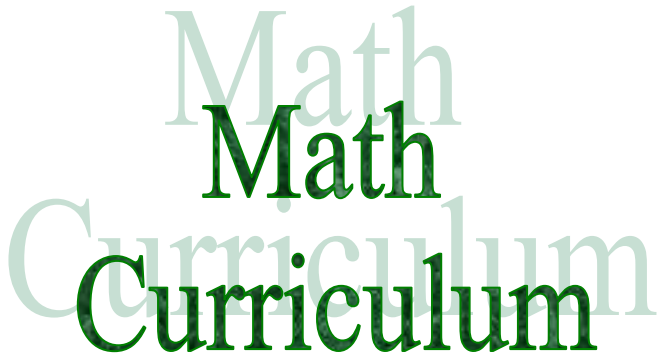
Wayne Central School District
Ontario Center, NY 14519



SEVENTH GRADE
Draft

Revised: June 12, 2001
August 6, 2001

Curriculum Team
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Scope and Sequence Team
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I. District Philosophy

The Wayne Central School District believes that the goal of education is the all-around development of each student. The role of the school is to enable individuals to develop to their fullest potential.

The school, in cooperation with the home and community, will assist the student with intellectual, social, cultural, emotional, physical and moral growth. The school should help create within each student an awareness of civic responsibilities and respect for authority to assist the student in becoming a well-integrated, responsible person capable of assuming a vital role in an evolving civilization.

The Wayne Central School District subscribes to the general theory of individual differences; namely, that each student is an individual and has innate abilities, ambitions, and emotions. In the process of educating this individual, the program should provide a challenge while reflecting a concern for needs based on individual capabilities.

The Wayne Central School District further subscribes to the following fundamental principles:

1. **Children, regardless of potential, are capable of learning and acquiring the skill and knowledge needed to function to the best of their ability in our society,**

2. **Our responsibility is to see that children learn. The energies of all participants should be focused on achieving the desired outcomes. Accountability does not end with following established rules and procedures; its essence is found in results,**

3. **Minimum competence, while necessary, is not enough. Successful participation in our society demands much more. All children are entitled to approved curriculum, to instructional methods, and to expectations that challenge them to perform at their best, and help them to become truly proficient in knowledge and skills,**

4. **Every child in New York State is entitled to the resources necessary to provide the sound, basic education that the state constitution requires,**

5. **Each participant in the educational system should have the opportunity to effectively discharge his or her responsibility, and each participant should be held accountable for achieving desired results. This principle applies to all participants in the educational process – students, parents, teachers, counselors, librarians, administrators, the Board of Education, and others,**

6. **Achievement of desired results by individuals and groups should be rewarded. Creativity in our students needs to be nurtured and encouraged. Occasional failure in a large and diverse system us probably unavoidable. However, failure should not be permitted to persist. When it occurs, with either individuals or groups, help should be provided and the situation changed.**

II. District Mission Statement:

Based upon the belief that all students can learn, the staff of Wayne Central School district accepts the responsibility to teach all students regardless of differences, the fundamental skills. We further accept the responsibility to challenge all students to attain higher levels of achievement. Wayne Central will provide the opportunity, environment, and encouragement to meet this goal while developing the whole child physically, emotionally, and culturally.

III. NYS Learning Standards:

Health, Physical Education, and Home Economics

1. Personal Health and Fitness – Students will have the necessary knowledge and skills to establish and maintain physical fitness, participate in physical activity, and maintain personal health.
2. A Safe and Healthy Environment – Students will acquire the knowledge and ability necessary to create and maintain a safe and healthy environment
3. Resource Management – Students will understand and be able to manage their personal and community resources.

Mathematics, Science, and Technology

1. Analysis, Inquiry, and Design – Students will use mathematical analysis, scientific inquiry, and engineering design, as appropriate, to pose questions, seek answers, and develop solutions.
2. Information Systems – Students will access, generate, process, and transfer information using appropriate technologies
3. Mathematics – Students will understand mathematics and become mathematically confident by communicating and reasoning mathematically, by applying mathematics in real-world settings, and by solving problems through the integrated study of number systems, geometry, algebra, data analysis, probability, and trigonometry.
4. Science – Students will understand and apply scientific concepts, principles, and theories pertaining to the physical setting and living environment and recognize the historical development of ideas in science.
5. Technology – Students will apply technological knowledge and skills to design, construct, use, and evaluate products and systems to satisfy human and environmental needs.
6. Interconnectedness: Common Themes – Students will understand the relationships and common themes that connect mathematics, science, and technology and apply the themes to these and other areas of learning.
7. Interdisciplinary Problem Solving – Students will apply the knowledge and thinking skills of mathematics, science, and technology to address real-life problems and make informed decisions.

English Language Arts

1. Students will listen, speak, read and write for information and understanding. As listeners and readers, students will collect data, facts and ideas; discover relationships, concepts, and generalizations; and use knowledge generated from oral, written, and electronically produced texts. As speakers and writers, they will use oral and written language that follows the accepted conventions of the English language to acquire, interpret, apply, and transmit information.
2. Language for Literary Response and Expression – Students will read and listen to oral, written, and electronically produced texts and performances from American and world literature; relate texts and performances to their own lives; and develop an understanding of the diverse social, historical, and cultural dimensions the texts and performances represent. As speakers and writers. Students will use oral and written language that follows the accepted conventions of the English language for self-expression and artistic creation.
3. Language for Critical Analysis and Evaluation – Students will listen, speak, read and write for critical analysis and evaluation. As listeners and readers, students will analyze experiences, ideas, information, and issues presented by others using a variety of established criteria. As speaker and writers, they will use oral and written language that follows the accepted conventions of the English language to present, from a variety of perspectives, their opinions and judgements on experiences, ideas, information and issues.
4. Language for Social Interaction – Students will listen, speak, read, and write for social interaction. Students will use oral and written language that follows the accepted conventions of the English language for effective social communication with a wide variety of people. As reader and listeners, they will use the social communications of others to enrich their understanding of people and their views.

Languages Other Than English

1. Communication Skills – Students will be able to use a language other than English for communication.
2. Cultural Understanding – Students will develop cross-cultural skills and understandings.

