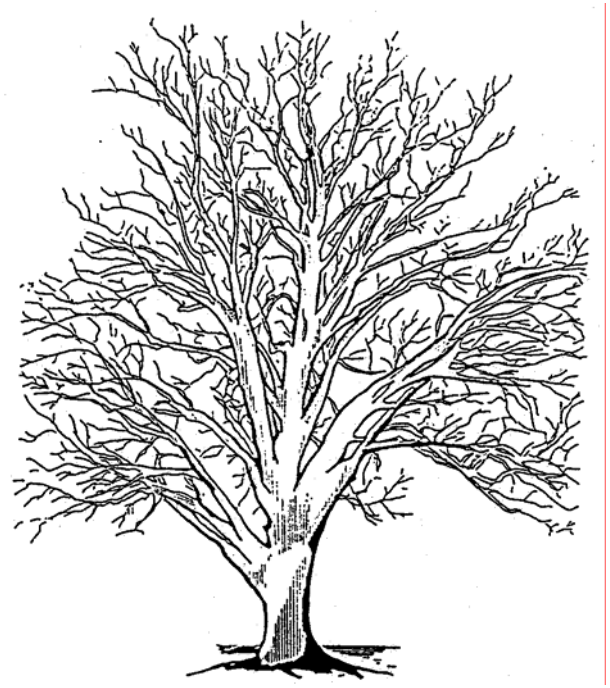
Monroe Township Schools



Curriculum Management System

Gifted & Talented Mathematics

Grades 2 - 4

July 2005

*** For adoption by all regular education programs as specified and for adoption or adaptation by all Special Education Programs in accordance with Board of Education Policy # 2220.**

Board Approved: August 2005

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MONROE TOWNSHIP SCHOOL DISTRICT

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Acknowledgments

The following individuals are acknowledged for their assistance in the preparation of this Curriculum Management System:

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Monroe Township Schools

Mission and Goals

Mission

The mission of the Monroe Township School District, a unique multi-generational community, is to collaboratively develop and facilitate programs that pursue educational excellence and foster character, responsibility, and life-long learning in a safe, stimulating, and challenging environment to empower all individuals to become productive citizens of a dynamic, global society.

Goals

To have an environment that is conducive to learning for all individuals.

To have learning opportunities that are challenging and comprehensive in order to stimulate the intellectual, physical, social and emotional development of the learner.

To procure and manage a variety of resources to meet the needs of all learners.

To have inviting up-to-date, multifunctional facilities that both accommodate the community and are utilized to maximum potential.

To have a system of communication that will effectively connect all facets of the community with the Monroe Township School District.

To have a staff that is highly qualified, motivated, and stable and that is held accountable to deliver a safe, outstanding, and superior education to all individuals.

INTRODUCTION, PHILOSOPHY OF EDUCATION, AND EDUCATIONAL GOALS

Philosophy

Monroe Township Schools are committed to providing students with a quality education resulting in life-long learners who can thrive in a global society. The Gifted & Talented mathematics program, grades 2 - 8, is predicated on that belief and is guided by the following principles as stated by the National Council of Teachers of Mathematics (NCTM) in the *Principles and Standards for School Mathematics, 2000.* First, a mathematics education requires equity. All students will be given worthwhile opportunities and strong support to meet high mathematical expectations. Second, a coherent mathematics curriculum will effectively organize, integrate, and articulate important mathematical ideas across the grades. Third, effective mathematics teaching requires the following: a) knowing and understanding mathematics, students as learners, and pedagogical strategies b) having a challenging and supportive classroom environment and c) continually reflecting on and refining instructional practice. Fourth, students must learn mathematics with understanding. A student's prior experiences and knowledge will actively build new knowledge. Fifth, assessment should support the learning of important mathematics and provide useful information to both teachers and students. Lastly, technology enhances mathematics learning, supports effective mathematics teaching, and influences what mathematics is taught.

As students begin their mathematics education in Monroe Township, classroom instruction will reflect the best thinking of the day. Children will engage in a wide variety of learning activities designed to develop their ability to reason and solve complex problems. Calculators, computers, manipulatives, technology, and the Internet will be used as tools to enhance learning and assist in problem solving. Group work, projects, literature, and interdisciplinary activities will make mathematics more meaningful and aid understanding. Classroom instruction will be designed to meet the learning needs of all children and will reflect a variety of learning styles.

In this changing world those who have a good understanding of mathematics will have many opportunities and doors open to them throughout their lives. Monroe Township Schools are committed to providing all students with the opportunity and the support necessary to learn significant mathematics with depth and understanding. This curriculum guide is designed to be a resource for staff members and to provide guidance in the planning, delivery, and assessment of the mathematics Gifted & Talented program for instruction for grades 2 - 8.

