

# Curriculum Grade Book

Jefferson County Schools  
Final, 05/30/01

## Grade 10 Mathematics

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
<b>Algebraic Concepts</b>																					
● The learner will be able to apply integers to obtain solutions to one- and two-step linear equations.																					
● The learner will be able to perform operations on simple expressions, and informally justify the procedures selected.																					
● The learner will be able to apply manipulatives to illustrate algebraic expressions and operations.																					
● The learner will be able to obtain solutions to problems in measurement and approximation using algebraic thought processes and symbolism.																					
■ The learner will be able to model the associative properties of addition and multiplication using manipulatives.																					
■ The learner will be able to model the commutative properties of addition and multiplication using manipulatives.																					
■ The learner will be able to communicate and use algebraic properties in symbolic manipulation.																					
■ The learner will be able to symbolically express a problem solving scenario by writing an equation.																					
■ The learner will be able to write an equation to explain the relationship between data sets.																					
■ The learner will be able to make translations of verbal sentences into algebraic equations.																					
■ The learner will be able to identify the transformation of the graph that exists when coefficients and/or constants of the corresponding linear equations are changed.																					
■ The learner will be able to obtain solutions to linear systems employing a variety of methods including matrices.																					
■ The learner will be able to obtain solutions to linear equations that involve more than two steps and variables on one side of the equation only.																					
■ The learner will be able to obtain solutions to linear equations that involve more than two steps and have variables on both sides of the equation.																					
■ The learner will be able to obtain solutions to linear equations that involve more than two steps and have one set of parentheses on each side of the equation.																					
■ The learner will be able to apply manipulatives to model the steps for solving basic linear equations.																					

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■ The learner will be able to explain the transformations of the graph that exists when coefficients and/or constants of the corresponding linear equations are changed.																					
■ The learner will be able to recognize the graph of the solution to a one-variable inequality on a number line.																					
■ The learner will be able to interpret graphs of inequalities.																					
■ The learner will be able to explain the absolute value of a number as distance from the origin by creating a number line.																					
■ The learner will be able to connect concrete, graphical, oral, and symbolic illustrations of absolute value.																					
■ The learner will be able to investigate a variety of illustrations of absolute value.																					
■ The learner will be able to determine an answer for a first degree algebraic expression when given values for one or more variables.																					
■ The learner will be able to add algebraic expressions.																					
■ The learner will be able to subtract algebraic expressions.																					
■ The learner will be able to determine an answer for an algebraic expression when given values for one or more variables applying grouping symbols and/or exponents less than four.																					
■ The learner will be able to translate word expressions into algebraic expressions.																					
■ The learner will be able to simplify a monomial expressed in expanded form by applying exponents.																					
■ The learner will be able to choose the area illustration for a specific product of two one-variable binomials having positive constants and coefficients.																					
■ The learner will be able to perform multiplication on two polynomials with each polynomial having two terms or less.																					
■ The learner will be able to informally explain and illustrate the concept of inverse.																					
■ The learner will be able to describe the inverse operations of addition/subtraction and multiplication/division.																					
■ The learner will be able to use the concept of inverse.																					
■ The learner will be able to model inverse operations.																					
■ The learner will be able to use inverse operations.																					
■ The learner will be able to interpret the outcomes of																					

