

Sanborn Regional School District

Math Curriculum 6-8

**Sanborn Regional School District Math/Science Curriculum
Measurement Benchmarks
Grade Level Expectations 5-8**

Measures	Grade 5	Grades 6 – 8
Length	<p>Units (accuracy): Inch (to 1/8 inch); Foot; Centimeter (to 0.5 centimeter); Meter (to 0.5 centimeter); Yard; Mile (use in scale questions); Kilometer (use in scale questions)</p> <p>Equivalencies: 12 inches in 1 foot; 100 centimeters in 1 meter; 3 feet in 1 yard; 36 inches in 1 yard; 10 millimeters in 1 centimeter</p>	<p>Units (accuracy): Inch (to 1/16 inch); Foot; Centimeter (to 1/10 centimeter); Meter (to 1/100 meter); Yard; Mile (use in scale and rate questions); Kilometer (use in scale and rate questions)</p> <p>Equivalencies: 12 inches in 1 foot; 100 centimeters in 1 meter; 3 feet in 1 yard; 36 inches in 1 yard; 10 millimeters in 1 centimeter; 1000 millimeters in 1 meter</p>
Time	<p>Unit (accuracy): Hour (to 1 minute); Day; Year</p> <p>Equivalencies: 24 hours in 1 day; 7 days in 1 week; 365 days in 1 year; 60 seconds in 1 minute; 60 minutes in 1 hour</p>	<p>Unit (accuracy): Hour (to 1 minute); Day; Year</p> <p>Equivalencies: 24 hours in 1 day; 7 days in 1 week; 365 days in 1 year; 60 seconds in 1 minute; 60 minutes in 1 hour</p>
Temperature	<p>Unit (accuracy): C° and F° (to 1 degree)</p>	<p>Unit (accuracy): C° and F° (to 1 degree)</p>
Capacity	<p>Unit (accuracy): Quart (to 1 ounce); Gallon; Pint</p> <p>Equivalencies: 32 ounces in 1 quart; 4 quarts in 1 gallon; 2 pints in 1 quart</p>	<p>Unit (accuracy): Quarts (to 1 ounce); Gallon; Pint; Liter</p> <p>Equivalencies: 32 ounces in 1 quart; 4 quarts in 1 gallon; 2 pints in 1 quart; 1000 milliliters in 1 liter</p>
Mass	<p>Unit (accuracy): Kilogram; Gram (to whole gram)</p>	<p>Unit (accuracy): Kilogram; Gram (to 1/10 gram)</p>
Weight	<p>Unit (accuracy): Pound (to 1 ounce)</p> <p>Equivalencies: 16 ounces in 1 pound</p>	<p>Unit (accuracy): Pound (to 1 ounce)</p> <p>Equivalencies: 16 ounces in 1 pound</p>
Angles and Rotation	<p>Unit (accuracy): Degree (to 2 degrees)</p>	<p>Unit (accuracy): Degree (to 2 degrees)</p> <p>Equivalencies: 360° in 1 circle; 90° in 1 right angle</p>

