

**New York State Learning Standards for Mathematics
Correlated to**

**Academic Language Notebooks
The Language of Math
Grade 4**

New York State Learning Standards	Module Number and Name
Problem Solving Strand	
Students will build new mathematical knowledge through problem solving.	
4.PS.1 Explore, examine, and make observations about a social problem or mathematical situation	
4.PS.2 Understand that some ways of representing a problem are more helpful than others	
4.PS.3 Interpret information correctly, identify the problem, and generate possible solutions	
Students will solve problems that arise in mathematics and in other contexts.	
4.PS.4 Act out or model with manipulative activities involving mathematical content from literature	
4.PS.5 Formulate problems and solutions from everyday situations	
4.PS.6 Translate from a picture/diagram to a numeric expression	
4.PS.7 Represent problem situations in oral, written, concrete, pictorial, and graphical forms	
4.PS.8 Select an appropriate representation of a problem	
Students will apply and adapt a variety of appropriate strategies to solve problems.	
4.PS.9 Use trial and error to solve problems	
4.PS.10 Use process of elimination to solve problems	
4.PS.11 Make pictures/diagrams of problems	
4.PS.12 Use physical objects to model problems	
4.PS.13 Work in collaboration with others to solve problems	
4.PS.14 Make organized lists to solve numerical problems	
4.PS.15 Make charts to solve numerical problems	
4.PS.16 Analyze problems by identifying relationships	
4.PS.17 Analyze problems by identifying relevant versus irrelevant information	
4.PS.18 Analyze problems by observing patterns	
4.PS.19 State a problem in their own words	
Students will monitor and reflect on the process of mathematical problem solving.	
4.PS.20 Determine what information is needed to solve a problem	
4.PS.21 Discuss with peers to understand a problem situation	
4.PS.22 Discuss the efficiency of different representations of a problem	
4.PS.23 Verify results of a problem	
4.PS.24 Recognize invalid approaches	
4.PS.25 Determine whether a solution is reasonable in the context of the original problem	

New York State Learning Standards	Module Number and Name
Reasoning and Proof Strand	
Students will recognize reasoning and proof as fundamental aspects of mathematics.	
4.RP.1 Use representations to support mathematical ideas	
4.RP.2 Determine whether a mathematical statement is true or false and explain why	
Students will make and investigate mathematical conjectures.	
4.RP.3 Investigate the use of knowledgeable guessing by generalizing mathematical ideas	
4.RP.4 Make conjectures from a variety of representations	
Students will develop and evaluate mathematical arguments and proofs.	
4.RP.5 Justify general claims or conjectures, using manipulative, models, and expressions	
4.RP.6 Develop and explain an argument using oral, written, concrete, pictorial, and/or graphical forms	
4.RP.7 Discuss, listen, and make comments that support or reject claims made by other students	
Students will select and use various types of reasoning and methods of proof.	
4.RP.8 Support an argument by trying many cases	
4.RP.9 Disprove an argument by finding counterexamples	
Communication Strand	
Students will organize and consolidate their mathematical thinking through communication.	
4.CM.1 Understand and explain how to organize their thought process	
4.CM.2 Verbally explain their rationale for strategy selection	
4.CM.3 Provide reasoning both in written and verbal form	
Students will communicate their mathematical thinking coherently and clearly to peers, teachers, and others.	
4.CM.4 Organize and accurately label work	
4.CM.5 Share organized mathematical ideas through the manipulation of objects, drawings, pictures, charts, graphs, tables, diagrams, models, symbols, and expressions in written and verbal form	
4.CM.6 Answer clarifying questions from others	
Students will analyze and evaluate the mathematical thinking and strategies of others.	
4.CM.7	
4.CM.8 Consider strategies used and solutions found in relation to their own work	
Students will use the language of mathematics to express mathematical ideas precisely.	
4.CM.9 Increase their use of mathematical vocabulary and language when communicating with others	
4.CM.10 Describe objects, relationships, solutions and rationale using appropriate vocabulary	
4.CM.11 Decode and comprehend mathematical visuals and symbols to construct meaning	

