	4-3

STANDARDS		LESSON REFERENCES
E.	***Deduce properties of and relationships between figures from given assumptions.***	
1.	Given assumptions about a figure, students will give formal or informal proofs regarding properties of the figure or relationships between the given figures.	6-6
F.	***Identify congruent and similar figures using transformations.***	
1.	Understand the effect that translating, reflecting, rotating, or dilating has on a figure and use this information to identify congruencies or similarities between figures.	11-1A
G.	***Analyze properties of Euclidean transformations and relate transformations to vectors.***	
1.	Understand the effect that translating, reflecting, rotating, or dilating has on a figure and use this information to identify the results of transforming vectors.	See Glencoe's *Geometry: Integration • Applications • Connections* Lessons 12-5, 13-5, 13-6, 13-7, 13-8.
2.	Use vectors as tools to transform figures into congruent or similar figures.	See Glencoe's *Geometry: Integration • Applications • Connections* Lesson 12-5.
CONTENT STANDARD 9: GEOMETRY AND MEASUREMENT CONCEPTS STUDENTS WILL UNDERSTAND AND USE MEASUREMENT		
A.	***Apply measurement as a tool in other disciplines and in everyday problem situations.***	
1.	Use ratio and proportion to find distances which are difficult to measure directly, e.g., heights of buildings or flagpoles.	4-1, 4-2, 4-3
2.	Find volumes and surface areas of geometric solids (e.g., cones, pyramids, and prisms).	1-1, 2-9, 9-7
B.	***Identify and use the appropriate units and tools of measurement to the degree of accuracy required in particular problems.***	
1.	Estimate the cost of a construction job given the job's blueprints, specifications, and material and labor costs.	See Glencoe's *Geometry: Integration • Applications • Connections* Chapter 8 Project.
2.	Determine if errors are within acceptable levels.	See Glencoe's *Geometry: Integration • Applications • Connections* Lesson 4-4.
CONTENT STANDARD 10: STATISTICS AND PROBABILITY CONCEPTS STUDENTS WILL UNDERSTAND AND USE STATISTICS		
A.	***Construct and draw inferences from charts, tables, and graphs that summarize data from inside and outside the school environment.***	
1.	Create and interpret a scatterplot.	6-3

STANDARDS		LESSON REFERENCES
B.	***Use curve fitting to predict from data.***	
1.	Given data, students will manually or with the aid of technology find a best curve fit.	6-3
2.	After determining the equation of the best fit, students will apply the equation in order to predict results of what could happen at other data points.	6-3
C.	***Apply measures of central tendency, variability, and correlation.***	
1.	Determine the most meaningful measure of central tendency for a given situation.	3-7
D.	***Define sampling and recognize its role in statistical claims.***	
1.	Use sampling techniques to draw inferences about large populations.	See Glencoe's *Geometry: Integration • Applications • Connections* Chapter 9 Project.
E.	***Design an experiment to study a problem and use the correct statistical procedures to summarize and analyze the data.***	
1.	Explore questions of experimental design, use of control groups, and reliability.	See Glencoe's *Geometry: Integration • Applications • Connections* Chapter 9 Project.
F.	***Analyze the effects of data transformations on measures of central tendency and variability.***	
1.	Explain what effect multiplication by a constant on a data set will have on the mean, median, mode, and standard deviation.	See Glencoe's *Advanced Mathematical Concepts* Lessons 15-2, 15-3.
CONTENT STANDARD 11: STATISTICS AND PROBABILITY CONCEPTS STUDENTS WILL UNDERSTAND AND USE PROBABILITY		
A.	***Use simulations to estimate probability.***	
1.	Devise experiments which can be generalized to estimate the probability of a larger event.	4-6
B.	***Use experimental or theoretical probability to represent and solve problems involving uncertainty.***	
1.	Organize the results of an experiment to give the best possible representation (graph, table, etc.) and use this representation as a tool to predict results and solve problems.	See Glencoe's *Geometry: Integration • Applications • Connections* Lesson 10-6.
2.	Use permutations and/or combinations to solve problems involving uncertainty.	See Glencoe's *Geometry: Integration • Applications • Connections* Lesson 10-6.
C.	***Apply the definition of a random variable to experimental design.***	
1.	Understand the meaning of a completely random event.	4-6
2.	Be able to use technology to simulate a random event.	4-6
3.	Devise an experiment in which a random event plays a key role.	4-6