Sanborn Regional School District Math Curriculum Grade 6 Proficiency Standards

Problem Solving and Reasoning	Communications and Connections	Numbers, Numeration, and Number Theory	Geometry, Measurement, and Trigonometry
<ul style="list-style-type: none"> • Solve problems that require the use of strategies (for example: working backwards; looking for patterns and relationships; guess and check; making tables, charts, and graphs; solving a simpler version of a problem; looking for similar problems; drawing a diagram; or creating a model). • Formulate, solve, and verify problems from every-day and mathematical situations and interpret the results. • Solve multi-step problems, solve problems with multiple solutions, recognize when a problem has no solution, and recognize problems where more information is needed. • Solve problems using manipulatives, graphs, charts, diagrams, and calculators. • Continue a pattern involving integers and positive rational numbers. • Solve problems involving two-and three-dimensional geometric shapes and explain one's reasoning. • Use elementary deductive reasoning to solve word problems. • Use models, known facts, properties, and relationships to explain thinking and to justify answers and solution processes. 	<ul style="list-style-type: none"> • Demonstrate an understanding of mathematical concepts and relationships through a variety of methods (for example: writing, graphing, charts, diagrams, number sentences, or symbols). • Explain, analyze, and evaluate mathematical arguments and conclusions presented by others. • Explain conclusions, thought processes, and strategies in problem-solving situations. • Make conjectures and defend generalizations. • Evaluate the validity of a mathematical statement. • Identify the relationships among the four basic operations on rational numbers. • Identify the relationship among the basic operations as applied to whole numbers and to positive rational numbers. • Use mathematical skills, concepts, and applications in other disciplines (for example: graphs in social studies, patterns in art, or music and geometry in technology education). 	<ul style="list-style-type: none"> • Name and identify a fraction or decimal, given a physical representation. • Given a decimal representation in tenths or hundredths, write an equivalent fraction. • Given a set of fractional models, name and write those that represent equivalent fractions. • Given a pair of fractions, determine which is larger by using physical models or illustrations. • Apply number theory to the factoring of whole numbers and the equivalency of positive rational numbers. • Apply the associative, commutative, and distributive properties in a problem solving situation. • Select an appropriate computational technique in the solution of problems and check the reasonableness of results through mental computation and estimation strategies. • Multiply three digit whole numbers by two digit whole numbers. • Divide three digit whole numbers by two digit whole numbers. • Multiply and divide two and three digit decimals. • Using physical models, illustrations, and calculators, determine the sum or difference of decimals • Select and use appropriate mental computation and estimation strategies in problem situations when exact answers are not needed. 	<ul style="list-style-type: none"> • Identify, describe, and name properties of triangles, quadrilaterals, and other polygons. • Measure and classify angles. • Tessellate (tile) a plane with a given figure and create a figure that will tile the plane. • Describe the shadow of certain figures • Make scale drawings, keeping sides in proportion. (Scale factor to be kept to a small whole number or fraction with denominator less than 6.)

Sanborn Regional School District Math Curriculum Grade 7 Proficiency Standards

Problem Solving and Reasoning	Communications and Connections	Numbers, Numeration, and Number Theory	Geometry, Measurement, and Trigonometry
<ul style="list-style-type: none"> • Determine, collect, and organize the relevant data needed to solve real-world problems. • Choose the appropriate technology needed to solve a real-world problem. • Translate results of a computation into solutions that fit the real-world problem (for example, when a computation shows that one needs 3.2 gallons of paint to paint a room, how much paint do you buy?). • Determine if the solution of a real-world problem is reasonable. • Use inductive reasoning to make generalizations from an observed pattern. • Use logical reasoning, as well as estimation and mental computations, to determine the validity of a solution. 	<ul style="list-style-type: none"> • Evaluate given information and determine appropriate questions suggested by the situation. • Evaluate given information and determine appropriate generalizations suggested by the situation. • Describe orally and/or in writing how various technologies can be used to communicate about a specific situation. • Use mathematical symbols and notation to communicate mathematically. • Explain in oral or written form the relationships among various mathematical concepts (for example, the relationship between exponentiation and multiplication). • Translate among equivalent representations of the same concept (for example, a table of values, an equation, and a graph may all be representations of the same function). 	<ul style="list-style-type: none"> • Read and write rational numbers. • Use physical models to represent rational numbers. • Perform the four basic operations with rational numbers. • Simplify expressions containing rational numbers, integer exponents, and grouping symbols using conventional methods and technology. • Evaluate numerical expressions containing scientific notation. • Use the order of operations to evaluate expressions. • Use estimation and mental computation to determine the reasonableness of answers obtained from the four basic operations on real numbers. • Select and use appropriate mental computation and estimation strategies in problem situations when exact answers are not needed. 	<ul style="list-style-type: none"> • Represent and solve problems using the properties of two dimensional geometric figures. • Sketch specific two dimensional figures, given definitions and/or properties. • Identify and use appropriate units of measurement. • Approximate areas of irregular shapes drawn on a grid. • Convert commonly used measurements to equivalent ones within a measurement system. • Apply the formulas for and choose an appropriate unit of measurement to find the linear and area measures associated with two dimensional figures and three dimensional figures.

