STATE GOAL 6: Demonstrate and apply a knowledge and sense of numbers, including numeration and operations (addition, subtraction, multiplication, division), patterns, ratios and proportions.

Why This Goal Is Important: Numbers and operations on numbers play fundamental roles in helping us make sense of the world around us. Operations such as addition, subtraction, multiplication and division, as well as the ability to find powers and roots, extend the notion of numbers to create tools to model situations and solve problems in our everyday lives. Discussing and solving problems related to budgets, comparing prices on merchandise, understanding the nature of interest charges, measuring fuel consumption and calculating the trajectory for space travel would all be impossible without a sense of numbers and numerical operations. All people must develop this sense of numbers and operations and be able to use it to solve problems using mental computation, paper-and-pencil algorithms, calculators and computers.

A. Demonstrate knowledge and use of numbers and their representations in a broad range of theoretical and practical settings.

EARLY ELEMENTARY	LATE ELEMENTARY	MIDDLE/JUNIOR HIGH SCHOOL	EARLY HIGH SCHOOL	LATE HIGH SCHOOL
6.A.1a Identify whole numbers and compare them using the symbols <, >, or = and the words "less than", "greater than", or "equal to", applying counting, grouping and place value concepts.	**6.A.2** Compare and order whole numbers, fractions and decimals using concrete materi-als, drawings and mathematical symbols.	**6.A.3** Represent fractions, decimals, percentages, exponents and scientific notation in equivalent forms.	**6.A.4** Identify and apply the associative, commutative, distributive and identity properties of real numbers, including special numbers such as pi and square roots.	**6.A.5** Perform addition, subtraction and multiplication of complex numbers and graph the results in the complex plane.
6.A.1b Identify and model fractions using concrete materials and pictorial representations.				

B. Investigate, represent and solve problems using number facts, operations (addition, subtraction, multiplication, division) and their properties, algorithms and relationships.

EARLY ELEMENTARY	LATE ELEMENTARY	MIDDLE/JUNIOR HIGH SCHOOL	EARLY HIGH SCHOOL	LATE HIGH SCHOOL
6.B.1 Solve one- and two-step problems with whole numbers using addition, subtraction, multiplication and division.	**6.B.2** Solve one- and two-step problems involving whole numbers, fractions and decimals using addition, subtraction, multiplication and division.	**6.B.3a** Solve practical computation problems involving whole numbers, integers and rational numbers.	**6.B.4** Select and use appropriate arithmetic operations in practical situations including calculating wages after taxes, developing a budget and balancing a checkbook.	**6.B.5** Identify, represent and apply numbers expressed in exponential, logarithmic and scientific notation using contemporary technology.
		6.B.3b Apply primes, factors, divisors, multiples, common factors and common multiples in solving problems.		
		6.B.3c Identify and apply properties of real numbers including pi, squares, and square roots.		

C. Compute and estimate using mental mathematics, paper-and-pencil methods, calculators and computers.

EARLY ELEMENTARY	LATE ELEMENTARY	MIDDLE/JUNIOR HIGH SCHOOL	EARLY HIGH SCHOOL	LATE HIGH SCHOOL
6.C.1a Select and perform computational procedures to solve problems with whole numbers.	**6.C.2a** Select and perform computational procedures to solve problems with whole numbers, fractions and decimals.	**6.C.3a** Select computational procedures and solve problems with whole numbers, fractions, decimals, percents and proportions.	**6.C.4** Determine whether exact values or approximations are appropriate (e.g., bid a job, determine gas mileage for a trip).	**6.C.5** Determine the level of accuracy needed for computations involving measurement and irrational numbers.
6.C.1b Show evidence that whole number computational results are correct and/or that estimates are reasonable.	**6.C.2b** Show evidence that computational results using whole numbers, fractions and decimals are correct and/or that estimates are reasonable.	**6.C.3b** Show evidence that computational results using whole numbers, fractions, decimals, percents and proportions are correct and/or that estimates are reasonable.		

D. Solve problems using comparison of quantities, ratios, proportions and percents.

EARLY ELEMENTARY	LATE ELEMENTARY	MIDDLE/JUNIOR HIGH SCHOOL	EARLY HIGH SCHOOL	LATE HIGH SCHOOL
6.D.1 Compare the numbers of objects in groups.	**6.D.2** Describe the relationship between two sets of data using ratios and appropriate notations (e.g., a/b, a to b, a:b).	**6.D.3** Apply ratios and proportions to solve practical problems.	**6.D.4** Solve problems involving recipes or mixtures, financial calculations and geometric similarity using ratios, proportions and percents.	**6.D.5** Solve problems involving loans, mortgages and other practical applications involving geometric patterns of growth.