The Arts

1. Creating, Performing, and Participating in the Arts – Students will actively engage in the processes that constitute creation and performance in the arts (dance, mucus, theatre, and visual arts) and participate in various roles in the arts.
2. Knowing and Using arts materials and Resources – Students will be knowledgeable about and make use of the materials and resources available for participation in the arts in various roles.
3. Responding to and Analyzing Works of Art – Students will respond critically to a variety of works in the arts, connecting the individual work to other works and to other aspects of human endeavor and thought.
4. Understanding the Cultural Contributions of the Arts – Students will develop an understanding of the personal and cultural forces that shape artistic communication and how the arts in turn shape the diverse cultures of past and present society.

Career Development and Occupational Studies

1. Career Development – Students will be knowledgeable about the world of work, explore career options, and relate personal skills, aptitudes, and abilities to future career decisions.
2. Integrated Learning – Students will demonstrate how academic knowledge and skills are applied in the workplace and other settings.
3. Universal Foundation Skills – Students will demonstrate mastery of the foundation skills and competencies essential for success in the workplace.
4. Career Majors – Students who choose a career major will acquire the career-specific technical knowledge/skills necessary to progress toward gainful employment, career advancement, and success in postsecondary programs.

Social Studies

1. History of the United State and New York – Students will use a variety of intellectual skills to demonstrate their understanding of major ideas, eras themes, developments, and turning points in the history of the United States and New York.
2. World History – Students will use a variety of intellectual skills to demonstrate their understanding of major ideas, eras, themes, developments and turning points in world history and examine the broad sweep of history from a variety of perspectives.
3. Geography – Students will use a variety of intellectual skills to demonstrate their understanding of the geography of the interdependent world in which we live – local, national and global – including the distribution of people, places, and environments over the Earth's surface.
4. Economics – Students will use a variety of intellectual skills to demonstrate their understanding of how the United States and other societies develop economic systems and associated institutions to allocate scarce resources, how major decision-making units function in the United States and other national economies, and how an economy solves the scarcity problem through market and nonmarket mechanisms.
5. Civics, Citizenship, and Government – Students will use a variety of intellectual skills to demonstrate their understanding of the necessity for establishing governments; the governmental system of the United States Constitution; the basic civil values of American constitutional democracy; and the roles, rights, and responsibilities of citizenship including avenues of participation.

IV. Commencement Outcomes

"Adult Roles, Skills & Knowledge"

CITIZEN

A citizen is a responsible, law-abiding member of society who:

- Has a strong sense of values;
- Knows right from wrong;
- Is aware of community news, issues and norms;
- Accepts diversity in ethnicity and belief;
- Has knowledge of government at all levels and issues relative to each;
- Associates with others in positive and productive ways.

LIFE - LONG LEARNER

A life-long learner is one who perseveres, is self-motivated, is innately curious, focused and:

- Is able to set goals;
- Adheres to deadlines/due-dates, has time management skills and abilities;
- Is a problem solver, can define problems, analyze information and task analyze/prioritize potential solutions, has the ability to select the best "tool/strategy" for the situation, and can enlist others in the process of evaluation and refocusing.

LEADER

A leader is a problem solver with effective communication skills. He/she has an ability to motivate others and:

- Is a strong willed person with vision, beliefs and convictions to carry out each.
- Is able to recognize and effectively use all resources, such as material, time and human
- Is responsible and accountable for self and others.

WORKER/WAGE EARNER/BUSINESS OWNER

A worker/wage earner is an individual who is trust worthy, moral and ethical, and who:

- Possess basic job skills with a willingness to change, grow and develop new skills;
- Is a good communicator;
- Demonstrates leadership skills and initiative and the ability to work as a team player;
- Is responsible, reliable and respectful to others;
- Has the ability to make sound decisions.

CONSUMER

A consumer is an individual who has knowledge of the global economy and:

- Utilizes and applies budgeting skills and credit awareness;
- Maintains long-terms personal financial planning (savings, banking, retirement);
- Understand one's rights, responsibilities and risks.

COUNSELOR/TEACHER/MENTOR

A counselor/teacher/mentor is an individual who is patient, self-confident, assertive leader who:

- Is a problem solver and can guide others to solve problems;
- Is an active listener;
- Is aware of issues, societal, family, religious differences and different customs;
- Has interpersonal skills and values others opinions.

PARENT/FAMILY MEMBER

A parent/family member is an individual who:

- Is nurturing and loving;
- Displays flexibility;
- Has high character and morals;
- Is accountable and consistent with respect to expectations and follow through;
- Becomes actively involved in their children and family's education and other pursuits.

FRIEND

A friend is an individual who shows great interest and respect for others, and who:

- Is non-judgmental and available when a time of need arises;
- Is unselfish, honest, supportive, caring and genuine;
- Is an open-minded listener who seeks to understand before being understood;
- Give him/herself to other without expectations of compensation or return of favor.

V. Scope and Sequence

	STRANDS	GRADE LEVEL 6	7	8
PROBLEM SOLVING				
Develop a plan		D	D	D
Strategies				
Look for a pattern	7A/7B	D	D	D
Solve a simpler problem	1A	D	D	D
Act it out	1A		D	D
Guess and check	1A	D	D	D
Draw a diagram	1A	D	D	D
Make a table	1A	D	D	D
Work backward	1A	I	D	M/R
Choose the method of computation	1B	D	D	D
Make a list	1A	D	D	D
Eliminate the possibilities	1A	D	D	D
Determine reasonable answers	1A	D	D	D
Make a model	1A	D	D	D
Use a graph	1B/5E	D	D	D
Use an equation	4E	I	D	D
Use logical reasoning	1C	D	D	D
Use the Pythagorean Theorem	5C/7I		I	D
Use a Venn diagram	1D	I	D	D/R
Use a frequency table	4D	D	D	D
Use a spreadsheet	5D	I	I	I
Use proportional reasoning	2B			D
Decimal concepts	2A	D	D/M	R
Reading and writing	2A	D	M	R
Decimal place value	2A	D	M	R
Comparing and ordering	2A	D	D/M	R
Rounding.	6A	D	D/M	R
Relating decimals and fractions	2A	I	D	M/R
Relating decimals, ratios, and percents	2A	I	D	M/R
Terminating and repeating decimals	3A	I	D	M/R
Scientific Notation	2D		I/D	D
Powers of Ten	2A	I	D	M/R

Key:

I Introduce – new topic/skill
D Develop – more in depth study of the skill
M Mastery – learning benchmark has been reached
R Reinforce – continued use of a mastered skill