Educational Goals

Children in Monroe Township Schools Gifted & Talented program will develop conceptual understanding, procedural knowledge, and problem solving skills as they become proficient in the areas of: 4.1 Number and Numerical Operations, 4.2 Geometry and Measurement, 4.3 Patterns & Algebra, 4.4 Data Analysis, Probability, & Discrete Mathematics, and 4.5 Mathematical Processes. The district Gifted & Talented Grades 2 – 8 mathematics program recognizes the need to challenge and enable all students to step into the twenty-first century with the mathematical skills, understandings, and attitudes that they will need to be successful in their careers and throughout their daily lives.

New Jersey State Department of Education
Core Curriculum Content Standards

A note about Mathematics Standards and Cumulative Progress Indicators:

The New Jersey Core Curriculum Content Standards for Mathematics were revised in 2002. The Cumulative Progress Indicators (CPI's) referenced in this curriculum guide refer to these new standards and may be found in the Curriculum folder on the district servers. A complete copy of the new Core Curriculum Content Standards for Mathematics may also be found at: http://www.nj.gov/njded/cccs/s4_math.htm

Gifted and Talented Mathematics
Scope and Sequence
Grade 2

Semester I	
I. Number and Operations a. Compare and order 2 and 3-digit numbers	II. Number and Operations a. Whole number computation
III. Number and Operations a. Estimation and mental computation	IV. Number and Operations a. Addition and subtraction numbers 1 - 100
V. Number and Operations a. Multiplication Patterns	VI. Algebra a. Analyze and create repeating patterns
VII. Algebra a. Use variables to write equations	VIII.Algebra a. Addition and Subtraction b. Create functions
IX. Problem Solving a. Deductive reasoning to replace variables	X. Geometry a. Three-dement ional figures and nets
XI. Geometry a. Rotational symmetry	XII. Geometry a. Identify edges and vertices of polyhedra

Gifted and Talented Mathematics
Scope and Sequence
Grade 2

Semester II	
XIII. Problem Solving a. Identify relationships b. Develop and test conjectures	XIV. Data Analysis a. Interpret bar and picture graphs
XV. Data Analysis a. Identify misrepresentations of data	XVI. Data Analysis a. Analyze data to justify choices
XVII. Data Analysis a. Collect and organize data in tables	XVIII. Measurement a. Recognize the relationship between size and unit b. Recognize most appropriate units and tools
XIX. Measurement a. Use referents to estimate measures	XX. Problem Solving a. Identify relationships b. Develop and test conjectures
XXI. Problem Solving a. Deductive reasoning to eliminate conjecture	XXII. Problem Solving a. Organize and display data in a tree diagram
XXIII. Problem Solving a. Expanded notation	XXIV. Problem Solving a. Decomposing and recomposing shapes b. Area

Gifted and Talented Mathematics
Scope and Sequence
Grade 3

Semester I	
I. Algebra a. Interpret variables b. Line graphs	II. Geometry a. Tetrominoes b. Slides, flips and turns
III. Algebra a. Number patterns using a hundred board	IV. Algebra a. Construct growing patterns
V. Algebra a. Rates of change	VI. Algebra a. Substitute numbers for variables
VII. Algebra a. Variables	VIII. Algebra a. Use replacement sets to solve equations
IX. Algebra a. Commutative properties of operations	X. Geometry a. Multi-step directions
XI. Geometry a. Lines of symmetry	

Gifted and Talented Mathematics
Scope and Sequence
Grade 3

Semester II	
XII. Geometry a. Transformations: translations, reflections, and rotations	XIII. Geometry a. Attributes of three-dimensional shapes
XIV. Data Analysis and Probability a. Data on a line plot	XV. Data Analysis and Probability a. Two sets of data on line plots
XVI. Data Analysis and Probability a. Likelihood of events	XVII. Problem Solving and Reasoning a. Analyze arrays
XVIII. Problem Solving and Reasoning a. Relationship between units of weight	XIX. Problem Solving and Reasoning a. Evaluate data
XX. Geometry a. Tessellations	XXI. Geometry a. Platonic solids
XXII. Geometry a. two- and three-dimensional shapes	

Gifted and Talented Mathematics
Scope and Sequence
Grade 4

Semester I	
I. Number and Operations a. Patterns.	II. Data Analysis and Probability a. Experimental probability
III. Geometry a. Geoboards b. Properties of triangles	IV. Geometry a. Faces, edges, and vertices
V. Algebra a. Calculator patterns	VI. Algebra a. Patterns and relationships
VII. Geometry a. shapes and patterns	VIII. Geometry a. Ordered pairs
IX. Geometry a. Logic puzzles	X. Geometry a. Rotating, reflecting, and translating three-dimensional shapes
XI. Data Analysis a. Compare and contrast two sets of data	

