K-12 Math Committee

2007-2010

k-12 Member Names	School	k	1	2	3	4	5	6	7	8	Alg I	Alab	A 1b	Geom	Alg II	INT I	Int II	Pre C	Calc
Tonya Sconiers	Denfeld DNA																		
Cher Obst	dropped																		
Kim Eaton	Laura MacArthur	x																	
Brenda Florestano	East													x*	x			x	
Kim Anderson	Morgan Park								x	x									
John Bushey	Piedmont (dropped)					x													
Melissa Kelley	Nettleton				x														
Erica Wittmers-Graves	Lakewood							x											
Terri Micheau	Homecroft			x															
Nathan Norman	Woodland																		
Jody Belcastro	Grant (dropped)																		
Patricia Bambenek	HOCHS																		
Timothy White	Denfeld											x*	x	*				x	x
Tamara Meyer	Ordean→MP Focus							x											
Rebecca Starks	Lincoln→ Morgan P								x*	x			x						
Ed Lewis	Central (dropped)																x		x
Deborah Debolt	Lowell → Grant		x	x*		x*													
Jill Anderson	Special Ed AJC																		
Lisa Heehn	Stowe			x															
Anne Krafthefer	Lester Park						x												
Marj Fisher	Congdon Park				x														
Nathan Norman	Woodland								x										
Nancy Broman	Nettleton Title I				x	x	x												
Chris Knox	Lincoln (joined Fall 08)		x																
Schools missing																			
Grant	Deb DeBolt (moved)																		
Lincoln Park	joined this Fall																		
Additions																			
Pam Nelson	East HS																		
Jill Dalbacka	Lowell						x												
Peter Graves	Central HS joined 2/10																		
Sheila Nyback	Morgan Park joined Fall 10)								x	x*									
Homecroft	Gwen Curran	x																	

* taught recently

2008 Math Committee Belief Statements

1. ***We believe that the goal of our K-12 mathematics program is to develop and improve student reasoning, communication, application and skills in all four math strands: Number and Operation, Algebra, Geometry and Measurement, Data Analysis and Probability.***

2. ***We believe an effective mathematics program is an articulated K-12 scope and sequence program developed through committee process.***

3. ***We believe that learning mathematics is an active, collaborative process.***

4. ***We believe that computational skills and number concepts are essential components of the mathematics curriculum.***

5. ***We believe that students should be able to communicate their thinking and understanding using appropriate mathematical vocabulary.***

6. ***We believe that students need to learn appropriate use of technology in mathematics.***

7. ***We believe that assessment practices and tasks in mathematics are clearly linked to the curriculum, the learner outcomes and the standards.***

8. ***We believe that qualified teachers are the key to achieving excellence in mathematics education. To this end, professional development opportunities must occur.***

Summary of *Foundations for Success:* The Final Report of the National Mathematics Advisory Panel, 2008

The National Mathematics Panel was charged with defining a system for delivering instruction in mathematics that enables all students to acquire competence in algebra and readiness for higher levels of mathematics. Although the report's findings and recommendations are focused on grades PreK-8, the PreK-8 path laid down by the panel is directed toward the study of *authentic algebra* in middle and secondary school. The panel goes on to define the content of *authentic algebra* in a one-page table of major topics.

The system of mathematics education set forth by the Panel includes Curricular Content, Learning Processes, Teachers and Teacher Education, Instructional Practices, Instructional Materials, Assessments, and Research Policies and Mechanisms. The report's Executive Summary presents 45 major findings and recommendations for the system that are based upon, among other resources, over 16,000 research publications and policy reports.

Curricular Content:
The Panel determined a progression of learning mathematics from less sophisticated topics to more sophisticated ones. For example, by the end of grade 5, students should be proficient, by that they should, understand the important concepts and develop flexible, accurate, and automatic execution of algorithms to solve problems working with whole numbers. Followed by, at the end of grade 7, students should be proficient with fractions, including decimals, percents, and negative fractions. The implementation of such progressions will support student proficiency in algebra with students understanding the important concepts and developing flexible, accurate, and automatic execution of algorithms to solve problems.

Learning Processes:
Since students come to school with different mathematical knowledge, effective mathematics interventions are necessary in every classroom. Curriculum must address the development of conceptual understanding, computational fluency, and problem solving simultaneously. This can be achieved when students are afforded sufficient time to learn. Students and families need to understand the importance of student effort as related to successful mathematics performance.

Teacher and Teacher Education:
Research shows direct relationship between teachers' content knowledge and their students' achievement. Key to improving teachers' effectiveness in the classroom is that teachers engage in multiple opportunities to learn the mathematics for teaching. Teacher education programs must graduate teachers knowledgeable in teaching school mathematics. Schools and district must support teachers throughout their career.

Instructional Practices:
A balance between teacher and student-centered approaches to teaching and learning is critical for student success in learning mathematics. The needs of students whether they are struggling or mathematically talented need to be met. Regular use of formative assessments to design and individualize instruction improves students learning.

Instructional Materials:
Schools and districts need to provide instructional materials aligned with state standards and the recommendations of the National Mathematics Panel and free of mathematical errors with regard to accuracy, clarity, and logical reasoning. Also, publishers should produce much shorter and more focused textbooks.

Assessment:
State and national assessments need to be aligned with the Panel's curricular content recommendations and accessible to all students.

Research Policies and Mechanisms:
Continuous research in partnership with PreK-16 educators needs to be conducted to ensure effective curricular, instructional practices, assessments, and teacher education. This PreK-16 partnership includes educators, psychologists, sociologists, economists, cognitive scientists, and mathematicians.

The National Mathematics Panel identified Benchmarks for Critical Foundations to Algebra. The interpretation of these benchmarks should be flexible to accommodate student needs. Three clusters of concepts and skills that are foundational for formal algebra coursework include:

- Fluency with whole numbers
- Fluency with fractions, and
- Particular aspects of geometry and measurement

Fluency with Whole Numbers:

- By the end of Grade 3, students should be proficient with the addition and subtraction of whole numbers.
- By the end of Grade 5, students should be proficient with multiplication and division of whole numbers.

Fluency with Fractions:

- By the end of Grade 4, students should be able to identify and represent fractions and decimals and compare them on a number line or with other common representations of fractions and decimals.
- By the end of Grade 5, students should be proficient with comparing fractions and decimals and common percents, and with the addition and subtraction of fractions and decimals.
- By the end of Grade 6, students should be proficient with multiplication and division of fractions and decimals.
- By the end of Grade 6, students should be proficient with all operations involving positive and negative integers.
- By the end of Grade 7, students should be proficient with all operations involving positive and negative fractions.
- By the end of Grade 7, students should be able to solve problems involving percent, ratio, and rate, and extend this work to proportionality.

Particular Aspects of Geometry and Measurement:

- By the end of Grade 5, students should be able to solve problems involving perimeter and area of triangles, and all quadrilaterals having at least one pair of parallel sides (i.e. trapezoids).
- By the end of Grade 6, students should be able to analyze the properties of two-dimensional shapes and solve problems involving perimeter and area. They should also be able to analyze properties of three- dimensional shapes and solve problems involving surface area and volume.
- By the end of Grade 7, students should understand relationships involving similar triangles.

The Major Topics of School Algebra

Symbols and Expressions

- Polynomial expressions
- Rational expressions
- Arithmetic and finite geometric series

Linear Equations

- Real numbers as points on the number line
- Linear equations and their graphs
- Solving problems with linear equations
- Linear inequalities and their graphs
- Graphing and solving systems of simultaneous linear equations

Quadratic Equations

- Factors and factoring of quadratic polynomials with integer coefficients
- Completing the square in quadratic expressions
- Quadratic formula and factoring of general quadratic polynomials
- Using the quadratic formula to solve equations

Functions

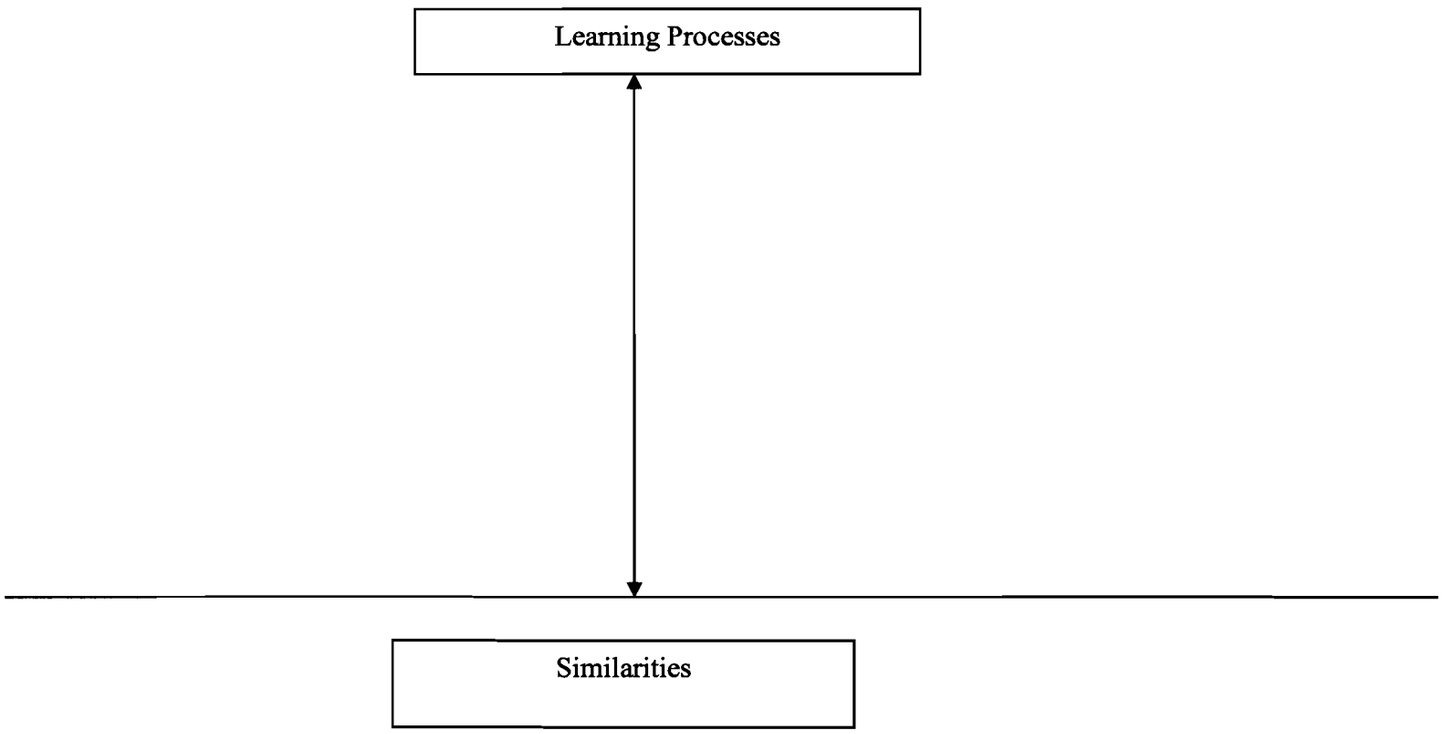
- Linear functions
- Quadratic functions—word problems involving quadratic functions
- Graphs of quadratic functions and completing the square
- Polynomial functions (including graphs of basic functions)
- Simple nonlinear functions (e.g., square and cube root functions; absolute value; rational functions; step functions)
- Rational exponents, radical expressions, and exponential functions
- Logarithmic functions
- Trigonometric functions
- Fitting simple mathematical models to data