Sanborn Regional School District Math Curriculum Grade 8 Proficiency Standards

Problem Solving and Reasoning	Communications and Connections	Numbers, Numeration, and Number Theory	Geometry, Measurement, and Trigonometry
<ul style="list-style-type: none"> • Determine, collect, and organize the relevant data needed to solve real-world problems. • Choose the appropriate technology needed to solve a real-world problem. • Translate results of a computation into solutions that fit the real-world problem (for example, when a computation shows that one needs 3.2 gallons of paint to paint a room, how much paint do you buy?). • Determine if the solution of a real-world problem is reasonable. • Use inductive reasoning to make generalizations from an observed pattern. • Use logical reasoning, as well as estimation and mental computations, to determine the validity of a solution. 	<ul style="list-style-type: none"> • Evaluate given information and determine appropriate questions suggested by the situation. • Evaluate given information and determine appropriate generalizations suggested by the situation. • Describe orally and/or in writing how various technologies can be used to communicate about a specific situation. • Use mathematical symbols and notation to communicate mathematically. • Explain in oral or written form the relationships among various mathematical concepts (for example, the relationship between exponentiation and multiplication). • Translate among equivalent representations of the same concept (for example, a table of values, an equation, and a graph may all be representations of the same function). 	<ul style="list-style-type: none"> • Read and write rational numbers. • Use physical models to represent rational numbers. • Examine the four basic operations from a functional perspective; that is, as operations on ordered pairs. • Connect the properties of operations on real numbers to common uses (for example, the distributive property is used in each of the following cases: <ul style="list-style-type: none"> • $2x + 3x = 5x$; $2/7 + 3/7 = 5/7$; • and $2(3x + 4) = 6x + 8$). • Simplify expressions containing rational numbers, integer exponents, and grouping symbols using conventional methods and technology. • Evaluate numerical expressions containing scientific notation. • Use the order of operations to evaluate expressions. • Use estimation and mental computation to determine the reasonableness of answers obtained from the four basic operations on rational numbers. • Select and use appropriate mental computation and estimation strategies in problem situations when exact answers are not needed. 	<ul style="list-style-type: none"> • Represent and solve problems using the properties of two and three dimensional geometric figures. • Use technology, manipulatives, and/or coordinate geometry to deduce and explain the properties of and the relationships among geometric figures. • Sketch specific two dimensional figures, given definitions and/or properties. • Demonstrate that the conditions necessary for congruence or the conditions necessary for similarity are met. • Demonstrate an understanding of properties among two and three dimensional figures. • Identify and use appropriate units of measurement. • Approximate areas of irregular shapes drawn on a grid. • Apply the formulas for and choose an appropriate unit of measurement to find the linear and area measures associated with two dimensional figures and the volume and surface area of three dimensional figures. • Apply the Pythagorean theorem to problem solving situations. • Select an appropriate procedure to determine a measure when a direct measurement cannot be made.

Sanborn Regional School District Math Curriculum Grade 6 Proficiency Standards

Data Analysis, Statistics, and Probability	Functions, Relations, and Algebra	Mathematics of Change	Discrete Mathematics
<ul style="list-style-type: none"> • Determine and explore various uses of mean, median, and mode. • Use sampling techniques to make predictions. • Given a sample space find probabilities of events. 	<ul style="list-style-type: none"> • Identify properties and relationships related to prime numbers, composite numbers, rational numbers, multiples, factors, and exponents. • Determine how a change in length or width affects perimeter, area, and volume of two and three dimensional figures. • Solve simple linear equations by using concrete materials, tables, or graphs. • Apply the following properties when appropriate: commutative, associative, distributive, inverse, and identity elements • Use trial and error to find a solution to an equation from among a given replacement set. • Solve simple linear equations using concrete, informal methods. • Given a table or graph, select a sentence describing the underlying relationship(s). 	<ul style="list-style-type: none"> • Find averages (for example: batting averages, or grade point averages) and compute rates in familiar contexts (for example: soft drink consumption, distance per unit of time, hourly wages , or paint mixing). 	

Sanborn Regional School District Math Curriculum Grade 7 Proficiency Standards

Data Analysis, Statistics, and Probability	Functions, Relations, and Algebra	Mathematics of Change	Discrete Mathematics
<ul style="list-style-type: none"> • Given a bar, line, circle or picture graph, interpret and analyze the data. • Choose an appropriate scale and construct a graph or diagram using a set of numerical data in a variety of mediums. • Calculate the common measures of central tendency: mean, median and mode. • Use sample sets to make appropriate inferences and predictions. • Predict and find the probability of outcomes of a simple probability experiment. 	<ul style="list-style-type: none"> • Recognize and describe relationships within a set of data • Evaluate simple algebraic expressions for given values of the variable. • Write an equation which represents a real-world problem. • Solve equations in one variable. • Graph the solution set of equations in one variable. • Solve and justify, orally or in writing, the algebraic solution to a real-world problem. 	<ul style="list-style-type: none"> • Solve rate problems that involve proportional reasoning. li>Extend patterns and predict nth terms in number sequences, using words and/or symbols. • Extend patterns and predict nth terms in sequences of geometric figures, using words and/or symbols. • Examine tables of numbers from familiar contexts to determine if patterns exist. • Differentiate among different types of change (for example: arithmetic, geometric, or periodic). • Interpret and analyze information about change in familiar situations (for example: percent change, average change, or rates such as distance per unit time). 	<ul style="list-style-type: none"> • Use combinations and permutations to solve a variety of problems

