Northpoint Horizons

CAVS (Content Academic Vocabulary System)
Correlated to the
New York State Mathematic Assessment Standards

Grade 4

This document provides a sampling of the extensive math directives offered throughout the *CAVS* program that meet the New York State Math Assessment Standards.

New York State Math Assessment Standards	***CAVS* Grades 3-5 Teacher's Guide Examples/Lessons**
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	The CAVS 3 – 5 **Concept Posters** (1 through 8) allow for whole group discussions pertaining to different mathematical situations. These posters serve as visuals to help the teacher engage the students. They are encouraged to explore, examine, and make observation about each scene.
4.PS.2 Understand that some ways of representing a problem are more helpful than others	*How can you solve problems?* Lesson 24 – TG p. 139
4.PS.3 Interpret information correctly, identify the problem, and generate possible solutions	*How can you solve problems?* Lesson 24 – TG p. 139
Students will solve problems that arise in mathematics and in other contexts.	
4.PS.4 Act out or model with manipulatives activities involving mathematical content from literature	The **Activity Placemats (1- 24)** and **Reader Cards (B) (1 – 24)** provide for activities with and without manipulatives that engage students and encourage them to explore and learn. Any of these activities could be tied to literature.
4.PS.5 Formulate problems and solutions from everyday situations	Weather Report – Activity Placemat 1 Sorting Circles – Activity Placemat 21 City Populations – Activity Placemat 22
4.PS.6 Translate from a picture/diagram to a numeric expression	Pick a Counter – Activity Placemat 2 Arranging Chairs – Activity Placemat 3
4.PS.7 Represent problem situations in oral, written, concrete, pictorial, and graphical forms	All **Activity Placemats**, lessons 1 – 24, allow for students to **Observe, Record, and Share** their findings. **Record and Share Sheets** are available for every lesson and found in the teacher's guide.

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4.PS.8 Select an appropriate representation of a problem	*Why do you need information?* Lesson 21 – TG p. 121
Students will apply and adapt a variety of appropriate strategies to solve problems.	
4.PS.9 Use trial and error to solve problems	*How can you solve problems?* Lesson 24 – TG p. 139
4.PS.10 Use process of elimination to solve problems	*How can you solve problems?* Lesson 24 – TG p. 139 see Lesson Review p. 144
4.PS.11 Make pictures/diagrams of problems	*Why do you need information?* Lesson 21 – TG p. 121
4.PS.12 Use physical objects to model problems	Making 4-Sided Shapes - Activity Placemat 16 Straw Triangles - Activity Placemat 17 Sorting Circles - Activity Placemat 21
4.PS.13 Work in collaboration with others to solve problems	All **Activity Placemats** allow students to work with a partner or in a small group for purposes of collaboration.
4.PS.14 Make organized lists to solve numerical problems	Vacation Plans - Activity Placemat 4 What's the Same? - Activity Placemat 18
4.PS.15 Make charts to solve numerical problems	Comparing Coins - Activity Placemat 5 Colorful Creations - Activity Placemat 6
4.PS.16 Analyze problems by identifying relationships	Quick Thinking - Activity Placemat 9 Measuring Space - Activity Placemat 12 Measuring Volume - Activity Placemat 13
4.PS.17 Analyze problems by identifying relevant versus irrelevant information	Is It Relevant? - Activity Placemat 24
4.PS.18 Analyze problems by observing patterns	*What is a pattern?* Lesson 7 – TG p. 37 Class Quilt - Activity Placemat 7
4.PS.19 State a problem in their own words	*How do numbers tell a story?* Lesson 2 – TG p. 7
Students will monitor and reflect on the process of mathematical problem solving.	
4.PS.20 Determine what information is needed to solve a problem	*How can you solve problems?* Lesson 24 – TG p. 139 See Concept Web 24
4.PS.21 Discuss with peers to understand a problem situation	*How can you solve problems?* Lesson 24 – TG p. 139 See Record Sheet 24
4.PS.22 Discuss the efficiency of different representations of a problem	*Why do you need information?* Lesson 21 – TG p. 121