Algebra of Polynomials

- Roots and factorization of polynomials
- Complex numbers and operations
- Fundamental theorem of algebra
- Binomial coefficients (and Pascal's Triangle)
- Mathematical induction and the binomial theorem

Combinatorics and Finite Probability

- Combinations and permutations, as applications of the binomial theorem and Pascal's Triangle


Learning Processes
Similarities
Differences

5

Curriculum Focal Points for Mathematics in Prekindergarten through Grade 8

Three curriculum focal points are identified and described for each grade level, pre-K–8, along with connections to guide integration of the focal points at that grade level and across grade levels, to form a comprehensive mathematics curriculum. To build students' strength in the use of mathematical processes, instruction in these content areas should incorporate—

- the use of the mathematics to solve problems;
- an application of logical reasoning to justify procedures and solutions; and
- an involvement in the design and analysis of multiple representations to learn, make connections among, and communicate about the ideas within and outside of mathematics.

The purpose of identifying these grade-level curriculum focal points and connections is to enable students to learn the content in the context of a focused and cohesive curriculum that implements problem solving, reasoning, and critical thinking.

These curriculum focal points should be considered as major instructional goals and desirable learning expectations, not as a list of objectives for students to master. They should be implemented with the intention of building mathematical competency for all students, bolstered by the pedagogical understanding that not every student learns at the same rate or acquires concepts and skills at the same time.

Those who are involved in curriculum planning for grades 6–8 should note that this set of curriculum focal points has been designed with the intention of providing a three-year middle school program that includes a full year of general mathematics in each of grades 6, 7, and 8. Those whose programs offer an algebra course in grade 8 (or earlier) should consider including the curriculum focal points that this framework calls for in grade 8 in grade 6 or grade 7. Alternatively, these topics could be incorporated into the high school program. Either way, curricula would not omit the important content that the grade 7 and grade 8 focal points offer students in preparation for algebra and for their long-term mathematical knowledge.

Curriculum Focal Points and Connections for Prekindergarten

The set of three curriculum focal points and related connections for mathematics in prekindergarten follow. These topics are the recommended content emphases for this grade level. It is essential that these focal points be addressed in contexts that promote problem solving, reasoning, communication, making connections, and designing and analyzing representations.

Number and Operations: Developing an understanding of whole numbers, including concepts of correspondence, counting, cardinality, and comparison

Children develop an understanding of the meanings of whole numbers and recognize the number of objects in small groups without counting and by counting—the first and most basic mathematical algorithm. They understand that number words refer to quantity. They use one-to-one correspondence to solve problems by matching sets and comparing number amounts and in counting objects to 10 and beyond. They understand that the last word that they state in counting tells "how many," they count to determine number amounts and compare quantities (using language such as "more than" and "less than"), and they order sets by the number of objects in them.

Geometry: Identifying shapes and describing spatial relationships

Children develop spatial reasoning by working from two perspectives on space as they examine the shapes of objects and inspect their relative positions. They find shapes in their environments and describe them in their own words. They build pictures and designs by combining two- and three-dimensional shapes, and they solve such problems as deciding which piece will fit into a space in a puzzle. They discuss the relative positions of objects with vocabulary such as "above," "below," and "next to."

Measurement: Identifying measurable attributes and comparing objects by using these attributes

Children identify objects as "the same" or "different," and then "more" or "less," on the basis of attributes that they can measure. They identify measurable attributes such as length and weight and solve problems by making direct comparisons of objects on the basis of those attributes.

Data Analysis: Children learn the foundations of data analysis by using objects' attributes that they have identified in relation to geometry and measurement (e.g., size, quantity, orientation, number of sides or vertices, color) for various purposes, such as describing, sorting, or comparing. For example, children sort geometric figures by shape, compare objects by weight ("heavier," "lighter"), or describe sets of objects by the number of objects in each set.

Number and Operations: Children use meanings of numbers to create strategies for solving problems and responding to practical situations, such as getting just enough napkins for a group, or mathematical situations, such as determining that any shape is a triangle if it has exactly three straight sides and is closed.

Algebra: Children recognize and duplicate simple sequential patterns (e.g., square, circle, square, circle, square, circle,...).

Curriculum Focal Points and Connections for Kindergarten

The set of three curriculum focal points and related connections for mathematics in kindergarten follow. These topics are the recommended content emphases for this grade level. It is essential that these focal points be addressed in contexts that promote problem solving, reasoning, communication, making connections, and designing and analyzing representations.

Number and Operations: Representing, comparing, and ordering whole numbers and joining and separating sets

Children use numbers, including written numerals, to represent quantities and to solve quantitative problems, such as counting objects in a set, creating a set with a given number of objects, comparing and ordering sets or numerals by using both cardinal and ordinal meanings, and modeling simple joining and separating situations with objects. They choose, combine, and apply effective strategies for answering quantitative questions, including quickly recognizing the number in a small set, counting and producing sets of given sizes, counting the number in combined sets, and counting backward.

Geometry: Describing shapes and space

Children interpret the physical world with geometric ideas (e.g., shape, orientation, spatial relations) and describe it with corresponding vocabulary. They identify, name, and describe a variety of shapes, such as squares, triangles, circles, rectangles, (regular) hexagons, and (isosceles) trapezoids presented in a variety of ways (e.g., with different sizes or orientations), as well as such three-dimensional shapes as spheres, cubes, and cylinders. They use basic shapes and spatial reasoning to model objects in their environment and to construct more complex shapes.

Measurement: Ordering objects by measurable attributes

Children use measurable attributes, such as length or weight, to solve problems by comparing and ordering objects. They compare the lengths of two objects both directly (by comparing them with each other) and indirectly (by comparing both with a third object), and they order several objects according to length.

Data Analysis: Children sort objects and use one or more attributes to solve problems. For example, they might sort solids that roll easily from those that do not. Or they might collect data and use counting to answer such questions as, "What is our favorite snack?" They re-sort objects by using new attributes (e.g., after sorting solids according to which ones roll, they might re-sort the solids according to which ones stack easily).

Geometry: Children integrate their understandings of geometry, measurement, and number. For example, they understand, discuss, and create simple navigational directions (e.g., "Walk forward 10 steps, turn right, and walk forward 5 steps").

Algebra: Children identify, duplicate, and extend simple number patterns and sequential and growing patterns (e.g., patterns made with shapes) as preparation for creating rules that describe relationships.

Curriculum Focal Points and Connections for Grade 1

The set of three curriculum focal points and related connections for mathematics in grade 1 follow. These topics are the recommended content emphases for this grade level. It is essential that these focal points be addressed in contexts that promote problem solving, reasoning, communication, making connections, and designing and analyzing representations.

Number and Operations and *Algebra:* Developing understandings of addition and subtraction and strategies for basic addition facts and related subtraction facts

Children develop strategies for adding and subtracting whole numbers on the basis of their earlier work with small numbers. They use a variety of models, including discrete objects, length-based models (e.g., lengths of connecting cubes), and number lines, to model "part-whole," "adding to," "taking away from," and "comparing" situations to develop an understanding of the meanings of addition and subtraction and strategies to solve such arithmetic problems. Children understand the connections between counting and the operations of addition and subtraction (e.g., adding two is the same as "counting on" two). They use properties of addition (commutativity and associativity) to add whole numbers, and they create and use increasingly sophisticated strategies based on these properties (e.g., "making tens") to solve addition and subtraction problems involving basic facts. By comparing a variety of solution strategies, children relate addition and subtraction as inverse operations.

Number and Operations: Developing an understanding of whole number relationships, including grouping in tens and ones

Children compare and order whole numbers (at least to 100) to develop an understanding of and solve problems involving the relative sizes of these numbers. They think of whole numbers between 10 and 100 in terms of groups of tens and ones (especially recognizing the numbers 11 to 19 as 1 group of ten and particular numbers of ones). They understand the sequential order of the counting numbers and their relative magnitudes and represent numbers on a number line.

Geometry: Composing and decomposing geometric shapes

Children compose and decompose plane and solid figures (e.g., by putting two congruent isosceles triangles together to make a rhombus), thus building an understanding of part-whole relationships as well as the properties of the original and composite shapes. As they combine figures, they recognize them from different perspectives and orientations, describe their geometric attributes and properties, and determine how they are alike and different, in the process developing a background for measurement and initial understandings of such properties as congruence and symmetry.

Number and Operations and ***Algebra:*** Children use mathematical reasoning, including ideas such as commutativity and associativity and beginning ideas of tens and ones, to solve two-digit addition and subtraction problems with strategies that they understand and can explain. They solve both routine and nonroutine problems.

Measurement and ***Data Analysis:*** Children strengthen their sense of number by solving problems involving measurements and data. Measuring by laying multiple copies of a unit end to end and then counting the units by using groups of tens and ones supports children's understanding of number lines and number relationships. Representing measurements and discrete data in picture and bar graphs involves counting and comparisons that provide another meaningful connection to number relationships.

Algebra: Through identifying, describing, and applying number patterns and properties in developing strategies for basic facts, children learn about other properties of numbers and operations, such as odd and even (e.g., "Even numbers of objects can be paired, with none left over"), and 0 as the identity element for addition.

Curriculum Focal Points and Connections for Grade 2

The set of three curriculum focal points and related connections for mathematics in grade 2 follow. These topics are the recommended content emphases for this grade level. It is essential that these focal points be addressed in contexts that promote problem solving, reasoning, communication, making connections, and designing and analyzing representations.

Number and Operations: Developing an understanding of the base-ten numeration system and place-value concepts

Children develop an understanding of the base-ten numeration system and place-value concepts (at least to 1000). Their understanding of base-ten numeration includes ideas of counting in units and multiples of hundreds, tens, and ones, as well as a grasp of number relationships, which they demonstrate in a variety of ways, including comparing and ordering numbers. They understand multidigit numbers in terms of place value, recognizing that place-value notation is a shorthand for the sums of multiples of powers of 10 (e.g., 853 as 8 hundreds + 5 tens + 3 ones).