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algebraic procedures.																				
■ The learner will be able to illustrate an understanding of rates and various derived and indirect measurements.																				
■ The learner will be able to describe the definition of a variable in an expression, equation, and inequality.																				
■ The learner will be able to use the concept of variable to simplify expressions and obtain solutions to equations.																				
■ The learner will be able to apply the idea of a variable in obtaining solutions to inequalities.																				
■ The learner will be able to use the concept of slope to illustrate rate of change in a real world scenario.																				
■ The learner will be able to explore alternate algorithms that illustrate the relationship of multiplication to addition.																				
■ The learner will be able to explore alternate algorithms that illustrate the relationship of division to subtraction.																				
■ The learner will be able to solve a system of two equations with two variables through substitution.																				
■ The learner will be able to apply the graphing method to obtain a solution to a system of two linear equations.																				
■ The learner will be able to apply the elimination method to obtain a solution to a system of two linear equations.																				
■ The learner will be able to justify the choice of a method for obtaining a solution to a system of equations.																				
■ The learner will be able to compare and differentiate between the least common multiple (LCM) and greatest common factor (GCF) of a set of algebraic expressions.																				
■ The learner will be able to use the concept of rate of change to obtain solutions to real world problems.																				
■ The learner will be able to choose the algebraic notation that generalizes the pattern illustrated by data in a table.																				
■ The learner will be able to justify correct solutions of algebraic methods.																				
■ The learner will be able to investigate patterns in Pascal's Triangle.																				
<b>Calculus and Pre-Calculus</b>																				
■ The learner will be able to describe the importance of the value of the determinant of a matrix.																				
■ The learner will be able to apply suitable technology to perform addition of matrices.																				
■ The learner will be able to apply suitable technology to																				

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perform subtraction of matrices.																					
■ The learner will be able to apply suitable technology to perform scalar multiplication of matrices.																					
■ The learner will be able to apply matrices and technology to solve systems of equations.																					
■ The learner will be able to apply matrices in real-world problem solving using appropriate technology.																					
<b>Data Interpretation</b>																					
● The learner will be able to draw and/or interpret graphs which model real-world phenomena.																					
■ The learner will be able to make interpretations of circle graphs that illustrate real world data.																					
■ The learner will be able to make interpretations of bar graphs that illustrate real world data.																					
■ The learner will be able to judge the choice of a graphical illustration which best explains specific data.																					
<b>Functions</b>																					
● The learner will be able to find the domain and/or range of a function illustrated by the graph of a real world scenario.																					
● The learner will be able to explain the domain and range of functions and describe restrictions imposed by either the operations or by the real-world scenario which the functions illustrate.																					
■ The learner will be able to study graphs to explain the behavior of functions.																					
■ The learner will be able to represent many different functions.																					
■ The learner will be able to use functions (such as tables, graphs, and expressions) to model real-world phenomena.																					
■ The learner will be able to identify many different functions.																					
■ The learner will be able to explain in writing the pattern for real world information entered in a function table.																					
■ The learner will be able to identify relationships which can and cannot be illustrated by a function.																					
■ The learner will be able to apply technology to investigate function families.																					
■ The learner will be able to differentiate between a function and other relationships.																					

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<b>Geometry</b>																				
● The learner will be able to determine the length of an unknown side of a triangle using proportion and the concepts of similar triangles.																				
● The learner will be able to study, represent, and use geometric properties and relationships.																				
● The learner will be able to explain real world applications of geometric formulas and relationships.																				
● The learner will be able to apply techniques of inductive reasoning to formulate a conjecture.																				
● The learner will be able to apply learned geometry concepts in solving problems.																				
● The learner will be able to use geometric relationships, properties, and formulas to obtain solutions to real-world problems.																				
● The learner will be able to find the height of an item that is hard to measure by applying the properties of similar triangles or the angle of elevation.																				
■ The learner will be able to describe the way to determine whether a triangle is a right triangle when given the lengths of all three sides.																				
■ The learner will be able to use right triangle relationships including the Pythagorean Theorem, distance formula and/or trigonometric ratios.																				
■ The learner will be able to show the Pythagorean theorem by measuring the length, width, and diagonals of rectangles.																				
■ The learner will be able to represent the Pythagorean theorem by creating area models.																				
■ The learner will be able to solve a real world problem modeled by a diagram using the Pythagorean Theorem (no radicals in answer).																				
■ The learner will be able to create a concept map illustrating connections between polygons.																				
<b>Integers</b>																				
■ The learner will be able to connect various real world scenarios to integers.																				
■ The learner will be able to use the order of operations when completing computations with integers that apply no more than two sets of grouping symbols and exponents 1 and 2.																				