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4.PS.23 Verify results of a problem	*How can you solve problems?* Lesson 24 – TG p. 139 See Lesson Review 24
4.PS.24 Recognize invalid approaches	*How can you solve problems?* Lesson 24 – TG p. 139
4.PS.25 Determine whether a solution is reasonable in the context of the original problem	*How can you solve problems?* Lesson 24 – TG p. 139
Reasoning and Proof Strand	
Students will recognize reasoning and proof as fundamental aspects of mathematics.	
4.RP.1 Use representations to support mathematical ideas	*How do numbers tell a story?* Lesson 2 – TG p. 7 Pick a Counter – Activity Placemat 2 Arranging Chairs - Activity Placemat 3
4.RP.2 Determine whether a mathematical statement is true or false and explain why	*Do you think it will happen?* Lesson 23 – TG p. 133
Students will make and investigate mathematical conjectures.	
4.RP.3 Investigate the use of knowledgeable guessing by generalizing mathematical ideas	*How can you solve problems?* Lesson 24 – TG p. 139
4.RP.4 Make conjectures from a variety of representations	*How can you solve problems?* Lesson 24 – TG p. 139
Students will develop and evaluate mathematical arguments and proofs.	
4.RP.5 Justify general claims or conjectures, using manipulatives, models, and expressions	Guess and Measure – Activity Placemat 14
4.RP.6 Develop and explain an argument using oral, written, concrete, pictorial, and/or graphical forms	*How do you compare facts and information?* Lesson 22 – TG p. 127
4.RP.7 Discuss, listen, and make comments that support or reject claims made by other students	Making Predictions – Activity Placemat 23 (see **Share** section)
Students will select and use various types of reasoning and methods of proof.	
4.RP.8 Support an argument by trying many cases	*How do you compare facts and information?* Lesson 22 – TG p. 127
4.RP.9 Disprove an argument by finding counterexamples	*How can you solve problems?* Lesson 24 – TG p. 139
Communication Strand	

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Students will organize and consolidate their mathematical thinking through communication.	
4.CM.1 Understand and explain how to organize their thought process	*Why do you need information?* Lesson 21 – TG p. 121
4.CM.2 Verbally explain their rationale for strategy selection	*How can you solve problems?* Lesson 24 – TG p. 139
4.CM.3 Provide reasoning both in written and verbal form	The **Activity Placemats**, lessons 1 through 24, provide for students to express their mathematical reasoning in both written (**Journal** and **Record**) and verbal (**Share**) forms.
Students will communicate their mathematical thinking coherently and clearly to peers, teachers, and others.	
4.CM.4 Organize and accurately label work	Sorting Circles – Activity Placemat 21
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	*Why do you need information?* Lesson 21 – TG p. 121
4.CM.6 Answer clarifying questions from others	Under **Explore and Learn** (TG) there is **Discuss the Activity** for every lesson. Students can pose questions related to their own questions or to those of others and also reflect upon the answers.
Students will analyze and evaluate the mathematical thinking and strategies of others.	
4.CM.7 Restate mathematical solutions shared by other students	*How can you solve problems?* Lesson 24 – TG p. 139 Reader Card - Lesson 24 See vocabulary reinforcement that formally asks students to restate the problem.
4.CM.8 Consider strategies used and solutions found in relation to their own work	*How can you solve problems?* Lesson 24 – TG p. 139
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	Content Academic Vocabulary System (CAVS) stresses vocabulary throughout every lesson with the use of **Vocabulary Cards**, the **Picture Dictionary**, the **Reader Cards Level B**, and the **Concept Web** pages provide for vocabulary reinforcement with each lesson. Vocabulary words, appropriate for a **Word Wall,** are also provided with each lesson in the Teacher's Guide.
4.CM.10 Describe objects, relationships, solutions and	Reader Cards Level B – Lessons 1 – 24

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rationale using appropriate vocabulary	Vocabulary Cards – Lessons 1 – 24 Concept Webs (TG) – Lessons 1 - 24
4.CM.11 Decode and comprehend mathematical visuals and symbols to construct meaning	*How do numbers tell a story?* Lesson 2 – TG p. 7
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	Weather Report - Activity Placemat 1 Arranging Chairs - Activity Placemat 3 Vacation Plans - Activity Placemat 4
4.CN.2 Compare and contrast mathematical ideas	What's the Same? - Activity Placemat 18 What Am I? - Activity Placemat 19
4.CN.3 Connect and apply mathematical information to solve problems	The **Reader Cards Level B** for lessons 1 through 24 allow students to connect and apply mathematical information when they reflect in their journals to question posed in the **Make Connections** section.
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	Sorting Circles – Activity Placemat 21
4.CN.5 Model situations with objects and representations and be able to make observations	Arranging Chairs - Activity Placemat 3
Students will recognize and apply mathematics in contexts outside of mathematics.	
4.CN.6 Recognize the presence of mathematics in their daily lives	Weather Report - Activity Placemat 1 Arranging Chairs - Activity Placemat 3 Vacation Plans - Activity Placemat 4 Concept Posters 1 - 8
4.CN.7 Apply mathematics to solve problems that develop outside of mathematics	Making Predictions - Activity Placemat 23
4.CN.8 Recognize and apply mathematics to other disciplines	Weather Report - Activity Placemat 1 Vacation Plans - Activity Placemat 4 Passing Time - Activity Placemat 15 Reader Cards – Lessons 1,4,15
Representation Strand	
Students will create and use representations to organize, record, and communicate mathematical ideas.	