Number and Operations and *Algebra:* Developing quick recall of addition facts and related subtraction facts and fluency with multidigit addition and subtraction

Children use their understanding of addition to develop quick recall of basic addition facts and related subtraction facts. They solve arithmetic problems by applying their understanding of models of addition and subtraction (such as combining or separating sets or using number lines), relationships and properties of number (such as place value), and properties of addition (commutativity and associativity). Children develop, discuss, and use efficient, accurate, and generalizable methods to add and subtract multidigit whole numbers. They select and apply appropriate methods to estimate sums and differences or calculate them mentally, depending on the context and numbers involved. They develop fluency with efficient procedures, including standard algorithms, for adding and subtracting whole numbers, understand why the procedures work (on the basis of place value and properties of operations), and use them to solve problems.

Measurement: Developing an understanding of linear measurement and facility in measuring lengths

Children develop an understanding of the meaning and processes of measurement, including such underlying concepts as partitioning (the mental activity of slicing the length of an object into equal-sized units) and transitivity (e.g., if object A is longer than object B and object B is longer than object C, then object A is longer than object C). They understand linear measure as an iteration of units and use rulers and other measurement tools with that understanding. They understand the need for equal-length units, the use of standard units of measure (centimeter and inch), and the inverse relationship between the size of a unit and the number of units used in a particular measurement (i.e., children recognize that the smaller the unit, the more iterations they need to cover a given length).

Number and Operations: Children use place value and properties of operations to create equivalent representations of given numbers (such as 35 represented by 35 ones, 3 tens and 5 ones, or 2 tens and 15 ones) and to write, compare, and order multidigit numbers. They use these ideas to compose and decompose multidigit numbers. Children add and subtract to solve a variety of problems, including applications involving measurement, geometry, and data, as well as nonroutine problems. In preparation for grade 3, they solve problems involving multiplicative situations, developing initial understandings of multiplication as repeated addition.

Geometry and ***Measurement:*** Children estimate, measure, and compute lengths as they solve problems involving data, space, and movement through space. By composing and decomposing two-dimensional shapes (intentionally substituting arrangements of smaller shapes for larger shapes or substituting larger shapes for many smaller shapes), they use geometric knowledge and spatial reasoning to develop foundations for understanding area, fractions, and proportions.

Algebra: Children use number patterns to extend their knowledge of properties of numbers and operations. For example, when skip counting, they build foundations for understanding multiples and factors.

Curriculum Focal Points and Connections for Grade 3

The set of three curriculum focal points and related connections for mathematics in grade 3 follow. These topics are the recommended content emphases for this grade level. It is essential that these focal points be addressed in contexts that promote problem solving, reasoning, communication, making connections, and designing and analyzing representations.

Number and Operations and *Algebra:* Developing understandings of multiplication and division and strategies for basic multiplication facts and related division facts

Students understand the meanings of multiplication and division of whole numbers through the use of representations (e.g., equal-sized groups, arrays, area models, and equal "jumps" on number lines for multiplication, and successive subtraction, partitioning, and sharing for division). They use properties of addition and multiplication (e.g., commutativity, associativity, and the distributive property) to multiply whole numbers and apply increasingly sophisticated strategies based on these properties to solve multiplication and division problems involving basic facts. By comparing a variety of solution strategies, students relate multiplication and division as inverse operations.

Number and Operations: Developing an understanding of fractions and fraction equivalence

Students develop an understanding of the meanings and uses of fractions to represent parts of a whole, parts of a set, or points or distances on a number line. They understand that the size of a fractional part is relative to the size of the whole, and they use fractions to represent numbers that are equal to, less than, or greater than 1. They solve problems that involve comparing and ordering fractions by using models, benchmark fractions, or common numerators or denominators. They understand and use models, including the number line, to identify equivalent fractions.

Geometry: Describing and analyzing properties of two-dimensional shapes

Students describe, analyze, compare, and classify two-dimensional shapes by their sides and angles and connect these attributes to definitions of shapes. Students investigate, describe, and reason about decomposing, combining, and transforming polygons to make other polygons. Through building, drawing, and analyzing two-dimensional shapes, students understand attributes and properties of two-dimensional space and the use of those attributes and properties in solving problems, including applications involving congruence and symmetry.

Algebra: Understanding properties of multiplication and the relationship between multiplication and division is a part of algebra readiness that develops at grade 3. The creation and analysis of patterns and relationships involving multiplication and division should occur at this grade level. Students build a foundation for later understanding of functional relationships by describing relationships in context with such statements as, "The number of legs is 4 times the number of chairs."

Measurement: Students in grade 3 strengthen their understanding of fractions as they confront problems in linear measurement that call for more precision than the whole unit allowed them in their work in grade 2. They develop their facility in measuring with fractional parts of linear units. Students develop measurement concepts and skills through experiences in analyzing attributes and properties of two-dimensional objects. They form an understanding of perimeter as a measurable attribute and select appropriate units, strategies, and tools to solve problems involving perimeter.

Data Analysis: Addition, subtraction, multiplication, and division of whole numbers come into play as students construct and analyze frequency tables, bar graphs, picture graphs, and line plots and use them to solve problems.

Number and Operations: Building on their work in grade 2, students extend their understanding of place value to numbers up to 10,000 in various contexts. Students also apply this understanding to the task of representing numbers in different equivalent forms (e.g., expanded notation). They develop their understanding of numbers by building their facility with mental computation (addition and subtraction in special cases, such as 2,500 + 6,000 and 9,000 – 5,000), by using computational estimation, and by performing paper-and-pencil computations.

Curriculum Focal Points and Connections for Grade 4

The set of three curriculum focal points and related connections for mathematics in grade 4 follow. These topics are the recommended content emphases for this grade level. It is essential that these focal points be addressed in contexts that promote problem solving, reasoning, communication, making connections, and designing and analyzing representations.

Number and Operations and *Algebra:* Developing quick recall of multiplication facts and related division facts and fluency with whole number multiplication

Students use understandings of multiplication to develop quick recall of the basic multiplication facts and related division facts. They apply their understanding of models for multiplication (i.e., equal-sized groups, arrays, area models, equal intervals on the number line), place value, and properties of operations (in particular, the distributive property) as they develop, discuss, and use efficient, accurate, and generalizable methods to multiply multidigit whole numbers. They select appropriate methods and apply them accurately to estimate products or calculate them mentally, depending on the context and numbers involved. They develop fluency with efficient procedures, including the standard algorithm, for multiplying whole numbers, understand why the procedures work (on the basis of place value and properties of operations), and use them to solve problems.

Number and Operations: Developing an understanding of decimals, including the connections between fractions and decimals

Students understand decimal notation as an extension of the base-ten system of writing whole numbers that is useful for representing more numbers, including numbers between 0 and 1, between 1 and 2, and so on. Students relate their understanding of fractions to reading and writing decimals that are greater than or less than 1, identifying equivalent decimals, comparing and ordering decimals, and estimating decimal or fractional amounts in problem solving. They connect equivalent fractions and decimals by comparing models to symbols and locating equivalent symbols on the number line.

Measurement: Developing an understanding of area and determining the areas of two-dimensional shapes

Students recognize area as an attribute of two-dimensional regions. They learn that they can quantify area by finding the total number of same-sized units of area that cover the shape without gaps or overlaps. They understand that a square that is 1 unit on a side is the standard unit for measuring area. They select appropriate units, strategies (e.g., decomposing shapes), and tools for solving problems that involve estimating or measuring area. Students connect area measure to the area model that they have used to represent multiplication, and they use this connection to justify the formula for the area of a rectangle.

Algebra: Students continue identifying, describing, and extending numeric patterns involving all operations and nonnumeric growing or repeating patterns. Through these experiences, they develop an understanding of the use of a rule to describe a sequence of numbers or objects.

Geometry: Students extend their understanding of properties of two-dimensional shapes as they find the areas of polygons. They build on their earlier work with symmetry and congruence in grade 3 to encompass transformations, including those that produce line and rotational symmetry. By using transformations to design and analyze simple tilings and tessellations, students deepen their understanding of two-dimensional space.

Measurement: As part of understanding two-dimensional shapes, students measure and classify angles.

Data Analysis: Students continue to use tools from grade 3, solving problems by making frequency tables, bar graphs, picture graphs, and line plots. They apply their understanding of place value to develop and use stem-and-leaf plots.

Number and Operations: Building on their work in grade 3, students extend their understanding of place value and ways of representing numbers to 100,000 in various contexts. They use estimation in determining the relative sizes of amounts or distances. Students develop understandings of strategies for multidigit division by using models that represent division as the inverse of multiplication, as partitioning, or as successive subtraction. By working with decimals, students extend their ability to recognize equivalent fractions. Students' earlier work in grade 3 with models of fractions and multiplication and division facts supports their understanding of techniques for generating equivalent fractions and simplifying fractions.

Curriculum Focal Points and Connections for Grade 5

The set of three curriculum focal points and related connections for mathematics in grade 5 follow. These topics are the recommended content emphases for this grade level. It is essential that these focal points be addressed in contexts that promote problem solving, reasoning, communication, making connections, and designing and analyzing representations.

Number and Operations and *Algebra:* Developing an understanding of and fluency with division of whole numbers

Students apply their understanding of models for division, place value, properties, and the relationship of division to multiplication as they develop, discuss, and use efficient, accurate, and generalizable procedures to find quotients involving multidigit dividends. They select appropriate methods and apply them accurately to estimate quotients or calculate them mentally, depending on the context and numbers involved. They develop fluency with efficient procedures, including the standard algorithm, for dividing whole numbers, understand why the procedures work (on the basis of place value and properties of operations), and use them to solve problems. They consider the context in which a problem is situated to select the most useful form of the quotient for the solution, and they interpret it appropriately.

Number and Operations: Developing an understanding of and fluency with addition and subtraction of fractions and decimals

Students apply their understandings of fractions and fraction models to represent the addition and subtraction of fractions with unlike denominators as equivalent calculations with like denominators. They apply their understandings of decimal models, place value, and properties to add and subtract decimals. They develop fluency with standard procedures for adding and subtracting fractions and decimals. They make reasonable estimates of fraction and decimal sums and differences. Students add and subtract fractions and decimals to solve problems, including problems involving measurement.

Geometry and *Measurement* and *Algebra:* Describing three-dimensional shapes and analyzing their properties, including volume and surface area

Students relate two-dimensional shapes to three-dimensional shapes and analyze properties of polyhedral solids, describing them by the number of edges, faces, or vertices as well as the types of faces. Students recognize volume as an attribute of three-dimensional space. They understand that they can quantify volume by finding the total number of same-sized units of volume that they need to fill the space without gaps or overlaps. They understand that a cube that is 1 unit on an edge is the standard unit for measuring volume. They select appropriate units, strategies, and tools for solving problems that involve estimating or measuring volume. They decompose three-dimensional shapes and find surface areas and volumes of prisms. As they work with surface area, they find and justify relationships among the formulas for the areas of different polygons. They measure necessary attributes of shapes to use area formulas to solve problems.