Gifted and Talented Mathematics
Scope and Sequence
Grade 4

Semester II	
XII. Data Analysis and Probability a. Predict events	XIII. Algebra a. Rules for a Pattern
XIV. Geometry a. Front, top, and side views of three-dimensional figures .	XV. Algebra a. Graph table of values
XVI. Algebra a. Patterns in an array	XVII. Geometry a. Attributes of quadrilaterals b. Venn diagrams
XVIII. Number and Operations a. Patterns in addition	XIX. Number and Operations a. Prime and composite numbers
XX. Number and Operations a. Multiplication b. Napier's method	XXI. Geometry a. Similar shapes
XXII. Geometry a. two-dimensional representations of three-dimensional shapes	

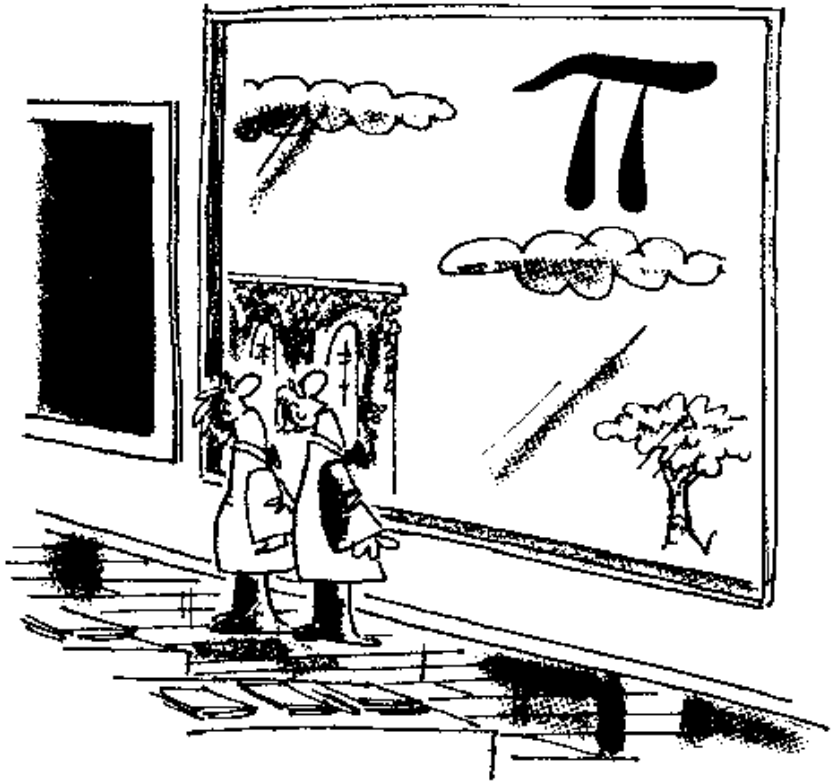
Resources and Materials

The Monroe Township Gifted and Talented Program for Mathematics in Grades 2 - 8 will focus on activities in the areas of Number and Operations, Algebra, Geometry, Data Analysis, Probability, Measurement, and Problem Solving. The Principals and Standards for School Mathematics Navigation Series will be a primary source for these projects and activities. In addition, NCTM Illuminations website will provide a wealth of interactive, multimedia math investigations. Beginning in grades 6 - 8 MATHCOUNTS and the American Mathematics Competition (AMC) will provide additional activities to stimulate and challenge students in this program.

Resources:

1. Principals and Standards for School Mathematics Navigation Series:
   Navigating through Number and Operations in Pre-kindergarten-Grade 2
   Navigating through Algebra in Pre-kindergarten-Grade 2
   Navigating through Geometry in Pre-kindergarten-Grade 2
   Navigating through Data Analysis and Probability in Pre-kindergarten-Grade 2
   Navigating through Measurement in Pre-kindergarten-Grade 2
   Navigating through Problem Solving and Reasoning in Grade 2
   Navigating through Problem Solving and Reasoning in Grade 3
   Navigating through Algebra in Grades 3 - 5
   Navigating through Geometry in Grades 3 - 5
   Navigating through Data Analysis and Probability in Grades 3 - 5
   Navigating through Algebra in Grades 6-8
   Navigating through Geometry in Grades 6-8
   Navigating through Data Analysis in Grades 6 - 8
   Navigating through Probability in Grades 6 - 8
2. NCTM Illuminations. Interactive, multimedia math investigations. Http://illumtest.nctm.org/
3. 2004 - 2005 MATHCOUNTS SCHOOL Handbook
4. The Art of Problem Solving - Volumes 1 and 2 by Richard Rusczyk and Sandor Lehoczky
5. Problem Solving Strategies: Crossing the River with Dogs by Ken Johnson and Ted Herr
6. Thought Provokers and More Thought Provokers by Doug Rohrer
7. Hands On Math for Middle Grades, Robert Smith, Creative Teaching Press, Inc. 1996
8. Mental Math Workout, Michael L. Lobosco, Scholastic, Inc. 1998
9. Mental Math Challenges, Michael L. Lobosco, Scholastic, Inc. 1999