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between two adjoining sides.																					
■ The learner will be able to determine the circumference of a circle using a given formula.																					
■ The learner will be able to calculate the area of a circle using a given formula.																					
■ The learner will be able to compare the volume of a container to its shape.																					
■ The learner will be able to justify an approximation for the volume of a container.																					
■ The learner will be able to use a formula to determine the volume of a rectangular prism.																					
■ The learner will be able to use the concept of rate of change.																					
■ The learner will be able to use suitable measurement instruments.																					
<b>Number Theory</b>																					
● The learner will be able to illustrate an understanding of the relative size of rational and irrational numbers.																					
● The learner will be able to identify, illustrate, represent, and use real numbers and operations verbally, physically, symbolically, and graphically.																					
● The learner will be able to illustrate a comprehension of the subsets, elements, properties, and operations of the real number system.																					
■ The learner will be able to recognize the reciprocal of a rational number.																					
■ The learner will be able to apply mathematical notations appropriately.																					
■ The learner will be able to choose ratios and proportions to illustrate real world problems.																					
■ The learner will be able to study prime and composite numbers.																					
■ The learner will be able to investigate the applications of prime numbers.																					
■ The learner will be able to investigate the history of prime numbers.																					
■ The learner will be able to find the square root of a perfect square number that is less than 169.																					
■ The learner will be able to use number theory concepts in mathematical problem scenarios.																					
■ The learner will be able to use number theory concepts to																					

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solve problems.																					
■ The learner will be able to compare and differentiate between the least common multiple (LCM) and greatest common factor (GCF) of a set of numbers.																					
■ The learner will be able to use real numbers to illustrate real-world applications.																					
<b>Numeration</b>																					
● The learner will be able to identify, continue, and/or make spatial patterns.																					
● The learner will be able to study mathematical patterns associated with algebra and geometry in real-world problem solving situations.																					
● The learner will be able to explain, continue, study, and develop a large variety of patterns and functions applying suitable materials and illustrations in real world problem solving.																					
● The learner will be able to create effective approximation and computation strategies for determining reasonable results.																					
● The learner will be able to clarify strategies for approximating whole numbers, fractions, and percentages.																					
■ The learner will be able to create patterns using numbers.																					
■ The learner will be able to identify number patterns.																					
■ The learner will be able to extend patterns of numbers.																					
■ The learner will be able to continue geometric patterns.																					
■ The learner will be able to identify geometric patterns.																					
■ The learner will be able to investigate patterns in a Fibonacci sequence.																					
■ The learner will be able to apply algebraic thought processes to generalize a pattern by expressing the pattern in function notation.																					
■ The learner will be able to extend and make geometric patterns.																					
■ The learner will be able to find a suitable solution for a tedious mathematical calculation using estimation.																					
■ The learner will be able to choose the best approximation for the position of a particular rational number on a number line.																					
■ The learner will be able to compute answers by applying appropriate instruments.																					

