

## PLANNED COURSE

**SUBJECT AREA:** Mathematics **GRADE/COURSE:** Algebra 1  
**Standard And Strand** 2.1 Numbers, Number Systems and Number Relationships

**Resources:** Algebra I, Prentiss Hall 2001; Beginning Algebra 6<sup>th</sup> Edition, Brooks/Cole 2002; Measuring Up to the Pennsylvania Academic Standards, People’s Publishing Group 2001; Larson’s PreAlgebra, Meridian (software)

OBJECTIVES	PERFORMANCE INDICATORS	ASSESSMENTS (Variety as per Section 4.52, Chapter 4)
<p>B. Demonstrate knowledge of numerical and algebraic expressions using integers, fractions, decimals, percents, exponents, scientific notation and square roots in equivalent forms.</p> <ul style="list-style-type: none"> <li>• Use a calculator to justify whether a result in scientific notation is reasonable.</li> </ul> <p>C. Distinguish between and compare rational and irrational numbers.</p> <p>D. Solve problems involving distance, rate, time, and similar triangles.</p>	<p>1. Represent and simplify numerical and algebraic expressions using integers, fractions, decimals, percents, exponents, scientific notation and square roots in equivalent forms.</p> <ul style="list-style-type: none"> <li>• Change scientific notation inot standard form to verify reasonableness of an answer.</li> </ul> <p>1. Classify numbers as rational or irrational and order them.</p> <p>1. Use ratio, proportion and formulas to set up and compute problems of distance, rate, time, and similar triangles.</p>	<p>Observation</p> <p>Cooperative learning groups</p> <p>Boardwork/Seatwork/Homework</p> <p>Projects</p> <p>Oral presentations</p> <p>Math journal</p> <p>Portfolio</p> <p>Quizzes</p> <p>Teacher-designed tests</p> <p>Standardized tests</p>

OBJECTIVES	PERFORMANCE INDICATORS	ASSESSMENTS (Variety as per Section 4.52, Chapter 4)
<p>E. Represent and simplify numerical and algebraic expressions using integers, fractions, decimals, percents, exponents, scientific notation and square roots in equivalent forms.</p> <p>F. Represent integers, their applications, inequalities and absolute value.</p> <ul style="list-style-type: none"> <li>• Use the number line to represent integers, their applications, inequalities and absolute value.</li> </ul> <p>G. Describe and use inverse operations to solve linear equations, inequalities, and absolute value.</p>	<p><u>Adaptation:</u></p> <ul style="list-style-type: none"> <li>Limit fractions to those commonly used.</li> <li>Keep exponents small.</li> <li>Provide formulas on reference sheets.</li> <li>Provide number lines.</li> <li>Provide a chart or resource sheet showing scientific notation/standard form.</li> </ul> <p><u>Enrichment:</u></p> <ul style="list-style-type: none"> <li>Include more word problems and problems of greater difficulty.</li> <li>Increase the depth and number of topics covered.</li> <li>Include more word problems and problems of greater difficulty.</li> <li>Increase the depth and number of topics covered.</li> </ul>	<p><u>Adaptation:</u></p> <ul style="list-style-type: none"> <li>Greater use of manipulatives.</li> <li>Limit the number of problems assigned for seatwork and homework.</li> <li>Choose projects according to student's strengths.</li> <li>Type or dictate math journal.</li> <li>Limit the number and degree of difficulty of items on tests and quizzes and portfolio.</li> <li>Give extended time during assessments.</li> <li>Read any tests or materials as needed.</li> <li>Greater use of manipulatives.</li> <li>Limit the number of problems assigned for seatwork and homework.</li> <li>Choose projects according to student's strengths.</li> <li>Type or dictate math journal.</li> <li>Limit the number and degree of difficulty of items on tests and quizzes and portfolio.</li> <li>Give extended time during assessments.</li> <li>Read any tests or materials as needed.</li> </ul>

<b>OBJECTIVES</b>	<b>PERFORMANCE INDICATORS</b>	<b>ASSESSMENTS (Variety as per Section 4.52, Chapter 4)</b>
		<u>Enrichment:</u> Include an independent research project or experiment. Increase abstraction and limit time. Include an independent research project or experiment. Increase abstraction and limit time.

