CDA KINDERGARTEN MATHEMATICS

STANDARDS & INSTRUCTION GUIDE

2025

NUMBER SENSE	CURRICULUM GUIDELINES	CORE CONCEPTS	RESOURCES
_____M.K.1	Apply problem-solving strategies to contextual situations to create and solve mathematical questions.	a. Trial and error b. Picture or object graphs c. Diagrams d. Patterns e. Use of manipulatives f. Storytelling g. Guess and test	
_____M.K.2	Problem-solve in each math area as well as in other curriculum areas.	a. Cross-curricular connections	• Calendar • Weather
_____M.K.3	Express mathematical ideas orally and in writing, using proper vocabulary terms.		
_____M.K.4	Recognize and write numerals 1 to 31.		
_____M.K.5	Count by 1s.	a. Count to 100. b. Count backwards from 20.	
_____M.K.6	Identify ordinals to tenth.		
_____M.K.7	Use one-to-one correspondence to determine how many are in a given set of 30 or fewer objects.		

_____M.K.8	Recognize sets through 31 and identify corresponding numerals.		
_____M.K.9	Recognize zero quantity.		
_____M.K.10	Relate physical materials, pictures, and diagrams to mathematical ideas.		
COMPUTATION AND FLUENCY	**CURRICULUM GUIDELINES**	**CORE CONCEPTS**	**RESOURCES**
_____M.K.11	Use manipulatives, drawings, words, and/or numbers to compose and decompose numbers less or equal to 10 in a variety of ways.		
_____M.K.12	Model and identify the number that makes 10 when added to a given number less or equal to 10.		
_____M.K.13	Recognize and describe with fluency part-part-whole relationships for numbers up to 10 in a variety of configurations.		
MEASUREMENT	**CURRICULUM GUIDELINES**	**CORE CONCEPTS**	**RESOURCES**
_____M.K.14	Indicate the ordered position of three objects and/or pictures from left-to-right, top-to-bottom, and/or bottom-to-top.		
_____M.K.15	Explore the meaning of inside and outside.		

____M.K.16	Recognize the concept of time for hour and half-hour using analog and digital clocks.		
____M.K.17	Locate numbers on calendar (day, month, and year).		
____M.K.18	Name and sequence the days of the week and the months of the year.		
____M.K.19	Recognize penny, nickel, dime, and quarter from either side of the coins.		
____M.K.20	Utilize coins to develop counting skills and money awareness.		
____M.K.21	Compare lengths and heights (long, short, and tall), using non-standard units.		
____M.K.22	Compare weight (light and heavy), using scales and balances.		
____M.K.23	Recognize the use of the thermometer to measure and compare temperatures.		
GEOMETRY	**CURRICULUM GUIDELINES**	**CORE CONCEPTS**	**RESOURCES**
____M.K.24	Recognize one-half and one-fourth.		
____M.K.25	Identify, describe, compare, and construct plane figures (rectangles, squares, triangles, circles, and ovals).	a. 3D figures, sphere, prism, cylinder, rectangle, cube, pyramid	
____M.K.26	Connect line segments to form basic figures using numbers up to 31.		

DATA ANALYSIS AND PROBABILITY	CURRICULUM GUIDELINES	CORE CONCEPTS	RESOURCES
_____M.K.27	Relate physical materials, pictures, and diagrams to mathematical ideas.		• Use manipulatives.
_____M.K.28	Identify whether the number of objects in one group is greater than, less than, or equal to the number of objects in another group.		
_____M.K.29	Understand and use the concept of estimation, educated guess.		
_____M.K.30	Select a reasonable quantity given a 1-digit numeral, a 2-digit numeral, and a 3-digit numeral (e.g. 5, 50, and 500) .	a. Ones, tens, and hundreds places	
_____M.K.31	Collect, organize, and describe data by counting and tallying.		
_____M.K.32	Read and interpret displays of data (bar graphs, pictographs, and tables).		
_____M.K.33	Understand the concept of chance (i.e. by investigating and describing the result of a two-colored counter or using a multi-colored spinner).		• Use manipulatives such as colored marbles, shapes, plastic bear, etc.

PATTERNS, FUNCTIONS AND ALGEBRA	CURRICULUM GUIDELINES	CORE CONCEPTS	RESOURCES
M.K.34	Sort and classify objects according to similar attributes (size, shape, color).		
M.K.35	Identify, describe, and extend a repeating relationship (pattern) found in common objects, sounds, and movements.		

Kindergarten Math Vocabulary

Comparing numbers:
more/less
equal or same

Addition:
together
and
add
part + part= whole
written in horizontal form

Subtraction:
take away
how much is leftover
whole – part = part

Fractions:
Whole
Half, one-fourth
recognize how shape is shaded
Ordinal Numbers:
1st - 10th
Place Value:
1's 10's 100's as relate to calendar

Graphing:
tally marks
bar graphs
picture graphs
tables
more, less, same or equal with graphs

Measurement:
longer
shorter
taller
light
heavy
comparing with more, less, same, hot cold, warm

Time:
analog/digital
hour and half hour
hour hand
minute hand
morning, afternoon, evening, night, day, week, month, year

Money:
pennies, nickels, dime, quarter, cents, dollars
value
equal amounts

Estimation:
educated guess
estimate
estimate the quantity
about

NUMBER SENSE	CURRICULUM GUIDELINES	CORE CONCEPTS	RESOURCES
_____M.1.1	Apply problem-solving strategies to contextual situations to create and solve mathematical questions.	a. Trial and error b. Lists and tables c. Diagrams d. Patterns e. Role playing f. Guess and test g. Use manipulatives h. Simplify the problem i. Write an equation/number sentence j. Estimation	
_____M.1.2	Problem-solve in each math area as well as in other curriculum areas.		Expand cross-curricular connections: • Calendar • Weather • Science
_____M.1.3	Relate physical materials, pictures, and diagrams to mathematical ideas.		
_____M.1.4	Express mathematical ideas orally and in writing, using proper vocabulary terms.		
_____M.1.5	Relate every-day language to mathematical language and symbols.		

____M.1.6	Identify number words from zero to twenty.		
____M.1.7	Utilize flexible counting strategies to determine and describe quantities up to 120.		
____M.1.8	Count to 120, starting at any number less than 120. In this range, read and write numerals and represent a number of objects with a written numeral.		
____M.1.9	Count backward by 1s from any number 30 or less.		
____M.1.10	Use a variety of tools (objects, 120 chart) to represent forward counting patterns when counting by groups of 5s and 10s to 120.		• 120 charts • Number line • Manipulatives
____M.1.11	Use a variety of tools (objects, 120 chart) to represent forward counting patterns when counting by groups of 2 to at least 30.		
____M.1.12	Group a collection of up to 120 objects into tens and ones, and count to determine the total (e.g., 5 groups of ten and 6 ones is equal to 56 total objects.		
____M.1.13	Identify pennies, nickels, dimes and quarters by their attributes and identify the number of pennies equivalent to a nickel, dime or quarter.		
____M.1.14	Count by 1s, 5s, and 10s to determine the value of a mixed collection of coins (pennies, nickels, dimes and/or quarters) whose total value is 100 cents or less.		

____M.1.15	Use concrete or pictorial representation to express a number up to 120 using tens and ones and write the corresponding numeral.		
____M.1.16	Given any two-digit number, identify the number of groups of tens and ones and justify answer.		
____M.1.17	Identify equivalent and non-equivalent sets.		
____M.1.18	Compare two whole number between 0 and 120 using symbols (>, <, =) and words.		• Base 10 blocks, rods and cubes
____M.1.19	Order three sets (up to 120 each) from least to greatest and from greatest to least.		
____M.1.20	Describe equal shares of a whole (halves or quarters) when given a word problem.		
____M.1.21	Represent and name halves and fourths of a whole using a region/area model and a set model.		• Pie pieces, drawings, cubes, counters
____M.1.22	Understand zero quantity and use in number sentences, 12+0=12.		
____M.1.23	Recognize place value through hundreds.		
COMPUTATION AND FLUENCY	**CURRICULUM GUIDELINES**	**CORE CONCEPTS**	**RESOURCES**
____M.1.24	Understand the basic relationship between addition and subtraction.		• Related facts • Fact families

____M.1.25	Use manipulatives and/or strategies to show addition and subtraction problems through 20.		• Counters • Ten frames
____M.1.26	Use horizontal and vertical notation.		• Dice • Dominoes
____M.1.27	Recognize and describe with fluency, part-part-whole relationships for numbers up to **20** in a variety of configurations.		
____M.1.28	Utilize a strategy to solve an addition or subtraction problem within **20**.		• Count on/back, doubles, make ten • Ten frames • Number line • Draw a picture
____M.1.29	Recall with automaticity addition and subtraction facts within 12.		
____M.1.30	Represent, solve, and justify solutions to single-step addition and subtraction problems (join, separate, and part-part- whole) within 20, including those in context, using words, objects, drawings or numbers .		
____M.1.31	Solve for the unknown number that will result in a sum or difference of 10 or 20. (e.g., 12-__=10 or 10 + __ =20).		
____M.1.32	Identify and use + as a symbol for addition and - as a symbol for subtraction.		
____M.1.33	Describe the equal symbol (=) as a balance representing that both sides of an equation are the same.		