STANDARDS		LESSON REFERENCES
D.	***Create and interpret discrete probability distributions.***	
1.	Analyze bar graphs, pie graphs, broken line graphs, etc.	1-4, 5-7
2.	Given data, create an appropriate bar graph, broken line graph, tree diagram, box and whiskers plot, etc., to display it in the best possible way.	7-5, 7-7
E.	***Describe the normal curve and apply its properties to answer questions about data that are assumed to be normally distributed.***	
1.	Given a normal curve, apply its properties to identify the number (or percent) of data points within one standard deviation, two standard deviations, etc.	See Glencoe's *Advanced Mathematical Concepts* Chapter 15 Project.
F.	***Solve enumeration and finite probability problems.***	
1.	Apply knowledge of permutations and combinations to solve problems involving enumeration and finite probability.	See Glencoe's *Advanced Mathematical Concepts* Lessons 14-1, 14-2, 14-3, 14-4.
CONTENT STANDARD 12: FUNCTIONS AND ALGEBRA CONCEPTS STUDENTS WILL UNDERSTAND AND USE PATTERNS AND FUNCTIONS		
A.	***Model everyday experiences with a variety of functions.***	
1.	Given a realistic problem or event, describe and correctly use various functions, including linear, exponential, power, rational, square and square root, and cube and cube root.	5-4, 5-5, 11-1, 11-2, 11-4
B.	***Represent and analyze relationships using tables, graphs, rules, and equations.***	
1.	Model realistic problems or the result of experiments using a table, graph, rule, or equation.	5-4, 5-5, 5-6, 8-5, 11-1, 11-4
2.	Given a table, graph, rule, or equation, analyze the meaning and apply to a realistic situation.	1-9, 5-5
C.	***Translate among tabular, symbolic, and graphical representations of functions.***	
1.	Use technology, such as graphing calculators, to analyze functions and to note properties such as domain and range.	5-4A, 6-5A, 11-1A, 11-4A, 12-1B
2.	Given one form of function representation (table, symbol, and graph), display the information in the other two ways.	5-2, 5-3, 5-4, 5-5, 5-6
D.	***Model a variety of problem situations using the same type of function.***	
1.	Determine which graphs and equations result from the following functions: linear, exponential, power, rational, square and square root, and cube and cube root.	5-4, 6-2, 6-5, 11-1, 11-4
2.	Given a type of function, formulate a realistic situation which would result in the given type of equation.	5-4, 11-1, 11-4

STANDARDS		LESSON REFERENCES
E.	***Analyze the effects of parameter changes on the graph of functions.***	
1.	Predict the effect of changes in slope and y-intercept on the graph of a linear function.	6-6
2.	Predict the effect on a graph which results from adding, subtracting, multiplying, or dividing various parts of an equation by a constant.	5-4, 11-4
F.	***Explore and represent everyday situations using the sine and cosine functions.***	
1.	Illustrate examples which approximate sine and cosine functions (voice patterns, radio frequency, etc.).	See Glencoe's *Advanced Mathematical Concepts* Lessons 6-1, 6-2, 6-3.
CONTENT STANDARD 13: FUNCTIONS AND ALGEBRA CONCEPTS STUDENTS WILL UNDERSTAND AND APPLY ALGEBRAIC CONCEPTS		
A.	***Represent situations that involve variable quantities with expressions, equations, inequalities, and matrices.***	
1.	Given a realistic problem, translate the problem into an expression equation, inequality or matrix as a first step to working toward a solution.	2-9, 3-3, 4-1, 4-2, 4-3, 4-4, 8-2, 8-3, 8-4, 8-5
B.	***Use tables and graphs as tools to interpret expressions, equations, and inequalities.***	
1.	Given an expression, equation, or inequality, represent it in tabular or graphical form as a further step toward clarity and analysis.	5-3, 5-4, 6-5, 7-8, 11-1, 11-2, 11-4
C.	***Operate on expressions and matrices and solve equations and inequalities.***	
1.	Use appropriate steps to simplify expressions and matrices, in order to solve equalities and inequalities.	1-5, 2-3, 2-6
2.	Solve quadratic equations using algebraic and graphing methods.	10-6, 11-2, 11-3
D.	***Identify the implications and usefulness of mathematical abstractions and symbolism.***	
1.	After solving the equation or inequality, use this information to make generalizations and/or explain what the results mean in the real-life problem or situation.	3-3, 4-1, 4-5, 4-7, 6-4, 7-6, 8-2, 10-6, 11-5, 13-1
2.	Understand that putting problems into algebraic expressions in order to use learned steps toward solutions results in a more efficient way of solving problems than trial and error.	10-3, 10-6
E.	***Use matrices to solve linear systems.***	
1.	Verify solution of a matrix with a graphical solution.	See Glencoe's *Advanced Mathematical Concepts* Lessons 2-3, 2-4.

STANDARDS		LESSON REFERENCES
2.	Use Cramer's rule (with the aid of technology) to solve linear equations with matrices.	See Glencoe's *Advanced Mathematical Concepts* Lessons 2-3, 2-4.
F.	***Apply trigonometry to problem situations involving triangles.***	
1.	Apply sine, cosine, or tangent to right triangles to find the measure of unknown sides or angles.	4-3
2.	Translate realistic problems to right triangles in order to solve problems (e.g., height of a flagpole, distance of a ship, etc.)	4-2, 4-3
G.	***Determine maximum and minimum points of a graph and interpret the results in problem situations.***	
1.	Given the equation of parabola, find the maximum or minimum point.	11-1
2.	Given an equation or graph, find maximums and minimums and apply their meaning to realistic problems (e.g., height of a rocket).	11-1
H.	***Describe limiting processes by examining infinite sequences, series, and areas under curves.***	
1.	Use manipulatives to investigate limiting processes (e.g., constantly decrease the height of a cylinder and determine the effect on volume, etc.).	See Glencoe's *Advanced Mathematical Concepts* Lessons 12-3, 17-1.
2.	Estimate the limit (if any) of an infinite sequence.	See Glencoe's *Advanced Mathematical Concepts* Lesson 12-3.
3.	Find the sum of a geometric series.	See Glencoe's *Advanced Mathematical Concepts* Lesson 12-2.
4.	Estimate (by counting smaller and smaller squares or trapezoids) areas under a curve and predict actual area under the curve.	See Glencoe's *Advanced Mathematical Concepts* Lesson 17-3.
I.	***Evaluate the logic of algebraic procedures.***	
1.	Explore algebraic relationships using technology.	8-1A, 11-1A, 11-1B, 11-4A, 12-1B
2.	Give a logical sequence of steps to lead to the solution of a more complicated algebraic problem.	8-1A, 11-1A, 11-1B, 11-4A, 12-1B