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4.R.1 Use verbal and written language, physical models, drawing charts, graphs, tables, symbols, and equations as representations	*How do numbers tell a story?* Lesson 2 – TG p. 7 Pick a Counter - Activity Placemat 2
4.R.2 Share mental images of mathematical ideas and understandings	Every activity, corresponding to the Activity Placemats 1 through 24, encourages the students to **Share** (section 5) their findings with others. Lesson plans in the Teacher's Guide for lessons 1 through 24 have specific questions in the **Discuss the Activity** section.
4.R.3 Recognize and use external mathematical representations	Weather Report - Activity Placemat 1
4.R.4 Use standard and nonstandard representations with accuracy and detail	Pick a Counter - Activity Placemat 2
Students will select, apply, and translate among mathematical representations to solve problems.	
4.R.5 Understand similarities and differences in representations	Pick a Counter - Activity Placemat 2 Quick Thinking - Activity Placemat 5 How do we describe shapes with three sides? Lesson 17 – Reader Card
4.R.6 Connect mathematical representations with problem solving	*How do numbers tell a story?* Lesson 2 – TG p. 7
4.R.7 Construct effective representations to solve problems	*How do numbers tell a story?* Lesson 2 – TG p. 7
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)	*How can you put numbers in order?* Lesson 1 – TG p. 1 Concept Posters 1,2,3
4.R.9 Use mathematics to show and understand social phenomena (e.g., determine the number of buses required for a field trip)	*How do we make equal groups?* Lesson 4 – TG p. 19 Concept Posters 1,2,3
4.R.10 Use mathematics to show and understand mathematical phenomena (e.g., use a multiplication grid to solve odd and even number problems)	*How do we count large amounts?* Lesson 3 – TG p. 13
Number Sense and Operations Strand	
Students will understand numbers, multiple ways of representing numbers, relationships among numbers, and	

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number systems.	
4.N.1 Skip count by 1,000's	*How can you put numbers in order?* Lesson 1 – TG p. 1 Reader Card – Lesson 1
4.N.2 Read and write whole numbers to 10,000	*How can you put numbers in order?* Lesson 1 – TG p. 1 Reader Card – Lesson 1
4.N.3 Compare and order numbers to 10,000	*How can you put numbers in order?* Lesson 1 – TG p. 1 Reader Card – Lesson 1
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	*How can you put numbers in order?* Lesson 1 – TG p. 1 Reader Card – Lesson 1
4.N.5 Recognize equivalent representations for numbers up to four digits and generate them by decomposing and composing numbers	*How can you put numbers in order?* Lesson 1 – TG p. 1 Reader Card – Lesson 1
4.N.6 Understand, use, and explain the associative property of multiplication	*How can math rules help you solve equations?* Lesson 9 – TG p. 49 Reader Card – Lesson 9
4.N.7 Develop an understanding of fractions as locations on number lines and as divisions of whole numbers	*How can math rules help you solve equations?* Lesson 9 – TG p. 49 Reader Card – Lesson 9
4.N.8 Recognize and generate equivalent fractions (halves, fourths, thirds, fifths, sixths, and tenths) using manipulatives, visual models, and illustrations	*How do you show that a number is not a whole?* Lesson 5 – TG p. 25 Reader Card – Lesson 5
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)	*How do you show that a number is not a whole?* Lesson 5 – TG p. 25 Reader Card – Lesson 5
4.N.10 Develop an understanding of decimals as part of a whole	*How do you show that a number is not a whole?* Lesson 5 – TG p. 25 Reader Card – Lesson 5
4.N.11 Read and write decimals to hundredths, using money as a context	*How do you show that a number is not a whole?* Lesson 5 – TG p. 25