____M.1.34	Use concrete materials to model, identify and justify an equation that represents the relationship of two expressions of equal value or non-equal value.		• Balance scale • Blocks, Base 10 Blocks • Counters
____M.1.35	Use addition or subtraction to write an equation to solve an oral, written, or pictorial problem.		
____M.1.36	Understand the concept of missing numerals in addition and subtraction problems having sums or differences no greater than 20.		
MEASUREMENT	**CURRICULUM GUIDELINES**	**CORE CONCEPTS**	**RESOURCES**
____M.1.37	Use standard and nonstandard units to measure and compare the lengths of two or more objects using longer/shorter, taller/shorter or the same as.		• Paperclips • Cubes
____M.1.38	Measure length to the nearest inch and nearest centimeter and measure volume capacity to the nearest pint, quart, and liter.		
____M.1.39	Use standard and nonstandard units to measure and compare the weights (using a balance/pan scale) of two objects using the terms lighter, heavier, or the same as.		• Balance scale
____M.1.40	Use nonstandard units to measure and compare the volume capacities of two containers using the terms more, less, or the same as.		• Jelly beans • Sand • Water • Rice

____M.1.41	Measure the length, weight, or volume of the same object or container with two different units and describe how and why the measurements differ.		
____M.1.42	Measure temperature in degrees Fahrenheit**.**	a. See science standards for cross-curricular ideas.	
____M.1.43	Identify clocks (analog and digital) and calendars as tools to measure time.		• Analog and digital clocks • Calendar
____M.1.44	Describe the units of time represented on a clock as minutes and hours.		
____M.1.45	Tell time to the hour and half hour using analog and digital clocks.		
____M.1.46	Match the time shown on a digital clock to an analog clock to the hour and half-hour.		
____M.1.47	Identify days, weeks, and months on a calendar, to include specific days/dates. (e.g., What date is Thursday? How many Sundays are in October?).		• Calendar
____M.1.48	Use ordinal numbers first through tenth to describe the relative position of specific days/dates (e.g., What is the first Monday in October? What day of the week is May 6th?).		

_____M.1.49	Determine the day/date before and after a given day/date (e.g., Today is the 8th, so yesterday was the?), and a date that is a specific number of days/weeks in the past or future (e.g., Tim's birthday is in 10 days, what will be the date of his birthday?).		
GEOMETRY	**CURRICULUM GUIDELINES**	**CORE CONCEPTS**	**RESOURCES**
_____M.1.50	Identify and describe triangles, squares and rectangles using the terms sides, vertices, and angles. Identify and describe circles using terms such as round and curved.		
_____M.1.51	Sort and classify plane figures according to similar attributes (sides, vertices, angles).		
_____M.1.52	Draw and name the plane figure (circle, square, rectangle, triangle) when given information about the number of sides, vertices, and angles.		
_____M.1.53	Identify, name and describe representations of objects in the environment that depict geometric figures (triangle, rectangle, square and circle) regardless of orientation, in different environments and explain reasoning.		
_____M.1.54	Recognize and name the angles found in rectangles and squares as right angles.		
_____M.1.55	Compose larger plane figures by combining two or three simple plane figures (triangles, squares, and/or rectangles).		
_____M.1.56	Identify geometric solids (pyramid, sphere, cone, cylinder, cube, rectangular solid).		

_____M.1.57	Recognize symmetry in two-dimensional objects.		
DATA ANALYSIS AND PROBABILITY	**CURRICULUM GUIDELINES**	**CORE CONCEPTS**	**RESOURCES**
_____M.1.58	Use estimation with quantities, measurement and problem solving.		
_____M.1.59	Investigate, identify, and describe various forms of data collection in real world (e.g. recording, daily temperature, lunch count, attendance, favorite foods).		• Counting objects, drawing pictures, tallying, T-charts
_____M.1.60	Pose questions, given a predetermined context, that require the collection of data (limited to 25 or fewer data points for no more than four categories).	a. Determine and collect the data needed to answer a posed question using various methods. b. Organize and represent a data set by sorting the collected data using various methods.	
_____M.1.61	Represent a data set (vertically or horizontally) using object graphs, pictographs, and tables.	a. Analyze data represented in object pictographs and tables (e.g. total number of data points represented, how many in each category, how many more or less are in one category than another) and draw conclusions and make predictions based on the data.	• Graphs • Pictographs • Tables

____M.1.62	Understand the concept of chance at a basic level.		• Two-colored counters • Spinners
PATTERNS, FUNCTIONS AND ALGEBRA	**CURRICULUM GUIDELINES**	**CORE CONCEPTS**	**RESOURCES**
____M.1.63	Sort and classify concrete objects into appropriate subsets (categories) based on one or more attributes, including color, size, shape, and/or thickness.	a. Sort a set of objects that are both red and thick.	
____M.1.64	Describe and label attributes of a set of objects that has been sorted.		
____M.1.65	Recognize, describe, extend, create or transfer a repeating or increasing pattern using objects, colors, movement, pictures, or geometric figures.		

NUMBER SENSE AND ESTIMATION	CURRICULUM GUIDELINES	CORE CONCEPTS	RESOURCES
_____M.2.1	Apply the following strategies to solve real-life problems:	a. Trial and error b. Lists and tables c. Diagrams d. Patterns e. Role playing f. Guess and test g. Use manipulatives h. Simplify the problem i. Write an equation j. Estimation	
_____M.2.2	Explain and justify answers.		
_____M.2.3	Use calculator for appropriate activities.	a. Computer literacy	• Computer, apps, websites
_____M.2.4	Problem-solve in each math area as well as in other curriculum areas.		
_____M.2.5	Create his/her own problems from every-day situations.		
_____M.2.6	Express mathematical ideas orally and in writing, using proper vocabulary terms.		• Problem-solving across subject areas
_____M.2.7	Relate every-day language to mathematical language and symbols.		

_____M.2.8	Read, write, and understand the magnitude of numbers through 1,000.	a. Demonstrate an understanding of the ten-to-one relationships of the base 10 number system to represent, compare, and order whole numbers up to 999.	
_____M.2.9	Write the three-digit whole number represented by a given model.		• Concrete objects, pictures of base 10 blocks
_____M.2.10	Read, write, and represent three-digit numbers in standard form, expanded form, and word form, using concrete or pictorial representations.		
_____M.2.11	Apply patterns within the base 10 system to determine and communicate, orally and in written form, the place (ones, tens, hundreds) and value of each digit in a three-digit whole number.	a. 5 items=50 b. 50 items= 500	
_____M.2.12	Investigate and explain the ten-to-one relationships among ones, tens, and hundreds, using models.	a. In 352, the 5 represents 5 tens and its value is 50.	
_____M.2.13	Construct and deconstruct whole numbers up to 200 by making connections between a variety of models and counting strategies.	a. 156 can be 1 hundred, 5 tens, 6 ones; 1 hundred, 4 tens, 16 ones; 15 tens, 6 ones.	

_____M.2.14	Plot and justify the position of a given number up to 100 on a number line with intervals of 1s, 2s, 5s, 10s, or 25s.		
_____M.2.15	Compare two whole numbers, each 999 or less, represented concretely, pictorially, or symbolically.		
_____M.2.16	Order up to three whole numbers, each 999 or less, represented concretely, pictorially, or symbolically from least to greatest and greatest to least.	a. Using words (great than, less than, or equal to) and symbols (>,<,or=). Justify reasoning orally, in writing, or with a model.	
_____M.2.17	Skip count by 2s, 3s, 4s, 5s, and 10s up to 100.		
_____M.2.18	Read and understand the meaning of ordinal numbers to 50.		
_____M.2.19	Master the concept of comparing two whole numbers using symbols (“>”, “<”, “=”), and words (“greater than”, “less than”, or “equal to”).		
_____M.2.20	Identify part of a set and/or region that represents ½, ⅓, ¼, ⅕, ⅛, and write the corresponding fraction.		
_____M.2.21	Divide shapes into fractional parts (½, ⅓, ¼, ⅕ , ⅛).		
_____M.2.22	Use mathematical reasoning and justification to solve contextual problems that involve partitioning models into equal-sized parts (halves, fourths, eighths, thirds).		
_____M.2.23	Model and describe fractions as representing equal-size parts of a whole.		