GIFTED & TALENTED MATHEMATICS
GRADE 2

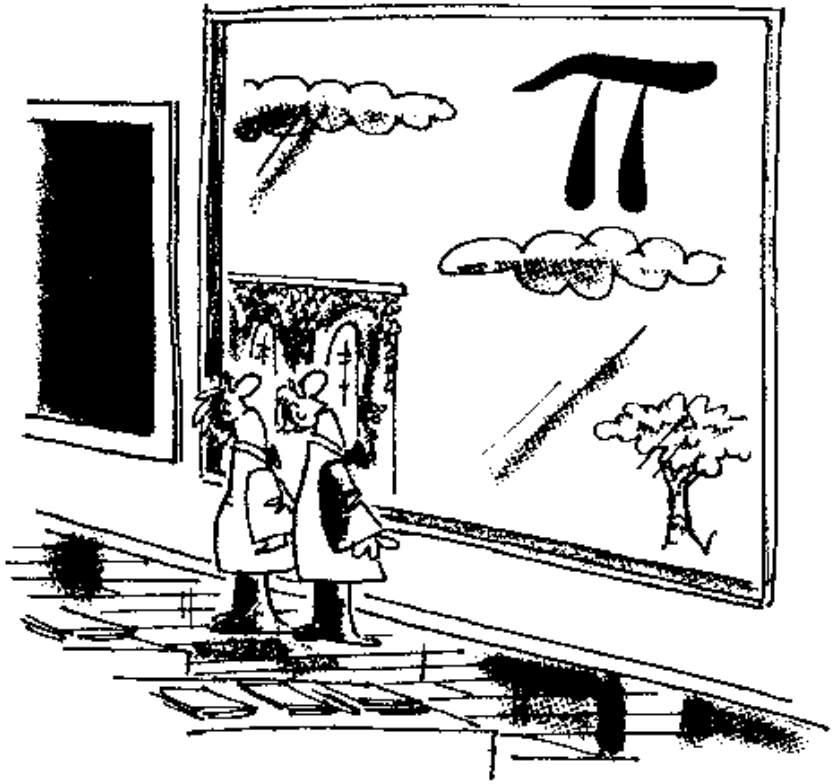


Grade 2				
Lesson	Strand	Grade Level	Title	Goals
1	Number and Operations	2	All in Order Navigating through Number and Operations Grade 2 pp 29-32 and BLM p 89	Students will Compare and order two-digit and three-digit numbers
2	Number and Operations	2	Valuable Art Navigating through Number and Operations Grade 2 pp 70-72 and BLM p 99	Students will develop and use strategies for whole-number computation and use a variety of methods and tools to compute.
3	Number and Operations	2	Four in a Row Navigating through Number and Operations Grade 2 pp 73-75 and BLM p 100	Students will estimate or mentally compute sums of two-digit numbers, practice addition with two-digit numbers, and develop and communicate game strategies
4	Number and Operations	2	Hit the Target Navigating through Number and Operations Grade 2 pp 79-81 BLM p 101	Students will add 1, 2, 5, or 10 to, or subtract it from, the numbers 1 through 100 and analyze addition and subtraction options on each turn
5	Number and Operations	2	Mirror Multiplication Navigating through Number and Operations Grade 2 pp 55-57	Students will identify equal groups in multiplication, record, and recognize that reflections duplicate the items being reflected.
6	Algebra	2	What's Above? Navigating through Algebra Grade 2 pp 27-29	Students will describe, continue, analyze, and create repeating patterns of shapes and relate the elements in a pattern to their positions in the pattern and generalize those relationships
7	Algebra	2	How Far? Navigating through Algebra Grade 2 pp 50-52 and BLM p 84	Students will explore maps in which variables represent unknown distances and use variables to write equations to show relationships. Students will also solve for unknowns in addition and subtraction situations. They will identify distances that are related proportionally and interpret maps
8	Algebra	2	Math Machines Navigating through Algebra grade 2 pp 69-70 and BLM p 87	Students will identify, describe, and record one-and two-step functions. They will use addition and subtraction to solve problems and create functions
9	Problem Solving	2	What's the Sum? Navigating through Problem Solving and Reasoning Grade 2pp 13-14 and BLM pp 35-37	Students will use deductive reasoning to replace variables with their values.

