Grade Seven
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Correlations with West Virginia
Instructional Math Goals and Objectives

The seventh grade year is an introduction to high school such as algebra, geometry, probability, and statistics. Instruction focuses on preparing the student for Algebra I in the 8th grade. With less emphasis on paper/pencil computation, calculators are emphasized in all facets of the mathematics daily work as well as test situations. Students should, by this time, have a mastery of general mathematics topics; however, review of all basic mathematics skills occurs in a relevant context. Problem solving is embedded in the curriculum utilizing a variety of new concepts, while cooperative learning promotes communication skills. Students are routinely permitted to use available technology.

Number Theory and Number Sense

7.1$_{6, 8}$ compare and order integers, decimals and fractions using symbols (<, >, =) manipulative, or graphing on a number line **Appetizers, Objective 1 A (Number Concepts)**

7.2$_{8}$ find powers, squares, and square roots using manipulatives, models, calculators, tables, and mental math **Appetizers, Objective 1 D (Number Concepts)**

7.3 determine the effect of absolute value on a number or expression

7.4$_{8}$ convert between fractions, mixed numbers, decimals, whole numbers, and percents mentally, on paper, and with a calculator **Appetizers, Objective 1 C (Number Concepts)**

7.5 recognize and write rational numbers in the form a/b **Appetizers Objective 1 A (Number Concepts)**

7.6$_{6, 8}$ identify pictorial representations of fractions and decimals **Appetizers, Objective 1 C (Number Concepts)**

7.7$_{5, 6, 8}$ identify the place value of a digit in a decimal **Appetizers, Objective 1 B (Number Concepts)**

7.8$_{8}$ distinguish between prime and composite numbers **Appetizers, Objectives 1 D, 1 E (Number Concepts)**

Computation and Estimation

7.9 add, subtract, multiply, and divide integers using mental math, paper/pencil, and calculators **Appetizers, Objectives 6, (Addition) 7 (Subtraction) 8 (Multiplication) 9 (Division) 11 (Problem Solving) 13 (Reasonableness) Applications, Final Test, Reasonableness Problems**

7.10 apply the commutative property of addition and multiplication, associative property of addition and multiplication, distributive property, identity property of addition and multiplication, inverse property of addition, and multiplicative property of zero to perform mental math operations with integers and whole numbers and to simplify expressions **Appetizers, Objectives 1 A, (Number Concepts) 2 A (Mathematical Relations)**

7.11$_{8}$ select and use an appropriate process for estimating and computing fractions, decimals, percents, and whole numbers using mental math, paper/pencil, calculator and computer methods in traditional, non-routine application problems **Appetizers, Objectives 1 B, (Number Concepts) 10 A (Estimation)**

7.12$_{5, 6, 8}$ use appropriate estimation strategies (overestimation, underestimation, front-end estimation, range of estimates) in problem situations including evaluating the reasonableness, of a solution and missing information **Appetizers Objectives 10 A (Estimation) 13 A (Reasonableness)**

Patterns, Functions, and Algebra

7.13$_{5, 6, 8}$ find missing elements in a variety of number patterns including sequences and series; apply a rule to generate a number pattern; use input/output models for functions (number machines) **Appetizers, Objectives 2 A 2 B (Mathematical Relations)**

7.14$_{5, 6, 8}$ simplify numerical expressions including whole numbers, integers, absolute value, and exponents using the order of operations **Appetizers, Objectives 1 E, (Number Concepts) 4 D (Measurement)**

7.15$_{8, 9, 10, 11}$ evaluate algebraic expressions containing variables with whole numbers, integers, absolute value, and exponents using the order of operations and exponent rules **Appetizers, Objectives 1 E, (Number Concepts) 2 B, (Mathematical Relations) 4 D (Measurement)**

7.16 add, subtract, multiply, and divide monomials, and put it in simplest form **Appetizers, Objective 11 A (Problem Solving)**

7.17 find and use the Greatest Common Factor and Least Common Multiple of a set of monomials or algebraic fractions using prime factorization and exponent rules **Appetizers, Objective 1 F (Number Concepts)**

7.18$_{8, 9, 10, 11}$ create algebraic expressions and equations from written statements **Appetizers, Objective 2 D (Mathematical Relations)**

7.19$_{8, 9, 10, 11}$ use ratios and proportions to represent and solve a variety of problems, such as rates **Appetizers, Objective 2 C (Mathematical Relations)**

7.20$_{8}$ use and apply formulas in problems solving situations such as perimeter, circumference, area, volume, surface area, distance, and Celsius/Fahrenheit **Appetizers, Objectives 4 D, (Measurement) 11 A (Problem Solving)**

