COMMUNITY UNIT SCHOOL DISTRICT 200
ESSENTIAL LEARNINGS- MATH/GIFTED PROGRAM
GRADE 3

THIRD GRADE

Subject expectation 1: **(State Goal 6)**	**Students will be able to demonstrate and apply an understanding of numbers and their operations, including meaning and relationships.**

Essential Learning 1 (Learning Standard A) (Learning Standard D)	Understand numbers, ways of representing numbers, relationships among numbers, and number systems

Critical Content	**6.A.2**	a. represent concretely or symbolically, compare and order • whole numbers to one million • decimals to the hundredths place as related to money
	6.A.2	b. use the place-value structure of the base-ten number system • identify the repeating place-value pattern (ones, tens, hundreds) within the periods • interpret expanded notation
	6.A.2	c. find numbers less than zero by extending the number line
	6.A.2	d. distinguish between prime and composite numbers using manipulatives
	6.A.2 **6.D.2**	e. develop understanding of fractions as parts of unit wholes, as parts of a collection and as locations on number lines

Essential Learning 2 (Learning Standard B)	Understand meanings of operations and how they relate to one another

Critical Content	**6.B.2** **6.B.3a***	a. create representations that show the various meanings of multiplication and division of whole numbers including partial products • equal groups • arrays • area of rectangles
	6.B.2 **6.B.3b***	b. identify and demonstrate relationships between operations using manipulatives • division as the inverse of multiplication • the model of multiplication as repeated addition • compare two models of division including fair share division and repeated subtraction
	6.C.2a **6.B.3c***	c. apply operations and number properties including commutative, associative, distributive, equality and use them to compute with whole numbers
	6.B.2	d. recognize and use zero property in multiplication
	6.C.2a	e. apply the appropriate operation to a real situation
	6.C.2b	f. describe a real situation in which multiplication and division are used and explain its solution

* exceeds state standards as cited
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Essential Learning 3 (Learning Standard C)	Compute fluently and make reasonable estimates

Critical Content

6.B.2

a. demonstrate automatic recall of basic facts through nine
- addition
- subtraction
- multiplication

6.C.2b

b. develop and use strategies to estimate the results of whole number computations and to judge the reasonableness of such results
- use rounding to make estimations

6.B.2 *

c. demonstrate fluency with basic number operations
- addition with *three* * or more addends with and without regrouping
- addition and subtraction with two or three digits with and without regrouping
- multiplication up to one digit times two digits
- addition and subtraction of decimals noted as money

Essential Learning 4 *	Choose appropriate technology/tools

Critical Content ***

a. select appropriate methods and tools, according to the context, for computing
- mental computation
- estimation
- calculators
- and paper and pencil

Essential Learning 5 *	Recognize the connections between number sense and other math strands

Critical Content

Essential Learning 6 *	Construct and communicate convincing arguments

Critical Content ***

a. demonstrate correct usage of the language related to number sense, product, factors, rounding, regrouping, expanded notation, digit vs. number, face value vs. place-value, zero property, equality

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b. make and test conjectures and form generalizations about number sense
- the larger the divisor, the smaller the quotient and vice versa

6.C.2b

c. show evidence that computational results using whole numbers are correct and/or that estimates are reasonable

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THIRD GRADE:

Subject Expectation 2 (State Goal 7)	**The student will be able to estimate, make and use measurements of objects, quantities and relationships and determine acceptable levels of accuracy.**

Essential Learning 1 (Learning Standard A)	Understand measurable attributes of objects and the units, systems, and process of measurement

Critical Content

7.A.2a a. recognize the measurable attribute

- geometric attributes: length, area and volume
  - estimate, compare and measure length, width, perimeter and area of shapes
  - determine the number of cubes needed to fill a variety of rectangular solids

7.A.3a*
- capacity
  - compare two or more containers in terms of their capacities including ounce, cups, pints, quarts, gallons, milliliters and liters

7.A.2a
- weight/mass
  - compare two or more objects according to weight (mass) including ounce, pound and ton

7.A.3b*
- temperature
  - understand degrees Fahrenheit and Celsius as a unit of measure

7.A.2b
- money
  - find equivalent collections of coins
  - use decimals and symbols to appropriately represent money
  - make change up through $1,000

7.A.3b*
- time
  - identify and order months of the year/days of the week
  - measure time in days, weeks, months, years, decades and centuries
  - read and write digital time
  - read and illustrate time on an analog clock to one minute intervals
  - estimate the passage of time
  - construct a time line

7.A.2a b. compare and order objects

7.A.2a c. use non-standard* and standard measurements

7.A.3b* d. recognize and apply appropriate benchmarks for an attribute *such as* the boiling point or freezing point, right angle and half past the hour