**SUBJECT AREA:** Mathematics  
**Standard And Strand** 2.2 Computation and Estimation

**GRADE/COURSE:** Algebra I

OBJECTIVES	PERFORMANCE INDICATORS	ASSESSMENTS (Variety as per Section 4.52, Chapter 4)
<p>B. Complete calculations with rational numbers.</p> <ul style="list-style-type: none"> <li>• Estimate and solve real life problems such as tips and discounts.</li> </ul> <p>C. Estimate the value of irrational numbers.</p> <ul style="list-style-type: none"> <li>• Perform calculations with irrational numbers and simplify irrational expressions involving square roots.</li> </ul> <p>D. Check the reasonableness of an answer and recognize and correct computational errors.</p> <p>E. Determine the appropriateness of overestimating or underestimating in computation.</p>	<p>1. Apply the order of operations to rational numbers including integers, decimal fractions, percents, and proper and improper fractions.</p> <p>1. Use mental math, charts and calculators to approximate the value of irrational numbers.</p> <p>2. Add, subtract, multiply and divide problems with irrational numbers.</p> <p>1. Verify the reasonableness of an answer and check computations in both abstract and practical problems.</p> <p>1. Name circumstances in which overestimating or underestimating can be used and when an exact or an approximate answer is appropriate.</p>	<p>Observation</p> <p>Cooperative learning groups</p> <p>Boardwork/Seatwork/Homework</p> <p>Projects</p> <p>Oral presentations</p> <p>Math journal</p> <p>Portfolio</p> <p>Quizzes</p> <p>Teacher-designed tests</p> <p>Standardized tests</p>

**SUBJECT AREA:** Mathematics  
**Standard And Strand** 2.3 Measurement and Estimation

**GRADE/COURSE:** Algebra I

<b>OBJECTIVES</b>	<b>PERFORMANCE INDICATORS</b>	<b>ASSESSMENTS (Variety as per Section 4.52, Chapter 4)</b>
<p>A. Develop formulas and procedures for determining measurements.</p> <p>B. Solve rate problems.</p> <p>D. Estimate, use, and explain units of measurement.</p> <p>E. Describe how a change in linear dimension of an object affects its perimeter, area, and volume.</p> <p>F. Interpret, create and use maps, drawings and scale models. <ul style="list-style-type: none"> <li>• Measure using appropriate tools.</li> </ul> </p>	<p>1. Use both metric and customary systems to calculate area, volume, distance, etc.</p> <p>1. Find distance, interest and other rate problems using appropriate formulas.</p> <p>1. Apply the correct unit of measurement to distance, rate, perimeter, area, volume, capacity, weight, mass, and angles.</p> <p>1. Describe the relationship between changes in linear dimensions and perimeter, area and volume using units, square units and cubic units of measure.</p> <p>1. Use scale measurements when working with maps, drawings, and scale models. <ul style="list-style-type: none"> <li>• Use a ruler, protractor and other tools of measurement with accuracy.</li> </ul> </p>	<p>Observation</p> <p>Cooperative learning groups</p> <p>Boardwork/Seatwork/Homework</p> <p>Projects</p> <p>Oral presentations</p> <p>Math journal</p> <p>Portfolio</p> <p>Quizzes</p> <p>Teacher-designed tests</p> <p>Standardized tests</p>

**SUBJECT AREA:** Mathematics  
**Standard And Strand** 2.4 Mathematical Reasoning and Connections

**GRADE/COURSE:** Algebra I

<b>OBJECTIVES</b>	<b>PERFORMANCE INDICATORS</b>	<b>ASSESSMENTS (Variety as per Section 4.52, Chapter 4)</b>
<p>A. Make and test conjectures.</p> <p>C. Construct simple valid arguments.</p> <p>D. Construct algorithms for multi-step and real world problems.</p> <p>E. Distinguish between deductive and inductive reasoning.</p>	<p>1. Use sound reasoning and counter examples.</p> <p>1. Create if...then statements.</p> <p>1. Explain and use procedures for computing and estimating with rational numbers.</p> <p>1. Use specific examples to generalize and apply the rule to concrete situations.</p>	<p>Observation</p> <p>Cooperative learning groups</p> <p>Boardwork/Seatwork/Homework</p> <p>Projects</p> <p>Oral presentations</p> <p>Math journal</p> <p>Portfolio</p> <p>Quizzes</p> <p>Teacher-designed tests</p> <p>Standardized tests</p>

