



MIDDLE SCHOOL COURSE OUTLINE

<b>Department</b>	Mathematics	<b>Course Code</b>	3101
<b>Course Title</b>	Pre-Algebra 8 SDAIE Primary Language Support		
<b>Abbreviation</b>	Pre-Alg 8 SDA/PLS	<b>Grade Level</b>	8
<b>Course Length</b>	1 year	<b>Co-requisites</b>	ELD English 1 or 2
<b>Teacher Certification</b>	BCLAD / BCC or CLAD, LDS, SB1969 or SB 395 plus bilingual aide		

**COURSE DESCRIPTION:**

Eighth grade SDAIE Pre-Algebra with primary language support is designed specifically for the needs of English Language Learners (ELLs) who are at the Beginning, and Early Intermediate, levels of listening, speaking, reading, and writing proficiency in English. Students in this course cover the essential content and utilize the same basic textbook as their Fluent English Speaker counterparts supplemented with content-parallel English materials at a simplified reading level. Additionally, primary language materials will be provided, when available, to facilitate the preview and review of essential content. The course delivery varies in pacing, instructional methodology, and supplemental materials. It is designed to provide depth versus breadth of the content standards, and provide more comprehensible input, primary language support, and literacy development in the content area.

The foundation for this course is the California State Math Standards. The course continues and extends a study of fundamental operations with the system of rational numbers. Concepts of algebra, discrete mathematics, functions and patterns, geometry, logic, numbers, probability and statistics are included. Attention is given to pre-algebra skills, geometric constructions, volume, ratio, proportion, percent and coordinate graphing. Mathematical development is written in more formal style with each step requiring justification.

**GOALS:**

Students will learn the middle school California State Standards necessary to prepare for ninth grade Algebra, the General Mathematics California Standards Test, and the California High School Exit Exam. By the end of grade eight, students are adept at manipulating numbers and equations and understand the general principles at work. They apply their knowledge to statistics and probability. Students understand the concepts of mean, median, and mode of data sets and how to calculate the range. They analyze data and sampling processes for possible bias and misleading conclusions. Students understand and use factoring of numerators and denominators and properties of exponents. They know the Pythagorean Theorem and solve problems in which they compute the length of an unknown side. Students know how to compute the surface area and volume of basic three-dimensional objects and understand how area and volume change with a change in scale. Students make conversions between different units of measurement. They know and use different representations of fractional numbers (fractions, decimals, and percents) and are proficient at changing from one to another. They increase their facility with ratio and proportion, compute percents of increase and decrease, and compute simple and compound interest. They graph linear functions and understand the idea of slope and its relation to ratio.

Students communicate precisely about quantities, logical relationships, and unknown values through the use of signs, symbols, models, graphs, and mathematical vocabulary. Regular opportunities are provided for students to communicate through oral and written explanations of math concepts.

Students learn to apply mathematics to everyday life and develop an interest in pursuing advance studies in mathematics and in a wide array of mathematically related career choices.

## **Academic Literacy in SDAIE Content-Area Classes for ELLs at Levels 1, 2**

The ELD Standards of reading, writing, listening and speaking describe the linguistic pathway that ELLs take to achieve academic literacy in English. SDAIE content area classes play an important role in developing and strengthening students' progress towards this goal. Students should be encouraged to expand their English skills, even though grammatical and vocabulary approximations will occur during this process.

When content-area information and materials have been made comprehensible through instruction in the SDAIE class, ELLs at each level will progress through the following phases of developing academic literacy in English. The students' degrees of literacy in their primary language will significantly affect the pace that students move through these levels.

### **ELD Level 1**

Upon entering ELD Level 1, students have little or no academic English proficiency and varying levels of academic literacy skills and concepts in their first language. ELLs progressing through this level will:

- Participate in group/class projects, discussions and presentations with non-verbal responses (e.g., gestures, drawings, graphic organizers, role-playing) and/or single words, phrases and simple sentences with assistance (e.g., using the academic participation cards).
- Participate orally in some content area reading strategies (especially pre-reading, KWL, academic participation cards, anticipation guides) with single words, phrases and/or simple sentences to analyze concepts from taught texts and other course reading materials.
- Respond to Curriculum Embedded Assessment prompts (read to them and clarified for them) nonverbally (e.g., graphic organizers with drawings) and/or orally with single words, phrases and simple sentences in an outline format
- Use writing in a variety of ways such as, but not limited to, guided class note-taking, learning logs, interactive notebooks, representing information on pictures, lists, charts and tables using single words, phrases or simple sentences, and completing student handouts, selected homework, and modified class projects
- Understand the need for using test-taking strategies (using taught vocabulary) on the required district/state assessments, such as, End of Course Exams (with alternate presentation and response), and STAR.