7.B.3* e. select appropriate unit or tools for the attribute being measured

7.A.3b* f. explore the value of measuring with standard units: customary and metric

7.A.2a g. compare the relationships among the various units within a system

7.A.2a h. compute simple unit conversions within a system of measurement, *such as* centimeter to meter

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Essential Learning 2 (Learning Standard B) (Learning Standard C)	Apply appropriate techniques, tools and formulas to determine measurements

Critical Content

7.B.3* a. select appropriate units and tools for the attribute to be measured

7.B.3* b. demonstrate an accurate use of tools to determine measurement

- geometric attributes
  - ruler, yardstick, meter stick, trundle wheel and tape measure
- capacity
  - graduated cylinders, various containers
- weight/mass
  - balance, customary scale
- temperature
  - variety of thermometers
- money
  - money manipulatives
- time
  - calendar, digital clock, analog clock

9.C.2
7.A.4b* *c.* develop and use strategies for finding area, perimeter of rectangles and squares culminating in the *determination of appropriate formulas**

Essential Learning 3 *	Recognize the connections between measurement and other math strands

Critical Content

Essential Learning 4 *	Construct and communicate convincing arguments and proofs to solve problems

Critical Content

***** a. defend the value of measuring with standard units in customary and metric systems

***** b. make and test conjectures about measurement properties and relationships *such as*

- form generalization that the smaller the unit, the more you need and vice versa
- recognize the transitive relationship in ordering objects according to some attribute *such as* a>b and b>c leads to a>c

* c. demonstrate correct usage of the language related to measurement

* d. develop logical arguments to justify conclusions about topics *such as* formulas for perimeter and area

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THIRD GRADE

Subject Expectation 3 (State Goal 8)	**The student will be able to use algebraic and analytical methods to identify and describe patterns and relationships in data, solve problems and predict results.**

Essential Learning 1 (Learning Standard A) (Learning Standard B)	Understand patterns, relations, and functions

Critical Content	**8.A.2a**	a.	describe, extend and create geometric and numeric patterns
	8.A.2a	b.	represent and analyze patterns and functions using words, tables and graphs
	8.A.2a	c.	relate and compare different forms of representation for a relationship
	8.B.2	d.	analyze a geometric pattern and express the results numerically

Essential Learning 2 (Learning Standard C)	Represent and analyze mathematical situations and structures using algebraic symbols

Critical Content	**8.C.2**	a.	explain operations and number properties including commutative, associative, distributive, equality and use them to compute with whole numbers
	8.A.2b	b.	construct and solve number sentences using a variable to represent an unknown quantity
	*****	c.	express mathematical relationships *using equations**

Essential Learning 3 (Learning Standard D)	Use mathematical models to represent and understand quantitative relationships and solve problems

Critical Content	**8.D.3a***	a.	model and solve real life problems using various representations including (but not limited to) objects, graphs and tables

Essential Learning 4 *	Use problem solving to analyze change in real life situations

Critical Content	*****	a.	investigate how a change in one variable relates to a change in a second variable using objects, tables and graphs
	*	b.	identify and describe situations with constant rates of change and compare them
	8.D.2	c.	solve linear equations involving whole numbers in real life situations

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Essential Learning 5 *	Choose appropriate technology/tools for algebraic representation

Critical Content ***** a. use manipulatives, *such as* Algebra Tiles, Hands On Equations, etc., to solve linear equations

Essential Learning 6 *	Recognize the connections between algebra and other math strands

Critical Content

***** a. apply the commutative and associative properties for addition
***** b. apply the commutative property for multiplication
***** c. explore the associative property for multiplication
***** d. use opposite operations to find missing numbers in equations
***** e. observe patterns in our environment, *such as* Fibonacci numbers
***** f. find, describe, extend and create patterns using manipulatives/numbers/letters/hundreds charts/arrays with an emphasis on number sense)
***** g. find, describe, extend and create geometric patterns using tessellations
***** h. recognize patterns of odd/even numbers

Essential Learning 7 *	Construct and communicate convincing arguments and proofs to solve problems

Critical Content

***** a. demonstrate correct usage of the language related to algebra, including constants, variables, commutative, associative, distributive, and equality
***** b. demonstrate correct usage of the language related to patterns including skip counting
***** c. develop logical arguments to justify conclusions about topics *such as* unknown quantities
***** d. identify the rule used to generate a pattern
***** e. make and test conjectures about algebra properties as seen in the patterns developed

THIRD GRADE:

Subject expectation 4 (State Goal 9)	**The student will use geometric methods to analyze, categorize and draw conclusions about points, lines, planes and space.**

Essential Learning 1 (Learning Standard A) (Learning Standard B)	Analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships

