

## **SAU 39 Critical Areas of Focus for Mathematics by Grade Level**

### **Grade K - Number**

Critical Areas of Focus:

1. Representing and comparing whole numbers, initially with sets of objects;
2. Describing shapes and space. More learning time in Kindergarten should be devoted to number than to other topics.
3. Fluency of number (phonemic, symbolic and cluster) – mastery with understanding
4. **Fluency of addition facts (10x10) - mastery with understanding** (Communicative Property, Number plus 1, 10 buddies, 10 plus n)
5. **Understanding place value of ones and tens**

### **Grade 1 - Addition**

Critical Areas of Focus:

1. Developing understanding of addition, subtraction, and strategies for addition and subtraction within 20;
2. Developing understanding of whole number relationships and place value, including grouping in tens and ones
3. Developing understanding of linear measurement and measuring lengths as iterating length units; and
4. Reasoning about attributes of, and composing and decomposing geometric shapes.
5. **Fluency of addition facts (10x10) - mastery with understanding**

### **Grade 2 - Subtraction**

Critical Areas of Focus:

1. Extending understanding of base-ten notation;
2. Building fluency with addition and subtraction;
3. Using standard units of measure; and
4. Describing and analyzing shapes.
5. **Fluency of subtraction facts (10x10) – mastery with understanding**

### **Grade 3 - Multiplication**

Critical Areas of Focus:

1. Developing understanding of multiplication and division and strategies for multiplication and division within 100.
2. Developing understanding of fractions, especially unit fractions (fractions with numerator 1);
3. Developing understanding of the structure of rectangular arrays and of area; and
4. Describing and analyzing two-dimensional shapes.
5. **Fluency of multiplication facts 10x10 – mastery with understanding**

### **Grade 4 - Division**

Critical Areas of Focus:

1. Developing understanding and fluency with multi-digit multiplication, and developing understanding of dividing to find quotients involving multi-digit dividends;
2. Developing an understanding of fraction equivalence, addition and subtraction of fractions with like denominators, and multiplication of fractions by whole numbers;
3. Understanding that geometric figures can be analyzed and classified based on their properties, such as having parallel sides, perpendicular sides, particular angle measures, and symmetry.
4. **Fluency of division facts (10x10) – mastery with understanding**

## **SAU 39 Critical Areas of Focus for Mathematics by Grade Level**

### **Grade 5 - Fractions**

#### Critical Areas of Focus:

1. Developing fluency with addition and subtraction of fractions, and developing understanding of the multiplication of fractions and of division of fractions in limited cases (unit fractions divided by whole numbers and whole numbers divided by unit fractions);
2. Extending division to 2-digit divisors, integrating decimal fractions into the place value system and developing understanding of operations with decimals to hundredths, and developing fluency with whole number and decimal operations; and
3. Developing understanding of volume

### **Grade 6 -- Fractions & Integers**

#### Critical Areas of Focus:

1. Connecting ratio and rate to whole number multiplication and division and using concepts of ratio and rate to solve problems;
2. Completing understanding of division of fractions and extending the notion of number to the system of rational numbers, which includes negative numbers;
3. Writing, interpreting, and using expressions and equations; and (4) developing understanding of statistical thinking.

### **Grade 7 - Algebraic Thinking - *Operations on variables***

#### Critical Areas of Focus:

1. Developing understanding of and applying proportional relationships;
2. Developing understanding of operations with rational numbers and working with expressions and linear equations;
3. Solving problems involving scale drawings and informal geometric constructions, and working with two- and three-dimensional shapes to solve problems involving area, surface area, and volume; and
4. Drawing inferences about populations based on samples.

### **Grade 8 - Algebraic Thinking - *Relationships***

#### Critical Areas of Focus:

1. Formulating and reasoning about expressions and equations, including modeling an association in bivariate data with a linear equation, and solving linear equations and systems of linear equations;
2. Grasping the concept of a function and using functions to describe quantitative relationships;
3. Analyzing two- and three-dimensional space and figures using distance, angle, similarity, and congruence, and understanding and applying the Pythagorean Theorem

## **SAU 39 Critical Areas of Focus for Mathematics by Grade Level**

### **High School - Formalize & Extend Learning**

Critical Areas of Focus (Core 1 – Core 3):

The fundamental purpose of Mathematics I is to formalize and extend the mathematics that students learned in the middle grades. The critical areas, organized into units, deepen and extend understanding of linear relationships, in part by contrasting them with exponential phenomena, and in part by applying linear models to data that exhibit a linear trend. Mathematics 1 uses properties and theorems involving congruent figures to deepen and extend understanding of geometric knowledge from prior grades. The final unit in the course ties together the algebraic and geometric ideas studied. The Mathematical Practice Standards apply throughout each course and, together with the content standards, prescribe that students experience mathematics as a coherent, useful, and logical subject that makes use of their ability to make sense of problem situations

The focus of Mathematics II is on quadratic expressions, equations, and functions; comparing their characteristics and behavior to those of linear and exponential relationships from Mathematics I as organized into 6 critical areas, or units. The need for extending the set of rational numbers arises and real and complex numbers are introduced so that all quadratic equations can be solved. The link between probability and data is explored through conditional probability and counting methods, including their use in making and evaluating decisions. The study of similarity leads to an understanding of right triangle trigonometry and connects to quadratics through Pythagorean relationships. Circles, with their quadratic algebraic representations, round out the course. The Mathematical Practice Standards apply throughout each course and, together with the content standards, prescribe that students experience mathematics as a coherent, useful, and logical subject that makes use of their ability to make sense of problem situations.

It is in Mathematics III that students pull together and apply the accumulation of learning that they have from their previous courses, with content grouped into four critical areas, organized into units. They apply methods from probability and statistics to draw inferences and conclusions from data. Students expand their repertoire of functions to include polynomial, rational, and radical functions. They expand their study of right triangle trigonometry to include general triangles. And, finally, students bring together all of their experience with functions and geometry to create models and solve contextual problems. The Mathematical Practice Standards apply throughout each course and, together with the content standards, prescribe that students experience mathematics as a coherent, useful, and logical subject that makes use of their ability to make sense of problem situations.