### **ELD Level 2**

Upon entering ELD Level 2, students have some academic English proficiency about topics that have been explicitly taught to them. ELLs progressing through this level will:

- Participate in group/class projects, discussions and presentations with simple sentences and many attempts at more complex sentences
- Use content area reading strategies (especially pre-reading, KWL, academic participation cards, anticipation guides, Reciprocal Teaching and Question/Answer Relationships) to analyze concepts from taught texts and other course reading materials
- Respond to Curriculum Embedded Assessment prompts (read to them and clarified for them) orally and with simple and some complex sentence structures in at least three paragraphs
- Use writing in a variety of ways such as, but not limited to, class note-taking, learning logs, interactive notebooks, response logs, and completing student handouts, homework, and class projects
- Understand the need for using test-taking strategies (using taught vocabulary) on the required district/state assessments, such as, End of Course Exams (with alternate presentation and response), and STAR.

## **CONTENT STANDARDS:**

### **Number Sense- Grade 7**

- 1.0 Students know the properties of, and compute with, rational numbers expressed in a variety of forms.
- 2.0 Students use exponents, powers, and roots and use exponents in working with fractions.

### **Algebra and Functions- Grade 7**

- 1.0 Students express quantitative relationships by using algebraic terminology, expressions, equations, inequalities, and graphs. (CAHSEE, CST)
- 2.0 Students interpret and evaluate expressions involving integer powers and simple roots. (CAHSEE, CST)
- 3.0 Students graph and interpret linear and some nonlinear functions. (CAHSEE, CST)
- 4.0\* Students solve simple linear equations and inequalities over the rational numbers. (CAHSEE, CST)

### **Measurement and Geometry- Grade 7**

- 1.0 Students choose appropriate units of measure and use ratios to convert within and between measurement systems to solve problems. (CAHSEE, CST)
- 2.0 Students compute the perimeter, area, and volume of common geometric objects and use the results to find measures of less common objects. They know how perimeter, area, and volume are affected by changes of scale. (CAHSEE, CST)
- 3.0 Students know the Pythagorean theorem and deepen their understanding of plane and solid geometric shapes by constructing figures that meet given conditions and by identifying attributes of figures. (CAHSEE, CST)

### **Statistics, Data Analysis, and Probability- Grade 6**

- 1.0 Students compute and analyze statistical measurements for data sets. (CAHSEE, CST)
- 2.0 Students use data samples of a population and describe the characteristics and limitations of the samples. (CAHSEE, CST)
- 3.0 Students determine theoretical and experimental probabilities and use these to make predictions about events. (CAHSEE, CST)

### **Statistics, Data Analysis, and Probability- Grade 7**

- 1.0 Students collect, organize, and represent data sets that have one or more variables and identify relationships among variables within a data set by hand and through the use of an electronic spreadsheet software program. (CAHSEE, CST)

### **Mathematical Reasoning- Grade 7**

- 1.0 Students make decisions about how to approach problems. (CAHSEE)
- 2.0 Students use strategies, skills, and concepts in finding solutions. (CAHSEE)
- 3.0 Students determine a solution is complete and move beyond a particular problem by generalizing to other situations. (CAHSEE)

\* Key standards (*Mathematics Framework for California Public Schools*) comprise a minimum of 70% of the California Standards Test

CST Standard assessed on the California Standards Test

CAHSEE Standard assessed on the California High School Exit Exam

## PERFORMANCE STANDARDS

The California State Board of Education has identified the following performance levels for the General Mathematics California Content Standards Test. The objective of Long Beach Unified School District is to have all students achieve at or above the Proficient Performance Standard (Level).

Grade 8	Far Below Basic	Below Basic	Basic	Proficient	Advanced Proficient
%	0% - 29%	30% - 43%	44% - 61%	62% - 80%	81% - 100%
# Correct	Less than 19	20 – 28	29 – 40	41 – 52	53 - 65

The Long Beach Unified School District has common assessments and assignments that are required for grade eight. The Performance Standard Criteria is shown in the table below. The objective is to have all students achieve at or above the Proficient Level and receive a C or better in the course.

### Mathematics Performance Standard Criteria

Assignments	Far Below Basic (FBB)	Below Basic (BB)	Basic (B)	Proficient (P)	Advanced Proficient (AP)
Key Assignments: LBUSD practice exams for Quarter 1, Quarter 2, Quarter 3, and EOC	The student completes at least 25%; not all work is shown.	The student completes at least 50%; not all work is shown.	The student completes 65% - 79% showing all work.	The student completes 80% - 89% showing all work.	The student completes at least 90% showing all work.
Assessments	FBB	BB	B	P	AP
Standards Based Assessments					
LBUSD Quarter 1, Quarter 2, and Quarter 3 Exams	0% - 28%	29% - 45%	46% - 63%	64% - 83%	84% - 100%
End-Of-Course Exam					

Assessment	Not Proficient 1	Partial Proficient 2	Proficient 3	Advanced Proficient 4
Integer Tests	Less than 80%	80% - 92% 56 of 70 Correct Completed in ≤ 15 mins.	93% - 96% 65 of 70 Correct Completed in ≤ 10 mins.	97% - 100% 68 of 70 Correct Completed in ≤ 5 mins.