		STRANDS	GRADE LEVEL 6	7	8
Fractions					
	Fraction concepts	2A	D	D/M	R
	Writing mixed numbers as fractions	2A	D	D/M	R
	Mixed numbers and improper fractions	2A	D	D/M	R
	Equivalent fractions	2A	D	D/M	R
	Comparing and ordering fractions	2D	D	D/M	R
	Simplifying fractions	2A	D	D/M	R
	Least common denominator (LCD)	2C	D	D/M	R
	Rounding and estimating fractions	6A	I	D/M	R
	Relating fractions and decimals	2B	D	D	D
	Relating fractions and percents	2B		I/D	D
Proportional Reasoning					
	Ratio				
	Concept of ratio	2B	I	D	D
	Reading and writing ratios	2B	I	D	D
	Simplifying ratios	2B		I/D	M/R
	Relating ratios and fractions	2B		I/D	D
	Relating ratios and rate	2B		I/D	D
	Ratio and probability	6E	I	I/D	I/D
	Proportion				
	Concept of proportion	2B		I/D	M
	Solving proportions	3G		I/D	D
	Property of proportion (cross product)	2D	I	D	D
	Scale drawings	4B		D	D
	Similar figures	7E	D	D	M/R
	Dilations	4H		I	D
	Indirect measurement	3G		I	D
	Percent				
	Concept of percent	2B	I	D	M
	Writing fractions and decimals as percent	2B		I/D	D
	Percents greater than l00 % or less than l %	2B		I/D	D
	Find percent of a number	2B/2D		I/D	D
	Percent one number is of another	2B/2D		I/D	D

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	STRANDS	GRADE LEVEL 6	7	8
Finding number when percent is known	2B/2D		I/D	D
Percent proportion	2B/2D		I/D	D/M
Relating percent and ratio	2B		I/D	I/D
Percent equation	2B/2D		I	D
Non-proportional relationships	2B			I/D
Computations and Estimation				
Order of operations	3C	I/D	D	M
Decimals				
Adding and subtracting	3A	D	M	R
Multiplying by a whole number	3A	D	M	R
Multiplying two decimals	3A	I/D	D/M	R
Dividing by a whole number	3A	I/D	D/M	R
Dividing by decimals	3A	I/D	D/M	R
Dividing with zeros in the quotient	3A	I	D/M	R
Fractions				
Adding and subtracting	3A	D	D	M
Subtracting with renaming	3A	I/D	D	M
Multiplying and dividing	3A/3D	I	D	M
Add and subtract mixed numbers	3A	I	D	M
Multiply and divide mixed numbers	3A/3C	I	D	M
Percents				
Discount	2B		I/D	D
Sales tax	2B		I/D	M
Simple interest	2B		I/D	D
Percent of change	2B		I	D
Integers				
Adding and subtracting	3A		I/D	D/M
Multiplying and dividing	3A		I/D	D/M
Estimation				
Whole numbers				
Rounding	6A	D	M	R
Sums and differences	6A	D	M	R
Products and quotients	6A	D	M	R

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	STRANDS	GRADE LEVEL 6	7	8
Decimals				
Rounding	6A	I	D	M
Sums and differences	6A	I	D	M
Products and quotients	6A	I	D	M
Fractions				
Sums and differences	6A		I/D	M
Products and quotients	6A		I/D	M
Percents			I	D
Use equivalent fractions, decimals, and percents	6A			I/D
Strategies for estimating				
Rounding	6B	I	D	M
Clustering	6B	I	M	
Square roots			I	D
Area or volume	5A/5C	D	D	D
Mental math				
Divisibility patterns	2C	D	M	R
Solving equations mentally	4E	M		
Finding percents	6A		I	D
Powers of ten	2A/3B	I/D	M	R
Using formulas	7H	I	D	D
Number Systems and Number Theory	2A/2C	D	D	M
Reading and writing whole numbers	2A	M	R	
Place value of whole numbers	2A	M	R	
Place value of decimals	2A/6A	D	M	R
Comparing and ordering				
Whole numbers	2D	R		
Decimals	2D	D	M	R
Fractions	2D	D	M	R
Integers	2D		I/D	M
Rationals	2D			I/D
Positive exponents	2A	I	D	M
Negative exponents	2A		I	D

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		STRANDS	GRADE LEVEL 6	7	8
Divisibility patterns		2C	D	M	R
Prime and composite numbers		2C	D	M	R
Relative primes		2C		M	R
Prime factorization		2C	I	D/M	R
Least common multiple (LCM)		2C	D	M	R
Scientific notation		2A		I/D	M
Square roots		2D/3C/7I		I	D
Properties					
	Properties of number	2A/3C	D	D	M
	Distributive property	3C/3D		I	D
	Property of proportions (cross products)	2B/2D		I/D	M
	Properties of equality	4E/7A/7E		I	D
PATTERNS AND FUNCTIONS					
Numeric patterns					
	Sequences	7A	I	D	D
	Fibonacci sequence	7A			I
	Divisibility patterns	2C	D	M	R
Geometric patterns					
	Recognizing geometry patterns	7A		M	R
	Tessellations	4A/1C		I	D
	Fractals	4A/1C		I	
Represent relationships					
	Tables	7B	I	D	D
	Graphs	7B			I/D
	Function rules	7A/7B/7D			I/D
Analyze functional relationships		7D			I/D
Use patterns and functions to solve problems		7A/7C	I	D	D
ALGEBRA					
Integers					
	Reading and writing integers	2A		I/D	M
	Graphing integers on a number line	2A/4D		I/D	M
	Comparing and ordering integers	2D		I/D	M

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		STRANDS	GRADE LEVEL 6	7	8
	Adding and subtracting integers	3A		I/D	M
	Multiplying and dividing integers	3A		I/D	M
	Absolute value	3A		I/D	M
Rational numbers					
	Identify and simplify rational numbers	2A/2D			I/D
	Properties of rational numbers	2D/3D			I/D
	Rational numbers and decimals	2A/2D			I/D
	Scientific notation	2A/2D			I/D
	Comparing and ordering	2D			I/D
	Solving equations with rational number solutions	4E/7C			I/D
Real numbers					
	Identify and classify real numbers	2A			I/D
	Square roots	3B		I	D
	Irrational numbers	2A		I	D
Functions					
	Function tables	7B			I/D
	Linear functions	7C			I/D
	Analyze tables and graphs	5D/7B			I/D
Equations and expressions					
	Concepts of variable, expression, equation	4E	I	D	M
	Order of operations	3B/3C	D	M	M/R
	Evaluate algebraic expressions	4E		I/D	M
	Write algebraic expressions and equations	4E		I/D	M
	Solve addition and subtraction equations	4E	I	D	M
	Solve multiplication and division equations	4E	I	D	M
	Solve two-step equations	7C			I/D
	Solve equations with two variables	7C			I/D
	Solve inequalities	2D/7C		I/D	D
	Solve equations with concrete methods	4F	I	M	
	Solve equations algebraically	4E/7A	I	D	D
Graphing					
	Integers on a number line	2D		I/D	M
	Irrational numbers on a number line	2D			I