_____M.2.24	Describe the relationship between the number of fractional parts needed to make a whole and the size of the parts (i.e., as the whole is divided into more parts, each part becomes smaller).		
_____M.2.25	Compose the whole for a given fractional part and its value (in context) for halves, fourths, eighths, thirds (e.g., when given $\frac{1}{4}$, determine how many pieces would be needed to make $\frac{4}{4}$).	a. Identify a unit fraction and how many parts.	
_____M.2.26	Using same-size fraction pieces, from a region/area model, count by unit fractions up to two wholes.	a. (e.g., Zero one-fourths, one one-fourth, two one-fourths, three one-fourths, four one-fourths, five one-fourths; or zero-fourths, one-fourth, two-fourths, three-fourths, four-fourths, five-fourths)	• Region/area models (e.g., pie pieces, pattern blocks, geoboards) • Length models (e.g., paper fraction strips, fraction bars, rods, number lines) • Set models (e.g., chips, counters, cubes)
_____M.2.27	Compare unit fractions for halves, fourths, eighths, thirds using words (greater than, less than or equal to) and symbols (>, <, =), with region/area and length models.		
_____M.2.28	Identify the place value of each digit in a 3-digit numeral.		
_____M.2.29	Recognize odd and even numbers up to 50.		
_____M.2.30	Relate physical materials, pictures, and diagrams to mathematical ideas.		

COMPUTATION AND FLUENCY	CURRICULUM GUIDELINES	CORE CONCEPTS	RESOURCES
_____M.2.31	Master basic addition facts, sums to 20 or less, and the corresponding subtraction facts.		
_____M.2.32	Add and subtract multiples of 100.		
_____M.2.33	Solve addition and subtraction problems using data. Problems will require a one-step solution.		• Charts and picture graphs
_____M.2.34	Be given a simple addition or subtraction fact, recognize and describe the inverse relationship between addition and subtraction (e.g.: 12+ ___= 20; 20- _____ = 12 ; 20 - _____=8) through the use of fact families.		
_____M.2.35	Solve addition equations up to three two-digit numbers.		
_____M.2.36	Find the sum and difference of two whole numbers, each 999 or less, using various methods of calculation problems involve both regrouping and no regrouping.		• Mental computation • Concrete materials • Paper and pencil
_____M.2.37	Understand and apply zero property of addition.		
_____M.2.38	Show multiplication by joining equivalent sets.		

_____M.2.39	Relate addition to multiplication, and subtraction to division.		
_____M.2.40	Multiply by 2, 3, 4, and 5, products to 25.		
_____M.2.41	Solve problems by completing a numerical sentence involving the basic facts for addition and subtraction. Examples include: 5 + __ = 20; or 15 - __ = 20. Students will create story problems using the numerical sentences.		
MEASUREMENT, MONEY, AND TIME	**CURRICULUM GUIDELINES**	**CORE CONCEPTS**	**RESOURCES**
_____M.2.42	Demonstrate an understanding of the concept of time to the nearest five minutes, using analog and digital clock.		
_____M.2.43	Identify the number of minutes in an hour (60 minutes) and the number of hours in a day (24 hours).		
_____M.2.44	Determine the unit of time (minutes, hours, days, or weeks) that is most appropriate when measuring a given activity or context and explain reasoning (e.g., Would you measure the time it takes to brush your teeth in minutes or hours?).		
_____M2.45	Show, tell, and write time to the nearest five minutes, using analog and digital clocks.		

_____M2.46	Match a written time (e.g., 1:35, 6:20, 9:05) to the time shown on an analog clock to the nearest five minutes.		
_____M.2.47	Recognize and explain elapsed time.		
_____M.2.48	Count, compare, and make change, using a collection of coins and one-dollar bills.		
_____M2.49	Solve problems that involve counting and representing money amounts up to $2.00.		
_____M2.50	Identify a quarter and its value and determine multiple ways to represent the value of a quarter.		
_____M2.51	Count by ones, fives, tens, and twenty-fives to determine the value of a collection of mixed coins and one-dollar bills whose total value is $2.00 or less.		• Use pennies, nickels, and/or dimes.
_____M2.52	Construct and represent the value of a collection of coins and one-dollar bills (limited to $2.00 or less) using the cent (¢) and dollar ($) symbols and decimal point (.).		
_____M.2.53	Identify the correct usage of the cent symbol (¢), dollar symbol ($), and decimal point(.).		
_____M.2.54	Estimate and then use a ruler to make linear measurements to the nearest centimeter, meter, inch, and foot, including the distance around a polygon (determine perimeter).		

_____M.2.55	Estimate and then determine weight of familiar objects in pounds using a scale and estimate and then determine mass of familiar objects in grams and kilograms, using a balance.		
_____M.2.56	Estimate and count the number of cubes in a rectangular box (determine volume).		
_____M.2.57	Use measuring devices to compare metric and U.S. customary units (Cups, pints, quarts, gallons, and liters) for measuring liquid volume using the concepts of more, less, and equivalent.		
_____M.2.58	Measure temperature in degrees Fahrenheit and degrees Celsius.		
_____M.2.59	Estimate and determine the number of square units of a given surface.		• Grid paper
GEOMETRY	**CURRICULUM GUIDELINES**	**CORE CONCEPTS**	**RESOURCES**
_____M.2.60	Relate physical materials, pictures, and diagrams to mathematical idea.		
_____M.2.61	Identify and describe a cube, rectangular solid, sphere, cylinder, pyramid, and cone, according to the number and shape of faces, edges, bases and corners (vertices) by using models and/or geoboards.		
_____M.2.62	Compare and contrast plane and solid geometric shapes (circle/sphere, square/cube, triangle/pyramid, and explain relationship with congruency. Understand rectangle/rectangular solid) by using models and/or geoboard.	a. Trace faces of solid figures (cubes and rectangular prisms) to create the set of plane figures related to the solid figure.	

_____M2.63	Compare and contrast models and nets (cutouts) of cubes and rectangular prisms (e.g., number and shapes of faces, edges, vertices).		
_____M2.64	Given a concrete or pictorial model, name and describe the solid figure (sphere, cube, and rectangular prism) by its characteristics (e.g., number of edges, number of vertices, shapes of faces).		
_____M.2.65	Demonstrate, using concrete models, how an object can slide, flip, or turn.		
DATA ANALYSIS AND PROBABILITY	**CURRICULUM GUIDELINES**	**CORE CONCEPTS**	**RESOURCES**
_____M.2.66	Read, construct, and interpret displays of data (bar graphs, pictographs, line graphs and tables).		
_____M.2.67	Explore and record concepts of chance using spinners and colored tiles/cubes, and use the data to predict which of two events is more likely to occur if the experiment is repeated.		
_____M.2.68	Apply the data cycle (pose questions; collect or acquire data; organize and represent data; and analyze data and communicate results) with a focus on pictographs and bar graphs.	a. Organize and represent a data set using a bar graph with a title and labeled axes (limited to 25 or fewer data points for up to six categories, and limit increments of scale to multiples of 1 or 2).	

_____M.2.69	Determine the data needed to answer a posed question and collect the data using various methods.	a. Identify, create, and extend a wide variety of patterns, using symbols and objects.	• Voting • Creating lists, tables, or charts • Tallying
_____M.2.70	Organize and represent a data set using a pictograph where each symbol represents up to 2 data points. Determine and use a key to assist in the analysis of the data.		
_____M.2.71	Analyze data represented in pictographs and bar graphs and communicate results.	a. Ask and answer questions about the data represented in pictographs and bar graphs (e.g., total number of data points represented, how many in each category, how many more or less are in one category than another). Pictograph keys will be limited to symbols representing 1, 2, 5, or 10 pieces of data and bar graphs will be limited to scales with increments in multiples of 1, 2, 5, or 10.	
_____M.2.72	Draw conclusions about the data and make predictions based on the data.		

PATTERNS, FUNCTIONS AND ALGEBRA	CURRICULUM GUIDELINES	CORE CONCEPTS	RESOURCES
_____M.2.73	Recognize number patterns in sequence.		
_____M.2.74	Identify, create, and extend a wide variety of patterns using symbols and objects. Explain the connection between the two patterns.	a. Transfer a given repeating or increasing pattern from one form to another (e.g., objects, pictures, numbers).	

NUMBER SENSE AND ESTIMATION	CURRICULUM GUIDELINES	CORE CONCEPTS	RESOURCES
_____M.3.1	Problem-solve in each math area as well as in other curriculum areas.	a. Trial and error b. Lists and tables c. Diagrams d. Patterns e. Guess and test f. Estimate g. Simplify h. Manipulatives	
____M.3.2	Create his/her own problems from every-day situations.		
____M.3.3	Relate physical materials, pictures, and diagrams to mathematical ideas.		
____M.3.4	Express mathematical ideas orally and in writing, using proper vocabulary terms.		
____M.3.5	Count, read, and write whole numbers up to 999,999.		
____M.3.6	Identify the place value of each digit up to 999,999.		
____M.3.7	Round 2 and 3-digit numbers to the nearest ten, and round 3-digit numbers to the nearest hundred and nearest thousand.		