**OUTLINE OF CONTENT AND RECOMMENDED TIME ALLOTMENT:**

For more detailed information on the context and the benchmarks to assess, refer to the Mathematics Content Standards document. Content time allocations are only suggestions and may be adjusted to suit school site curriculum plans and student needs.

**Number Sense - Grade 7**

California Content Standards		Adopted Textbook Correlation	Assessments Grade 8 Assessment Portfolio Student Workbook	Key Vocabulary and Recommended Aids	Time
1.0 Students know the properties of, and compute with, rational numbers expressed in a variety of forms:	1.1 Read, write, and compare rational numbers in scientific notation (positive and negative powers of 10) with approximate numbers using scientific notation. (CAHSEE, CST)	Glencoe Algebra Readiness Mastering the CA Math Standards Wbk pp 17-18	p. 99	<b>KEY VOCABULARY:</b> Absolute Value Base Commission Common denominator Compound interest Decimal Discount Estimate Exponent Factor Fraction Increase Integer Markup Percent Power Repeating decimal Scientific notation Square root Terminating decimal  <b>VISUALS &amp; DEMOS:</b> Algeblocks Algebra tiles Base-ten blocks Color tiles Factor trees Fraction circles Fraction squares Graph paper Ladder method Number lines Overhead calculator Walk-on number line	5.5 weeks
	1.2* Add, subtract, multiply, and divide rational numbers (integers, fractions, and terminating decimals) and take positive rational numbers to whole-number powers. (CAHSEE, CST)	Glencoe Algebra Readiness Prerequisite 5, Ch. 1-3, 2-3, 2-4, 2-5, 3-5, 3-6, 3-7, 3-8, 3-9, 4-2, 4-3, 4-4			
	1.3 Convert fractions to decimals and percents and use these representations in estimations, computations, and applications. (CAHSEE, CST)	Glencoe Algebra Readiness Ch. 4-1, 4-2, 4-3, 4-4, 6-1, 6-2, 6-4			
	1.5* Know that every rational number is either a terminating or repeating decimal and be able to convert terminating decimals into reduced fractions. (CAHSEE, CST)	Glencoe Algebra Readiness Prerequisite 8, Ch. 4-1			
	1.6 Calculate the percentage of increases and decreases of a quantity. (CAHSEE, CST)	Glencoe Algebra Readiness Mastering the CA Math Standards Wbk pp 29-30			
	1.7* Solve problems that involve discounts, markups, commissions, and profit and compute simple and compound interest. (CAHSEE, CST)	Glencoe Algebra Readiness Ch. 6-5			
2.0 Students use exponents, powers, and roots and use exponents in working with fractions:	2.1 Understand negative whole-number exponents. Multiply and divide expressions involving exponents with a common base. (CAHSEE, CST)	Glencoe Algebra Readiness Ch. 5-2	p. 99		2 weeks
	2.2* Add and subtract fractions by using factoring to find common denominators. (CAHSEE, CST)	Glencoe Algebra Readiness Ch. 3-8, 3-9			
	2.3* Multiply, divide, and simplify rational numbers by using exponent rules. (CAHSEE, CST)	Glencoe Algebra Readiness Ch. 5-1, 5-2			
	2.4 Use the inverse relationship between raising to a power and extracting the root of a perfect square integer; for an integer that is not square, determine without a calculator the two integers between which its square root lies and explain why. (CAHSEE, CST)	Glencoe Algebra Readiness Ch.5-4			
	2.5* Understand the meaning of the absolute value of a number; interpret the absolute value as the distance of the number from zero on a number line; and determine the absolute value of real numbers. (CAHSEE, CST)	Glencoe Algebra Readiness Ch. 2-2			

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## Algebra and Functions- Grade 7