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		STRANDS	GRADE LEVEL 6	7	8
	Inequalities on a number line	2D		I	D
	Points on a coordinate plane	4C	I	D	M
	Transformations on a coordinate plane	4C/4H		I	D
	Functions	7A		I	D
	Linear functions (equations)	4E/7C			I/D
Polynomials					I/D
	Hands on equations	4F			I/D
	Represent and simplify polynomials	4E			I/D
	Like and unlike terms	4E			I/D
	Laws of exponents (Add, Subtract, Multiply and divide)	4E			I/D
Apply algebra to real-world and math problems		2A/4F		I	D
STATISTICS					
Taking a survey		1B	D	D	D
Analyzing survey data		1B/5D	D	D	D
Organizing Data					
	Using a table to organize data.	1B/7B	D	D	D
	Frequency tables	1B/7B	I	D	D
	Using tables to solve problems	1B/7B		I	D
	Using matrices to organize data	1B/7B			I
Constructing and interpreting graphs					
	Bar graphs	4D/5D	D	M	R
	Circle graphs	4D/5D		I	D
	Line graphs	4D/5D	D	M	
	Line plots	4D/5D		I	M
	Histograms	4D/5E			I/D
	Scatter plots	4D		I	D
Interpreting data					
	Clusters	5D		I	D
	Mean, median, and mode	5D	I	D	M
	Range	5D	I	D	D
	Making predictions from statistics	5D/1B	D	D	D

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		STRANDS	GRADE LEVEL 6	7	8
	Making predictions from graphs	4D/5D	D	D	D
PROBABILITY					
	Outcomes	4G/6A/6E	I	D	D
	Simple event	4G/6C/6E	I	D	D
	Independent events	4G/6E		I	D
	Dependent events	4G/6E		I	D
	Complementary events	6C/6E	I/D		
	Experimental probability	6C/6D/6E	I	D	D
	Theoretical probability	4G/6E	I	D	D
	Tree diagrams	4F/4G	I	D	D
	Counting principle	4F4G	I	D	D
	Probability and ratio	4G/6C	I	D	D
	Fair and unfair games	4G/6C	I	D	D
	Simulations or experiments	4G/6D	I	D	R
GEOMETRY					
Constructions					
	Congruent segments	4I/4J		I	
	Perpendicular lines	4I/4J		I	
	Parallel lines	4I/4J		I	
	Segment bisectors	4I/4J		I	
	Congruent angles	4I/4J		I	
	Angle bisectors	4I/4J		I	
	Polygons, inscribed	4I/4J		I	
	Congruent triangles	4I/4J		I	
Angles					
	Classify and measure angles	5B/4I/4J	I	D	M/R
	Sum of angle measures	7G		I/D	M
	Parallel lines and transversal	7H		I	D
Polygons					
	Identify polygons	4A/7G	I	D	M

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		STRANDS	GRADE LEVEL		
			6	7	8
	Classify triangles and quadrilaterals	7G	I	D	M
	Identify congruent figures	4I	I	D	M
Triangles					
	Determine congruent triangles	4I			I
	Right triangle relationships (trigonometry)	5C/7I			I
	Pythagorean Theorem	5C/7I		I	I/D
	Special right triangles	7I/7J			I
Similarity					
	Corresponding parts of similar figures	4H/4I	I	I/D	D
	Identify similar figures	4H/4I	I	I/D	D
	Scale drawings	4B		I	D
	Dilations	4H		I	D
Circles					
	Circumference (radius, diameter)	5C		I/D	M
	Area	5C		I/D	M
Perimeter					
	Regular shapes	5C	D	D	M
	irregular shapes	5C	I	D	M
Area					
	Rectangles	5B/5C	D	D	M
	Parallelograms (base, height)	5B/5C		I/D	M
	Trapezoids	5B/5C		I/D	M
	Triangles	5B/5C	I	D	M
	Circles	5B/5C		I/D	M
	Square roots and area of squares	2D/5C		I	D
Transformations					
	Translations, reflections, and rotations	4H		I	D
	Dilations	4H		I	D
	On the coordinate plane	4H		I	D
	Symmetry	4H	D	D	D
Solids					
	Identify, draw three-dimensional figures	4A		I	D
	Surface area	5C/5B		I	D

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		STRANDS	GRADE LEVEL 6	7	8
	Volume	5C/5B	I	D	D
Coordinate Geometry					
	Graphing ordered pairs	4C	I	D	M
	Transformations on the coordinate plane	4H		I	D
Patterns					
	Recognizing geometric patterns	4A/7K	I	D	M
	Symmetry	4H	D	D	D
	Fractals	4A/1C		I	
Trigonometry		7J			I
Inductive and deductive thinking		1A			I
MEASUREMENT					
Metric System					
	Units of length, capacity, and mass	5F	I	D	M
	Changing units within the metric system	5F	I	D/M	R
Customary system					
	Units of length, capacity, and weight	5F		I/D	
	Change units within the customary system	5F		I/D	
Time			D		
Perimeter and circumference			I	D	D
Area					
	Irregular figures	5C		I/D	M
	Rectangles	5C	D	D	M
	Parallelograms	5C		I/D	M
	Triangles	5C	I	D	M
	Circles	5C		I/D	M
	Trapezoids	5C		I/D	M
Surface area					
	Rectangular prisms	5C		I	D
Volume					
	Rectangular prisms	5C	I	D	M

Key:
I Introduce – new topic/skill
D Develop – more in depth study of the skill
M Mastery – learning benchmark has been reached
R Reinforce – continued use of a mastered skill

	STRANDS	GRADE LEVEL		
		6	7	8
Cylinders	5C		I	D
Pyramids and cones	5C		I	D
Precision and significant digits	5B			I
Indirect measurement	3G		I	D

Key:

I Introduce – new topic/skill
D Develop – more in depth study of the skill
M Mastery – learning benchmark has been reached
R Reinforce – continued use of a mastered skill

VI. Course Overview

Mathematics: Applications and Connections (Course 2) will continue to prepare all students for success in algebra and geometry. Students use manipulatives to bridge the gap from the concrete to the abstract, hands-on labs and mini-labs to discover concepts on their own, and cooperative learning activities to achieve academic and interpersonal skills. This course is used to help prepare students for eighth grade and the NYS Math 8 exam.
Glencoe, Mathematics: Applications and Connections, Course 2, T4-T5, 1999.