New York State Learning Standards	Module Number and Name
Connections Strand	
Students will recognize and use connections among mathematical ideas.	
4.CN.1 Recognize, understand, and make connections in their everyday experiences to mathematical ideas	
4.CN.2 Compare and contrast mathematical ideas	
4.CN.3 Connect and apply mathematical information to solve problems	
Students will understand how mathematical ideas interconnect and build on one another to produce a coherent whole.	
4.CN.4 Understand multiple representations and how they are related	
4.CN.5 Model situations with objects and representations and be able to make observations	
Students will recognize and apply mathematics in contexts outside of mathematics.	
4.CN.6 Recognize the presence of mathematics in their daily lives	
4.CN.7 Apply mathematics to solve problems that develop outside of mathematics	
4.CN.8 Recognize and apply mathematics to other disciplines	
Representation Strand	
Students will create and use representations to organize, record, and communicate mathematical ideas.	
4.R.1 Use verbal and written language, physical models, drawing charts, graphs, tables, symbols, and equations as representations	
4.R.2 Share mental images of mathematical ideas and understandings	
4.R.3 Recognize and use external mathematical representations	
4.R.4 Use standard and nonstandard representations with accuracy and detail	
Students will select, apply, and translate among mathematical representations to solve problems.	
4.R.5 Understand similarities and differences in representations	
4.R.6 Connect mathematical representations with problem solving	
4.R.7 Construct effective representations to solve problems	
Students will use representations to model and interpret physical, social, and mathematical phenomena.	
4.R.8 Use mathematics to show and understand physical phenomena (e.g., estimate and represent the number of apples in a tree)	
4.R.9 Use mathematics to show and understand social phenomena (e.g., determine the number of buses required for a field trip)	
4.R.10 Use mathematics to show and understand mathematical phenomena (e.g., use a multiplication grid to solve odd and even number problems)	
Number Sense and Operations Strand	
Students will understand numbers, multiple ways of representing numbers, relationships among numbers, and number systems.	
Number Systems	
4.N.1 Skip count by 1,000	
4.N.2 Read and write whole numbers to 10,000	
4.N.3 Compare and order numbers to 10,000	2. Compare and Order Whole Numbers
4.N.4 Understand the place value structure of the base ten number system: 10 ones = 1 ten, 10 tens = 1 hundred, 10 hundreds = 1 thousand, 10 thousands = 1 ten thousand	1. Place Value
4.N.5 Recognize equivalent representations for numbers up to four digits and generate them by decomposing and composing numbers	

New York State Learning Standards	Module Number and Name
4.N.6 Understand, use, and explain the associative property of multiplication	
4.N.7 Develop an understanding of fractions as locations on number lines and as divisions of whole numbers	26. Read and Write Fractions
4.N.8 Recognize and generate equivalent fractions (halves, fourths, thirds, fifths, sixths, and tenths) using manipulative, visual models, and illustrations	27. Compare and Order Equivalent Fractions
4.N.9 Use concrete materials and visual models to compare and order unit fractions or fractions with the same denominator (with and without the use of a number line)	
4.N.10 Develop an understanding of decimals as part of a whole	
4.N.11 Read and write decimals to hundredths, using money as a context	4. Money
4.N.12 Use concrete materials and visual models to compare and order decimals (less than 1) to the hundredths place in the context of money	
Number Theory	
4.N.13 Develop an understanding of the properties of odd/even numbers as a result of multiplication	
Students will understand meanings of operations and procedures, and how they relate to one another	
Operations	
4.N.14 Use a variety of strategies to add and subtract numbers up to 10,000	
4.N.15 Select appropriate computational and operational methods to solve problems	
4.N.16 Understand various meanings of multiplication and division	8. Multiplication Properties and Division Rules 9. Multiplication and Division Facts
4.N.17 Use multiplication and division as inverse operations to solve problems	7. Multiplication and Division Concepts
4.N.18 Use a variety of strategies to multiply two-digit numbers by one-digit numbers (with and without regrouping)	10. Model Multiplication by 1- and 2-Digit Numbers
4.N.19 Use a variety of strategies to multiply two-digit numbers by one-digit numbers (with and without regrouping)	10. Model Multiplication by 1- and 2-Digit Numbers
4.N.20 Develop fluency in multiplying and dividing multiples of 10 and 100 up to 1,000	
4.N.21 Use a variety of strategies to divide two-digit dividends by one-digit divisors (with and without remainders)	11. Model Division by 1- and 2-Digit Numbers
4.N.22 Interpret the meaning of remainders	29. Add and Subtract Fractions and Mixed Numbers with Like and Unlike Denominators
4.N.23 Add and subtract proper fractions with common denominators	29. Add and Subtract Fractions and Mixed Numbers with Like and Unlike Denominators
4.N.24 Express decimals as an equivalent form of fractions to tenths and hundredths operational method in problem solving situations	30. Decimal Concepts
4.N.25 Add and subtract decimals to tenths and hundredths using a hundreds chart	
Students will compute accurately and make reasonable estimates.	
Estimation	
4.N.26 Round numbers less than 1,000 to the nearest tens and hundreds	3. Round Whole Numbers