Algebra: Students use patterns, models, and relationships as contexts for writing and solving simple equations and inequalities. They create graphs of simple equations. They explore prime and composite numbers and discover concepts related to the addition and subtraction of fractions as they use factors and multiples, including applications of common factors and common multiples. They develop an understanding of the order of operations and use it for all operations.

Measurement: Students' experiences connect their work with solids and volume to their earlier work with capacity and weight or mass. They solve problems that require attention to both approximation and precision of measurement.

Data Analysis: Students apply their understanding of whole numbers, fractions, and decimals as they construct and analyze double-bar and line graphs and use ordered pairs on coordinate grids.

Number and Operations: Building on their work in grade 4, students extend their understanding of place value to numbers through millions and millionths in various contexts. They apply what they know about multiplication of whole numbers to larger numbers. Students also explore contexts that they can describe with negative numbers (e.g., situations of owing money or measuring elevations above and below sea level).

Curriculum Focal Points and Connections for Grade 6

The set of three curriculum focal points and related connections for mathematics in grade 6 follow. These topics are the recommended content emphases for this grade level. It is essential that these focal points be addressed in contexts that promote problem solving, reasoning, communication, making connections, and designing and analyzing representations.

Number and Operations: Developing an understanding of and fluency with multiplication and division of fractions and decimals

Students use the meanings of fractions, multiplication and division, and the inverse relationship between multiplication and division to make sense of procedures for multiplying and dividing fractions and explain why they work. They use the relationship between decimals and fractions, as well as the relationship between finite decimals and whole numbers (i.e., a finite decimal multiplied by an appropriate power of 10 is a whole number), to understand and explain the procedures for multiplying and dividing decimals. Students use common procedures to multiply and divide fractions and decimals efficiently and accurately. They multiply and divide fractions and decimals to solve problems, including multistep problems and problems involving measurement.

Number and Operations: Connecting ratio and rate to multiplication and division

Students use simple reasoning about multiplication and division to solve ratio and rate problems (e.g., "If 5 items cost $3.75 and all items are the same price, then I can find the cost of 12 items by first dividing $3.75 by 5 to find out how much one item costs and then multiplying the cost of a single item by 12"). By viewing equivalent ratios and rates as deriving from, and extending, pairs of rows (or columns) in the multiplication table, and by analyzing simple drawings that indicate the relative sizes of quantities, students extend whole number multiplication and division to ratios and rates. Thus, they expand the repertoire of problems that they can solve by using multiplication and division, and they build on their understanding of fractions to understand ratios. Students solve a wide variety of problems involving ratios and rates.

Algebra: Writing, interpreting, and using mathematical expressions and equations

Students write mathematical expressions and equations that correspond to given situations, they evaluate expressions, and they use expressions and formulas to solve problems. They understand that variables represent numbers whose exact values are not yet specified, and they use variables appropriately. Students understand that expressions in different forms can be equivalent, and they can rewrite an expression to represent a quantity in a different way (e.g., to make it more compact or to feature different information). Students know that the solutions of an equation are the values of the variables that make the equation true. They solve simple one-step equations by using number sense, properties of operations, and the idea of maintaining equality on both sides of an equation. They construct and analyze tables (e.g., to show quantities that are in equivalent ratios), and they use equations to describe simple relationships (such as $3x = y$) shown in a table.

Number and Operations: Students' work in dividing fractions shows them that they can express the result of dividing two whole numbers as a fraction (viewed as parts of a whole). Students then extend their work in grade 5 with division of whole numbers to give mixed number and decimal solutions to division problems with whole numbers. They recognize that ratio tables not only derive from rows in the multiplication table but also connect with equivalent fractions. Students distinguish multiplicative comparisons from additive comparisons.

Algebra: Students use the commutative, associative, and distributive properties to show that two expressions are equivalent. They also illustrate properties of operations by showing that two expressions are equivalent in a given context (e.g., determining the area in two different ways for a rectangle whose dimensions are $x + 3$ by 5). Sequences, including those that arise in the context of finding possible rules for patterns of figures or stacks of objects, provide opportunities for students to develop formulas.

Measurement and ***Geometry:*** Problems that involve areas and volumes, calling on students to find areas or volumes from lengths or to find lengths from volumes or areas and lengths, are especially appropriate. These problems extend the students' work in grade 5 on area and volume and provide a context for applying new work with equations.

Curriculum Focal Points and Connections for Grade 7

The set of three curriculum focal points and related connections for mathematics in grade 7 follow. These topics are the recommended content emphases for this grade level. It is essential that these focal points be addressed in contexts that promote problem solving, reasoning, communication, making connections, and designing and analyzing representations.

Number and Operations and *Algebra* and *Geometry:* Developing an understanding of and applying proportionality, including similarity

Students extend their work with ratios to develop an understanding of proportionality that they apply to solve single and multistep problems in numerous contexts. They use ratio and proportionality to solve a wide variety of percent problems, including problems involving discounts, interest, taxes, tips, and percent increase or decrease. They also solve problems about similar objects (including figures) by using scale factors that relate corresponding lengths of the objects or by using the fact that relationships of lengths within an object are preserved in similar objects. Students graph proportional relationships and identify the unit rate as the slope of the related line. They distinguish proportional relationships ($y/x = k$, or $y = kx$) from other relationships, including inverse proportionality ($xy = k$, or $y = k/x$).

Measurement and *Geometry* and *Algebra:* Developing an understanding of and using formulas to determine surface areas and volumes of three-dimensional shapes

By decomposing two- and three-dimensional shapes into smaller, component shapes, students find surface areas and develop and justify formulas for the surface areas and volumes of prisms and cylinders. As students decompose prisms and cylinders by slicing them, they develop and understand formulas for their volumes (*Volume = Area of base* × *Height*). They apply these formulas in problem solving to determine volumes of prisms and cylinders. Students see that the formula for the area of a circle is plausible by decomposing a circle into a number of wedges and rearranging them into a shape that approximates a parallelogram. They select appropriate two- and three-dimensional shapes to model real-world situations and solve a variety of problems (including multistep problems) involving surface areas, areas and circumferences of circles, and volumes of prisms and cylinders.

Number and Operations and *Algebra:* Developing an understanding of operations on all rational numbers and solving linear equations

Students extend understandings of addition, subtraction, multiplication, and division, together with their properties, to all rational numbers, including negative integers. By applying properties of arithmetic and considering negative numbers in everyday contexts (e.g., situations of owing money or measuring elevations above and below sea level), students explain why the rules for adding, subtracting, multiplying, and dividing with negative numbers make sense. They use the arithmetic of rational numbers as they formulate and solve linear equations in one variable and use these equations to solve problems. Students make strategic choices of procedures to solve linear equations in one variable and implement them efficiently, understanding that when they use the properties of equality to express an equation in a new way, solutions that they obtain for the new equation also solve the original equation.

Measurement and ***Geometry:*** Students connect their work on proportionality with their work on area and volume by investigating similar objects. They understand that if a scale factor describes how corresponding lengths in two similar objects are related, then the square of the scale factor describes how corresponding areas are related, and the cube of the scale factor describes how corresponding volumes are related. Students apply their work on proportionality to measurement in different contexts, including converting among different units of measurement to solve problems involving rates such as motion at a constant speed. They also apply proportionality when they work with the circumference, radius, and diameter of a circle; when they find the area of a sector of a circle; and when they make scale drawings.

Number and Operations: In grade 4, students used equivalent fractions to determine the decimal representations of fractions that they could represent with terminating decimals. Students now use division to express any fraction as a decimal, including fractions that they must represent with infinite decimals. They find this method useful when working with proportions, especially those involving percents. Students connect their work with dividing fractions to solving equations of the form $ax = b$, where a and b are fractions. Students continue to develop their understanding of multiplication and division and the structure of numbers by determining if a counting number greater than 1 is a prime, and if it is not, by factoring it into a product of primes.

Data Analysis: Students use proportions to make estimates relating to a population on the basis of a sample. They apply percentages to make and interpret histograms and circle graphs.

Probability: Students understand that when all outcomes of an experiment are equally likely, the theoretical probability of an event is the fraction of outcomes in which the event occurs. Students use theoretical probability and proportions to make approximate predictions.

Curriculum Focal Points and Connections for Grade 8

The set of three curriculum focal points and related connections for mathematics in grade 8 follow. These topics are the recommended content emphases for this grade level. It is essential that these focal points be addressed in contexts that promote problem solving, reasoning, communication, making connections, and designing and analyzing representations.

Algebra: Analyzing and representing linear functions and solving linear equations and systems of linear equations

Students use linear functions, linear equations, and systems of linear equations to represent, analyze, and solve a variety of problems. They recognize a proportion ($y/x = k$, or $y = kx$) as a special case of a linear equation of the form $y = mx + b$, understanding that the constant of proportionality (k) is the slope and the resulting graph is a line through the origin. Students understand that the slope (m) of a line is a constant rate of change, so if the input, or x-coordinate, changes by a specific amount, a, the output, or y-coordinate, changes by the amount ma. Students translate among verbal, tabular, graphical, and algebraic representations of functions (recognizing that tabular and graphical representations are usually only partial representations), and they describe how such aspects of a function as slope and y-intercept appear in different representations. Students solve systems of two linear equations in two variables and relate the systems to pairs of lines that intersect, are parallel, or are the same line, in the plane. Students use linear equations, systems of linear equations, linear functions, and their understanding of the slope of a line to analyze situations and solve problems.

Geometry and *Measurement:* Analyzing two- and three-dimensional space and figures by using distance and angle

Students use fundamental facts about distance and angles to describe and analyze figures and situations in two- and three-dimensional space and to solve problems, including those with multiple steps. They prove that particular configurations of lines give rise to similar triangles because of the congruent angles created when a transversal cuts parallel lines. Students apply this reasoning about similar triangles to solve a variety of problems, including those that ask them to find heights and distances. They use facts about the angles that are created when a transversal cuts parallel lines to explain why the sum of the measures of the angles in a triangle is 180 degrees, and they apply this fact about triangles to find unknown measures of angles. Students explain why the Pythagorean theorem is valid by using a variety of methods—for example, by decomposing a square in two different ways. They apply the Pythagorean theorem to find distances between points in the Cartesian coordinate plane to measure lengths and analyze polygons and polyhedra.

Data Analysis and *Number and Operations* and *Algebra:* Analyzing and summarizing data sets

Students use descriptive statistics, including mean, median, and range, to summarize and compare data sets, and they organize and display data to pose and answer questions. They compare the information provided by the mean and the median and investigate the different effects that changes in data values have on these measures of center. They understand that a measure of center alone does not thoroughly describe a data set because very different data sets can share the same measure of center. Students select the mean or the median as the appropriate measure of center for a given purpose.