California Content Standards		Adopted Textbook Correlation	Assessments <u>Grade 8</u> <u>Assessment</u> <u>Portfolio</u> <u>Student</u> <u>Workbook</u>	Key Vocabulary and Recommended Aids	Time
1.0 Students express quantitative relationships by using algebraic terminology, expressions, equations, inequalities, and graphs:	1.1 Use variables and appropriate operations to write an expression, an equation, an inequality, or a system of equations or inequalities that represents a verbal description (e.g., three less than a number, half as large as area A). (CAHSEE, CST)	Glencoe Algebra Readiness Ch. 1-2	p. 63	<b>KEY VOCABULARY:</b> Algebraic expression Associative property Commutative property Cubic Direct variation Distribute Distributive property Equation Evaluate Exponent Expression Function Graph Identity Inequality Inverse operation Justify Monomial Numerical expression Order of operations Power Property of equality Radical Rate Ratio Rise Root Run Quadratic Simplify Slope Square root System of equations System of inequalities Volume	5 weeks
	1.2 Use the correct order of operations to evaluate algebraic expressions such as $3(2x + 5)^2$ . (CAHSEE, CST)	Glencoe Algebra Readiness Ch. 5-5			
	1.3* Simplify numerical expressions by applying properties of rational numbers (e.g., identity, inverse, distributive, associative, commutative) and justify the process used. (CAHSEE, CST)	Glencoe Algebra Readiness Ch. 1-4, 1-5, 1-7, 1-8, 2-3, 2-4, 2-5, 3-6, 4-2, 4-3,			
	1.5 Represent quantitative relationships graphically and interpret the meaning of a specific part of a graph in the situation represented by the graph. (CAHSEE, CST)	Glencoe Algebra Readiness Ch. 7-3			
2.0 Students interpret and evaluate expressions involving integer powers and simple roots:	2.1 Interpret positive whole-number powers as repeated multiplication and negative whole-number powers as repeated division or multiplication by the multiplicative inverse. Simplify and evaluate expressions that include exponents. (CAHSEE, CST)	Glencoe Algebra Readiness Prerequisite 5, Ch. 1-3, 5-1, 5-2	p. 63	<b>KEY VOCABULARY:</b> Power Property of equality Radical Rate Ratio Rise Root Run Quadratic Simplify Slope Square root System of equations System of inequalities Volume	2 weeks
	2.2 Multiply and divide monomials; extend the process of taking powers and extracting roots to monomials when the latter results in a monomial with an integer exponent. (CAHSEE, CST)	Glencoe Algebra Readiness Ch. 5-1, 5-2			
3.0 Students graph and interpret linear and some nonlinear functions:	3.1 Graph functions of the form $y = nx^2$ and $y = nx^3$ and use in solving problems. (CAHSEE, CST)	Glencoe Algebra Readiness Mastering the CA Math Standards Wbkb pp 61-62	p. 63	<b>VISUALS &amp; DEMOS:</b> Algeblocks Algebra tiles Graph paper Number lines Overhead calculator Pattern blocks Polygon models Rulers Walk-on coordinate grid	1.5 weeks
	3.3* Graph linear functions, noting that the vertical change (change in y-value) per unit of horizontal change (change in x-value) is always the same and know that the ratio ("rise over run") is called the slope of a graph. (CAHSEE, CST)	Glencoe Algebra Readiness Ch. 7-5, 7-6			
	3.4* Plot the values of quantities whose ratios are always the same (e.g., cost to the number of an item, feet to inches, circumference to diameter of a circle). Fit a line to the plot and understand that the slope of the line equals the quantities. (CAHSEE, CST)	Glencoe Algebra Readiness Ch. 7-3			
4.0* Students solve simple linear equations and inequalities over the rational numbers:	4.1* Solve two-step linear equations and inequalities in one variable over the rational numbers, interpret the solution or solutions in the context from which they arose, and verify the reasonableness of the results. (CAHSEE, CST)	Glencoe Algebra Readiness Ch. 2-7	p. 63		3 weeks
	4.2* Solve multistep problems involving rate, average speed, distance, and time or a direct variation. (CAHSEE, CST)	Glencoe Algebra Readiness Ch. 6-3, 6-4, 6-5, 6-6			

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## Measurement and Geometry- Grade 7