____M.3.8	Compare whole numbers through hundred thousand utilizing symbols ">", "<", "="and words "greater than", "less than," and "equal to." Arrange them in order.		
____M.3.9	Recognize and use the inverse relationships of addition/subtraction and multiplication/division to complete basic fact sentences.		
____M.3.10	Identify Roman Numerals to 1,000.		
COMPUTATION AND FLUENCY	**CURRICULUM GUIDELINES**	**CORE CONCEPTS**	**RESOURCES**
____M.3.11	Use estimation strategies by rounding to nearest ten, hundred, and thousand for all four operations.		
____M.3.12	Use 0 as a placeholder.		
____M.3.13	Find the sums and differences of two whole numbers (9,999 or less), with and without regrouping.		• Paper and pencil, estimation, and mental computation • Technology is to be used, at times, to check answers.
____M.3.14	Subtract across zeros with at least 4- and 5-digit numbers.		
____M.3.15	Solve addition equations with three or more addends.		

_____M.3.16	Use word clues to determine which of the four operations to use in problem solving.		
_____M.3.17	Solve one and two step word problems.		
_____M.3.18	Determine, by counting, the value of a group of bills and coins up to five dollars, compare the value of coins and bills and make change.		
_____M.3.19	Express monetary values using cent (¢), dollar ($), and decimal points.		
_____M.3.20	Use mental computation for all four operations.		
_____M.3.21	Identify and investigate the identity, associative and the commutative properties for addition and multiplication.		
_____M.3.22	Show mastery of multiplication facts for 0, 1, 2, 3, 4, 5, 6, 7, 8, 9,10, 11 and 12.	a. Students should memorize and recall multiplication facts. b. Recall with automaticity the multiplication facts through 10 × 10.	• Flash cards, IXL (online resource) math board
_____M.3.23	Define and use the terms: factor, product, dividend, divisor and quotient.		
_____M.3.24	Multiply three1-digit numbers, with products up to 144.		

_____M.3.25	Multiply 1, 2, 3 and 4-digit factors by1-digit factors, with and without regrouping.		
_____M.3.26	Divide 1, 2, 3 and 4-digit dividends by1-digit divisors, with and without remainders.		
_____M.3.27	Represent and compare fractions (proper and improper) and mixed numbers with denominators of 2, 3, 4, 5, 6, 8, and 10), including those in context.		
_____M.3.28	Use a model of a fraction greater than one to count the fractional parts to name and write it as an improper fraction and as a mixed number.		
_____M.3.29	Express a whole number as a fraction.		
_____M.3.30	Represent equivalent fractions with denominators of 2,3,4,5,6,8 or 10 using region/area models and length models .		
_____M.3.31	Compare the numerical value of two fractions having like and unlike denominators, using concrete materials.		• Blocks • Cuisenaire Rods
_____M.3.32	Add and subtract with proper fractions having like denominators of 12 or less, using concrete materials and paper and pencil.		

____M.3.33	Read and write decimals expressed as tenths and hundredths using concrete materials.		• Base blocks • Fraction circles
____M.3.34	Add and subtract with decimals expressed as tenths, using concrete materials and paper and pencil.		
____M.3.35	Use repeated addition to model multiplication.		
____M.3.36	Represent the concept of division as repeated subtraction, equal sharing, and forming equal groups. (e.g. 9 divided by 3 = 9-3-3=3).		
MEASUREMENT	**CURRICULUM GUIDELINES**	**CORE CONCEPTS**	**RESOURCES**
____M.3.37	Tell time to one-minute intervals using both analog and digital clocks.		
____M.3.38	Identify equivalent periods of time, including relationships among days, weeks, months, and years, as well as between minutes, hours, and fractions of an hour.		
____M.3.39	Calculate elapsed time, expressed in hours and minutes.		
____M.3.40	Use estimation for quantities and measurement.		
____M.3.41	Measure:	a. **Length** (½ inch, inches, feet, yards, centimeters, and meters) b. **Capacity** (cups, pints, quarts, gallons, and liters)	

		c. **Weight** (ounces, pounds) d. **Mass** (grams and kilograms) e. **Temperature** (degrees Fahrenheit and degrees Celsius). f. **Volume**	
_____M.3.42	Order (least to greatest and greatest to least) customary and metric units for length, capacity, volume and weight.	a. Justify what measuring tool.	
GEOMETRY	**CURRICULUM GUIDELINES**	**CORE CONCEPTS**	**RESOURCES**
_____M.3.43	Identify and describe congruent and symmetrical two-dimensional figures, using tracing procedures when given appropriate drawings or models.		
_____M.3.44	Use concrete materials to predict and describe the results of sliding, flipping and turning two-dimensional objects.		
_____M.3.45	Recognize and describe plane and solid geometric figures using identifying properties (angles, number and shape of faces, number of edges and vertices).	a. Square b. Rectangle c. Triangle d. Cube e. Rectangular solid f. Cone g. Sphere h. Cylinder	
_____M.3.46	Classify and compare polygons (triangles, quadrilaterals, pentagons, hexagons, octagons).	a. Combine no more than three polygons, where each has three or four sides, and name the resulting polygon (triangles,	

		quadrilaterals, pentagons, hexagons, octagons). b. Subdivide a three-sided or four-sided polygon into no more than three parts and name the resulting polygons.	
_____M.3.47	Identify, draw, and label points, lines, line segments, angles, rays and diagonals, using a ruler or straight edge.		
_____M.3.48	Find the perimeter of regular polygons and area of rectangles and squares.		
_____M.3.49	Estimate and determine the area of a given surface by counting the number of square units, describe the measurement (using the number and unit) and justify the measurement.		
_____M.3.50	Describe and give examples of perimeter as a measurement in contextual situations.		
_____M.3.51	Find the volume of rectangular prisms.		
DATA ANALYSIS AND PROBABILITY	**CURRICULUM GUIDELINES**	**CORE CONCEPTS**	**RESOURCES**
_____M.3.52	Construct, collect, organize, read, and interpret data represented on:	a. Pictographs b. Bar graphs c. Line graphs d. Tables	

		e. Circle graphs f. Venn diagrams	
____M.3.53	Formulate questions that require the collection or acquisition of data.	a. Coordinate grids (ordered pairs)	
____M.3.54	Investigate and explore the concept of probability as chance, listing possible outcomes of a given situation.		
PATTERNS, FUNCTIONS AND ALGEBRA	**CURRICULUM GUIDELINES**	**CORE CONCEPTS**	**RESOURCES**
____M.3.55	Identify and locate missing whole numbers and fractional parts on a number line.		
____M.3.56	Recognize, describe, create and extend patterns formed using concrete materials, tables, and pictures.	a. Create increasing and decreasing patterns using objects, pictures, numbers, and number lines. b. Investigate and explain the connection between two different representations of the same increasing or decreasing pattern.	• Objects • Pictures • Numbers • Number lines
____M.3.57	Analyze a given pattern formed using concrete objects and pictures, and then create a pattern with the same attributes.		
____M.3.58	Explore and predict number patterns.		• Objects • Pictures • Numbers • Number lines

TERMS TO KNOW			
	• Addend • Area • Area model • Array • Associative property • Attribute • Bar graph • Capacity • Centimeter • Commutative property • Congruent • Customary system • Decompose • Denominator • Difference • Divide • Dividend • Divisor • Elapsed time • Endpoint • Equation • Equivalent fractions • Estimate • Evaluate • Expanded form • Expression • Facto	• Fraction • Key • Line • Line plot • Line segment • Mass • Multiple • Numerator • Open number line • Parallel lines • Parallelogram • Pattern • Perimeter • Place value • Point • Polygon • Product • Quadrilateral • Quotient • Remainder • Rhombus • Round • Scale • Square unit • Sum • Unit fraction • Vertex	

NUMBER SENSE AND ESTIMATION	CURRICULUM GUIDELINES	CORE CONCEPTS	RESOURCES
____M.4.1	Apply problem-solving strategies to contextual situations to create and solve mathematical questions.	a. Trial and error b. Lists or tables c. Diagrams d. Patterns e. Role playing f. Guess and test. g. Use manipulatives. h. Simplify the problem. i. Write an equation. j. Work backwards	
____M.4.2	Understand the use of the calculator and computer for appropriate problem- solving activities.		• Basic calculator functions • Desmos (online calculator)
____M.4.3	Read and write whole numbers up to nine digits in standard and expanded from.	a. Determine place and value of each digit (i.e in 568,165,724 the 8 represents 8 million and its value is 8,000,000).	
____M.4.4	Compose and decompose (break down) fractions (proper and improper) and/or mixed numbers with denominators of 12 or less, in multiple ways, with and without models.		
____M.4.5	Apply strategies (e.g., rounding to the nearest 100 or 1,000, using compatible numbers, other number relationships) to estimate a solution for single-step or multistep addition or subtraction problems		

	with whole numbers, where addends or minuends do not exceed 100,000.		
____M.4.6	Compare and order whole numbers up to nine digits using words (greater than, less than, equal, not equal to) and symbols (>,<,=,≠).		
____M.4.7	Use mathematical reasoning and justification to represent, compare, and order fractions (proper, improper, and mixed numbers with denominators 12 or less), with and without models.		
____M.4.8	Identify, represent and write equivalent fractions with denominators of 12 or less, with and without models.		
____M.4.9	Read, write, represent, identify, compare and order decimals expressed through thousandths and round decimals to the nearest whole number, nearest tenth and nearest hundredth.		
COMPUTATION AND FLUENCY	**CURRICULUM GUIDELINES**	**CORE CONCEPTS**	**RESOURCES**
____M.4.10	Recognize and use properties of an operation (commutative, associative, zero, identity).		
____M.4.11	Determine if a given whole number is divisible by one or more of the following: 2,3,5 and 10.		
____M.4.12	Use 0 as a placeholder.		