Grade 2				
Lesson	Strand	Grade Level	Title	Goals
10	Geometry	2	Rolling Net Navigating through Geometry Grade 2 pp 27-30	Students will recognize the relationship between the attributes of a three-dimensional figure and the attributes of its net. Students will recognize that a three-dimensional figure can have different nets.
11	Geometry	2	Rotating Geoboards Navigating through Geometry Grade 2 pp 64-65	Students will recognize rotational symmetry, identify quarter, half, and three-quarter turns. Students will use transformations to analyze mathematical situations.
12	Geometry	2	Skeletons Navigating through Geometry Grade 2 pp 76-78	Students will visualize and describe characteristics of polyhedral and identify edges and vertices of polyhedra.
13	Problem Solving	2	Match Me Navigating through Problem Solving and Reasoning Grade 2 pp15-18 and BLM pp 38-40	Students will make and investigate mathematical conjectures. They will check, guess, and revise possible solutions and use deductive reasoning to eliminate possible solutions
14	Data Analysis	2	Morley Most and Lutie Least Navigating through Data Analysis and Probability Grade 2 pp 36-40 and CD-Rom graphs	Students will interpret bar and picture graphs. They will represent data using bar and picture graphs. Students will describe parts of the data displayed in bar and picture graphs and decide on the basis of the data displayed in bar and picture graphs which event is most or least likely.
15	Data Analysis	2	Whom Do You Believe? Navigating through Data Analysis and Probability Grade 2 pp 58-60 and BLM pp 89 -90 and CD-ROM grid paper	Students will identify misrepresentations of data and read and interpret picture graphs in which the pictures represent more than one individual
16	Data Analysis	2	Travel Agent Navigating through Data Analysis and Probability Grade 2 pp 61-62 and BLM pp 91-92	Students will analyze relevant data to answer questions and use data to justify choices.
17	Data Analysis	2	Some Sums Navigating through Data Analysis and Probability Grade 2 pp 73-75	Students will conduct experiments to collect data to answer a question and organize data in tables. Students will identify likely and unlikely events

Grade 2				
Lesson	Strand	Grade Level	Title	Goals
18	Measurement	2	Which Unit Do I Use? Navigating through Measurement Grade 2 pp 59-61	Students will recognize the inverse relationship between the size of the measurement unit and the numeric measure. Students will recognize the most appropriate units and tools to measure different lengths.
19	Measurement	2	Fit The Facts Navigating through Measurement Grade 2 pp 62-63 BLM pp77-78	Students will use known referents to estimate measures and develop measurement sense.
20	Problem Solving	2	From Small to Tall Navigating through Problem Solving and Reasoning Grade 2 pp 19-22 BLM pp 42-43	Students will identify relationships. Students will develop and test conjectures.
21	Problem Solving	2	Piggy Bank Navigating through Problem Solving and Reasoning Grade 2 pp 10-12 and BLM 32-34	Students will identify problem conditions. Students will check, guess, and revise possible solutions and use deductive reasoning to eliminate conjectures. Students will use what is known about one problem to help solve another problem
22	Problem Solving	2	Hats Off Navigating through Problem Solving and Reasoning Grade 2 pp 23-27 BLM 44-45	Students will organize and display data in tree diagrams. Students will use deductive reasoning to eliminate possible solutions and make generalizations
23	Problem Solving	3	Walking into Place Value Navigating through Problem Solving and Reasoning Grade 3 pp 8-11 and BLM 40-41	Students will identify the place values in two-,three-, and four-digit numbers and write numbers using expanded notation
24	Problem Solving	3	Cut it Apart, Put It Together Navigating through Problem Solving and Reasoning pp 19-25 BLM pp 46-51	Students will improve reasoning about decomposing and recomposing shapes and develop skills in decomposing polygonal regions and recomposing their parts to make other polygonal regions. Students will develop reasoning about area.