California Content Standards		Adopted Textbook Correlation	Assessments <u>Grade 8 Assessment Portfolio Student Workbook</u>	Key Vocabulary and Recommended Aids	Time
1.0 Students choose appropriate units of measure and use ratios to convert within and between measurement systems to solve problems:	1.1 Compare weights, capacities, geometric measures, times, and temperatures within and between measurement systems (e.g., miles per hour and feet per second, cubic inches to cubic centimeters). (CAHSEE, CST)	Glencoe Algebra Readiness Mastering the CA Math Standards Wkbk pp 73-74	p. 87	<b>KEY VOCABULARY:</b> Area Capacity Celsius Coordinate graph Cubic units Dimensional analysis Estimate Fahrenheit Image Interior angle Parallelogram Perimeter Pythagorean Theorem Protractor Quadrilateral Rate Rectangle Reflection Rhombus Scale Skew lines Square Surface area Translation Trapezoid Weight Volume	1.5 weeks
	1.2 Construct and read drawings and models made to scale. (CAHSEE, CST)	Glencoe Algebra Readiness Mastering the CA Math Standards Wkbk pp 75-76			
	1.3* Use measures expressed as rates (e.g., speed, density) and measures expressed as products (e.g., person-days) to solve problems; check the units of the solutions; and use dimensional analysis to check the reasonableness of the answer. (CAHSEE, CST)	Glencoe Algebra Readiness Ch. 7-4			
2.0 Students compute the perimeter, area, and volume of common geometric objects and use the results to find measures of less common objects. They know how perimeter, area, and volume are affected by changes of scale:	2.1 Use formulas routinely for finding the perimeter and area of basic two-dimensional figures and the surface area and volume of basic three-dimensional figures, including rectangles, parallelograms, trapezoids, squares, triangles, circles, prisms, and cylinders. (CAHSEE, CST)	Glencoe Algebra Readiness Ch. 8-4, 8-5, 8-7, 8-8	p. 87	<b>VISUALS &amp; DEMOS:</b> 3-D models Color tiles Compasses Cubic-inch blocks Dot paper Geoboards Graph paper Paper circles Paper triangles Pattern blocks Polygon models Protractors Rulers String	2.5 weeks
	2.2 Estimate and compute the area of more complex or irregular two- and three-dimensional figures by breaking the figures down into more basic geometric objects. (CAHSEE, CST)	Glencoe Algebra Readiness Mastering the CA Math Standards Wkbk pp 81-82			
	2.3 Compute the length of the perimeter, the surface area of the faces, and the volume of a three-dimensional object built from rectangular solids. Understand that when the lengths of all dimensions are multiplied by a scale factor, the surface area is multiplied by the square of the scale factor and the volume is multiplied by the cube of the scale factor. (CAHSEE, CST)	Glencoe Algebra Readiness Mastering the CA Math Standards Wkbk pp 83-86			
	2.4 Relate the changes in measurement with a change of scale to the units used (e.g., square inches, cubic feet) and to conversions between units (1 square foot = 144 square inches or $[1 \text{ ft}^2] = [144 \text{ in}^2]$ , 1 cubic inch is approximately 16.38 cubic centimeters or $[1 \text{ in}^3] = [16.38 \text{ cm}^3]$ ). (CAHSEE, CST)	Glencoe Algebra Readiness Mastering the CA Math Standards Wkbk pp 87-88			

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3.0 Students know the Pythagorean theorem and deepen their understanding of plane and solid geometric shapes by constructing figures that meet given conditions and by identifying attributes of figures:	3.2 Understand and use coordinate graphs to plot simple figures, determine lengths and areas related to them, and determine their image under translations and reflections. (CAHSEE, CST)	Glencoe Algebra Readiness Mastering the CA Math Standards Wbk pp 89-90	p. 75		2 weeks
	3.3* Know and understand the Pythagorean theorem and its converse and use it to find the length of the missing side of a right triangle and the lengths of other line segments and, in some situations, empirically verify the Pythagorean theorem by direct measurement. (CAHSEE, CST)	Glencoe Algebra Readiness Ch. 7-7			

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## Statistics, Data Analysis, and Probability- Grade 6

California Content Standards		Adopted Textbook Correlation	Assessments <u>Grade 8 Assessment Portfolio Student Workbook</u>	Key Vocabulary and Recommended Aids	Time
1.0 Students compute and analyze statistical measurements for data sets:	1.1 Compute the range, mean, median, and mode of data sets. (CAHSEE, CST)	Glencoe Algebra Readiness Mastering the CA Math Standards Wkbk pp 95-96		<b>KEY VOCABULARY:</b> Biased Central tendency Claim Conclusion Dependent events Experimental probability Independent events Mean Median Mode Outcome Outlier Population Probability Random sample Range Sample Sampling error Survey Theoretical probability Tree diagram Validity  <b>VISUALS &amp; DEMOS:</b> Baseball cards Coins, dice spinners Graph paper Newspaper data Overhead calculator	2.5 weeks
2.0 Students use data samples of a population and describe the characteristics and limitations of the samples:	2.5* Identify claims based on statistical data and, in simple cases, evaluate the validity of the claims. (CAHSEE, CST)	Glencoe Algebra Readiness Mastering the CA Math Standards Wkbk pp 97-98			
3.0 Students determine theoretical and experimental probabilities and use these to make predictions about events:	3.1* Represent all possible outcomes for compound events in an organized way (e.g., tables, grids, tree diagrams) and express the theoretical probability of each outcome. (CAHSEE, CST)	Glencoe Algebra Readiness Mastering the CA Math Standards Wkbk pp 99-100			
	3.3* Represent probabilities as ratios, proportions, decimals between 0 and 1, and percentages between 0 and 100 and verify that the probabilities computed are reasonable; know that if P is the probability of an event, 1-P is the probability of an event not occurring. (CAHSEE, CST)	Glencoe Algebra Readiness Prerequisite 12, Mastering the CA Math Standards Wkbk pp 101-102			
	3.5* Understand the difference between independent and dependent events. (CAHSEE, CST)	Glencoe Algebra Readiness Mastering the CA Math Standards Wkbk pp 103-104			