Algebra: Students encounter some nonlinear functions (such as the inverse proportions that they studied in grade 7 as well as basic quadratic and exponential functions) whose rates of change contrast with the constant rate of change of linear functions. They view arithmetic sequences, including those arising from patterns or problems, as linear functions whose inputs are counting numbers. They apply ideas about linear functions to solve problems involving rates such as motion at a constant speed.

Geometry: Given a line in a coordinate plane, students understand that all "slope triangles"—triangles created by a vertical "rise" line segment (showing the change in y), a horizontal "run" line segment (showing the change in x), and a segment of the line itself—are similar. They also understand the relationship of these similar triangles to the constant slope of a line.

Data Analysis: Building on their work in previous grades to organize and display data to pose and answer questions, students now see numerical data as an aggregate, which they can often summarize with one or several numbers. In addition to the median, students determine the 25th and 75th percentiles (1st and 3rd quartiles) to obtain information about the spread of data. They may use box-and-whisker plots to convey this information. Students make scatterplots to display bivariate data, and they informally estimate lines of best fit to make and test conjectures.

Number and Operations: Students use exponents and scientific notation to describe very large and very small numbers. They use square roots when they apply the Pythagorean theorem.

2/3/10

Elementary Math Committee
Program Strength and Weaknesses

Strengths of Math Expressions	Total		**Strengths of Math In Focus**	Total
Embedded Professional Development	4		Focused scope and sequence	5
Math Talk/ student led discussions	4		Rigorous	4
Multiple strategies to build to algorithm	3		Bar Model	2
Practice opportunities- Remembering Pages	3		Reteaching/extension components	2
Differentiation - and extension activities	3		Bar Model	2
Opportunities for active engagement	2		Ample instructional materials	1
Progression from concrete to pictorial to abstract	2		Focus on algebra skills	1
Manipulative support/ sequence	2		Ties in with EDC Calendar Math	1
friendly' for teacher, parent,student	2		Vocabulary	1
Rigor	1			
Strong algebra	1			
Homework informs instructions	1			
Weaknesses of Math Expressions			**Weaknesses of Math In Focus**	
Too much content/ topics for a year 'mile wide'	5		Too teacher directed	3
Differentiated card format difficult for primary	2		less balance of concepts/procedures	2
Manipulatives not holding up, trays	2		kindergarten component - weak	2
Too many options	1		not enough hands on	1
Too fast paced	1		instruction - boring delivery	1
Wrap up not as visual or easy to use as MIF	1		primary - lack of flow to components	1
Calendar math overlaps with routines	1		lack review of previously learned concepts	1
Cost of bells and whistles	1		Not enough practice in daily lessons	1
not enough reteaching	1		Lacks real world problems	1
			technology	1
			Rely on teacher/ preteaching b/4 text	1
			More Professional Development required	1

March 9, 2010

Elementary Criterion Tool Results
Math Expressions compared to Math In Focus

Score range - 1-5	MX - 5	MX - 4	% high rank	% high rank	MIF - 5	MIF - 4
1. Concepts/skills align to MN standards	29	4	100	100	28	5
2. Concepts/skills align to NCTM Focal Points	30	3	100	100	29	4
3. Accurate mathematics	22	11	100	100	22	11
4. Technology integrated with content	13	17	91	30	1	9
5. Gender Fair	22	8	91	79	17	9
6. Racially, ethnically & culturally diverse	18	8	79	76	18	7
7. Age appropriate	23	9	97	64	6	15
8. Consistency of content & correct vocabulary	16	15	94	73	17	7
9. Topics ↑ in complexity, focused, excessive review↓	11	14	76	82	10	17
10. Clear explanations of concepts	19	11	91	67	3	19
11. Explicit technology instruction as it relates to math	13	12	91	27	1	8
12. Connects between math concepts, prior knowledge	22	8	91	58	7	12
13. Multiple representations (table, graph, visual, symbolic)	21	11	97	49	3	13
14. More than one way to solve a problem	25	6	94	15	0	5
15. **Method to move student to abstract (C,P,A)**	26	5	94	61	7	13
16. **Higer order thinking, meta-cognition**	17	13	91	64	8	13
17. Supports networks of knowledge (conceptual)	14	17	94	67	6	16
18. Evidence of justifying, explaining, evaluating	19	11	91	39	1	12
19. Clear identification of mastery level for basic skills	12	17	88	61	7	13
20. **Enough practice to develop computational fluency**	14	15	88	37	2	10
21. Engaging and relevant for students	25	7	97	33	1	10
22. Promotes transfer - to solve novel problems	16	14	91	30	3	7
23. Reform & explicit instruction of computation	20	7	82	46	3	12
24. ELL component	14	11	76	42	2	12
25. Provides parent information (reference, reinforcement)	25	7	97	45	5	10
26. Provides PD in a variey of formats	14	13	82	24	2	6
27. Materials accessible to students (texts, e version, audio)	16	12	85	33	3	8
28. User friendly for teachers	25	5	91	30	1	9
29. Applicable to other settings (Title, Sp. Ed.)	15	13	85	9	2	12
30. High quality differentiated instruction	10	20	91	58	6	13
31. A variety of assessments- formative to summatvie	14	7	63	46	4	11

Key-Big Ideas Math- BIM
March 9, 2010

Middle School Math
Textbook Comparisons

Key: PH/CMP II
Prentice Hall Connected Mathematics Project

scale: 1-5	BIM 5	BIM 4	% high rank	% high rank	PH/CMPII- 5	PH/CMPII -4
1. Concepts/skills align to NCTM Focal Points	8	3	100	64	2	5
2. Concepts/skills align to MN standards	6	5	100	73	1	7
3. Accurate mathematics	7	4	100	91	5	5
4. Technology integrated with content	4	3	64	73	2	6
5. Gender Fair	6	3	82	64	3	4
6. Racially, ethnically & culturally diverse	4	4	73	55	2	4
7. Age appropriate	8	2	91	82	1	8
8. Consistency of content & correct vocabulary	7	4	100	73	2	6
9. Topics ↑ in complexity, focused, excessive review↓	6	5	100	46	0	5
10. Clear explanations of concepts	7	5	109	64	1	6
11. Explicit technology instruction as it relates to math	2	5	64	55	1	5
12. Connects between math concepts, prior knowledge	6	5	100	37	0	4
13. Multiple representations (table, graph, visual, symbolic)	7	4	100	46	0	5
14. More than one way to solve a problem	6	5	100	28	0	3
15. **Method to move student to abstract (C,P,A)**	8	3	100	37	0	4
16. **Higher order thinking, meta-cognition**	8	3	100	9	0	3
17. Supports networks of knowledge (conceptual)	2	9	100	18	1	1
18. Evidence of justifying, explaining, evaluating	8	3	100	18	1	1
19. Clear identification of mastery level for basic skills	5	7	109	37	0	4
20. **Enough practice to develop computational fluency**	6	5	100	82	2	7
21. Engaging and relevant for students	7	4	100	37	0	4
22. Promotes transfer - to solve novel problems	3	7	91	18	0	2
23. Reform & explicit instruction of computation	7	4	100	27	0	3
24. ELL component	2	2	37	9	1	0
25. Provides parent information (reference, reinforcement)	6	5	100	55	3	3
26. Provides PD in a variety of formats	3	6	82	46	0	5
27. Materials accessible to students (texts, e version, audio)	5	4	82	37	0	4
28. User friendly for teachers	10	1	100	18	0	2
29. Applicable to other settings (Title, Sp. Ed.)	6	4	91	9	0	1
30. High quality differentiated instruction	7	4	100	9	0	1
31. A variety of assessments- formative to summative	3	7	100	27	0	3

Reviewer's Name: Date reviewed: Grade level(s)

Publisher: Title: Copyright date:

Review Criteria Scale	**Low**				**High**
Standards-Based Content					
1. Content/skills align to MN standards	1	2	3	4	5
2. Content/skills align to NCTM Focal Points	1	2	3	4	5
3. Mathematically accurate	1	2	3	4	5
4. Technology integrated with content	1	2	3	4	5
5. Gender fair	1	2	3	4	5
6. Racially, ethnically diverse	1	2	3	4	5
Understanding					
7. Connects to prior knowledge	1	2	3	4	5
8. Provides real world connections	1	2	3	4	5
9. Consistency of content & correct vocab.	1	2	3	4	5
10. Multiple representations of math (Tables, graphs, visual, symbolic)	1	2	3	4	5
11. Method to move student to **abstract** (concrete, pictorial, abstract)	**1**	**2**	**3**	**4**	**5**
12. Topics increase in complexity (reduce excessive review)	1	2	3	4	5
13. Clear explanations of concepts	1	2	3	4	5
14. Emphasis on higher order thinking skills & meta-cognition	1	2	3	4	5
15. A variety of assessments from formative to summative	1	2	3	4	5
16. Explicit technology instruction as it relates to math	1	2	3	4	5
Reasoning					
17. Supports networks of knowledge	1	2	3	4	5
18. Promotes accountable talk (justify)					

Computing

19. Clear identification of mastery level and prerequisite skill for basic skills fluency	1	2	3	4	5
20. Enough practice to develop computational fluency	1	2	3	4	5
21. Reform and explicit instruction of computation	1	2	3	4	5
22. More than one way to solve a problem	1	2	3	4	5

Applying

23. Promotes transfer and independent problem solvers	1	2	3	4	5

Engaging

24. Interesting, relative for students	1	2	3	4	5
	1	2	3	4	5

Support and Infrastructure

25. Parent information piece (reference/reinforcement)	1	2	3	4	5
26. Materials accessible to students (texts, web e versions, audio versions)	1	2	3	4	5
27. High quality differentiated learning offered (especially high ability and underperforming)	1	2	3	4	5
28. ELL component (appropriate strategies & technology	1	2	3	4	5
29. Applicable to other settings (Sp. Ed., Title, Focus)	1	2	3	4	5
30. User friendly for teachers	1	2	3	4	5

Reviewer's Comments:

Final recommendation

☐ Recommend

☐ Do not recommend

☐ Recommend with modification; specify:

Math Alignment k-12

Alignment of current instructional tools/curriculum to MN 2007 state standards

Strands

Grades	Number and Operation	Algebra	Geometry/ Measurement	Data Analysis
K	4/7	0/1	2/5	*
1	2/10	3/5	4/5	*
2	8/11	2/2	4/7	*
3	11/14	3/3	6/8	*
4	13/16	3/3	8/10	1/1
5	11/14	2/2	7/7	1/1
6	10/16	5/5	5/8	¼
7	1/13	2/9	0/6	3/6
8	4/5	13/21	3/6	3/3
9-12	*	2/30	1/25	8/16

*No benchmarks in this strand for this grade

Analysis of current materials: Number of benchmarks needing to be added or strengthened (only partially met)/ total number of benchmarks per strand.