GIFTED & TALENTED MATHEMATICS
GRADE 3

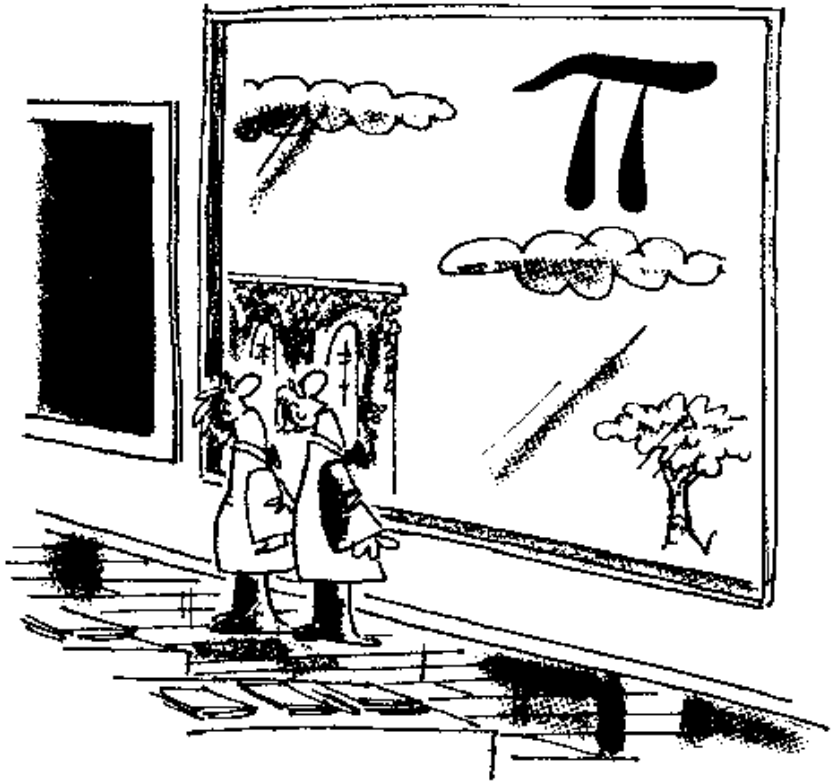


Grade 3				
Lesson	Strand	Grade Level	Title	Goals
1	Algebra	3	Graphic Stories Navigating through Algebra Grade 3-5 pp 31- 32 BLM pp77-78	Students will explore relationships between variables and interpret relationships expressed in a line graph
2	Geometry	3	Tetrominoes Cover-Up Navigating through Geometry Grade 3-5 pp 59-63 BLM pp 120-121	Students will make and verify all possible arrangements of four squares, called tetrominoes and use slides, flips, and turns to completely cover a 10x12 grid with a variety of tetrominoes.
3	Algebra	3,4	Hundred Board Wonders Navigating through Algebra Grade 3-5 pp 9-11 BLM pp 72-73	Given a rule, students will explore number patterns using a hundred board.
4	Algebra	3,4	Watch Them Grow Navigating through Algebra Grades 3-5 pp12-14 BLM p 74	Students will construct growing patterns using pattern blocks, record patterns numerically in a table and state rules for extending patterns.
5	Algebra	3,4	The Ups and Downs of Patterns Navigating through Algebra Grade 3-5 pp 27-30 BLM 75-76	Students will identify and analyze situations with constant or varying rates of change.
6	Algebra	3,4	The Variable Machine Navigating through Algebra Grade 3-5 pp 39-40	Students will explore the idea of a variable as a symbol that can stand for a member of a set of numbers and substitute numbers for variables to discover unknown values.
7	Algebra	3,4	Catch of the Day! Navigating through Algebra Grade 3-5 pp 41-42 BLM p 80	Students will work with variables as they determine the number of each kind of fish caught and record algebraically the statements of the results of their "catch."
8	Algebra	3,4	Algebra Scales Navigating through Algebra Grade 3-5 pp 44-47 BLM p 81	Students will determine if expressions constitute an equation or an inequality; students will understand that quantities on both sides of an equation must be equal and use logical thinking to find a replacement set to solve equations.
9	Algebra	3,4	I Spy Patterns Navigating through Algebra Grade 3-5 pp 48-50 BLM p 82	Students will partition the given array parts, translate visual patterns into numerical expressions, and explore how equivalent numerical expressions represent the commutative properties of operations.
10	Geometry	3,4	Find the Hidden Figure Navigating through Geometry Grade 3-5 pp 37-39	Students will understand and use the compass directions (N,S,E,W), compose specific multiple step directions to reach a location successfully.
11	Geometry	3,4	Patchwork Symmetry Navigating through Geometry Grade 3-5 pp 49-51 CD-ROM	Students will identify lines of symmetry in various pattern blocks and use them to design patchwork-quilt squares that have line symmetry.