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## Statistics, Data Analysis, and Probability- Grade 7

California Content Standards	Adopted Textbook Correlation	Assessments <u>Grade 8 Assessment Portfolio Student Workbook</u>	Key Vocabulary and Recommended Aids	Time
<p>1.0 Students collect, organize, and represent data sets that have one or more variables and identify relationships among variables within a data set by hand and through the use of an electronic spreadsheet software program:</p>	<p>1.1 Know various forms of display for data sets, including a stem-and-leaf plot or box-and-whisker plot; use the forms to display a single set of data or to compare two sets of data. (CAHSEE, CST)</p>	<p>Glencoe Algebra Readiness Mastering the CA Math Standards Wkbk pp 105-106</p>	<p><b>KEY VOCABULARY:</b> Box and whisker plot Data Lower quartile Maximum Median Minimum Negative correlation No correlation Outlier Positive correlation Scatterplot Stem and leaf plot Upper quartile</p> <p><b>VISUALS &amp; DEMOS:</b> Graph paper Newspaper data Overhead calculator</p>	2 weeks
	<p>1.2 Represent two numerical variables on a scatterplot and informally describe how the data points are distributed and any apparent relationship that exists between the two variables (e.g., between time spent on homework and grade level). (CAHSEE, CST)</p>	<p>Glencoe Algebra Readiness Ch. 7-3</p>		
	<p>1.3* Understand the meaning of, and be able to compute the minimum, the lower quartile, the median, the upper quartile, and the maximum of a data set.</p>	<p>Glencoe Algebra Readiness Mastering the CA Math Standards Wkbk pp 109-110</p>		

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## Mathematical Reasoning- Grade 7

California Content Standards		Adopted Textbook Correlation	Assessments Grade 8 Assessment Portfolio Student Workbook	Key Vocabulary and Recommended Aids	Time
1.0 Students make decisions about how to approach problems:	1.1 Analyze problems by identifying relationships, distinguishing relevant from irrelevant information, identifying missing information, sequencing and prioritizing information, and observing patterns. (CAHSEE)	Glencoe Algebra Readiness Mathematical Reasoning occurs throughout text	Mathematical Reasoning is embedded throughout	<b>KEY VOCABULARY:</b> Degree of accuracy Estimation Graph Irrelevant Mathematical conjecture Missing information Prioritizing Reasonable Relevant Sequencing	Mathematical Reasoning is embedded throughout
	1.2 Formulate and justify mathematical conjectures based on a general description of the mathematical question or problem posed. (CAHSEE)	Glencoe Algebra Readiness Mathematical Reasoning occurs throughout text			
2.0 Students use strategies, skills, and concepts in finding solutions:	2.1 Use estimation to verify the reasonableness of calculated results. (CAHSEE)	Glencoe Algebra Readiness Mathematical Reasoning occurs throughout text	Mathematical Reasoning is embedded throughout		
	2.3 Estimate unknown quantities graphically and solve for them by using logical reasoning and arithmetic and algebraic techniques. (CAHSEE)	Glencoe Algebra Readiness Mathematical Reasoning occurs throughout text			
	2.4 Make and test conjectures by using both inductive and deductive reasoning. (CAHSEE)	Glencoe Algebra Readiness Mathematical Reasoning occurs throughout text			
3.0 Students determine a solution is complete and move beyond a particular problem by generalizing to other situations:	3.1 Evaluate the reasonableness of the solution in the context of the original situation. (CAHSEE)	Glencoe Algebra Readiness Mathematical Reasoning occurs throughout text	Mathematical Reasoning is embedded throughout		
	3.3 Develop generalizations of the results obtained and the strategies used and apply them to new problem situations. (CAHSEE)	Glencoe Algebra Readiness Mathematical Reasoning occurs throughout text			

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## **APPLICATION OF COURSE CONTENT**

### **Career Connection:**

#### **Related Major Skills & Characteristics –**

Problem Solving , Organizational Skills, Numerical Computation, Ability to Analyze & Interpret Data, Critical Thinking, Computer Literacy, Logical Thinking, Team Skills Efficient, Systemizing Skills, Advanced Quantitative Skills, Testing Skills

#### **Related Career Titles –**

Students who major in mathematics will be prepared for any of the following careers.