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	Reader Card – Lesson 5
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	*How do you show that a number is not a whole?* Lesson 5 – TG p. 25 Reader Card – Lesson 5 Comparing Coins – Activity Placemat 5
4.N.13 Develop an understanding of the properties of odd/even numbers as a result of multiplication	*How can you put numbers in order?* Reader Card – Lesson 1 *How do we count large amounts?* Reader Card – Lesson 3
Students will understand meanings of operations and procedures, and how they relate to one another.	
4.N.14 Use a variety of strategies to add and subtract numbers up to 10,000	*How do numbers tell a story?* Reader Card – Lesson 2
4.N.15 Select appropriate computational and operational methods to solve problems	*How do numbers tell a story?* Reader Card – Lesson 2
4.N.16 Understand various meanings of multiplication and division	*How do we count large amounts?* Reader Card – Lesson 3
4.N.17 Use multiplication and division as inverse operations to solve problems	*How do we count large amounts?* Lesson 3 – TG p. 13 Reader Card – Lesson 3
4.N.18 Use a variety of strategies to multiply two-digit numbers by one-digit numbers (with and without regrouping)	*How do we count large amounts?* Lesson 3 – TG p. 13 Reader Card – Lesson 3
4.N.19 Use a variety of strategies to multiply two-digit numbers by two-digit numbers (with and without regrouping)	*How do we count large amounts?* Lesson 3 – TG p. 13 Reader Card – Lesson 3
4.N.20 Develop fluency in multiplying and dividing multiples of 10 and 100 up to 1,000	*How do we make equal groups?* Lesson 4 – TG p. 19 Reader Card – Lesson 4
4.N.21 Use a variety of strategies to divide two-digit dividends by one-digit divisors (with and without remainders)	*How do we make equal groups?* Lesson 4 – TG p. 19 Reader Card – Lesson 4
4.N.22 Interpret the meaning of remainders	*How do we make equal groups?* Lesson 4 – TG p. 19 Reader Card – Lesson 4

New York State Math Assessment Standards	*CAVS* Grades 3-5 Teacher's Guide Examples/Lessons
4.N.23 Add and subtract proper fractions with common denominators	*How do you show that a number is not a whole?* Reader Card – Lesson 5
4.N.24 Express decimals as an equivalent form of fractions to tenths and hundredths	*How else can you show less than one whole?* Lesson 6 – TG p. 31 Reader Card – Lesson 6
4.N.25 Add and subtract decimals to tenths and hundredths using a hundreds chart	*How else can you show less than one whole?* Lesson 6 – TG p. 31 Reader Card – Lesson 6
Students will compute accurately and make reasonable estimates.	
4.N.26 Round numbers less than 1,000 to the nearest tens and hundreds	*How can you put numbers in order?* Reader Card – Lesson 1
4.N.27 Check reasonableness of an answer by using estimation	*How can you solve problems?* Lesson 24 – TG p. 139 Reader Card – Lesson 24 (strategies)
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	*How do numbers tell a story?* Lesson 2 – TG 7 Concept Web 2 Reader Card – Lesson 2
Students will perform algebraic procedures accurately.	
4.A.2 Use the symbols <, >, =, and ≠ (with and without the use of a number line) to compare whole numbers and unit fractions and decimals (up to hundredths)	*How do you show that a number is not a whole?* Lesson 5 – TG p. 25 Concept Web – Lesson 5 Reader Card – Lesson 5 *How else can you show less than one whole?* Lesson 6 – TG p. 31 Math Vocabulary Cards 22 - 26
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.	
4.A.4 Describe, extend, and make generalizations about numeric () and geometric patterns	*What is a pattern?* Lesson 7 – TG p. 37 Lesson Review 7 Reader Card – Lesson 7

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4.A.5 Analyze a pattern or a whole-number function and state the rule, given a table or an input/output box	*What is a pattern?* Lesson 7 – TG p. 37 Reader Card – Lesson 7
Geometry Strand	
Students will use visualization and spatial reasoning to analyze characteristics and properties of geometric 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)	*How do we describe shapes with straight sides?* Lesson 16 – TG p. 91 Reader Card – Lesson 16
4.G.2 Identify points and line segments when drawing a plane figure	*How do we describe shapes with straight sides?* Lesson 16 – TG p. 91 Reader Card – Lesson 16
4.G.3 Find perimeter of polygons by adding sides	*How do you measure flat shapes?* Lesson 12 – TG p. 67 Reader Card – Lesson 12
4.G.4 Find the area of a rectangle by counting the number of squares needed to cover the rectangle	*How do you measure flat shapes?* Lesson 12 – TG p. 67 Reader Card – Lesson 12
4.G.5 Define and identify vertices, faces, and edges of three-dimensional shapes	*What attributes do solid shapes share?* Lesson 19 – TG p. 109 Reader Card – Lesson 19
Students will identify and justify geometric relationships, formally and informally.	
4.G.6 Draw and identify intersecting, perpendicular, and parallel lines	*How do we describe shapes with straight sides?* Lesson 16 – TG p. 91 *How do we draw different shapes?* Lesson 18 – TG p. 103 Reader Card – Lesson 16, 18
4.G.7 Identify points and rays when drawing angles	*How do we describe shapes with three sides?* Lesson 17 – TG p. 97 Reader Card 17
4.G.8 Classify angles as acute, obtuse, right, and straight	*How do we describe shapes with three sides?* Lesson 17 – TG p. 97 Reader Card 17