____M.4.13	Read and write roman numerals through 3,000 using symbols: I, V, X, L, C, D, M.		
____M.4.14	Add and subtract whole numbers up to six digits with and without regrouping.		
____M.4.15	Recall with automaticity the multiplication facts through. 12 × 12 and the corresponding division facts.		
____M.4.16	Multiply whole numbers up to four digits by whole numbers up to three digits.	a. Estimate the solution by first rounding the factors to the greatest place value before multiplying.	
____M.4.17	Multiply and divide by 10, 100, and 1,000, mentally.		
____M.4.18	Estimate, represent, solve and justify division with dividends up to four digits and divisors up to 2 digits.	a. Explore how the digits move between place values. b. Include problems with zero in the quotients. c. Interpret the quotients and remainder when solving a word problem.	
____M.4.19	Find the greatest common factor, least common multiple, and least common denominator.		

____M.4.20	Add and subtract fractions and mixed numbers with: • like denominators • unlike denominators.	a. Express answer in simplest form.	
____M.4.21	Add, subtract, multiply, and divide dollars and cents.		
____M.4.22	Add and subtract decimals through thousandths and multiply and divide decimals by whole numbers.	a. Include dollars and cents. b. Estimate by rounding decimals to the nearest whole number before adding, subtracting, multiplying and dividing.	
____M.4.23	Multiply and divide fractions by a whole number and express in simplest form.	a. Interpret fraction multiplication as 'of' (1/2 *10 ½ of 10=5).	
____M.4.24	Represent the division of two whole numbers as a fraction given a word problem.		*The Cookie Fiasco* by Dan Santat and McMillian
MEASUREMENT	**CURRICULUM GUIDELINES**	**CORE CONCEPTS**	**RESOURCES**
____M.4.25	Estimate and measure objects or liquid volume using accurate tools in the following units: (see next column).	a. Length (⅛, ¼, ½ inches; feet; yards; millimeters; centimeters; meters; and kilometers b. Volume (cups, pints, quarts, gallons, milliliters, and liters) c. Weight (ounces, pounds and tons) d. Mass (grams and kilograms) e. Temperature (degrees Fahrenheit and degrees Celsius)	

____M.4.26	Convert units within a measurement system (either customary or metric).		
____M.4.27	Solve single-step and multistep contextual problems involving elapsed time in hours and minutes, within a 12-hour period (within a.m., within p.m., and across a.m. and p.m.) when given: (see next column).	a. The starting time and the ending time, determine the amount of time that has elapsed in hours and minutes. b. The starting time and amount of elapsed time in hours and minutes, determine the ending time. c. The ending time and the amount of elapsed time in hours and minutes, determine the starting time.	
GEOMETRY	**CURRICULUM GUIDELINES**	**CORE CONCEPTS**	**RESOURCES**
____M.4.28	Recognize and identify three-dimensional figures, including pyramids, cylinders, cones, spheres, rectangular prisms, triangular prisms and cubes.	a. Describe and classify each figure based on their characteristics: number of vertices, edges, and faces, and shapes of faces.	
____M.4.29	Find the perimeter of polygons; find the area of rectangles and squares.		
____M.4.30	Identify and draw the relationship between and among plane, line, line segment, point, ray, circle and angles including end points and vertices.	a. Identify parallel, perpendicular, and intersecting lines. b. Identify acute, right, obtuse, and straight angles. c. Use symbolic notation to name points, lines, line segments, rays, angles, parallel and perpendicular	

		lines.	
____M.4.31	Estimate angle measures using 45 degrees and 180 degrees as referents and use protractors to measure given angle(s).	a. Understand that angles are measured in degrees.	
____M.4.32	Use concrete materials to predict and describe transformation that result from sliding (translation), flipping (reflection), and turning (rotation) two-dimensional objects.	a. Use transformations to identify congruent and symmetrical figures.	
____M.4.33	Recognize and identify intersecting, parallel and perpendicular lines.		
____M.4.34	Develop definitions for parallelograms, rectangles, squares, rhombi, and trapezoids through the exploration of properties and attributes.	a. Identify and draw geometric markings (parallel sides, congruent sides and right angles) that correspond with specific quadrilaterals.	.
DATA ANALYSIS AND PROBABILITY	**CURRICULUM GUIDELINES**	**CORE CONCEPTS**	**RESOURCES**
____M.4.35	Apply the data cycle (formulate questions; collect or acquire data, organize and represent data; analyze data; communicate results) with a focus on line graphs.	a. Pictographs b. Bar Graphs c. Line Graphs d. Tables e. Pie Charts f. Venn diagrams g. Coordinate grids (ordered pairs)	
____M.4.36	Model and determine the probability of an outcome of a simple event as a fraction.	a. Describe probability using the following terms: b. --Impossible c. --Unlikely	

		d. --Equally likely e. --Likely.	
_____M.4.37	Compute mean, median, mode and range from simple data sets.		
PATTERNS, FUNCTIONS AND ALGEBRA	**CURRICULUM GUIDELINES**	**CORE CONCEPTS**	**RESOURCES**
_____M.4.38	Identify, describe and create increasing and decreasing patterns using various representations (object, pictures, numbers, number lines, input/ouput tables and function machines).	a. Identify the rule given a pattern. b. Extend pattern. c. Identify missing terms.	
_____M.4.39	Create an equation using addition, subtraction, multiplication, and division to represent the relationship between equivalent mathematical expressions.	a. $4 \times 3 = 2 \times 6$ b. $10 + 8 = 36 \div 2$ c. $12 \times 4 = 60 - 12$	
_____M.4.40	Understand the concept of a variable and solve a simple equation using a variable to represent a missing number in the equation.		

NUMBER SENSE AND ESTIMATION	CURRICULUM GUIDELINES	CORE CONCEPTS	RESOURCES
_____M.5.1	Apply the following strategies to solve real-life problems:	a. Trial and error b. Lists or tables c. Diagrams d. Patterns e. Act it out f. Guess and test g. Use manipulatives h. Simplify the problem i. Write an equation j. Work backwards	
_____M.5.2	Read, write, and identify the place values of whole numbers (though millions) and decimals (through ten-thousandths).		
_____M.5.3	Apply the following properties when working with addition and multiplication: commutative, associative, zero, identity, and distributive.		
_____M.5.4	Round any number to any place from millions to the thousandths place.		
_____M.5.5	Compare and order whole numbers, fractions, decimals, and percents.		
_____M.5.6	Convert fractions to decimals, decimals to fractions and decimals to percents.		
_____M.5.7	Read and locate negative integers on a number line.		

_____M.5.8	Understanding negative integers through familiar applications such as temperatures below zero, yards lost and gained in football, etc.		• Football • Percent change • Elevation • Temperature • Bank balances
_____M.5.9	Classify whole numbers as prime, composite, or neither, and justify reasoning; determine the prime factorization for whole numbers (no exponents).		
_____M.5.10	Determine if a given whole number is divisible by one or more of the following: 2, 3, 4, 5, 9, and 10.		
COMPUTATION AND FLUENCY	**CURRICULUM GUIDELINES**	**CORE CONCEPTS**	
_____M.5.11	Create, estimate, solve, and justify solutions to single-step and multi-step problems, including those in context, using addition, subtraction, multiplication, division with whole numbers.	a. For division, include dividends up to four digits and divisors up to three digits. b. Interpret quotients and remainders when solving word problems. c. Identify and represent multiplication using an 'x,' a dot, and parentheses.	
_____M.5.12	Create and solve problems using the order of operations involving addition, subtraction, multiplication, and division of whole numbers.		

_____M.5.13	Create, estimate, solve, and justify solutions to single-step and multi-step problems, including those in context, using addition, subtraction, multiplication, division with decimals.	a. Use 0 as a place holder. b. Find the product of two numbers expressed as decimals through thousandths. c. Given a dividend expressed as a decimal through ten-thousandths and a decimal divisor through the hundredths, find the quotient.	
_____M.5.14	Create, estimate, solve, and justify solutions to single-step and multi-step problems, including those in context, using addition, subtraction, multiplication, division with fractions and mixed numbers.	a. Like and unlike denominators b. Write answers in simplest form. c. Make equivalent fractions for a given fraction.	
_____M.5.15	Determine if a number is divisible by one or more of the following: 2, 3, 4, 5, 9, and 10.		
MEASUREMENT	**CURRICULUM GUIDELINES**	**CORE CONCEPTS**	
_____M.5.16	Use appropriate measuring devices and units of measurement (customary and metric) to solve problems involving: • Length (inches, feet, yards, miles, centimeters, millimeters, meters and kilometers) • Capacity (fluid ounces, cups, pints, quarts, gallons, and liters and milliliters) • Weight (ounces, pounds, and tons) • Mass (grams and kilograms) • Temperature (degrees Fahrenheit and degrees Celsius).	a. Determine equivalent measurements within Customary or Metric units b. (ex. 1.5 lbs. = 24 oz; 120 mm = 12 cm). c. Measure objects/liquid volume using appropriate tools. d. Estimate measurement of real-life objects/liquid volume.	