1. Problem solving, Algebra and Geometry
2. Decimals
3. Statistics, Analyzing Data and Graphs
4. Number Theory, Fractions and Percents
5. Sets
6. Integers
7. Algebra: Expressions and Equations with Whole Numbers
8. Fractions
9. Ratios, Proportions, Percents and Applications of Percents
10. Geometry: Lines, Planes, Angles, Polygons
11. Rational and Irrational Numbers, Radicals, Pythagorean Theorem, and Area
12. Geometry: volume and Surface Area
13. Probability

VII. Instructional Outline

I. Problem solving, Algebra and Geometry ch 1

A. Whole number operations
B. Order of operations
C. Exponents
D. Algebra
- Variables
- Evaluate algebraic expressions
- One step equations
- Geometry
  1. Perimeter rectangles & irregular figures
  2. Area rectangles
  3. Area parallelograms

II. Decimals ch 2

A. Reading and writing decimals*
B. Comparing and rounding decimals
C. Adding and Subtracting decimals*
D. Estimating with decimals
E. Multiplying decimals
F. Powers of ten (shortcut multiplying and dividing)
G. Division
H. Converting decimals and fractions
I. Metric system
J. Scientific notation

III. Statistics, Analyzing data, graphs ch 3

A. Frequency tables
B. Graphs
C. Predictions
D. Line plots
E. Mean, median, mode, range
F. Computer applications – use computer to generate graphs

IV. Number theory, fractions and percents ch 4

A. Factors
B. Divisibility
C. Prime factorizations, prime and composite
D. Sequences
E. GCF
F. Simplifying ratios and fractions –equivalencies
G. Ratios, decimals and percents – conversions
H. Probability of a simple event
I. LCM
J. Compare and ordering fractions

V. Sets*

A. Definition, set notation, general vocabulary, Venn diagrams
B. Union and intersection
C. Venn diagrams, shading and creating
D. Problem solving with Venn diagrams

VI. Integers ch 5

A. Meaning of integers
B. Comparing and ordering of integers
C. Coordinate system
   - Graphing points
   - Coordinate pictures*
D. Adding integers
E. Subtracting integers
F. Multiplying integers
G. Dividing integers
H. Graphing transformations

VII. Algebra – Expressions and Equations with whole numbers, decimals and integers ch 6

A. One Step equations – adding and subtracting
B. One Step equations – multiplying
C. One Step equations - division
D. Writing expressions and equations
E. Inequalities

VIII. Fractions ch 7

A. Estimating
B. Adding and subtracting fractions
C. Adding and subtracting mixed numbers
D. Multiplying fractions
E. Multiplying mixed numbers
F. Dividing fractions and mixed numbers
G. Measurement – customary measures – conversions
H. Perimeter
I. Circles and circumference
J. Properties
   - Multiplicative inverse
   - Distributive property
   - Multiplication property of equality

IX. Ratios, proportions, percents and applications of percents ch 8/ch 11

A. Ratios
B. Rates
C. Solving proportions
D. Scale drawings
E. Percents and fractions
F. Percents and decimals
G. Percents greater than 100% and less that 1%
H. Percent of a number
I. Percent proportion
   - Find the percentage
   - Find the rate
   - Find the base
J. Percent equations
K. Percent circle graphs : reading and interpreting only
L. Discount
M. Sales tax
N. Simple interest

X. Geometry: Lines, planes, angles, polygons — ch 9

A. Lines and planes*
   - points, segments, rays
   - parallel
   - perpendicular
   - planes

B. Angles
   - measuring angles*
   - classifying angles
   - complementary and supplementary*
   - transversals and parallel lines

C. Polygons
   - classify polygons
   - similar polygons

D. Dilations
E. Triangles and quadrilaterals
F. Tessellations
G. Translations
H. Reflections

XI. Rational and irrational numbers, radicals, Pythagorean theorem, area — ch 10

A. Squares and square roots
B. Pythagorean theorem (finding hypotenuse only)
C. Area
   - irregular figures (not including circular figures)
   - review rectangles, squares and parallelograms
   - triangles
   - trapezoids
   - circles

D. Area models

XII. Geometry – volume and surface area — ch 12

A. Classify solids
B. Volume of rectangular prisms
C. Volume of pyramids
D. Volume of cylinders
E. Surface area of rectangular prisms

XIII. Probability — ch 13

A. experimental vs. theoretical
B. tree diagrams
C. counting principal
D. independent and dependent events

VIII. Course Benchmarks

IX. Units of Study

Unit One

Problem Solving, Algebra and Geometry

A. Unit Benchmarks

Students will be able to:

1. Solve word problems using the four-step plan.
2. Solve real life problems using whole number operations.
3. Evaluate expressions using the order of operations.
4. Evaluate simple algebraic expressions.
5. Use powers and exponents in expressions and expanded notation.
6. Solve one step equations.
7. Find, extend and explain patterns.
8. Use models to find the areas of rectangles and parallelograms.
9. Find the areas of rectangles and parallelograms using their formulas.
10. Find the areas of rectangles and squares through measurement.