Grade 3				
Lesson	Strand	Grade Level	Title	Goals
12	Geometry	3, 4	Motion Commotion Navigating through Geometry Grade 3-5 pp 64-67 BLM p 122	Students will manipulate a figure using the following basic transformations: translations (slides), reflections (flips), and rotations (turns); students will be able to predict the new orientation of a figure after a specific transformation.
13	Geometry	3, 4	Exploring Packages Navigating through Geometry Grade 3-5 pp 80-82 BLM pp113,114,127	Students will examine three dimensional shapes and create a list of their attributes, compare a container with a solid shape and determine how they are alike and different, create a net of a container by tracing the packaging, compare the attributes of different nets, and explore congruent faces of three-dimensional shapes.
14	Data Analysis and Probability	3, 4	Long Jump Navigating through Data Analysis and Probability Grade 3-5 pp 23-28 BLM p101	Students will make predictions about the jumping ability of their peers and construct a rough draft of a graph to show their predictions; measure the distance if their classmates jumps; describe and summarize the shape of the jumping data; generate ways of identifying a typical jump; and organize jumping data on a line plot.
15	Data Analysis and Probability	3, 4	How Many Stars Can You Draw in One Minute? Navigating through Data Analysis and Probability Grade 3-5 pp 29-33 BLM 102-102	Students will collect and represent data on line plots, describe the shape of data, summarize the data, indicating what is typical of the data, and compare two sets of data on line plots.
16	Data Analysis and Probability	3, 4	How Likely Is It to Land in the Trash Can? Navigating through Data Analysis and Probability Grade 3-5 pp 62-67 BLM p 114	Students will - describe an event as certain, likely, equally likely to occur and not occur, unlikely, or impossible; qualify the likelihood of an event using a value from 0 to 1.
17	Problem Solving and Reasoning	3	And We All Go Marching Navigating through Problem Solving and Reasoning pp 12-18 BLM pp 42-44	Students will investigate the number 36 by representing and analyzing an arrangement of thirty-six objects. Students will model and explain how a change in one quantity produces a change in a second quantity.
18	Problem Solving and Reasoning	3	How Many Are Too Many? Navigating through Problem Solving and Reasoning Grade 3-5 pp 26-30 BLM pp 52-53	Students will explore the relationship between a unit of weight and the number of units that will sink a "boat"
19	Problem Solving and Reasoning	3	Grant Avenue Elementary School Reading Certificates Navigating through Problem Solving and Reasoning Grade 3-5 pp 31-36 BLM 54-56 and CD-ROM	Students will use given data to establish rules for eligibility for a reading certificate. Students will evaluate and revise rules in response to self-assessment, peer assessment, and comments made by the teacher during informal assessment.

Grade 3				
Lesson	Strand	Grade Level	Title	Goals
20	Geometry	4,5	Zany Tessellations Navigating through Geometry Grade 3-5 pp 68-74	Students will explore tessellations like those created by M. C. Escher. Students will identify geometric transformations found in tessellations and create tessellations using translations and rotations.
21	Geometry	4,5	Searching for the Perfect Solids Navigating through Geometry Grade 3-5 pp 31-34 BLM 106-108	Students will discover the five perfect solids (also known as Platonic solids) and develop mathematical arguments to justify conclusions.
22	Geometry	3,4,5	Geo City Navigating through Geometry Grade 3-4 pp 90-94 BLM 126,114,128	Students will explore the relationship between two- and three-dimensional shapes and explore the effects of rotating, reflecting, and translating three-dimensional shapes. Students will create a front view of a city block on graph paper or geodot paper.

GIFTED & TALENTED MATHEMATICS
GRADE 4



Grade 4				
Lesson	Strand	Grade Level	Title	Goals
1	Number and Operations	4	Magical Mind Reader Window Cards Mental Math Workout pp 22-24	Students will "magically" produce a spectator's secret number from 1-31 after getting "yes" or "no" answers to five questions
2	Data Analysis and Probability	3, 4	Is There Such a Thing as a Lucky Coin? Navigating through Data Analysis and Probability Grade 3-5 pp 68-72	Students will - explain why the term lucky is not a descriptor of the likelihood of an event by thinking about the fact that a lucky coin is not a fair coin; realize that with a fair coin heads and tails are equally likely to occur and that characteristics such as the size and weight of different fair coins do not effect toss outcomes; determine that the experimental probability for getting heads or getting tails when tossing different coins is approximately one-half; and predict how often an event will happen in a given number of trials.
3	Geometry	3, 4,	Thinking About Triangles Navigating through Geometry grade 3-5 pp 15-21 BLM pp100-101	Students will use geoboards to investigate properties of triangles, transcribe geoboard designs onto geodot paper, make and test conjectures on the basis of experimentation with a variety of examples.
4	Geometry	3, 4	Building Solids Navigating through Geometry Grade 3-5 pp 26-30 BLM pp104-105	Students will build a variety of solids from materials supplied, discover the relationship among the numbers of faces, edges, and vertices of solids, and discover relationships between two - and three -dimensional figures.
5	Algebra	3, 4, 5	Calculator Patterns Navigating through Algebra Grade 3-5 pp15-17	Students will explore patterns using a calculator and translate observed patterns into numerical patterns.
6	Algebra	3, 4, 5	Tiling a Patio Navigating through Algebra Grades 3-5 pp 18-22	Students will observe patterns and relationships, make conjectures about patterns and test them, and discuss, verbalize generalize, and represent patterns and relationships.
7	Geometry	3, 4, 5	Build What I've Created Navigating through Geometry Grades 3-5 pp 11-14 CD-ROM pp 1-7	Students will construct a geometric design from oral directions, use precise geometric vocabulary in giving directions, and recognize geometric shapes and patterns in quilt designs.
8	Geometry	3, 4, 5	Xs and Os Navigating through Geometry Grades 3-5 pp 40-43 BLM pp109-112	Students will locate points on a rectangular coordinate plane using ordered pairs, use the point of origin (0,0) as a point of reference, and understand and use positive and negative integers to identify points in four quadrants.
9	Geometry	3, 4, 5	Puzzles with Pizzazz Navigating through Geometry Grades 3-5 pp 77-79 BLM pp123-124 CD-ROM pp1-9	Students will practice mentally manipulating shapes, develop strategies to solve visual logic puzzles, and combine shapes to create different shapes.