\*Accountant \*Contract Administrator \*Information Scientist \*Actuary \*Cost Estimator/Analyst \*Inventory Control Specialist \*Aerospace Engineer \*Cryptographer/Cryptologist \*Investment Banker \*Air Traffic Controller \*Data Control Administrator \*ISO 2000 Specialist \*Applications Programmer \*Data Processing Manager \*Market Research Analyst \*Applied Science Technologist \*Database Manager \*Mathematician \*Artificial Intelligence Programmer \*Demographer \*Media Buyer \*Astronomer \*Econometrician \*Meteorologist \*Banking/Credit/ Investment Mgr \*Economist \*Mortgage Researcher \*Biometrician/ Biostatistician \*EDP Auditor \*Network Programmer \*Commodity Manager \*Employee Relations Specialist \*Numerical Analyst \*Compensation/Benefits Administrator \*Engineer \*Operations Research Analyst \*Computer Consultant \*Engineering Lab Technician \*Physicist \*Computer Engineer \*Environmental Technologist \*Pollution Meteorologist \*Computer Facilities Manager \*Estate Planner \*Production Manager \*Computer Installation \*External Auditor \*Production Support Specialist \*Computer Marketing/Sales Rep \*Financial Auditor \*Psychometrician \*Computer Programmer \*Financial Consultant \*Public Health Statistician \*Computer Scientist \*Financial Manager \*Purchasing/Contract Agent \*Computer-Aided Design Tech. \*Hydro Geologist \*Quality Assurance Analyst \*Consumer Loan/Credit Officer \*Hydrologist \*Rate Analyst \*Cartographer \*Software Engineer \*Teacher: Science/Math/Computers \*Research Analyst \*Software Support Specialist \*Technical Support Rep. \*Risk & Insurance Specialist \*Statistician \*Technical Writer \*Risk Analyst \*Systems Analyst \*Transportation Planner \*Robotics Programmer \*Systems Engineer \*Treasury Management Specialist \*Satellite Communications Specialist \*Systems Programmer \*Underwriter \*Software Development Specialist \*Urban Planner \*Value Engineer \*Weight Analyst

#### **Service Learning –**

Students who are Advanced Proficient on the Content Standards Tests or those who are earning an A in the course, can participate in after school tutoring programs to assist other students in learning mathematics. All hours can be credited towards the Service Learning requirement.

**METHODS:** A variety of instructional strategies will be utilized to accommodate all learning styles including, but not limited to:

**Lesson Design & Delivery:** Teachers will incorporate these components of lesson design during direct instruction and inquiry activities. The order of components is flexible, depending on the teacher’s vision for the individual lesson. For instance, the objective and purpose, while present in the teacher’s lesson plan, are not made known to the students at the beginning of an inquiry lesson.

<b>Essential Elements of Effective Instruction Model for Lesson Design Using Task Analysis</b>	Anticipatory Set Objective Standard Reference Purpose Input Modeling Check for Understanding Guided Practice Closure Independent Practice
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Some components may occur once in a lesson, but others will recur many times. Checking for understanding occurs continually; input, modeling, guided practice and closure may occur several times. There may even be more than one anticipatory set when more than one content piece is introduced.

**Active Participation:** Teachers will incorporate the principles of active participation and specific strategies to ensure consistent, simultaneous involvement of the minds of all learners in the classroom. Teachers should include both covert and overt active participation strategies, incorporating cooperative learning structures and brain research. Some of the possible active participation strategies include:

COVERT	OVERT (Oral)	OVERT (Written)	OVERT (Gestures)
• Recall	• Pair/Share	• Restate in Journals / Notes	• Hand Signals
• Imagine	• Idea Wave	• Response Boards	• Model with Manipulatives
• Observe	• Choral Response	• Graphic Organizers	• Stand up/ Sit down
• Consider	• Give One, Get One	• Folded Paper	• Point to Examples
	• “Foggiest” point	• Ticket Out of Class	
	• Socratic Seminar		
	• Cooperative Discussion Groups (i.e. Talking Chips, Gambit Chips)		

**Literacy and Differentiation Strategies**

Learning styles and learning challenges of your students may be addressed by implementing combinations of the following:

<p><b><u>Reading Strategies in Mathematics</u></b></p> <ul style="list-style-type: none"> <li>▪ Learning Logs</li> <li>▪ Pre-teaching</li> <li>▪ Vocabulary</li> <li>▪ Pre-reading</li> <li>▪ Text Structures</li> <li>▪ Trail Markers</li> <li>▪ Reciprocal Teaching</li> <li>▪ Functional Text</li> <li>▪ Anticipation Guide</li> </ul>	<p><b><u>SDAIE Strategies for English Learners</u></b></p> <ul style="list-style-type: none"> <li>▪ Tapping/Building Prior Knowledge (Graphic Organizers, Schema)</li> <li>▪ Grouping Strategies</li> <li>▪ Multiple Intelligences</li> <li>▪ Adapt the Text</li> <li>▪ Interactive Learning (Manipulatives, Visuals)</li> <li>▪ Acquisition Levels</li> <li>▪ Language Sensitivity</li> <li>▪ Lower the Affective Filter (including Processing Time)</li> <li>▪ Home/School Connection (including Cultural Aspects)</li> </ul>	<p><i>Differentiation for Advanced Learners</i></p> <ul style="list-style-type: none"> <li>▪ Curriculum Compacting</li> <li>▪ Tiered Assignments</li> <li>▪ Flexible Grouping</li> <li>▪ Acceleration</li> <li>▪ Depth and Complexity</li> <li>▪ Independent Study</li> </ul>
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**MATERIALS USED IN TEACHING THE COURSE:**