B. Unit Assessment

Quizzes/ tests
Informal checks for understanding through use of oral and written questions
Observation/ dialogue
Academic prompt
Fractal Project
Extended Response Questions

C. Rubric

D. Activities

1. Teacher Constructed Activities:

Activity	Benchmark	Standard	Application Level
a. Fractal Project: Students create their own fractal after researching fractals on the internet. *Materials: graph paper, poster board, colored pens/pencils*	**7**	**MST: 3**	**1, 2, 3, 4**
b. Perimeter and area activity: Students create rectangles and squares with different perimeters and areas on graph paper. Students create different rectangles and squares with the same perimeter or the same area. What happens to the area if the perimeter is doubled or what happens to the perimeter if the area is doubled? *Materials: graph paper, ruler*	**8, 9**	**MST: 3**	**1, 2, 3, 4**
c. Order of operations: Use the pneumonic device, "Please Excuse My Dear Aunt Sally," for the order of operations. Also use the following chart: **Parenthesis (inside)** **Exponents** **Multiply or divide →** **Add or subtract →** *Materials: math spiral*	**2**	**MST: 3**	**1, 2, 3, 4**
d. *Materials:*			

Application Level:

1: Knowledge
2: Apply in Discipline
3: Apply Across Disciplines
4: Apply to Real World Predictable Situations
5: Apply to Real World Unpredictable Situations

2. Textbook with Teaching Strategies

Activity	Benchmark	Standard	Application Level
a. Textbook pages 2-41 can be used in class and for homework. *Materials:*	**1-10**	**MST: 3**	**1, 2, 3, 4**
b. Fractals and other Patterns Mini Lab Page 24 can be used as a lead in to the Fractal Project. *Materials:*	**7**	**MST: 3**	**1**
c. Worksheets can be used from the Teacher Classroom Resources including the following: **Study Guide Masters** **Practice Masters** **Transparencies masters** **Etc.** *Materials: Teacher's Classroom Resources*	**1-10**	**MST: 3**	**1, 2, 3, 4**
d. *Materials:*			

Application Level:

1: Knowledge
2: Apply in Discipline
3: Apply Across Disciplines
4: Apply to Real World Predictable Situations
5: Apply to Real World Unpredictable Situations

3. Computer Assisted Instruction

Activity	Benchmark	Standard	Application Level
a. Fractal Project: use the internet sites on fractals to introduce fractals and explore computer generated fractals. *Materials: computer and large TV screen, internet access*	**7**	**MST: 3**	**1, 2, 3, 4**
b. Test and review software available in teacher set. *Materials: Test and review CD*	**1-10**	**MST: 3**	**1, 2, 3, 4, 5**
c. *Materials:*			
d.			

Application Level:

1: Knowledge
2: Apply in Discipline
3: Apply Across Disciplines
4: Apply to Real World Predictable Situations
5: Apply to Real World Unpredictable Situations

4. Cross Disciplinary

Activity	Benchmark	Standard	Application Level
a. *Materials:*			
b. *Materials:*			
c. *Materials:*			
d. *Materials:*			

Application Level:

1: Knowledge
2: Apply in Discipline
3: Apply Across Disciplines
4: Apply to Real World Predictable Situations
5: Apply to Real World Unpredictable Situations

5. Miscellaneous

Activity	Benchmark	Standard	Application Level
a. Extended Response questions: modeling questions similar to the Math 8 assessment. *Materials: see references and resources*	**1-10**	**MST: 3**	**1, 2, 3, 4, 5**
b. *Materials:*			
c. *Materials:*			
d. *Materials:*			

Application Level:

1: Knowledge
2: Apply in Discipline
3: Apply Across Disciplines
4: Apply to Real World Predictable Situations
5: Apply to Real World Unpredictable Situations

E. Vocabulary

Sample
Sum
Difference
Product
Quotient
Order of operations
Perimeter
Variable
Algebra
Algebraic expression
Numerical expression
Evaluate
Factors
Exponent
Base
Powers
Squared
Cubed
Product
Equation
Solve
Solution
Modeling
Equivalent
Fractal
Area
Rectangle
Square
Parallelogram
Rhombus
Base
Height

F. References and Resources

Glencoe Mathematics Applications and Connections, Course 2
Glencoe Teacher Classroom Resources, Course 2
Buckle Down: Sharpen Up, New York Mathematics, Book 8
Topical Review Book Company: Practice Tests for Grade 8
Glencoe: State Test Practice and Sample Test Workbook, Grade 8 Mathematics
Westsea Publishing Co. Inc.: New York State Intermediate Mathematics 8

Unit Two

Decimals

A. Unit Benchmarks

Students will be able to:

1. Read and write decimal numbers.
2. Compare and order decimals.
3. Add and subtract decimals.
4. Solve word problems by determining reasonable answers (estimating).
5. Multiply decimals.
6. Divide decimals using decimal models.
7. Divide decimals.
8. Solve real world problems using all four operations.
9. Use powers of ten to multiply and divide decimals.
10. Express fractions as terminating and repeating decimals.
11. Convert decimals to fractions.
12. Measure real world distances using the metric system.
13. Change metric units of length, capacity and mass and explain why.
14. Express numbers in scientific notation.

B. Unit Assessment

Quizzes/ tests
Informal checks for understanding through use of oral and written questions
Observation/ dialogue
Academic prompt
Graded measurement activity
Extended Response Questions

C. Rubric

D. Activities

1. Teacher Constructed Activities:

Activity	Benchmark	Standard	Application Level
a. Reading and writing decimals. Teacher creates worksheets to review reading and writing of decimals and their place values. *Materials: worksheets*	**1**	**MST: 3**	**1, 2, 3, 4**
b. Adding and subtracting decimals. Teacher creates worksheets to review adding and subtracting of decimals and the rules for addition and subtraction of decimals. *Materials: worksheets*	**3, 8**	**MST: 3**	**1, 2, 3, 4**
c. Metric staircase is used to teach conversions in the metric system. **Kilo** **Hecto** **Deka** **Root** **Deci** **Centi** **Milli** **Use the pneumonic device:** **King Henry drank my delicious chocolate milk.** **Right one step multiply by 10.** **Left one step divide by 10.** *Materials: spiral notes*	**5, 7, 9, 12, 13**	**MST: 3**	**1, 2, 3, 4**
d. Measurement Activity: Students will measure line segments and the perimeter of polygons using the Metric system of measurement. *Materials: worksheet and ruler*	**12, 13**	**MST: 3**	**1, 2, 3, 4**
e. Comparing and ordering decimals on the number line: The teacher can create a large number line on the blackboard. Students can place cards with decimals on the number line using magnets in the correct place and order. *Materials: magnets and 3x5 index cards*	**2**	**MST: 3**	**1, 2, 3, 4**

Application Level:

1: Knowledge
2: Apply in Discipline
3: Apply Across Disciplines
4: Apply to Real World Predictable Situations
5: Apply to Real World Unpredictable Situations