____M.5.17	Estimate and determine the perimeter and area of squares, rectangles, triangles, and parallelograms and the volume of rectangular prisms to solve problems, including word problems, recording the solution with the appropriate unit of measure.	a. Identify whether the application of the concept of perimeter, area, and volume is appropriate for a given situation. b. Investigate and develop formulas for determining the area of a square, rectangle, triangle, and parallelogram and the volume of a rectangular prism. c. Develop strategies for estimating the perimeters, areas, and volumes of irregular shapes. d. Develop strategies to determine the surface area (square units) of rectangular prisms including formulas (enrichment).	• (ex. Area = 10 ft^2; Volume = 7mm^3)
____M.5.18	Determine and use elapsed time to solve problems.		
____M.5.19	Identify and describe the diameter, radius, chord, and circumference of a circle.		
GEOMETRY	**CURRICULUM GUIDELINES**	**CORE CONCEPTS**	
____M.5.20	Recognize, draw and construct three-dimensional geometric figures from two- dimensional representations, or from nets.		
____M.5.21	Properly write lines, line segments, rays and angles with appropriate letters and symbols.		
____M.5.22	Identify the ordered pair for a point, and locate the point for an ordered pair in all four quadrants of a coordinate plane.	a. Find the distance between points along horizontal and vertical lines of a coordinate graph.	

_____M.5.23	Identify, measure and draw acute, right, obtuse, and straight angles, using a protractor.		
_____M.5.24	Classify triangles by sides (scalene, isosceles, equilateral) and angles (acute, right and obtuse). Identify congruent sides and angles using hatch or arc markings.		
_____M.5.25	Determine an unknown angle measure in a triangle.	a. Use models to prove that the sum of the angles of a triangle is 180 degrees.	
DATA ANALYSIS AND PROBABILITY	**CURRICULUM GUIDELINES**	**CORE CONCEPTS**	
_____M.5.26	Apply the data cycle (formulate questions; collect and acquire data; organize and represent data; and analyze data and communicate results) with a focus on dot plots (i.e. line plot) and stem-and-leaf plots; review pictographs, bar graphs, and line graphs.		
_____M.5.27	Solve problems, including data and those in context, using the measures of central tendency (i.e. mean, median, mode) and the range.		
_____M.5.28	Determine the probability of an outcome by constructing a sample space, using a tree diagram, list, and chart to represent and determine all possible outcomes, representing the likelihood as a fraction and decimal; determine the number of possible outcomes by using the Fundamental (Basic) Counting Principle.		

PATTERNS, FUNCTIONS AND ALGEBRA	CURRICULUM GUIDELINES	CORE CONCEPTS	
_____M.5.29	Identify, describe, extend, and create increasing and decreasing numeric and geometric patterns (ex. powers of 10, perfect squares, triangular numbers, arithmetic and geometric sequences); investigate and describe patterns when multiplying and dividing numbers by powers of 10 (ex. what happens to the decimal point and digits).		
_____M.5.30	Investigate, describe, and apply the concept of variables (presented as a box, letter, and other symbol) as representations of unknown quantities.		
_____M.5.31	Use variable expressions to represent given verbal expressions involving one operation (ex. "5 more than a number" can be represented by y + 5).		
_____M.5.32	Analyze increasing and decreasing single-operation numerical patterns found in lists, input/output tables, and function machines, and generalize the change to identify rules, extend patterns, identify missing terms, and solve contextual problems.		
_____M.5.33	Write and solve equations (with a single variable that represents an unknown quantity and one operation) that represent verbal sentences and contextual situations, using addition, subtraction, multiplication, and division.		

____M.5.34	Create, write, and solve word problems and situations to match given equations (i.e. open sentences) consisting of a single variable and one operation.		

5th Grade Math Vocabulary

Acute (angle, triangle)	Cone	Elapsed time	Height	Mass
Algebraic Expression	Congruent figures	Equally likely outcomes	Heptagon	Mathematical expression
Arc	Coordinate plane	Equation	Hexagon	Mean
Area	Corresponding parts	Equilateral triangle	Hexagonal Prism	Measures of central tendency
Associative Property	Cross products	Equivalent fractions	Hexagonal Pyramid	Median
Axis	Cross section	Estimate	Histogram	Metric system
Base	Cumulative frequency	Evaluate	Identity Property	Mixed number
Benchmark	Customary system	Event	Improper Fraction	Mode
Capacity	Data	Expanded form	Inequality	Multiple
Celcius scale	Decagon	Exponent	Integers	Net
Central angle	Decimal	Face	Intersecting lines	Numerator
Chord	Degree	Factor	Interval	Obtuse (angle, triangle)
Circle	Dependent events	Factor tree	Inverse operations	Order of Operations
Circle graph	Diagonal	Fahrenheit scale	Isosceles triangle	Ordered pair
Circumference	Diameter	Formula	Line graph	Origin
Clustering	Discount	Fraction	Line of symmetry	Outcome
Commutative Property	Distributive Property	Frequency table	Line plot	Outlier
Compatible numbers	Divisible	Graph	Line segment	Parallel lines
Composite number	Double bar (line) graph	Greatest common factor (GCF)		Parallelogram
Compound event	Edge	Half-turn symmetry	Linear measure	Pentagon
Pentagonal prism	Random sample	Scalene triangle	Triangular prism	
Pentagonal pyramid	Range	Scientific notation	Triangular pyramid	
Percent	Ratio	Sequence	Unit fraction	
Perimeter	Rational Number	Similar figures	Unit price	

Period
Perpendicular lines
Pi
Place value
Plane figure
Polygon
Polyhedron
Power of a number
Prime factorization
Prime number
Prism
Probability
Proportion
Protractor
Pyramid
Quadrilateral
Radius
Reciprocals
Rectangle
Rectangular prism
Rectangular pyramid
Reflection
Regular polygon
Repeating Decimal
Rhombus
Right (angle, triangle)
Roman numerals
Rotation
Sale price
Sales tax
Sample
Sample space
Scale
Scale drawing
Simplest form
Solution
Sphere
Square measure
Square pyramid
Statistics
Stem-and-leaf plot
Straight angle
Surface area
Survey
Symmetrical figure
Terminating decimal
Tessellation
Transformation
Translation
Trapezoid
Tree diagram
Variable
Venn diagram
Vertex
Volume
Weight
Whole number
x-axis
y-axis
Zero Property

CDA SIXTH GRADE MATHEMATICS

STANDARDS & INSTRUCTION GUIDE

2025

NUMBER SENSE AND ESTIMATION	CURRICULUM GUIDELINES	CORE CONCEPTS	RESOURCES
_____M.6.1	Identify, compare, and order integers; represent values from real world contexts with integers; interpret and apply the absolute value of an integer.		
_____M.6.2	Round, compare, order, and graph (on a number line) positive rational numbers .	a. Whole numbers, fractions, mixed numbers, terminating and repeating decimals	
_____M.6.3	Convert between positive fractions (including improper fractions and mixed numbers), decimals, percents, and points on a number line.		
_____M.6.4	Find the prime factorization of a composite number using exponents (if applicable).	a. Use Greatest Common Factor (GCM) and Least Common Multiple (LCM).	
_____M.6.5	Identify and evaluate square roots of perfect squares from 0 to 400.		
_____M.6.6	Identify the base and exponent of a power; evaluate powers with whole number positive exponents; convert numbers ten or greater between scientific notation (positive and negative exponents) and standard form.		

COMPUTATION AND FLUENCY	CURRICULUM GUIDELINES	CORE CONCEPTS	RESOURCES
_____M.6.7	Solve single-step and multi-step problems that involve addition, subtraction, multiplication, and division of fractions or mixed numbers, expressing answer either in simplest form or rounded to the nearest given place value; check solution by comparing it with the estimation resulting from rounding the original fractions or mixed numbers.		
_____M.6.8	Solve single-step and multi-step problems that involve addition, subtraction, multiplication, and division of decimals, expressing answer either precisely [terminating or repeating decimal (using bar notation)] or rounded to the nearest given place value; check solution by comparing it with the estimation resulting from rounding the original decimals.		
_____M.6.9	Add, subtract, multiply, and divide integers.	a. simplify expressions comprised of integers, absolute value bars, and/or negative signs using the order of operations:	Examples: $3\|-2\| = 3(2) = 6$ $-\|4-9\| = -\|-5\| = -(5) = -5$
_____M.6.10	Estimate, find, and interpret the percent of numbers in real world contexts (ex. compute 5%, 10%, 15%, or 20% in practical situations such as tips, tax, and discounts).		