Current materials: Investigations and Connected Mathematics Project, HS by course
Cross grade level meetings and k-12 committee work summarized – Spring 2008- Fall 2009

Fifth Grade Math Curriculum and Assessment Form

Strand	Standard	Benchmarks	Curriculum tools and materials	Assessment
Number & Operation	Divide multi-digit numbers; solve real-world and mathematical problems using arithmetic.	Divide multi-digit numbers, using efficient and generalizable procedures, based on knowledge of place value, including standard algorithms. Recognize that quotients can be represented in a variety of ways, including a whole number with a remainder, a fraction or mixed number, or a decimal. *For example*: Dividing 153 by 7 can be used to convert the improper fraction $\frac{153}{7}$ to the mixed number $21\frac{6}{7}$. 5.1.1.1	**Houghton Mifflin** ***Math Expressions*** Unit 7 Lessons 7.12,7.13, 7.17-7.21,7.23 Unit 9 Lesson 9.12	
		Consider the context in which a problem is situated to select the most useful form of the quotient for the solution and use the context to interpret the quotient appropriately. *For example*: If 77 amusement ride tickets are to be distributed evenly among 4 children, each child will receive 19 tickets, and there will be one left over. If $77 is to be distributed evenly among 4 children, each will receive $19.25, with nothing left over. 5.1.1.2	Unit 7 Lesson 7.20	
		Estimate solutions to arithmetic problems in order to assess the reasonableness of results of calculations. 5.1.1.3	Unit 2 Lessons 2.2, 2.6 Unit 3 Lessons 3.10, 3.13, 3.15 Unit 4 Lesson 4.7 Unit 6 Lessons 6.2, 6.5 Unit 7 Lesson 71.,7.6,7.16	

Strand	Standard	Benchmarks	Curriculum tools and materials	Assessment
Number & Operation	Divide multi-digit numbers; solve real-world and mathematical problems using arithmetic.	Solve real-world and mathematical problems requiring addition, subtraction, multiplication and division of multi-digit whole numbers. Use various strategies, including the use of a calculator and the inverse relationships between operations, to check for accuracy. *For example*: The calculation 117 ÷ 9 = 13 can be checked by multiplying 9 and 13. 5.1.1.4	**Houghton Mifflin** ***Math Expressions*** Fluency Plan Unit 1 Lessons 1.1-1.4, 1.8 Unit 2 Lesson 2.2 Unit 3 Lessons 3.10, 3.20, 3.21 Unit 6 Lessons 6.3-6.5 Unit 7 7.2-7.6,7.11,7.13,7.15,7.20,7.21 Unit 8 Lesson 8.2 Unit 9 Lesson 9.1,9.2,9.13 Unit 11 Lesson 11.2	
	Read, write, represent and compare fractions and decimals; recognize and write equivalent fractions; convert between fractions and decimals; use fractions and decimals in real-world and mathematical situations.	Read and write decimals using place value to describe decimals in terms of groups from millionths to millions. *For example*: Possible names for the number 0.37 are: 37 hundredths 3 tenths + 7 hundredths; possible names for the number 1.5 are: one and five tenths 15 tenths. 5.1.2.1	Unit 3 Lesson 3.1-3.3, 3.5, 3.15 Unit 5 Lesson 5.18 Unit 7 Lessons 7.7-7.9	

Strand	Standard	Benchmarks	Curriculum tools and materials	Assessment
Number & Operation		Find 0.1 more than a number and 0.1 less than a number. Find 0.01 more than a number and 0.01 less than a number. Find 0.001 more than a number and 0.001 less than a number. 5.1.2.2	**Houghton Mifflin** ***Math Expressions*** Unit 7 Lessons 7.8,7.9	
		Order fractions and decimals, including mixed numbers and improper fractions, and locate on a number line. *For example*: Which is larger 1.25 or $\frac{6}{5}$? *Another example*: In order to work properly, a part must fit through a 0.24 inch wide space. If a part is $\frac{1}{4}$ inch wide, will it fit? 5.1.2.3	Unit 3 Lessons 3.2, 3.3 Unit 5 Lessons 5.2,5.11,5.13,5.14,5.18,5.19 Unit 9 Lesson 9.2,9.10 Unit 11 Lesson 11.10	
	Read, write, represent and compare fractions and decimals; recognize and write equivalent fractions; convert between fractions and decimals; use fractions and decimals in real-world and mathematical situations.	Recognize and generate equivalent decimals, fractions, mixed numbers and improper fractions in various contexts. *For example*: When comparing 1.5 and $\frac{19}{12}$, note that $1.5 = 1\frac{1}{2} = 1\frac{6}{12} = \frac{18}{12}$, so $1.5 < \frac{19}{12}$. 5.1.2.4	Unit 5 Lessons 5.11-5.14, 5.16, 5.18, 5.19, 5.21 Unit 6 Lesson 6.4 Unit 7 Lesson 7,14 Unit 9 Lesson 9.7 Unit 11 Lesson 11.10	
		Round numbers to the nearest 0.1, 0.01 and 0.001. *For example*: Fifth grade students used a calculator to find the mean of the monthly allowance in their class. The calculator display shows 25.80645161. Round this number to the nearest cent. 5.1.2.5	Unit 3 Lesson 3.15 Unit 7 Lessons 7.10,7.11	

Strand	Standard	Benchmarks	Curriculum tools and materials	Assessment
Number & Operation	Add and subtract fractions, mixed numbers and decimals to solve real-world and mathematical problems.	Add and subtract decimals and fractions, using efficient and generalizable procedures, including standard algorithms. 5.1.3.1	**Houghton Mifflin** ***Math Expressions*** Unit 3 Lessons 3.4, 3.7-3.9 Unit 5 Lessons 5.1, 5.3-5.10, 5.14-5.17, 5.19-5.21 Unit 7 Lesson 7.7 Unit 9 Lessons 9.6,9.9,9.14	
		Model addition and subtraction of fractions and decimals using a variety of representations. *For example*: Represent $\frac{2}{3}+\frac{1}{4}$ and $\frac{2}{3}-\frac{1}{4}$ by drawing a rectangle divided into 4 columns and 3 rows and shading the appropriate parts or by using fraction circles or bars. 5.1.3.2	Unit 3 Lessons 3.4, 3.7, 3.9 Unit 5 5.1,5.3-5.7,5.9,5.14, 5.17, 5.19	
		Estimate sums and differences of decimals and fractions to assess the reasonableness of results in calculations. *For example*: Recognize that $12\frac{2}{5}-3\frac{3}{4}$ is between 8 and 9 (since $\frac{2}{5}<\frac{3}{4}$). 5.1.3.3	Unit 5 Lesson 5.20 Unit 7 Lessons 7.10,7.15	
		Solve real-world and mathematical problems requiring addition and subtraction of decimals, fractions and mixed numbers, including those involving measurement, geometry and data. *For example*: Calculate the perimeter of the soccer field when the length is 109.7 meters and the width is 73.1 meters. 5.1.3.4	Unit 3 Lessons 3.4, 3.8, 3.9, 3.21 Unit 5 Lesson 5.1, 5.3-5.5,5.9-5.11,5.14,5.19,5.21 Unit 6 Lesson 6.7 Unit 7 Lesson 7.7 Unit 9 Lessons 9.13,9.14	

Strand	Standard	Benchmarks	Curriculum tools and materials	Assessment
Algebra	Recognize and represent patterns of change; use patterns, tables, graphs and rules to solve real-world and mathematical problems.	Create and use rules, tables, spreadsheets and graphs to describe patterns of change and solve problems. *For example*: An end-of-the-year party for 5th grade costs $100 to rent the room and $4.50 for each student. Know how to use a spreadsheet to create an input-output table that records the total cost of the party for any number of students between 90 and 150. 5.2.1.1	**Houghton Mifflin** ***Math Expressions*** Fluency Plan Unit 1 Lesson 1.5, 1.11 Unit 5 Lesson 5.18 Unit 6 Lesson 6.2 Unit 7 Lessons 71.,7.2,7.5,7.9 Unit 8 Lesson 8.3 Unit 10 Lessons 10.1, 10.2 Unit 11 Lessons 11.1-11.6, 11/13	
		Use a rule or table to represent ordered pairs of positive integers and graph these ordered pairs on a coordinate system. 5.2.1.2	Unit 10 Lesson 10.4 Need to include prior to MCA III	
	Use properties of arithmetic to generate equivalent numerical expressions and evaluate expressions involving whole numbers.	Apply the commutative, associative and distributive properties and order of operations to generate equivalent numerical expressions and to solve problems involving whole numbers. *For example*: Purchase 5 pencils at 19 cents and 7 erasers at 19 cents. The numerical expression is $5 \times 19 + 7 \times 19$ which is the same as $(5 + 7) \times 19$. 5.2.2.1	Fluency Plan Unit 1 Lessons 1.6, 1.9, 1.10 Unit 3 Lessons 3.11, 3.19 Unit 8 Lesson 8.4	

Strand	Standard	Benchmarks	Curriculum tools and materials	Assessment
Algebra	Understand and interpret equations and inequalities involving variables and whole numbers, and use them to represent and solve real-world and mathematical problems.	Determine whether an equation or inequality involving a variable is true or false for a given value of the variable. *For example*: Determine whether the inequality $1.5 + x < 10$ is true for $x = 2.8$, $x = 8.1$, or $x = 9.2$. 5.2.3.1	**Houghton Mifflin** ***Math Expressions*** Supplement	
		Represent real-world situations using equations and inequalities involving variables. Create real-world situations corresponding to equations and inequalities. *For example*: $250 - 27 \times a = b$ can be used to represent the number of sheets of paper remaining from a packet of 250 when each student in a class of 27 is given a certain number of sheets. 5.2.3.2	Fluency Plan Unit 1 Lessons 1.5-1.7, 1.9 Unit 3 Lessons 3.11, 3.18, 3.19 Unit 8 Lesson 8.4	
		Evaluate expressions and solve equations involving variables when values for the variables are given. *For example*: Using the formula, $A = \ell w$, determine the area when the length is 5, and the width 6, and find the length when the area is 24 and the width is 4. 5.2.3.3	Unit 1 Lessons 1.1-1.3, 1.10 Unit 2 Lessons 2.2-2.4 Unit 3 Lessons 3.6, 3.18-3.20, 3.22 Unit 5 Lesson 5.3, 5.15 Unit 8 Lesson 8.1 Unit 10 Lesson 10.2 Unit 11 Lessons 11.5-11.7, 11.9	