2. Textbook with Teaching Strategies

Activity	Benchmark	Standard	Application Level
a. Textbook pages 42-85 can be used in class and for homework. *Materials:*	**1-14**	**MST: 3**	**1, 2, 3, 4, 5**
b. Worksheets can be used from the Teacher Classroom Resources including the following: **Study Guide Masters** **Practice Masters** **Transparencies masters** *Materials: Teacher's Classroom Resources*	**1-14**	**MST: 3**	**1, 2, 3, 4, 5**
c. *Materials:*			
d. *Materials:*			

Application Level:

1: Knowledge
2: Apply in Discipline
3: Apply Across Disciplines
4: Apply to Real World Predictable Situations
5: Apply to Real World Unpredictable Situations

3. Computer Assisted Instruction

Activity	Benchmark	Standard	Application Level
a. Test and review software available in teacher set. *Materials: Test and review CD*	**1- 14**	**MST: 3**	**1, 2, 3, 4, 5**
b. *Materials:*			
c. *Materials:*			
d. *Materials:*			

Application Level:

1: Knowledge
2: Apply in Discipline
3: Apply Across Disciplines
4: Apply to Real World Predictable Situations
5: Apply to Real World Unpredictable Situations

4. Cross Disciplinary

Activity	Benchmark	Standard	Application Level
a. *Materials:*			
b. *Materials:*			
c. *Materials:*			
d. *Materials:*			

Application Level:

1: Knowledge
2: Apply in Discipline
3: Apply Across Disciplines
4: Apply to Real World Predictable Situations
5: Apply to Real World Unpredictable Situations

5. Miscellaneous

Activity	Benchmark	Standard	Application Level
a. Extended Response questions: modeling questions similar to the Math 8 assessment. *Materials: see references and resource list*	**1-14**	**MST: 3**	**1, 2, 3, 4, 5**
b. *Materials:*			
c. *Materials:*			
d. *Materials:*			

Application Level:

1: Knowledge
2: Apply in Discipline
3: Apply Across Disciplines
4: Apply to Real World Predictable Situations
5: Apply to Real World Unpredictable Situations

E. Vocabulary

Place value
Decimals
Standard form
Digits
Compare
Order
Is greater than
Is less than
Inequality
Clustering
Estimate
Terminating decimal
Repeating decimal
Bar notation
Metric system
Meter
Gram
Liter
Scientific notation

F. References and Resources

Glencoe: Mathematics Applications and Connections, Course 2
Glencoe: Teacher Classroom Resources, Course 2
Buckle Down: Sharpen Up, New York Mathematics, Book 8
Topical Review Book Company: Practice Tests for Grade 8
Glencoe: State Test Practice and Sample Test Workbook, Grade 8 Mathematics
Westsea Publishing Co. Inc.: New York State Intermediate Mathematics 8

Unit Three

Statistics, Analyzing Data, and Graphs

A. Unit Benchmarks

Students will be able to:

1. Choose appropriate scales and intervals for data, and organize data in a frequency table.
2. Solve real life problems by using graphs.
3. Take predictions from graphs.
4. Construct and interpret line and bar graphs.
5. Construct and interpret line plots.
6. Find the mean, median, mode and range given data and reading data from graphs.
7. Construct and interpret stem and leaf plots.
8. Construct and interpret box and whisker plots.
9. Use data to make predictions.
10. Recognize when statistics and graphs are misleading.

B. Unit Assessment

Quizzes/ tests
Informal checks for understanding through use of oral and written questions
Observation/ dialogue
Academic prompt
Extended Response Questions

C. Rubric

D. Activities

1. Teacher Constructed Activities:

Activity	Benchmark	Standard	Application Level
a. Using real data collected by the students, construct a line and bar graph from the data. *Materials: graph paper, ruler*	**1, 2, 4**	**MST: 3**	**1, 2, 3, 4, 5**
b. *Materials:*			
c. *Materials:*			
d. *Materials:*			

Application Level:

1: Knowledge
2: Apply in Discipline
3: Apply Across Disciplines
4: Apply to Real World Predictable Situations
5: Apply to Real World Unpredictable Situations

2. Textbook with Teaching Strategies

Activity	Benchmark	Standard	Application Level
a. Textbook pages 86-127 can be used in class and for homework. *Materials:*	**1-10**	**MST: 3**	**1, 2, 3, 4, 5**
b. Worksheets can be used from the Teacher Classroom Resources including the following: **Study Guide Masters** **Practice Masters** **Transparencies masters** *Materials: Teacher's classroom Resources*	**1-10**	**MST: 3**	**1, 2, 3, 4, 5**
c. *Materials:*			
d. *Materials:*			

Application Level:

1: Knowledge
2: Apply in Discipline
3: Apply Across Disciplines
4: Apply to Real World Predictable Situations
5: Apply to Real World Unpredictable Situations

3. Computer Assisted Instruction

Activity	Benchmark	Standard	Application Level
a. Using the data collected in a real life problem, create computer-generated graphs. *Materials: Computer graphing software*	**1, 2, 4**	**MST: 3**	**1, 2, 3, 4, 5**
b. *Materials:*			
c. *Materials:*			
d. *Materials:*			

Application Level:

1: Knowledge
2: Apply in Discipline
3: Apply Across Disciplines
4: Apply to Real World Predictable Situations
5: Apply to Real World Unpredictable Situations

4. Cross Disciplinary

Activity	Benchmark	Standard	Application Level
a. *Materials:*			
b. *Materials:*			
c. *Materials:*			
d. *Materials:*			

Application Level:

1: Knowledge
2: Apply in Discipline
3: Apply Across Disciplines
4: Apply to Real World Predictable Situations
5: Apply to Real World Unpredictable Situations

5. Miscellaneous

Activity	Benchmark	Standard	Application Level
a. Extended Response questions: modeling questions similar to the Math 8 assessment. *Materials: see references and resources*	**1-10**	**MST: 3**	**1, 2 ,3 ,4 ,5**
b. *Materials:*			
c. *Materials:*			
d. *Materials:*			

Application Level:

1: Knowledge
2: Apply in Discipline
3: Apply Across Disciplines
4: Apply to Real World Predictable Situations
5: Apply to Real World Unpredictable Situations

E. Vocabulary

Statistics
Data
Range
Frequency table
Scale
Interval
Graph
Line graph
Bar graph
Scatter plot
Predictions
Line plot
Cluster
Mean
Arithmetic average
Mode
Median
Stem and leaf plot
Leaves
Stems
Box and whisker plot
Upper quartile
Lower quartile
Upper and lower extreme
Interquartile range
Outlier

