

COMMUNITY UNIT SCHOOL DISTRICT 200

Direct Pre-Algebra High School Regular Level – Two Semesters

- 1. Subject Expectation (State Goal 6)** **The student will demonstrate and apply a knowledge and sense of numbers, including numeration and operations (addition, subtraction, multiplication, division), patterns, ratios and proportions.**

Essential Learning 1 (Learning Standard A)	Demonstrate knowledge and use of numbers and their representations in a broad range of theoretical and practical settings
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- Critical Content
- 6.A.3 a. represent fractions, decimals, percentages, exponents and scientific notation in equivalent forms
- practice calculator functions relative to percentages, fractions, and decimals
- 6.A.4 b. identify and apply the associative, commutative, distributive and identity properties of real numbers, including special numbers such as pi and square roots
- practice functional applications of pi and square roots
 - apply algebraic fundamentals to practical situations

Essential Learning 2 (Learning Standard B)	Investigate, represent and solve problems using number facts, operations (addition, subtraction, multiplication, and division) and their properties, algorithms and relationships
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- Critical Content
- 6.B.3a a. solve practical computation problems involving whole numbers, integers and rational numbers
- practice functional applications of whole numbers, integers, integers and rational numbers
- 6.B.3b b. apply primes, factors, divisors, multiples, common factors and common multiples in solving problems
- practice problems involving reducing radicals or factoring
- 6.B.4 c. select and use appropriate arithmetic operations in practical situations
- use arithmetic skills to calculate measures of angles, segment lengths, distance, and midpoints

Essential Learning 3 (Learning Standard C)	Compute and estimate using mental mathematics, paper and pencil methods, calculators and computers
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- Critical Content
- 6.C.3a a. select computational procedures and solve problems with whole numbers, fractions, decimals, percents and proportions
- practice calculator functions for computational procedures

- 6.C.3b b. show evidence that computational results using whole numbers, fractions, decimals, percents and proportions are correct and/or that estimates are reasonable
- demonstrate ability to check answer
- 6.C.4 c. determine whether exact values or approximations are appropriate
- practice problems involving measurement or currency

Essential Learning 4 (Learning Standard D)	Solve problems using comparison of quantities, ratios, proportions and percents
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Critical Content 6.D.4 a. solve problems using ratios, proportions and percents

**2. Subject Expectation
(State Goal 7)** **The student will estimate, make, and use measurements of objects, quantities and relationships and determine acceptable levels of accuracy.**

Essential Learning 1 (Learning Standard A)	Measure and compare quantities using appropriate units, instruments and methods
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- Critical Content 7.A.2b a. solve addition, subtraction, multiplication and division problems
- apply algebraic fundamentals to practical situations
- 7.A.3b a. apply the concepts and attributes of length, perimeter, area, volume, time, temperature, and angle measures in practical situations
- practice functional applications of perimeter, area, time, and temperature
- 7.A.4a c. apply units and scales to describe and compare numerical data and physical objects
- practice solving problems using formulas
- 7.A.4b d. apply formulas in a wide variety of theoretical and practical real-world measurement applications, involving perimeter, area, volume, angle, time, temperature, speed, distance, and monetary values
- practice functional applications of perimeter, area, time, and temperature

Essential Learning 2 (Learning Standard B)	Estimate measurements and determine acceptable levels of accuracy
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- Critical Content 7.B.3 a. select and apply instruments including rulers and protractors and units of measure to the degree of accuracy required
- estimate measurements of angles and segments
 - use appropriate instruments to determine accurate measurements
- 7.B.5 b. estimate perimeter and area
- determine if an answer is valid for a real-life application
 - use mental math to estimate quantities

Essential Learning 3 (Learning Standard C)	Select and use appropriate technology, instruments and formulas to solve problems, interpret results and communicate findings
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| Critical Content | 7.C.3a | a. | construct a simple scale drawing for a given situation |
| | | | <ul style="list-style-type: none"> practice creating a diagram from a worded problem |
| | 7.C.3b | b. | use concrete and graphic models and appropriate formulas to find perimeters, areas, surface areas and volumes of two- and three-dimensional regions |
| | | | <ul style="list-style-type: none"> practice selecting appropriate formulas to solve for a given word problem |
| | 7.C.4a | a. | make indirect measurements, including heights and distances, using proportions (e.g., finding the height of a tower by its shadow) |
| | | | <ul style="list-style-type: none"> set up and solve application problems using proportions |