MEASUREMENT AND GEOMETRY	CURRICULUM GUIDELINES	CORE CONCEPTS	RESOURCES
____M.6.11	Determine reasonable estimates for the measurement of a given object within a given unit of the customary and metric systems (ex. verify the solution from a real-world context problem).	a. length/distance, mass/weight, and capacity/volume	
____M.6.12	Compare and convert units of measure within the customary and metric systems (including compound units (ex. 6 ft 2 in).	a. length/distance, mass/weight, and capacity/volume	
____M.6.13	Derive an approximation for π (pi) (3.14 or 22/7) by gathering data and comparing the circumference to the diameter ratio of various circles.		
____M.6.14	Find the perimeter and area of rectangles, triangles, parallelograms, and trapezoids, including those in context; find the circumference and area of circles, approximating for π (pi) or writing in π (pi) notation as necessary.	a. Develop the formula for determining the area of parallelograms and triangles, and trapezoids using pictorial representations and concrete manipulatives (e.g., two-dimensional diagrams, grid paper)	Example: The circumference of a circle with a diameter of 2 could be written as an approximation 2(3.14)=6.28 or precisely as 2π.
____M.6.15	Find the volume and surface area of cubes and prisms (rectangular and triangular) using unit cubes, nets, and formulas.		
____M.6.16	Identify, classify, and sketch transformations (translations, reflections, rotations, dilations) of a given figure.		
____M.6.17	Identify and construct figures with line and/or rotational symmetry.		

____M.6.18	Recognize and define congruent and similar geometric figures; identify their corresponding sides and angles.	a. Regular and non-regular polygons through the use of geometric markings b. Identify corresponding sides and angles of congruent figures by writing congruence statements using symbols.	Examples: • ∠ABC ≅ ∠DEF • $\overline{AB} \cong \overline{DE}$
____M.6.19	Measure, draw, and classify angles using a protractor.		
____M.6.20	Define and identify complementary and supplementary angles; find the measurement of an unknown angle of a pair of complementary or supplementary angles.		
____M.6.21	Write the ordered pair of a given point; graph an ordered pair onto a coordinate plane; determine the location of an ordered pair (axis or quadrant); find the distance between two points on the same horizontal or vertical line.		
DATA ANALYSIS AND PROBABILITY	**CURRICULUM GUIDELINES**	**CORE CONCEPTS**	**RESOURCES**
____M.6.22	Investigate and solve problems involving theoretical and experimental probability of a single event (as a decimal, fraction, or percent).		
____M.6.23	Calculate and interpret measures of central tendency (mean, median, and mode) or range from a set of data (consisting of integers or positive rational numbers).		

____M.6.24	Determine the effect on the measures of central tendency (mean, median, and mode) or range when data (ex. An outlier) is added, removed, or changed.		
____M.6.25	Apply the data cycle (formulate questions; collect or acquire data; organize and represent data; and analyze data and communicate results) with a focus on circle graphs; review dot plots (i.e. line plot), stem-and-leaf plots, pictographs bar graphs, and line graphs.		
PATTERNS, FUNCTIONS AND ALGEBRA	**CURRICULUM GUIDELINES**	**CORE CONCEPTS**	**RESOURCES**
____M.6.26	Write, interpret, and compare ratios (part: part and part: whole) or rates given real world context or data; make a table of equivalent ratios to represent a proportional relationship between two quantities when given a ratio or practical situation.		
____M.6.27	Determine whether a proportional relationship exists between two quantities (from a table of values, contexts, and graphs) and, if so, determine its unit rate; determine its unit rate; create a graph on a coordinate plane that represents a proportional relationship between two quantities.		
____M.6.28	Identify and create examples of variables, terms, coefficients, expressions, equations, and inequalities; write simple variable expressions, equations, and inequalities that model verbal phrases, patterns, and real-world contexts.		
____M.6.29	Write, solve, and verify solutions to one-step linear equations with one variable, including proportions, by applying the Properties of Equality.		

_____M.6.30	Write, interpret, and graph inequalities with one variable.		
_____M.6.31	Identify which Property of Real Numbers is shown given equivalent numerical expressions; create equivalent numerical expressions by applying the Properties of Real Numbers.	a. Commutative; Associative; Identity; and Distributive Properties	

NUMBER SENSE AND ESTIMATION	CURRICULUM GUIDELINES	CORE CONCEPTS	RESOURCES
_____M.7.1	Evaluate powers with positive, zero, and negative exponents (numerical bases); write equivalent expressions of powers with negative exponents [Example: $2^{-3} = 1/(2^3)$].		
_____M.7.2	Convert numbers greater than zero between scientific notation (including positive, zero, and negative exponents) and standard form.		
_____M.7.3	Round, compare, order, and graph (on a number line) positive and negative rational numbers.	a. i.e. Integers, fractions, mixed numbers, terminating and repeating decimals, numbers written in scientific notation, and percents	
COMPUTATION AND FLUENCY	**CURRICULUM GUIDELINES**	**CORE CONCEPTS**	**RESOURCES**
_____M.7.4	Add, subtract, multiply, and divide positive rational numbers (whole numbers, fractions, mixed numbers, decimals), expressing answer in either simplest form or rounded to the nearest given place value; solve real world context problems involving positive rational numbers (decimals, fractions, mixed numbers) using a variety of problem-solving strategies.		
_____M.7.5	Estimate, solve, and justify solutions to problems, including those in context, involving addition, subtraction, multiplication, and division of positive and negative fractions, mixed numbers, expressing answer in simplest form.		

_____M.7.6	Estimate, solve, and justify solutions to problems, including those in context, involving addition, subtraction, multiplication, and division of positive and negative decimals rounded to the nearest given place value.	a. Addition, subtraction, multiplication, and division of positive and negative decimals rounded to the nearest given place value.	
_____M.7.7	Evaluate numerical expressions (consisting of one or more of the following: integers, absolute value bars, exponents, square roots, and negative signs) by applying the Order of Operations and the Properties of Real Numbers.	a. Order of Operations b. Properties of Real Numbers	
_____M.7.8	Find the percent of a number, what percent one number is of another, and find a number when the percent is known.	a. Applying proportional reasoning and writing equations	
_____M.7.9	Find and apply the percent of change (percent increase or percent decrease) to solve real world context problems.		
MEASUREMENT AND GEOMETRY	**CURRICULUM GUIDELINES**	**CORE CONCEPTS**	**RESOURCES**
_____M.7.10	Approximate unit conversions between the Customary and Metric systems (Example: 1 kg ≈ 2.2 lbs.).		
_____M.7.11	Write equivalent rates by converting one or both of its units (Ex.: 1 in/min = 5 ft/hr.).		
_____M.7.12	Convert square and cubic units (Examples: 1 ft^2 = 144 in^2; 1 cm^3 = 1000 mm^3).		

_____M.7.13	Find the perimeter and area of compound figures composed of rectangles, right triangles, and/or half circles.		
_____M.7.14	Identify properties of triangles (scalene, isosceles, equilateral, acute, right, obtuse) and quadrilaterals (trapezoids, parallelograms, rhombi, rectangles, squares).		
_____M.7.15	Find unknown angles and side lengths of a given diagram or situation (Examples: special angle pairs; triangle or quadrilateral).		
_____M.7.16	Find the scale factor, unknown angle measurement, and side lengths of pairs of similar figures (methods include writing equations and using proportional reasoning).		
_____M.7.17	Identify and graph a transformation of ordered pairs and polygons on the coordinate plane.	a. Translations b. Reflections over the x-axis and y-axis c. 90° and 180° rotations with center (0, 0) d. Dilations of positive scale factors with center (0, 0) e. Identify and define preimage and image.	
_____M.7.18	Recognize and define congruent and similar geometric figures; identify their corresponding sides and angles and apply this to justify that they are congruent and/or similar; write similarity or congruent statements using symbols.		
_____M.7.19	Identify special angle pairs and their properties (complementary, supplementary, adjacent, vertical, linear pair		

_____M.7.20	Investigate and determine the formulas for the volume and surface area of prisms and cylinders; find the volume and surface area of prisms and cylinders using formulas, nets, and/or calculating the sum of the area of the faces [approximating for π (pi) using a calculator or writing in π (pi) notation as necessary].		
DATA ANALYSIS AND PROBABILITY	**CURRICULUM GUIDELINES**	**CORE CONCEPTS**	**RESOURCES**
_____M.7.21	Determine one or more missing data values from a set of data given its mean, median, mode, and/or range, including real world context (Example: Find the score a student must earn on their next test to earn an A for their total grade).		
_____M.7.22	Identify and find the probability of multiple events: mutually exclusive, overlapping, and independent and dependent events as fractions and percents.		
_____M.7.23	Make predictions given a probability (theoretical or experimental) or data display.	a. Tree diagram b. Counting principles	
_____M.7.24	Apply the data cycle focusing on frequency tables, histograms and boxplots (formulate questions; collect or acquire data; organize and represent data; and analyze data and communicate results).	a. Box and whisker diagram; median, interquartile range, percent of data within a given interval b. Review circle graphs, line graphs, and stem-and-leaf plots.	