Sanborn Regional School District Math Curriculum Grade 8 Proficiency Standards

Data Analysis, Statistics, and Probability	Functions, Relations, and Algebra	Mathematics of Change	Discrete Mathematics
<ul style="list-style-type: none"> • Choose an appropriate scale and construct a graph or diagram using a set of numerical data in a variety of mediums. • Calculate the common measures of central tendency: mean, median and mode. • Use appropriate measure of central tendency in problem situations. • Use sample sets to make appropriate inferences and predictions. • Predict and find the probability of outcomes of a simple probability experiment. • Interpret probabilities in real world situations (for example: lotteries, or medical testing) 	<ul style="list-style-type: none"> • Develop algebraic formulas to express relationships which occur in other disciplines (for example: science, or economics). • Recognize and describe relationships within a set of data • Write an equation in one variable which represents a real- world problem. • Solve equations in one variable. • Graph the solution set of equations in one variable. • Use appropriate graphing technology (for example: a graphing calculator, or graphing software) to graph an equation or inequality in two variables. • Solve and justify, orally or in writing, the algebraic solution to a real-world problem. 	<ul style="list-style-type: none"> • Solve rate problems that involve proportional reasoning. li>Extend patterns and predict nth terms in number sequences, using words and/or symbols. • Extend patterns and predict nth terms in sequences of geometric figures, using words and/or symbols. • Examine tables of numbers from familiar contexts to determine if patterns exist. • Differentiate among different types of change (for example: arithmetic, geometric, or periodic). • Interpret and analyze information about change in familiar situations (for example: percent change, average change, or rates such as distance per unit time). 	<ul style="list-style-type: none"> • Use combinations and permutations to solve a variety of problems

Sanborn Regional School District Math Curriculum

Grade 6

Essential Questions	Topics	Key Concepts/Vocabulary
<ul style="list-style-type: none"> • How are decimals, fractions, and percents inter-related? • In what real world applications do we need an understanding of the properties of fractions, decimals, and percents? • What connections can be made between ratios, proportions, and percents? • What are some of the real world applications for problem solving strategies? 		

Sanborn Regional School District Math Curriculum

Grade 6

Academic Expectations	Instructional Strategies	Assessments
	<ul style="list-style-type: none"> • Collins Writing Program • Differentiated Instruction • Critical Skills Program: Education By Design • Essential Questions • Open-ended response questions • Test-taking strategies • Vocabulary Building strategies 	<ol style="list-style-type: none"> 1. Student Collins Writing Portfolio 2. NWEA Map Goal Area Assessments and End of course tests 3. NECAP 4. Common assessments within grade level disciplines

Sanborn Regional School District Math Curriculum

Grade 7

Essential Questions	Topics	Key Concepts/Vocabulary
<ul style="list-style-type: none"> • What are the different number systems and how are they related? • How are algebraic expressions and equations useful to us? • What are the similarities and differences between congruency and similarity? • How and where are the customary and metric systems of measurement used in the world? • What problem solving strategies could you use to answer an open response question? 		

Sanborn Regional School District Math Curriculum

Grade 7

Academic Expectations	Instructional Strategies	Assessments
	<ul style="list-style-type: none"> • Collins Writing Program • Differentiated Instruction • Critical Skills Program: Education By Design • Essential Questions • Open-ended response questions • Test-taking strategies • Vocabulary Building strategies 	<ol style="list-style-type: none"> 1. Student Collins Writing Portfolio 2. NWEA Map Goal Area Assessments and End of course tests 3. NECAP 4. Common assessments within grade level disciplines

Sanborn Regional School District Math Curriculum

Grade 8

Essential Questions	Topics	Key Concepts/Vocabulary
<ul style="list-style-type: none">• What role does mathematics play in the real world?• What are the connections between different areas of mathematics?		

Sanborn Regional School District Math Curriculum

Grade 8

Academic Expectations	Instructional Strategies	Assessments
	<ul style="list-style-type: none"> • Collins Writing Program • Differentiated Instruction • Critical Skills Program: Education By Design • Essential Questions • Open-ended response questions • Test-taking strategies • Vocabulary Building strategies 	<ol style="list-style-type: none"> 1. Student Collins Writing Portfolio 2. NWEA Map Goal Area Assessments and End of course tests 3. NECAP 4. Common assessments within grade level disciplines