7.21 use patterns to develop the concept of negative exponents

7.22$_{8}$ use and apply scientific notation containing positive and negative exponents in problem solving situations **Appetizers, Objective 1 D (Number Concepts)**

7.23 solve linear equations containing whole numbers and integers using substitution or inverse operations for addition, subtraction, multiplication, and division **Appetizers, Objectives 2 D, (Mathematical Relations) 11 A (Problem Solving)**

7.24 graph inequalities (e.g., $x>7$) on a number line and explain the solution sets **Appetizers, Objective 2 F (Mathematical Relations)**

7.25$_{3, 4, 5, 6, 8, 9, 10, 11}$ locate and plot points and lines with the Cartesian Coordinate Plane using ordered pairs and a table of values **Appetizers, Objective 2 E (Mathematical Relations)**

7.26$_{9, 10, 11}$ recognize the slope of a line through inspection and modeling and relate slope to real world situations

Probability and Statistics

7.27$_{8}$ read and interpret multiple line graphs **Appetizers: Objective 5 D (Probability and Statistics)**

7.28$_{8, 9, 10, 11}$ express probability as a ratio, decimal, or percent and predict outcomes from the data obtained through student experimentation or written information **Appetizers, Objective 5 C (Probability and Statistics)**

7.29$_{9, 10, 11}$ construct sample spaces by listing, tree diagrams, and frequency distribution tables, and calculate combinations and permutations **Appetizers, Objective 5 B (Probability and Statistics)**

7.30$_{8, 9, 10, 11}$ extrapolate information from multiple-line graphs, circle graphs, bar graphs, histograms, tables, and frequency distributions (tally charts) **Appetizers, Objective 5 D (Probability and Statistics)**

7.31$_{9, 10, 11}$ collect, organize, graphically represent, and interpret data using frequency distributions, line-plots, stem-and-leaf plots, box-and-whisker plots, and scatter plots **Appetizers, Objective 11 D (Probability and Statistics)**

7.32$_{8, 9, 10, 11}$ determine measures of central tendency (mean, median, mode, range) and dispersion from data, graphs, tables, and experiments **Appetizers, Objective 5 E (Probability and Statistics)**

7.33$_{5, 6, 8}$ determine combinations and permutations

Geometry with Measurement

7.34$_{8}$ identify, describe, and classify plane and space geometric figures including triangles, quadrilaterals, pentagons, hexagons, octagons, decagons, dodecagons, prisms, pyramids, cones, and spheres **Appetizers, Objective 3 A (Geometry)**

7.35 construct congruent segments and angles, perpendicular bisectors of segments, and angle bisectors using straightedge/compass, computer, and paper folding **Appetizers, Objective 3 C (Geometry)**

7.36$_{2, 3, 4, 5, 6, 8, 9, 10, 11}$ apply transformations (rotations, reflections, translations) to plane figures using physical models and graph paper **Appetizers, Objective 3 B (Geometry)**

7.37$_{2, 3, 4, 5, 6, 8, 9, 10, 11}$ discover lines of symmetry in any plane geometric figure; apply and demonstrate by paper folding, mirrors, and drawings **Appetizers, Objective 3 C (Geometry)**

7.38$_{6, 8, 9, 10, 11}$ define similar and congruent plane geometric figures and apply in problem solving situations involving proportions and scale drawings **Appetizers, Objective 11 C (Problem Solving)**

7.39$_{8, 9, 10, 11}$ find perimeter, area, circumference, and volume of plane and solid geometric figures using measurement, diagrams, or calculations **Appetizers, Objectives 4 D, 4 E, (Measurement) 11 B (Problem Solving)**

7.40$_{9, 10, 11}$ use the Pythagorean Theorem to find the length of any side of a right triangle **Appetizers, Objective 3 B (Geometry)**

7.41 find length, mass, and capacity in both metric and standard units using direct and indirect methods **Appetizers, Objective 4 E (Measurement)**

7.42$_{5, 6, 8}$ solve application problems using measurement including elapsed time and conversion of units within the same system **Appetizers, Objective 4 A (Measurement)**

7.43$_{6, 8}$ identify radius and diameter **Appetizers, Objective 4 D (Measurement)**

7.44$_{8}$ identify parallel and perpendicular lines **Appetizers, Objective 3 A (Geometry)**

7.45$_{5, 6}$ classify angles **Appetizers: Objective 3 A (Geometry)**

Computer Technology

7.46 use appropriate software to practice and master seventh grade instructional objectives in mathematics

7.47 use a calculator to find squares, square roots, and exponential numbers (7.2)