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Measurement Strand	
Students will determine what can be measured and how, using appropriate methods and formulas.	
4.M.1☐☐Select tools and units (customary) appropriate for the length measured ☐☐☐☐	*What do you use to measure things?* Lesson 10 – TG p. 55 Reader Card – Lesson 10
4.M.2☐☐Use a ruler to measure to the nearest standard unit (whole, ½ and ¼ inches, whole feet, whole yards, whole centimeters, and whole meters) ☐☐	*How do you measure flat shapes?* Lesson 12 – TG p. 67 Measuring Space – Activity Placemat 12 Reader Card – Lesson 12
4.M.3☐☐Know and understand equivalent standard units of length: 12 inches = 1 foot 3 feet = 1 yard ☐☐	*How do you measure?* Reader Card – Lesson 11
4.M.4☐☐Select tools and units appropriate to the mass of the object being measured (grams and kilograms) ☐☐	*What do you use to measure things?* Lesson 10 – TG p. 55 Reader Card – Lesson 10
4.M.5☐☐Measure mass, using grams ☐☐	*How do you measure solid shapes?* Lesson 13 – TG p. 73 *What are units of measurement?* Lesson 14 – TG p. 79 Reader Cards – Lesson 13, 14
4.M.6☐☐Select tools and units appropriate to the capacity being measured (milliliters and liters) ☐☐	*What are units of measurement?* Lesson 14 – TG p. 79 Reader Card – Lesson 14
4.M.7☐☐Measure capacity, using milliliters and liters ☐☐	*What are units of measurement?* Lesson 14 – TG p. 79 Reader Card – Lesson 14
Students will use units to give meaning to measurements.	
4.M.8☐☐Make change, using combined coins and dollar amounts ☐☐☐☐	Comparing Coins – Activity Placemat 5 *How can you show less than a whole?* Reader Card – Lesson 6
4.M.9☐☐Calculate elapsed time in hours and half hours, not crossing A.M./P.M. ☐☐☐☐	*How long does it take?* Lesson 15 – TG p. 85 Reader Card – Lesson 15
4.M.10☐☐Calculate elapsed time in days and weeks, using a calendar ☐☐	*When is your Birthday?* **CAVS K – 2** Lesson 10 – TG p. 55

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Statistics and Probability Strand	
Students will collect, organize, display, and analyze data.	
4.S.1☐☐Design investigations to address a question from given data☐☐☐☐	*Do you think it will happen?* Lesson 23 – TG p. 133 *How can you solve problems?* Lesson 24 – TG p. 139 Reader Cards – Lessons 23, 24
4.S.2☐☐Collect data using observations, surveys, and experiments and record appropriately☐☐☐☐	*Why do you need information?* Lesson 21 – TG p. 121 *How do you compare facts and information?* Lesson 22 – TG p. 127 Reader Card – Lesson 22
4.S.3☐☐Represent data using tables, bar graphs, and pictographs☐☐☐☐	*Why do you need information?* Lesson 21 – TG p. 121 *How do you compare facts and information?* Lesson 22 – TG p. 127 Concept Poster 7
4.S.4☐☐Read and interpret line graphs ☐☐☐☐	Concept Poster 7
Students will make predictions that are based upon data analysis.	
4.S.5☐☐Develop and make predictions that are based on data ☐☐☐☐	*Do you think it will happen?* Lesson 23 – TG p. 133 *How can you solve problems?* Lesson 24 – TG p. 139 Reader Cards – Lessons 23, 24
4.S.6☐☐Formulate conclusions and make predictions from graphs☐☐	*Why do you need information?* Lesson 21 – TG p. 121 *Do you think it will happen?* Lesson 23 – TG p. 133