3. Subject Expectation (State Goal 8) **The student will use algebraic and analytical methods to identify and describe patterns and relationships in data, solve problems and predict results.**

Essential Learning 1 (Learning Standard A)	Describe numerical relationships using variables and patterns
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| Critical Content | 8.A.2b | a. | construct and solve number sentences using a variable to represent an unknown quantity |
| | | | <ul style="list-style-type: none"> practice creating and solving linear equations |
| | 8.A.3a | b. | apply the basic properties of commutative, associative, distributive, transitive, inverse, identify, zero, equality and order of operations to solve problems |
| | | | <ul style="list-style-type: none"> recognize and use the distributive, associative and commutative properties identify like terms and their leading coefficients simplify expressions by combining like terms including adding and subtracting two or more polynomials simplify expressions that have grouping symbols apply order of operations translate written expressions that involve multiple operations into algebraic expressions multiply polynomials |
| | 8.A.3b | c. | solve problems using linear expressions, equations and inequalities |
| | | | <ul style="list-style-type: none"> solve one-step equations using the four basic operations solve and graph one-step inequalities solve multiple step equations including variables on both sides |
| | 8.A.4a | d. | use algebraic methods to convert repeating decimals to fractions |
| | | | <ul style="list-style-type: none"> convert repeating decimals to fractions |

- 8.A.4b e. represent mathematical patterns and describe their properties using variables and mathematical symbols
- practice problems involving compound interest

Essential Learning 2 (Learning Standard B)	Interpret and describe numerical relationships using tables, graphs and symbols
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| Critical Content | 8.B.3 a. use graphing technology and algebraic methods to analyze and predict linear relationships and make generalizations from linear patterns |
| | <ul style="list-style-type: none"> • graph and write equations for horizontal and vertical lines • graph linear functions using a variety of strategies |
| | 8.B.4a a. represent algebraic concepts with physical materials, words, diagrams, tables, graphs, equations, and inequalities and use appropriate technology |
| | <ul style="list-style-type: none"> • create algebraic equations or expressions to solve real world applications |

Essential Learning 3 (Learning Standard D)	Use algebraic concepts and procedures to represent and solve problems
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| Critical Content | 8.D.3c a. apply properties of powers, perfect squares and square roots |
| | <ul style="list-style-type: none"> • apply laws of exponents • evaluate perfect squares and square roots • solve quadratic equations using inverse operations |

4. Subject Expectation (State Goal 9) **The student will use geometric methods to analyze, categorize, and draw conclusions about points, lines, planes, and space.**

Essential Learning 1 (Learning Standard B)	Identify, describe, classify and compare relationships using points, lines, planes and solids
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| Critical Content | 9.B.3 a. identify, describe, classify and compare two- and three-dimensional geometric figures and models according to their properties |
| | <ul style="list-style-type: none"> • classify and name triangles • identify different types of quadrilaterals • name types of polygons • identify parts of a right triangle • classify, name and measure angles |

5. Subject Expectation (State Goal 10) **The student will collect, organize and analyze data using statistical methods; predict results; and interpret uncertainty using concepts of probability.**

Essential Learning 1 (Learning Standard A)	Organize, describe, and make predictions from existing data
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- Critical Content 10.A.2b a. using a data set, determine mean, median, mode and range, with and without the use of technology
- 10.A.2c b. make predictions and decisions based on data and communicate their reasoning
- determine the best measure of central tendency from mean, median, or mode
- 10.A.3a a. construct, read and interpret tables, graphs (including circle graphs) and charts to organize and represent data
- interpret pictographs and time lines
 - use bar graphs, line graphs and histograms to represent data
 - use scatter plots to recognize patterns in data

Essential Learning 2 (Learning Standard C)	Determine, describe and apply the probabilities of events
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- Critical Content 10.C.3a a. analyze problem situations (e.g., board games grading scales) and make predictions about results
- test the reasonableness of an argument based on data and communicate the findings
 - determine appropriate graph for a given set of data