OBJECTIVES	PERFORMANCE INDICATORS	ASSESSMENTS (Variety as per Section 4.52, Chapter 4)
	<p><u>Adaptation:</u>            Provide concrete strategies with logical steps to solve problems. Ex. Ask, How, Help, Compute, Check.            Provide word banks for math terminology.            Work with manipulatives to develop equations. (ex. Colored blocks to correspond with variables; yellow-y, blue-b,etc.)</p> <p><u>Enrichment:</u>            Include more word problems and problems of greater difficulty.            Increase the depth and number of topics covered.            Create problems that would generate a given answer.</p>	<p><u>Adaptation:</u>            Greater use of manipulatives.            Limit the number of problems assigned for seatwork and homework.            Choose projects according to student's strengths.            Type or dictate math journal.            Limit the number and degree of difficulty of items on tests and quizzes and portfolio.            Give extended time during assessments.            Read any tests or materials as needed.</p> <p><u>Enrichment:</u>            Include an independent research project or experiment.            Increase abstraction and limit time.</p>

**SUBJECT AREA:** Mathematics  
**Standard And Strand** 2.6 Statistics and Data Analysis

**GRADE/COURSE:** Algebra I

<b>OBJECTIVES</b>	<b>PERFORMANCE INDICATORS</b>	<b>ASSESSMENTS (Variety as per Section 4.52, Chapter 4)</b>
<p>A. Define, calculate and apply data distributions.</p> <p>B. The learner will explain the validity and reliability of sampling procedures and recognize the possibility for bias.</p> <p>D. The learner will use random sampling procedures.</p> <p>E. The learner will organize, display, and analyze data.</p>	<p>1. Use mean, median, mode, quartiles, range and standard deviation.</p> <p>1. Design, describe and carry out a random sampling.</p> <p>1. Explain effects on reliability of sampling procedures and of missing or incorrect information.</p> <p>1. Construct a “stem and leaf”, “box and whisker” and “scatter” plot and use scientific calculators and other appropriate technology.</p>	<p>Observation</p> <p>Cooperative learning groups</p> <p>Boardwork/Seatwork/Homework</p> <p>Projects</p> <p>Oral presentations</p> <p>Math journal</p> <p>Portfolio</p> <p>Quizzes</p> <p>Teacher-designed tests</p> <p>Standardized tests</p>

**SUBJECT AREA:** Mathematics  
**Standard And Strand** 2.7 Probability and Predictions

**GRADE/COURSE:** Algebra I

<b>OBJECTIVES</b>	<b>PERFORMANCE INDICATORS</b>	<b>ASSESSMENTS (Variety as per Section 4.52, Chapter 4)</b>
<p>A. Determine the number of combinations and permutations for an event.</p> <p>B. Define, calculate and apply probability and odds of an event.</p> <p>C. Analyze predictions and make valid inferences.</p> <p>D. Analyze the probability of events.</p>	<p>1. Apply strategies such as tree diagrams, factorials, and algorithms.</p> <p>1. Use simulations and appropriate technology.</p> <p>1. Present, compare and contrast results from observations, experiments and mathematical models.</p> <p>1. Define and determine dependence or independence, and the probability of compound events.</p>	<p>Observation</p> <p>Cooperative learning groups</p> <p>Boardwork/Seatwork/Homework</p> <p>Projects</p> <p>Oral presentations</p> <p>Math journal</p> <p>Portfolio</p> <p>Quizzes</p> <p>Teacher-designed tests</p> <p>Standardized tests</p>