In addition to the basic text (**mandatory information – Title, Author, Copyright Date and Publisher**), a variety of instructional tools will be used to meet the needs of all students

**Basic Text:** California Algebra Readiness: Concepts, Skills, and Problem Solving; Price; 2008; Glencoe McGraw-Hill

**Supplemental Materials**

- Assessment Portfolio Student Workbooks
- Algebra Power Video for Integers
- Quick Review Math Handbook
- Quick Review Math Handbook – Books 1 – 3 – Spanish Student Editions
- Skills Practice Workbook
- Skills, Concepts, and Problem Solving Workbook
- Problem Solving Workbook
- Mastering the CA Math Standards Workbook
- Math Skills Maintenance Workbook
- Interactive Study Notebook with Foldables
- Algebra Readiness Activities Workbook

**Related Career Resources**

There are many web sites that will help with career selection such as Eguidance.com, BRIDGES.com, and icouldbe.org. The software package COIN JR also has career information. Video tapes such as the Futures with Jamie Escalante - School to Career shows how math is used in various careers (FASE productions 800-404-FASE). Other videos are Career Futures. Call the Career/Tech Ed Office (562-989-7872 x 291) for more information on careers.

**EVALUATION:**

Assessments include informal (daily math warm-ups, journals, notes, quizzes), authentic (open-ended questions performance tasks) and formal assessments (chapter tests, District Math Facts Tests, standardized tests (STAR) ). A variety of assessment scoring formats should include multiple choice, short answer, rubrics and scoring guides.

Source	Diagnosis	Monitor	Evaluate
District Developed Assessments	Practice End of Course Exam	Integer Tests Practice Exams for Quarter 1, Quarter 2, and Quarter 3 Standards Based Assessments	Quarter 1, Quarter 2, and Quarter 3 Exams End-of-Course Exam
California Algebra Readiness: Concepts, Skills, and Problem Solving (Grade 8 Pre-Algebra)	Prerequisite Skills Pretest (text) Diagnostic Pre-Test (Chapter Resource Masters) Readiness Quiz (online) Chapter Preview (text) Anticipation Guide (Chapter Resource Masters)	Standards Practice (text) Spiral Review (text) Progress Checks (text) Chapter Study Guide (text)	Chapter Tests (Chapter Resource Masters) • Formal Assessment • Alternative Assessment Test Generator (CD-ROM) Chapter Test (text) Chapter Assessment (text) Cumulative Standardized Test Practice (Chapter Resource Masters)

## Scoring Guide for Written Response/Projects

Score	Description
4	The student response thoroughly accomplishes the task. <ul style="list-style-type: none"> <li>Shows thorough understanding and use of the central mathematical ideas(s)</li> <li>Includes appropriate and accurate mathematical computations</li> <li>Presents mathematical knowledge and ideas clearly and skillfully, using combinations of mathematical symbols and/or visual means as supporting evidence</li> </ul>
3	The student response substantially accomplishes the task. <ul style="list-style-type: none"> <li>Shows an essential grasp of the central mathematical idea(s)</li> <li>Includes appropriate and generally correct mathematical computations</li> <li>Presents mathematical knowledge and ideas clearly with supporting evidence</li> </ul>
2	The student response partially accomplishes the task. <ul style="list-style-type: none"> <li>Shows a limited grasp of the central mathematical ideas(s)</li> <li>May include incomplete and/or misdirected mathematical computations</li> <li>Presents mathematical knowledge and ideas in an unclear manner or without supporting evidence</li> </ul>
1	The student response makes little or no progress toward accomplishing the task. <ul style="list-style-type: none"> <li>Shows little or no grasp of the central mathematical idea(s)</li> <li>Includes mathematical computations that are incorrect or inappropriate</li> <li>Presents mathematical knowledge and ideas in a barely (if at all) comprehensible manner</li> </ul>

**GRADING POLICY:** A common grading policy ensures consistency between schools and classrooms across the district.

### **Suggested Percent of Grade**

Assessment: 75%

- Chapter Tests
- Quizzes
- Standards Based Assessments
- End-of-Course Exam 5% (Last Quarter)

Homework: 10%

Cornell Notes: 5%

Other (Classwork/Projects): 10%

### **Standard Grading Scale**

**A** 90% - 100%

**B** 80% - 89%

**C** 70% - 79%

**D** 60% - 69%

**F** Below 60%

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School/Office: Math Office

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