Grade 4				
Lesson	Strand	Grade Level	Title	Goals
10	Geometry	3, 4, 5	Geo City Navigating through Geometry Grades 3-5 pp 90-94 BLM pp 126, 114, 128	Students will explore relationships between two and three-dimensional shapes, explore the effects of rotating, reflecting, and translating three-dimensional shapes, create a front view of a city block on graph paper or geodot paper, apply mapping skills and strategies to the Geo City constructed by the class, integrate real-world knowledge of a city block in creating a three-dimensional model of a city from packaging materials from packaging materials and then use art skills to complete the design of the city block. Finally, students will use the Internet to explore types of buildings.
11	Data Analysis	3, 4, 5	Questions Please? Navigating through Data analysis and Probability Grades 3-5 pp 13-16 BLM 88, 92, 94	Students will describe or summarize a set of data, determine preferences and opinions from a set of data, compare and contrast two or more sets of data, and generalize or make predictions from a set of data.
12	Data Analysis and Probability	3, 4, 5	Can You Catch Up? Navigating through Data Analysis and Probability Grades 3-5 pp 51-55 BLM p 110	Students will - predict the length of the flow of ketchup that is hot, cold, and at room temperature; conduct an experiment to determine the distance that the ketchup flows at different temperatures; design further investigations to evaluate their conclusions.
13	Algebra	4	Triangle-Rule Machine Navigating through Algebra Grades 3-5 pp 58-60 BLM pp 84-85	Students will investigate perimeters of figures composed of equilateral triangles arranged in a row, describe the rule or function that will produce the perimeter for any given arrangement, and make a connection to the idea of a function when describing the rule for a pattern with numbers.
14	Geometry	4	It's All in the Packaging Navigating through Geometry Grades 3-5 pp 83-85	Students will explore how three-dimensional packages are constructed, use geodot paper or grid paper to create front, top, and side views of packages, and create new "packages" for a product.
15	Algebra	4, 5	What's the Best Deal? Navigating through Algebra Grades 3-5 pp 33-36 BLM p 79	Students will create a table of values for a given pattern, graph the given table of values, and discuss the shape of the graphs (straight lines, curved lines) and what the graphs tell about the growth of the pattern (i.e. the function).
16	Algebra	4, 5	That's Odd! Navigating through Algebra Grades 3-5 pp 61-63	Students will observe patterns in an array, represent observed visual patterns as numerical patterns, and represent a numerical pattern as a functional relationship.
17	Geometry	4, 5	Roping in Quadrilaterals Navigating through Geometry Grades 3-5 pp 22-25 BLM pp101-103	Students will sort quadrilaterals on the basis of specific attributes, use Venn diagrams to classify quadrilaterals, determine the common attributes of a set of quadrilaterals.
18	Number and Operations	4,5	Lightning Addition Mental Math Challenges pp 40, 42	Students will be able to add the numbers formed by mixing the number strips any of forty-eight different ways. Students will explore to find the pattern that enables them to do the "trick."

Grade 4				
Lesson	Strand	Grade Level	Title	Goals
19	Number and Operations	4	Prime Picks Hands-On Math for Middle Grades pp 34-35 and 81	Students will be able to identify prime and composite numbers
20	Number and Operations	4	Napier's Bones Hands-On Math for Middle Grades pp 60, 61, 91 and template	Students will use Napier's "Bones" as an alternative to standard multiplication. Students will be able to explain how Napier's "Bones" work.
21	Geometry	5	Can They Be the Same? Navigating through Geometry Grades 3-5 pp 44-46 BLM pp113-115	Students will explore similar shapes and develop an understanding of similarity. Students will test for similarity of shapes using the coordinate grid and explore the effects of magnifying or shrinking a shape
22	Geometry	5	It's the View that Counts! pp 86-87	Students will build three-dimensional objects from two-dimensional representations and draw representations of three-dimensional shapes on isodot paper.

Addendum

Supplementary Materials

Please see the print copy of the full Gifted & Talented curriculum for grade level worksheets referred to in this guide. In addition, the Navigation series and other sources referenced contain detailed teacher notes and lesson plans for each lesson.