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<ul style="list-style-type: none"> <li>■ The learner will be able to apply estimation strategies to forecast computational results.</li> </ul>																				
<b>Perspective/Role in Society</b>																				
<ul style="list-style-type: none"> <li>■ The learner will be able to find the best buy by computing rates involving cost per unit (up to three samples).</li> </ul>																				
<b>Probability/Statistics</b>																				
<ul style="list-style-type: none"> <li>● The learner will be able to gather, illustrate and explain linear and nonlinear data sets formulated from the real world.</li> </ul>																				
<ul style="list-style-type: none"> <li>● The learner will be able to gather and organize real world information.</li> </ul>																				
<ul style="list-style-type: none"> <li>● The learner will be able to use the counting principles of permutations or combinations in real world scenarios.</li> </ul>																				
<ul style="list-style-type: none"> <li>● The learner will be able to gather, organize, illustrate, and interpret data; formulate, present, and evaluate inferences and predictions; present and evaluate arguments based on analysis of data; and model situations to find theoretical and experimental probabilities.</li> </ul>																				
<ul style="list-style-type: none"> <li>● The learner will be able to use the ideas of probability and statistics in many different problem solving contexts.</li> </ul>																				
<ul style="list-style-type: none"> <li>● The learner will be able to select, create, and study suitable graphical illustrations for a set of data including pie charts, histograms, stem and leaf plots, scatterplots and/or box and whisker plots.</li> </ul>																				
<ul style="list-style-type: none"> <li>■ The learner will be able to find the median for a real world data set that contains an even number of data points.</li> </ul>																				
<ul style="list-style-type: none"> <li>■ The learner will be able to find the mean of a real world data set containing up to five two-digit numbers.</li> </ul>																				
<ul style="list-style-type: none"> <li>■ The learner will be able to use the Law of Large Numbers.</li> </ul>																				
<ul style="list-style-type: none"> <li>■ The learner will be able to logically argue about potential conclusions that can be supported by data.</li> </ul>																				
<ul style="list-style-type: none"> <li>■ The learner will be able to apply a line of best fit to formulate predictions from real world data.</li> </ul>																				
<ul style="list-style-type: none"> <li>■ The learner will be able to use lines of best fit to make predictions from a set of data.</li> </ul>																				
<ul style="list-style-type: none"> <li>■ The learner will be able to interpret a group of data using the suitable measure of central tendency.</li> </ul>																				
<ul style="list-style-type: none"> <li>■ The learner will be able to apply the idea of randomness in sampling.</li> </ul>																				

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<b>Mathematics</b>																					
■ The learner will be able to justify the sampling method selected to perform a survey.																					
■ The learner will be able to use the counting principles of permutations and combinations applying suitable technology.																					
■ The learner will be able to develop a strategy for gathering real world information for a scientific investigation.																					
■ The learner will be able to critique the validity of statements made in probability situations.																					
■ The learner will be able to use a variety of representations (bar graphs, line graphs, tables, etc.) to display real-world data.																					
<b>Problem Solving</b>																					
■ The learner will be able to select an appropriate solution for a real world division problem involving a remainder that must be considered.																					
■ The learner will be able to evaluate the reasonableness of a given solution.																					
<b>Rational and Irrational Numbers</b>																					
■ The learner will be able to order a group of rational numbers in the appropriate sequence.																					
■ The learner will be able to recognize the opposite of a rational number.																					
■ The learner will be able to study rational number patterns.																					
<b>Real Numbers and the Coordinate Plane</b>																					
● The learner will be able to choose and use an appropriate strategy for computing with real numbers.																					
■ The learner will be able to use the graph of a linear equation to determine the slope.																					
■ The learner will be able to use the graph of a real world linear data set to formulate a prediction.																					
■ The learner will be able to identify points on a coordinate plane.																					
■ The learner will be able to choose the appropriate graphical illustration of a given linear inequality.																					
■ The learner will be able to find solutions to multi-step linear inequalities that illustrate real world scenarios.																					
■ The learner will be able to choose the non-linear graph that represents the given real world scenario or vice versa.																					
■ The learner will be able to explore the relationships																					

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	between a variety of subsets of the real number system.																					
■	The learner will be able to analyze estimated values of real numbers including pi and radical two.																					
■	The learner will be able to select the matching linear graph when given a set of coordinate points.																					
■	The learner will be able to choose the linear graph that represents a given real world situation explained in a narrative (no data set given).																					
■	The learner will be able to choose the linear graph that represents a given real world situation explained in a tabular set of data.																					
■	The learner will be able to choose the graph that illustrates a linear function expressed in slope-intercept form.																					
■	The learner will be able to graph inequalities on the coordinate plane.																					
■	The learner will be able to use the distance formula to find the distance between two coordinate points.																					
■	The learner will be able to compute the distance between two points when given the Pythagorean Theorem.																					