Critical Content	**9.A.1a 9.B.2 ***	a. identify, compare, order *and analyze** attributes of regular and non-regular polygons (convex and non-convex) and circles/ellipses up to 12-sided figures
	9.A.1a 9.B.2 & *	b. identify, compare, order and *analyze** attributes of 3-dimensional figures including sphere/cone/cylinder/pyramid/rectangular prism
	9.B.2	c. explore concepts of congruence and similarity
	*****	d. develop and use vocabulary to describe attributes of 2-dimensional figures including angles, sides, vertices
	*****	e. develop and use vocabulary to describe attributes of 3-dimensional shapes including faces, vertices, edges
	*****	f. recognize shapes that do and do not tessellate

Essential Learning 2 *	Specify locations and describe spatial relationships using coordinate geometry and (or) other representational systems

Critical Content	*****	a. make and use coordinate systems to specify locations and to describe paths
	*****	b. make representations of polygons using tools *such as* geoboards, dot paper, power blocks, grid paper and pattern blocks

Essential Learning 3 (Learning Standard C)	Use visualization, spatial reasoning and geometric modeling to solve problems

Critical Content	*****	a. examine polygons to determine whether or not they can be put into patterns without gaps and overlaps (tessellate)

Essential Learning 4 *	Apply transformations and use symmetry to analyze mathematical situations

Critical Content	**9.A.3b***	a. transform it into shapes that will tessellate
	*****	b. predict and describe results of sliding, flipping, and turning 2-dimensional shapes
	9.A.3c*	c. identify and describe line symmetry in 2-dimensional shapes and designs
	9.A.3c*	d. identify and describe rotational symmetry in 2-dimensional shapes and designs

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Essential Learning 5 *	Recognize the connections between geometry and other math strands

Critical Content *

a. construct models showing connections between geometry and square and triangular numbers

Essential Learning 6 (Learning Standard C)	Construct convincing arguments and proofs to solve problems

Critical Content 9.C.2

a. make and test conjectures about geometric properties and relationships and develop logical arguments to justify conclusions

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THIRD GRADE

Subject Expectation 5 (State Goal 10)	**The student will select, organize and analyze data using statistical methods; predict results; and interpret uncertainty using concepts of probability.**

Essential Learning 1 (Learning Standard A) (Learning Standard B)	Develop concepts of data collection and analysis

Critical Content

10.B 2a **10.B.2b** **10.B.2b** **10.B.2c** **10.B.2d** **10.B.2d** **10.A.2b**	a. use the steps to solve for problems • identify the problem (question) • collect/gather data • organize and display the data • analyze the data • make and test conjectures about data • draw conclusions
	b. develop strategies using manipulatives to determine mean, median and mode
10.A.2b	c. identify mean, median, mode and range using a data set (given or collected)
10.B.2d	d. read and interpret data represented on a tally chart, a bar graph, a circle graph, a line plot, a pictograph, a line graph and a stem and leaf plot
10.A.3a*	e. display and analyze data using line plots, bar graphs and circle graphs
*****	f. move from noticing individual features of the data to describing the overall shape of the data distribution
10.A.2c	g. make predictions and decisions based on data and communicate their reasoning

Essential Learning 2 (Learning Standard C)	Develop the concept of probability

Critical Content

10.C.2d	a. explore experimental probability through a series of data collection experiments (simple events) that are recorded and analyzed *such as* coin toss, spinners, dice and computer games
*****	b. make a connection between theoretical probability and experimental probability through repetition of each of the experiments
10.C.2b	c. describe events as likely or unlikely and discuss the degree of likelihood using words, *such as* certain, equally likely and impossible
10.C.2b	d. understand that the measure of the likelihood of an event can be represented by a number on a scale from 0 to 1
10.C.1b	e. chart/list combinations of possible outcomes

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Essential Learning 3*	Choose appropriate tools for data collection and representation

Critical Content	**10.B.2c**	a.	use technology, *such as* Math Keys, to show and analyze data

Essential Learning 4*	Recognize the connections between data collection and probability and other math strands

Critical Content	*****	a.	connect the concept of mean to fair share division
	*****	b.	connect the concept of the scale of probability to ratio
	*****	c.	connect number scale 0-1 to fractions

Essential Learning 5*	Construct and communicate convincing arguments and proofs to solve problems

Critical Content	*****	a.	demonstrate correct usage of the language related to data collection and probability including mean, median, mode, range, cluster, gap, interval, outliers and extrapolate
	10.A.2c	b.	discuss possible outcomes of experiments
	10.A.3c*	c.	make and test conjectures about data/probability properties and relationships *such as* different measures of central tendency reveal different aspects of data distribution
	10.A.3c*	d.	develop logical arguments to justify conclusions about topics including the shape of data

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Math Curriculum for the Replacement Program Grades 3,4, and 5

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