Strand	Standard	Benchmarks	Curriculum tools and materials	Assessment
Geometry & Measurement	Describe, classify, and draw representations of three-dimensional figures.	Describe and classify three-dimensional figures including cubes, prisms and pyramids by the number of edges, faces or vertices as well as the types of faces. 5.3.1.1	**Houghton Mifflin** ***Math Expressions*** Unit 6 Lesson 6.1, 6.2 Unit 11 Lesson 11.13 Unit 12 Lesson 12.1-12.4	
		Recognize and draw a net for a three-dimensional figure. 5.3.1.2	Unit 12 Lesson 12.1,12.2	
Geometry & Measurement	Determine the area of triangles and quadrilaterals; determine the surface area and volume of rectangular prisms in various contexts.	Develop and use formulas to determine the area of triangles, parallelograms and figures that can be decomposed into triangles. 5.3.2.1	Fluency Plan Unit 6 Lessons 6.2,6.5 Unit 11 Lesson 11.7	
		Determine the surface area of a rectangular prism by applying various strategies. *For example*: Use a net or decompose the surface into rectangles. 5.3.2.2	Unit 6 Lesson 6.2 Unit 12 Lessons 12.1,12.2	

Strand	Standard	Benchmarks	Curriculum tools and materials	Assessment
Geometry & Measurement	Determine the area of triangles and quadrilaterals; determine the surface area and volume of rectangular prisms in various contexts.	Understand that the volume of a three-dimensional figure can be found by counting the total number of same-size cubic units that fill a shape without gaps or overlaps. Use cubic units to label volume measurements. *For example*: Use cubes to find the volume of a small fish tank. 5.3.2.3	**Houghton Mifflin** ***Math Expressions*** Unit 6 Lesson 6.1	
		Develop and use the formulas $V = \ell wh$ and $V = Bh$ to determine the volume of rectangular prisms. Justify why base area B and height h are multiplied to find the volume of a rectangular prism by breaking the prism into layers of unit cubes. 5.3.2.4	Unit 6 Lessons 6.1-6.3, 6.5	
Geometry & Measurement	Determine the area of triangles and quadrilaterals; determine the surface area and volume of rectangular prisms in various contexts.	Know and use the definitions of the mean, median and range of a set of data. Know how to use a spreadsheet to find the mean, median and range of a data set. Understand that the mean is a "leveling out" of data. *For example*: The set of numbers 1, 1, 4, 6 has mean 3. It can be leveled by taking one unit from the 4 and three units from the 6 and adding them to the 1s, making four 3s. 5.4.1.1	Unit 3 Lesson 3.12 Unit 7 Lesson 7.22	
Data Analysis	Display and interpret data; determine mean, median and range.	Create and analyze double-bar graphs and line graphs by applying understanding of whole numbers, fractions and decimals. Know how to create spreadsheet tables and graphs to display data. 5.4.1.2	Unit 3 Lessons 3.14, 3.16, 3.17, 3.21, 3.22 Unit 4 Lesson 4.6 Unit 7 Lesson 7.22	

Big Ideas Math – Grade 6 - Required Lessons - School Year 2010-2011

Curricular Unit Math Topic	Benchmark	Required lessons	Approx# of Days	Suggested Timeline*	Test Specifications
NUMBERS AND OPERATIONS Chapter 1 Expressions & Number Properties (*and include factors/multiples, number properties, area/surface area*)	6.1.1.5. 6.1.1.6. 6.2.1.1. 6.2.2.1. 6.3.1.2.	All sections *Also include*: BSH Topic 2 and SRH Topics: 2.1, 2.2, 2.3 3.4, 11.2, 11.5 and 12	20 days	September 13 – October 8	Allowable multiplication notation: 3x, xy, 3· 4, 3(4) Prime factors are not greater than 13 Equations not containing exponents Conversions are limited to within a representation (e.g. 7/4 = 1 ¾, not 0.5 = ½) *Vocabulary*: evaluate, area, order of operations, simplify, x^2, >, < , GCF, LCM, prime factor, prim factorization, exponent, power, base and vocabulary given at previous grades
NUMBERS AND OPERATIONS Chapter 2 Multiplying and Dividing Fractions	6.1.1.4. 6.1.3.1. 6.1.3.2. 6.1.3.4. 6.1.3.5.	All sections	22 days	October 11 – November 11	Items must not have context *Vocabulary*: reciprocal, rate, ratio, unit rate, and vocabulary given at previous grades
NUMBERS AND OPERATIONS Chapter 3 Multiplying and Dividing Decimals	6.1.3.1. 6.1.3.2. 6.1.3.4. 6.1.3.5.	All sections	15 days	November 15 – December 9	Items must not have context *Vocabulary*: reciprocal, rate, ratio, unit rate, and vocabulary given at previous grades
PERCENTS, RATIOS, AND RATES Chapter 4 Fractions, Decimals and Percents	6.1.1.1. 6.1.1.2. 6.1.3.3. 6.1.1.3. 6.1.3.4. 6.1.1.4. 6.1.3.5. 6.1.1.7 .	All sections *Also include*: App B 8.1, SRH Topics: 4.2, 5.1 5.4 and 10.1	18 days	December 10 – January 14	Allowable notation: 25%, 50%, ¼, 1:4, 0.95,0.25 Same scale on both axes No more than 2 operations Items may require locating pts on x or y axis Percents included: 100, 110, 125, 150, 200% *Vocabulary*: reciprocal, integer, x-axis, y-axis, horizontal & vertical axes, rational number, coordinate grid, is greater than, is less than, exponent, integer and vocabulary given at previous grades

Big Ideas Math – Grade 6 - Required Lessons - School Year 2010-2011

PERCENTS, RATIOS, AND RATES Chapter 5 Rate, Ratios, and Data Analysis	6.1.1.7. 6.1.2.1. 6.1.2.2. 6.1.2.3. 6.1.2.4.	All sections *Also include*: SRH Topic 18.1 and Gr 7 text – 9.1, 9.2 and 9.3	20 days	January 18 – February 17	Allowable ratio notation: ¼, 1 to 4, 1 out of 4, and 24% Rates may be expressed as "per" *Vocabulary*: ratio, percent, unit rate and vocabulary given at previous grades
Chapter 9 Probability In Grade 7 text (red) *Find more	6.4.1.1. 6.4.1.2. 6.4.1.3. 6.4.1.4.	Chp 9 – Sections 9.2 – 9.3			Size of sample space not exceed 36 then, 100 *Vocabulary*: probability, outcome, event, predict, sample space, tree diagram, likely, unlikely, certain, impossible, random, theoretical and experimental frequencies, relative frequency
GEOMETRY Chapter 6 *Circles and <u>Area</u> (*and include Surface area/volume of 2 and 3-d figures*)	6.3.1.1. 6.3.1.2. 6.3.1.3.	*Area/Perimeter:* SRH Topics: 12.2 and 13.1 & BSH Topic 14.2 **May want to teach circle lessons after spring MCA testing*	19 days	February 28 – March 25	Allowed notation: 3 sq cm = 3 cm sq = 3 cm^3 Justify formulas (may involve decomposition nets Vocabulary: surface area/volume of prisms and units cm^2, cm^3
Chapter 1 Angles & Similarity Grade 8 text (blue) * Find more	6.3.2.1. 6.3.2.2. 6.3.2.3.	Gr 8 txt – 1.1, 1.5, 5.1, 5.2, 5.3 & 5.5 and SRH Topics: 16.1 & 16.2			*Vocabulary*: intersecting, vertical, adjacent, complementary, supplementary, straight, hypotenuse, leg, interior, exterior, diagonal
Measurement Grade 8 text (red) * Find more	6.3.3.1. 6.3.3.2.	Chp 1 – Section 1.5 (8^{th}) SRH Topic 16 – 16.1 & 16.2			*Vocabulary*: customary, metric, capacity
ALGEBRA Chapter 7 Equations	6.2.1.1. 6.2.2.1. 6.2.1.2. 6.2.3.1. 6.2.3.2.	All sections Chp 1 – Sections 1.1 and 1.2 Chp 9 – Sections 9.1 – 9.3	19 days + 8 MCA practice days	March 28 – April 29	Allowable multiplication notation: 3x, xy, 3 4 and 3(4) Equations not containing exponents *Vocabulary*: evaluate, translate, function, and coordinate grid
ALGEBRA Chapter 8 Inequalities	6.2.3.1.	All sections	14 days	May 2 – 20	*Vocabulary*: Same as above
ALGEBRA Chapter 9 Tables, Graphs and Functions	6.2.1.1. 6.2.1.2.	All sections Chp 1 – Sections: 1.1, 1.2 Also include: App B.7	15 days	May 23 – June 6	Allowable multiplication notation:3x, xy, 3 4 & 3(4) Equations not containing exponents *Vocabulary*: evaluate, translate function, coordi-ate grid & vocabulary given at previous grade

K-12 Math Committee Meeting Minutes

December 9th, 2009

8-4

Attendees: Pamela Nelson, Kim Anderson, Becky Starks, Sheila Nyback, Brenda Florestano, Deb DeBolt, Jill Anderson, Nate Norman, Terri Micheau, Marge Fisher, Melissa Kelley, Tami Meyer, Kristin Know, Nancy Broman, Tim White, Gwyn Curran, Patti Bambenek

Webinar- "Teaching math to Low-Achieving Students: Response to Intervention in Mathematics"

Review first 4 of 8 recommendations based on scientific research. Levels of evidence rated as low, moderate, and high. See attachment

Tier I 1. Universal screening

Tier II 2. Focus instruction on whole number for grades k-5 and rational numbers for grades 6-8