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4.N.27 Check reasonableness of an answer by using estimation	5. Mental Math 6. Estimation 12. Mental Math and Estimation with Multiplication and Division
Algebra Strand	
Students will represent and analyze algebraically a wide variety of problem solving situations.	
4.A.1 Evaluate and express relationships using open sentences with one operation	13. Algebraic Expressions
Students will perform algebraic procedures accurately	
Equations and Inequalities	
4.A.2 Use the symbols $<$, $>$, $=$, and \neq (with and without the use of a number line) to compare whole numbers and unit fractions and decimals (up to hundredths)	14. Algebraic Equations
4.A.3 Find the value or values that will make an open sentence true, if it contains $<$ or $>$	
Students will recognize, use, and represent algebraically patterns, relations, and functions.	
Patterns, Relations, and Functions	
4.A.4 Describe, extend, and make generalizations about numeric and Functions($+$, $-$, \times , \div) and geometric patterns	
4.A.5 Analyze a pattern or a whole-number function and state the rule, given a table or an input/output box	15. Patterns and Functions
Geometry Strand	
Students will use visualization and spatial reasoning to analyze characteristics and properties of geometric shapes.	
Shapes	
4.G.1 Identify and name polygons, recognizing that their names are related to the number of sides and angles (triangle, quadrilateral, pentagon, hexagon, and octagon)	22. Polygons and Circles
4.G.2 Identify points and line segments when drawing a plane figure	21. Points, Lines, Line Segments, Rays, and Angles
4.G.3 Find perimeter of polygons by adding sides	24. Perimeter and Area
4.G.4 Find the area of a rectangle by counting the number of squares needed to cover the rectangle	24. Perimeter and Area
4.G.5 Define and identify vertices, faces, and edges of three-dimensional shapes	25. Solid Figures and Volume
Students will identify and justify geometric relationships, formally and informally.	
Geometric Relationships	
4.G.6 Draw and identify intersecting, perpendicular, and parallel lines	
4.G.7 Identify points and rays when drawing angles	
4.G.8 Classify angles as acute, obtuse, right, and straight	

New York State Learning Standards	Module Number and Name
Measurement Strand	
Students will determine what can be measured and how, using appropriate methods and formulas.	
Units of Measurement	
4.M.1 Select tools and units (customary and metric) appropriate for the length being measured	17. Measures of Length (Customary and Metric)
4.M.2 Use a ruler to measure to the nearest standard unit (whole, $\frac{1}{2}$, and $\frac{1}{4}$ inches, whole feet, whole yards, whole centimeters, and whole meters)	
4.M.3 Know and understand equivalent standard units of length: 12 inches = 1 foot 3 feet = 1 yard	
4.M.4 Select tools and units appropriate to the mass of the object being measured (grams and kilograms)	18. Measures of Capacity and Weight/Mass (Customary and Metric)
4.M.5 Measure mass, using grams	
4.M.6 Select tools and units appropriate to the capacity being measured (milliliters and liters)	18. Measures of Capacity and Weight/Mass (Customary and Metric)
4.M.7 Measure capacity, using milliliters and liters	
Students will use units to give meaning to measurements.	
Units	
4.M.8 Make change, using combined coins and dollar amounts	
4.M.9 Calculate elapsed time in hours and half hours, not crossing A.M./P.M.	16. Time
4.M.10 Calculate elapsed time in days and weeks, using a calendar	
New York State Learning Standards	Module Number and Name
Statistics and Probability Strand	
Students will collect, organize, display, and analyze data.	
Collection of Data	
4.S.1 Design investigations to address a question from given data	20. Read and Make Graphs
4.S.2 Collect data using observations, surveys, and experiments and record appropriately	19. Collect and Organize Data
Organization and Display of Data	
4.S.3 Represent data using tables, bar graphs, and pictographs	
4.S.4 Read and interpret line graphs	
Students will make predictions that are based upon data analysis.	
Predictions from Data	
4.S.5 Develop and make predictions that are based on data	
4.S.6 Formulate conclusions and make predictions from graphs	