PATTERNS, FUNCTIONS AND ALGEBRA	CURRICULUM GUIDELINES	CORE CONCEPTS	RESOURCES
_____M.7.25	Identify parts of a given variable expression, equation, or inequality (operations, variables, constants, coefficients, exponents, bases, terms, factors). Write and interpret variable expression, equation, or inequality that represents a real-world context.		
_____M.7.26	Evaluate multi-step, multi-operational variable expressions and formulas (given numerical replacement values) including those with exponents (ex. surface area and volume formulas; converting temperatures between Fahrenheit and Celsius) by applying the order of operations.		
_____M.7.27	Write, solve, and verify solutions to two-step linear equations with one variable, including those that represent real world contexts, by applying the Properties of Equality.		
_____M.7.28	Write, solve, graph, verify and interpret the solutions of one-step or two-step inequalities with one variable.	a. Include those that represent real world contexts by applying the Properties of Inequality. b. Determine if a given number is a solution to an inequality. c. Investigate and explain how the solution set of a linear inequality is affected by multiplying or dividing both sides of the inequality by a negative number.	

_____M.7.29	Find and interpret the unit rate and slope (*m*) as the rate of change of a given real world context, ratio table, graph, and equation that represents a proportional relationship between two quantities.		
_____M.7.30	Identify the independent and dependent variables of a given relationship within a real-world context, table, graph, or two-variable equation.		
_____M.7.31	Write an equation and graph a line to represent a proportional relationship ($y = mx$) given one or more of the following: a real-world context, table of values, slope, and ordered pairs.		
_____M.7.32	Simplify variable expressions (i.e. combine like terms; multiply linear monomials or an integer by a multi-term expression) by applying the Properties of Real Numbers.	a. Commutative, Associative, Identity and Distributive Properties *Examples:* • $4x + x \rightarrow 5x$ using identity and distributive properties. • $(2a)(3a) \rightarrow 6a^2$ using commutative and associative properties. • $7(8x - 9) \rightarrow 56x - 63$ using distributive property.	

CDA EIGHTH GRADE MATHEMATICS (PRE-ALGEBRA)

STANDARDS & INSTRUCTION GUIDE

2025

NUMBER SENSE AND ESTIMATION	CURRICULUM GUIDELINES	CORE CONCEPTS	RESOURCES
_____M.8.1	Classify numbers within the subsets of the real number system. Justify the classification; give examples and non-examples of each subset.	a. Natural number b. Whole number c. Integer d. Rational number e. Irrational number f. Real number	
_____M.8.2	Compare, order, and graph (on a number line) real numbers (i.e. integers, fractions, mixed numbers, decimals, radicals, pi, percent, scientific notation); approximate square root radicals of non-perfect squares by finding the whole numbers it is between.		
_____M.8.3	Write square roots of non-perfect square whole numbers in simplest radical form (ex. √12 = 2√3).		
COMPUTATION AND FLUENCY	**CURRICULUM GUIDELINES**	**CORE CONCEPTS**	**RESOURCES**
_____M.8.4	Add, subtract, multiply, and divide: • whole numbers • mixed numbers • positive fractions (expressing answer in simplest form) • positive decimals (expressing answer either precisely or rounded to the nearest given place value).		

_____M.8.5	Add, subtract, multiply, and divide: • negative integers • negative fractions (expressing answer in simplest form) • negative decimals (expressing answer either precisely or rounded to the nearest given place value).		
_____M.8.6	Evaluate variable expressions (consisting of one or more of the following: grouping symbols, exponents, fraction bars, absolute values, negative signs, square roots) given integers as the known values of each variable by applying the order of operations and the Properties of Real Numbers.		
_____M.8.7	Write and solve equations that model percent problems: estimate and find the discount, mark-up, tax, tip, sales price, and total price; find and apply the percent increase or decrease given original and new values.		
MEASUREMENT AND GEOMETRY	**CURRICULUM GUIDELINES**	**CORE CONCEPTS**	**RESOURCES**
_____M.8.8	Use and apply the Pythagorean Theorem to solve for missing side lengths of a right triangle, written in either simplest radical form or rounded to the nearest given place value.	a. Find the distance between any two points on the coordinate plane. b. Convert between the height and slant height of a pyramid or cone.	
_____M.8.9	Determine and apply coordinate notation to describe and graph a transformation (or multiple transformations) of ordered pairs or polygons on the coordinate plane, identify and defining preimage and image.	a. Translations b. Reflections over the *x*-axis and c. *y*-axis d. 90° or 180° rotations with center (0, 0)	

		e. Dilations of positive scale factors with center (0, 0).	
_____M.8.10	Identity and evaluate formulas that model surface area and volume of prisms, cylinders, pyramids, cones, and compound figures.	• Examine and explain the relationships between: a. the volume of cones and cylinders b. the volume of pyramids and prisms.	
_____M.8.11	Identify regular polygons and determine their individual angle measurements and sum of angle measurements, with an emphasis on investigating and applying the formulas to find measurement of any polygon's angle or sum of angle measurements.		
DATA ANALYSIS AND PROBABILITY	**CURRICULUM GUIDELINES**	**CORE CONCEPTS**	**RESOURCES**
_____M.8.12	Collect, display, and analyze data in scatter plots on a coordinate plane .	a. Identify its correlation (positive, negative, none). b. estimate and sketch the line of best fit for the data represented in a scatter plot.	
_____M.8.13	Given a contextual situation, justify which graphical representation (e.g., pictographs, bar graphs, line graphs, line plots/dot plots, stem-and-leaf plots, circle graphs, histograms, and boxplots) best represents the data; identify components of graphical displays that can be misleading.		

PATTERNS, FUNCTIONS AND ALGEBRA	CURRICULUM GUIDELINES	CORE CONCEPTS	RESOURCES
_____M.8.14	Simplify variable expressions (i.e. add and subtract like terms; multiply monomials; multiply a monomial by a multi-term expression) by applying the Properties of Real Numbers.		
_____M.8.15	Using FOIL, multiply a binomial by a binomial.		
_____M.8.16	Factor variable expressions as products by applying the Distributive Property (with greatest common factor limited to a whole number) [ex. $8x - 12 = 4(2x - 3)$].	a. Distributive Property	
_____M.8.17	Investigate, develop, and apply the Law of Exponent formulas	a. Multiplication Rule $(x^a)(x^b)=x^{(a+b)}$ b. Division Rule $(x^a)/(x^b)=x^{(a-b)}$ c. Power of a Power Rule $(x^a)^b= x^{(ab)}$ d. Negative Exponents rule $x^{-a} = 1/x^a$	
_____M.8.18	Simplify and write equivalent exponential expressions (both numerical and variable) with integer exponents [ex. $(12x)/4x^2 \rightarrow 3/x$ or $3x^{-1}$].		
_____M.8.19	Solve simple quadratic and absolute value equations (involving positive rational numbers) (ex: $x^2 = 16 \rightarrow x = -4$ and 4; $\|x\| = 16 \rightarrow x = -16$ & 16).		
_____M.8.20	Write, solve, and verify solutions to multi-step variable equations (ex. combine like terms; apply distributive property), including ones with variables on both sides of the equation, by applying the Properties of Equality.	a. Properties of Equality	

_____M.8.21	Write, solve, graph, and interpret the solution of multi-step inequalities with one variable by applying the Properties of Inequality; determine if a number is a solution to the inequality.	a. Properties of Inequality	
_____M.8.22	Determine if a relation is a function given a set of ordered pairs, table, mapping diagram or a graph of points; find the domain and range of a function.		
_____M.8.23	Classify variable expressions (i.e. polynomials) by its terms (i.e. monomial, binomial, trinomial) and degree (i.e. constant, linear, quadratic).	a. Polynomial, monomial, binomial, trinomial expressions.	
_____M.8.24	Interpret and find the *y*-intercept and slope of a line on the coordinate plane, including graphs that represent a real-world context.		
_____M.8.25	Convert the form of linear functions between equations (in the form $y = mx + b$), function tables, lines or points graphed on a coordinate plane, and real-world context or relationships.		
_____M.8.26	Model direct variations using tables, graphs, and equations.		
_____M.8.27	Write and solve direct variation equations in the form $k=y/x$ or $y1/x1=y2/x2$.		
_____M.8.28	Solve literal equations for a particular variable (ex. solve d=rt for r → r = d/t).		
_____M.8.29	Graph equations in slope intercept form by identifying and plotting the *y*-intercept and slope.		

_____M.8.30	Graph equations in standard form by calculating and plotting the *x*-intercept and *y*-intercept.		
_____M.8.31	Convert between slope-intercept and standard form.		