3. Systematic instruction

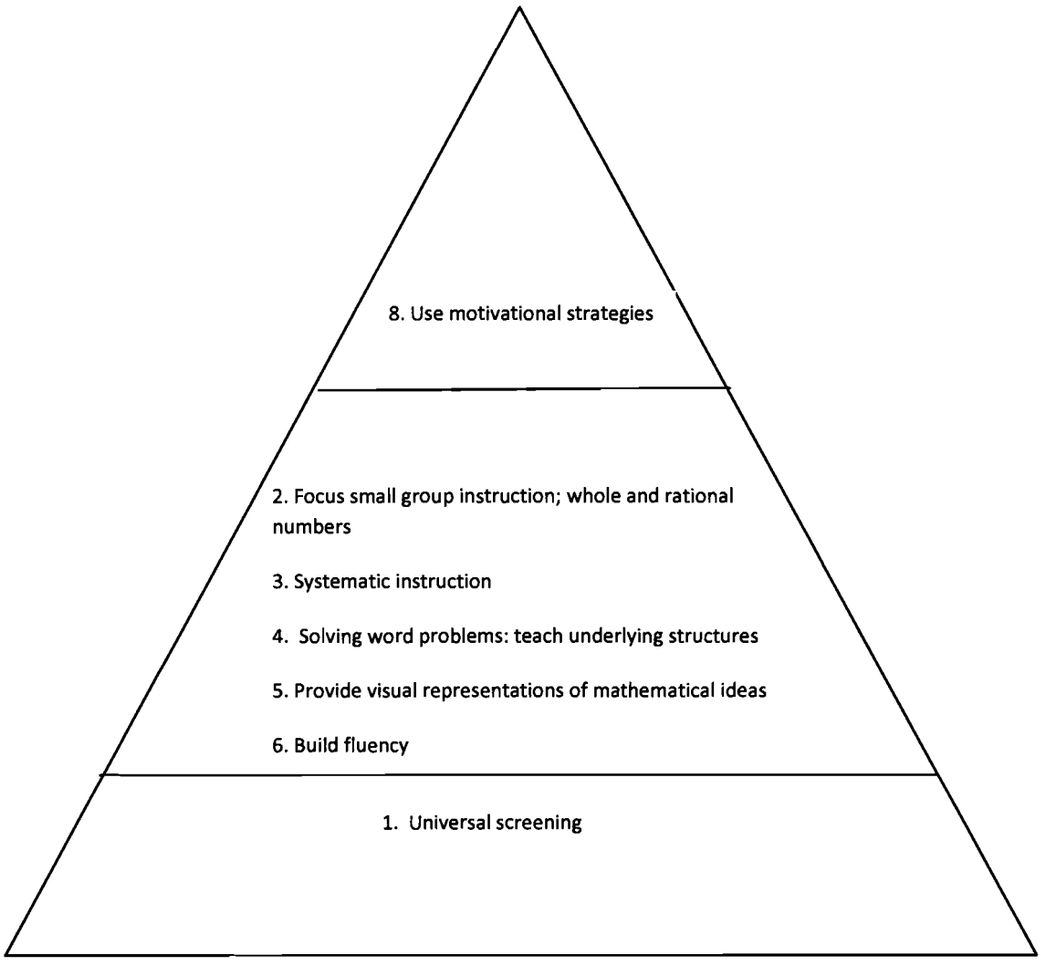
4. Visual representations

5. Building fluency with basic arithmetic facts

7. Progress Monitoring

8. Use of motivational strategies

See attached checklist for further information



1. Universal screening – currently assess (district priority)

k-5- Quantity Discrimination/ MBSP: Computation

6-9 NWEA, 11th at Denfeld

*High School – inconsistent and least screened

2. Focus 'small group' instruction- k-5 whole numbers and 6-8 rational numbers

3. Systematic Instruction- i.e. Clear examples, teacher think alouds, students communicate their problem solving

4. Solving word problems- teach underlying common structures

5. Provide visual representations of mathematical ideas

6. Build fluency- k-12 changed recommendation from fact fluency to incorporate computational fluency etc.

K-12 recommendations to build fluency

K-5 (6) – Provide 10 minutes of fluency instruction a day

6-8 – Provide 5 minutes of fluency instruction a day

HS- Provide fluency instruction in intervention settings; Excell, Focus, Title I, Special Ed., Math Labs

Will investigate tools: i.e. Fact Fluency- Trans Math, Otter Creek, FastMath, and FreeRice.com

Difficulty with computer based programs is the lack of access to computers

7. Progress Monitoring- use tools such as QD and Monitoring Basic Skills Progress or other Curriculum Based Measurement such as EDC Calendar Math at the elementary level.

8. Use motivational Strategies- k-12 committee suggested it for Tier III

Question: Who does small group? Is Title I pull out considered Tier II intervention for example?

Compared previous intervention suggestions from March 24th 2009 to research in webinar.

Changes are noted in green on chart.

Other topics discussed

Summer school: Re-evaluate – not seen as productive use of time or resources.

Focus and Excel: what is their purpose? Confusion as to whether there is a math/reading focus. Lack of consistency in implementation and no data to evaluate effectiveness were seen as areas for improvement.

Credit Recovery:

1. Is the rigor there for Plato or on-line courses? Needs to be evaluated

Credit Recovery for 6 week summer school - only allow ½ a credit instead of full credit

Note: Changes are in green

Structure	High School	Middle School	Elementary School
Additional math class	Algebra Math Lab (NWEA for placement)	Math Lab (Morgan Park only) Woodland	Extra math class
Additional time in school	* Hourly volunteer tutoring	Pull outs- from electives Morgan Park – 6th ~~Team taught math Lunch~~ Math (Ordean) Five Points Math	*Peer tutor *Enrichment ~~*Ability groups~~ ~~In at recess~~ *Flexible Grouping
Additional time after school		After school math class Excel	Math Club Excel Compass Program
Additional time- summer school	*6 week summer for 8th graders that failed		*6 week summer school
Computer Assisted Technology	Plato- check rigor of credit recovery	Study Island	
Special Math Class		Co-taught Focus	Co-taught
Building Fluency	Incorporate into all Intervention math settings	6th-8th – 5 minutes a day	k-5- 10 minutes a day
Tools/resources 3-11	Learning Locator Create or locate test of Critical Benchmarks (webinar) Teach critical benchmarks only	Learning Locator Create or locate test of Critical Benchmarks (webinar) Teach critical benchmarks only	Learning Locator
Math Labs for transition years- 6th and 9th	Identify incoming 9th graders at the end of 8th for 9th grade math lab	Identify incoming 6th graders at the end of 5th grade for 6th grade math lab	

- Not current practice at all sights
- Colored green- additions, changes, corrections to last year

Adoption of materials

High School generated list of their greatest needs to focus evaluation of k-8 materials adoption process

1. Factors

2. Rationale #s – fluency with and in particular multiplication of whole numbers and rationale numbers

3. Estimation

4. Transfer math from words to symbols

5. Incorporate algebraic thinking prior to coming to HS

6. Foster perseverance- effort counts

7. Multi-step problems

8. Show their thinking – organize written work

9. Read more

10. Recommend a focused curriculum – see critical benchmarks

Committee read *45* recommendations from the NMAP and *Guiding Principles for Mathematics Curriculum and* Assessment

Suggestions written above underlined in green indicate recommendations that were the same from both sources.

Elementary and Middle School Adoption Process

Shared selection process, evaluation tools, and chapter/unit titles of k-5 program. Texts were brought for both grade bands. Some opportunity for reviewing the materials was provided.

Questions on Parking Lot

1. Can district override state decision for math requirements and credits?

2. What is the on-line curriculum teaching in math?

3. What would qualify as a HS math credit? (Sped students receive credit for Alt. Math)

4. Research- how comparable districts at elementary are able to increase their math time?

5. Purpose of Excell?

6. Special Ed- hiring practices to encourage greater math background?

Additional tasks

1. Evaluate current/possible new intervention resources

2. Investigate the use of responders with lack of available computer lab time

3. Contact other districts to determine how they build in additional math time.

K-12 Math Committee Minutes

Attendees: Peter Graves (no sub left early), Brenda Florestano, Pam Nelson, Tim White, Nate Norman, Sheila Nyback, Kim Anderson, Becky Starks(l1/2 day no sub), Tami Meyer, Nancy Broman, Melissa Kelley, Deb DeBolt, Marge Fisher, Terri Micheau, Gwen Curran, Anne Krafthefer (1/2 day another meeting), Jill Dalbacka, Jill Anderson, Patti Bambenek

March 18, 2010

1. Update on **adoption** and selection process shared-

Handouts-

*Elementary Evaluation Results – % of participants with score of 4 or 5 (5 point scale) - Math Expressions and Math in Focus

* Elementary program strength and weaknesses comparison

* Middle School Evaluation Results- % or participants with scores of 4 or 5 – Big Ideas Math and Prentice Hall/CMP II

*Middle School focus question results – 6-8

Feedback to pilot

Peter Graves – wanted to know if all teachers knew what they were responsible to teach

Melissa Kelley- shared that elementary teachers are given pacing guides and assessment packets yearly; teachers may or may not read them.

Anne Krafthefer- suggested that teachers are given standards aligned to their materials

2. **Professional Development**

*Secondary - May 14th all day - Identify essential concepts and skills – Dr. Cash facilitating, Dr. Wayne Roberts – guest

*High School - Assessment trainings-– late August – TBD -

* Elementary- Math Expressions training – first round offered in June – the week of June 14th

* Middle School- Big Ideas Math 2 day training – week of August 23rd

Elementary: CBM- continue to investigate, may delay a year

Upcoming math meetings- added by need

Elementary- March 31st room 302 – 406

Middle School – ½ + TBD

2010-2011 Professional Development Proposals

* Elementary grade level implementation meetings – recommend ½ day grade level meetings monthly

* Middle school meetings- recommend ½ day middle school meetings-1 per grading period

* High school meetings – meet 5-6 times – ½ day per grading period

Upcoming math meetings- added by need

Elementary- March 31st room 302 – 4 -6 pm

Middle School – ½ + TBD

3. **Interventions**

Shared draft of tiered interventions

*handouts- copies of tiered intervention draft by grade band

Elementary tiered Intervention suggested changes

Core- 80 minutes –materials: Math Expressions (include embedded fact fluency from core materials) and Everyday Counts Calendar math goal: to meet the MN standards and benchmarks

Strategic – 20 minutes (a portion dedicated to fact/computational fluency)

Reduce classroom interruptions

Evaluate current materials by grade bands for use in interventions

Elementary recommendations_

With the new curriculum adoption, we recommend the following be considered

* To lessen the fiscal impact and make the best use of the materials in our new curriculum, for the first year all teachers be trained and required to use the intervention and extension materials associated with the curriculum. This includes Mega Math, Destination Math, and Soar to Success.

* Excel programs also use these allowed materials to enhance student support

* After school program staff (NYS, Compass, etc.) be offered in-service on intervention programs to support students outside of the school day.

* Open computer lab nights for parent to support student or for parent/student collaborative work

Middle School – Labs - pre-teaches, re-teach and address gaps, Excel- 4 days, 2 math 2 reading

High School Intervention suggestions: Math Resource (not math study hall) possible 6th assignment, add after school

Beginning Algebra (no lab)

*small classes (extra body/teacher)

*Grade Periods I and 2

Topics: Order of operations, rational numbers, integers, percents, arithmetic, applications, Chapter 1 of Algebra I

Materials: MCA practice books, Black box of worksheets, Slossen worksheets, Algebra I text

*Grade Periods 3 -6

Topics: Chapters 2-6 from Algebra 1 text. Chapter 7 optional, online resources

Intermediate Algebra- with Algebra Lab for selected students, criteria- NWEA and teacher recommendation

9th graders- online textbook, learner locator #, pre-teach, homework help, manipulatives/concrete

Geometry Labs- integrate into Math Resource Lab

Need: Diagnostic test and specific skills review

Webinars

ISucceed – 3- 8 Intervention program organized by strands

VMath – 2-8 Intervention program organized by grade level modules

Handout- criteria for evaluating intervention programs

Will investigate further for Middle School adoption/training – sample materials will be sent ASAP