**SUBJECT AREA:** Mathematics  
**Standard And Strand** 2.8 Algebra and Functions

**GRADE/COURSE:** Algebra I

<b>OBJECTIVES</b>	<b>PERFORMANCE INDICATORS</b>	<b>ASSESSMENTS (Variety as per Section 4.52, Chapter 4)</b>
<p>A. Identify, describe, and analyze algebraic patterns.</p> <ul style="list-style-type: none"> <li>• Discover, describe, and generalize patterns.</li> <li>• Represent algebraic concepts.</li> <li>• Simplify calculations and rewrite and evaluate expressions.</li> <li>• Combine like terms using properties.</li> </ul>	<ol style="list-style-type: none"> <li>1. Apply algebraic patterns to basic number theory and number relations.</li> <li>2. Analyze linear, exponential, and simple quadratic relationships.</li> <li>3. Model concepts such as integers, like terms, and equations using manipulatives.</li> <li>4. Compute answers using order of operations.</li> <li>5. Select appropriate properties such as commutative, associative and distributive.</li> </ol>	<p>Observation</p> <p>Cooperative learning groups</p> <p>Boardwork/Seatwork/Homework</p> <p>Projects</p> <p>Oral presentations</p> <p>Math journal</p> <p>Portfolio</p> <p>Quizzes</p> <p>Teacher-designed tests</p> <p>Standardized tests</p>

**SUBJECT AREA:** Mathematics  
**Standard And Strand** 2.9 Geometry

**GRADE/COURSE:** Algebra I

OBJECTIVES	PERFORMANCE INDICATORS	ASSESSMENTS (Variety as per Section 4.52, Chapter 4)
<p>C. Classify polygons as regular or irregular, similar or congruent, and identify corresponding parts of congruent figures.</p> <p>D. Identify properties of various geometric figures.</p> <p>G. Determine the approximate value of pi and recognize it as an irrational number.</p> <p>H. Transform figures through reflection, rotation and translation.</p>	<p>1. Use drawings to represent types of polygons.</p> <p>1. Draw and list the properties of lines, angles, polygons, and solid figures.</p> <p>1. Investigate using experimentation involving the ratio of circumference to diameter.</p> <p>1. Transform figures using basic operations and illustrate the results on a coordinate plane.</p>	<p>Observation</p> <p>Cooperative learning groups</p> <p>Homework/Seatwork/Boardwork</p> <p>Projects</p> <p>Oral presentations</p> <p>Math journals</p> <p>Portfolio</p> <p>Quizzes</p> <p>Teacher-designed tests</p> <p>Standardized tests</p>

**SUBJECT AREA:** Mathematics  
**Standard And Strand** 2.10 Trigonometry

**GRADE/COURSE:** Algebra I

<b>OBJECTIVES</b>	<b>PERFORMANCE INDICATORS</b>	<b>ASSESSMENTS (Variety as per Section 4.52, Chapter 4)</b>
A. The learner will calculate the measure of sides in a right triangle.		Observation  Cooperative learning groups  Boardwork/Seatwork/Homework  Projects  Oral presentations  Math journal  Portfolio  Quizzes  Teacher-designed tests  Standardized tests

**SUBJECT AREA:** Mathematics  
**Standard And Strand** 2.11 Calculus

**GRADE/COURSE:** Algebra I

<b>OBJECTIVES</b>	<b>PERFORMANCE INDICATORS</b>	<b>ASSESSMENTS (Variety as per Section 4.52, Chapter 4)</b>
<p>A. The learner will indicate whether a given relation is also a function given a set of ordered pairs.</p> <p>C. The learner will continue a pattern of numbers or objects that could be extended indefinitely.</p> <p>D. The learner will identify situations which involve rate of change.</p>	<p>1. Construct T-tables and/or graph and observe results.</p> <p>2. Investigate the number relationships which create a pattern.</p> <p>3. Apply the concepts of unit rates, ratios, and slope.</p>	<p>Observation</p> <p>Cooperative learning groups</p> <p>Boardwork/Seatwork/Homework</p> <p>Projects</p> <p>Oral presentations</p> <p>Math journal</p> <p>Portfolio</p> <p>Quizzes</p> <p>Teacher-designed tests</p> <p>Standardized tests</p>