F. References and Resources

Glencoe: Mathematics Applications and Connections, Course 2
Glencoe: Teacher Classroom Resources, Course 2
Buckle Down: Sharpen Up, New York Mathematics, Book 8
Topical Review Book Company: Practice Tests for Grade 8
Glencoe: State Test Practice and Sample Test Workbook, Grade 8 Mathematics
Westsea Publishing Co. Inc.: New York State Intermediate Mathematics 8

Unit Four

Number Theory, Fractions and Percents

A. Unit Benchmarks

Student will be able to:

1. Find the factors of whole numbers.
2. Use the divisibility rules.
3. Find the prime factorization of a composite number.
4. Recognize and extend a pattern for sequences.
5. Explore and explain patterns in sequences.
6. Find the greatest common factor (GCF) of two or more numbers.
7. Use the greatest common factor to solve everyday problems.
8. Express fractions and ratios in simplest form.
9. Illustrate the meaning of percent using models or symbols.
10. Relate the meaning of percents to real life problems.
11. Express fractions as percents, and percents and decimals as fractions.
12. Find the probability of a simple event.
13. Find the least common multiple of two or more numbers.
14. Use the least common multiple to solve everyday problems.
15. Compare and order fractions.

B. Unit Assessment

Quizzes/ tests
Informal checks for understanding through use of oral and written questions
Observation/ dialogue
Academic prompt
Extended Response Questions
Card Flip Lab

C. Rubric

D. Activities

1. Teacher Constructed Activities:

Activity	Benchmark	Standard	Application Level
a. Experimental Probability Card Flip Lab: Students flip an index card and record how it lands; tent, side or edge. Students find the probability for each event with their results and class results in fraction and percent form. Students create a bar graph and line graph (honor students could do a circle graph) with their results. Students write a paragraph explaining their outcomes and comparing their results to the class results. (Graphs could be computer generated.) *Materials: index cards, graph paper, ruler, computer*	**Unit 4: 8, 9, 10, 11, 12** **Unit 3: 1, 2, 4**	**MST: 3**	**1, 2, 3, 4, 5**
b. Divisibility tests: Set up a worksheet in table format to test numbers for divisibility. *Materials: worksheet*	**1, 2**	**MST: 3**	**1, 2**
c. Percent modeling: Use graph paper to have student model the meaning of percents. *Materials: graph paper*	**9, 10**	**MST: 3**	**1, 2, 4**
d. Prime factorization: Use the prime division algorithm to find the prime factorization of a number. All the divisors are primes starting in order 2,3,5,7,etc. (Upside down division method.) *Materials: spiral notebook*	**3**	**MST: 3**	**1, 2**

Application Level:

1: Knowledge
2: Apply in Discipline
3: Apply Across Disciplines
4: Apply to Real World Predictable Situations
5: Apply to Real World Unpredictable Situations

2. Textbook with Teaching Strategies

Activity	Benchmark	Standard	Application Level
a. Textbook pages 130-181 can be used in class and for homework. *Materials:*	**1-15**	**MST: 3**	**1, 2, 3, 4, 5**
b. Worksheets can be used from the Teacher Classroom Resources including the following: **Study Guide Masters** **Practice Masters** **Transparencies masters** *Materials: Teacher's Classroom Resources*	**1-15**	**MST: 3**	**1, 2, 3, 4, 5**
c. *Materials:*			
d. *Materials:*			

Application Level:

1: Knowledge
2: Apply in Discipline
3: Apply Across Disciplines
4: Apply to Real World Predictable Situations
5: Apply to Real World Unpredictable Situations

3. Computer Assisted Instruction

Activity	Benchmark	Standard	Application Level
a. Experimental Probability Card Flip Lab: students can use the computer to generate bar, line and circle graphs to illustrate their results. (See teacher related activities.) *Materials: index cards, graph paper, rulers, computer*	**Unit 4: 8, 9, 10, 11, 12** **Unit 3: 1, 2, 4**	**MST: 3**	**1, 2, 3, 4, 5**
b. Test and review software available in teacher set. *Materials: Test and review software*	**1-15**	**MST: 3**	**1, 2, 3, 4, 5**
c. *Materials:*			
d. *Materials:*			

Application Level:

1: Knowledge
2: Apply in Discipline
3: Apply Across Disciplines
4: Apply to Real World Predictable Situations
5: Apply to Real World Unpredictable Situations

4. Cross Disciplinary

Activity	Benchmark	Standard	Application Level
a. *Materials:*			
b. *Materials:*			
c. *Materials:*			
d. *Materials:*			

Application Level:

1: Knowledge
2: Apply in Discipline
3: Apply Across Disciplines
4: Apply to Real World Predictable Situations
5: Apply to Real World Unpredictable Situations

5. Miscellaneous

Activity	Benchmark	Standard	Application Level
a. Extended Response questions: modeling questions similar to the Math 8 assessment. *Materials: see references and resources*	**1 -15**	**MST: 3**	**1, 2, 3, 4, 5**
b. *Materials:*			
c. *Materials:*			
d. *Materials:*			

Application Level:

1: Knowledge
2: Apply in Discipline
3: Apply Across Disciplines
4: Apply to Real World Predictable Situations
5: Apply to Real World Unpredictable Situations

E. Vocabulary

Factor
Divisible
Divisible by
Digit
Even
Odd
Prime
Composite
Factor tree
Prime factorization
Sequence
Terms
Arithmetic sequence
Geometric sequence
Diagonals
Fibonacci sequence
Greatest common factor (GCF)
Ratio
Numerator
Denominator
Simplest form
Lowest terms
Percent
Probability
Event
Random
Outcomes
Equally likely
Biased
Unbiased
Multiple
Least common multiple (LCM)
Common denominator
Least common denominator (LCD)
Cross products (cross multiplication)

F. References and Resources

Glencoe: Mathematics Applications and Connections, Course 2
Glencoe: Teacher Classroom Resources, Course 2
Buckle Down: Sharpen Up, New York Mathematics, Book 8
Topical Review Book Company: Practice Tests for Grade 8
Glencoe: State Test Practice and Sample Test Workbook, Grade 8 Mathematics
Westsea Publishing Co. Inc.: New York State Intermediate Mathematics

Unit Five

Sets

A. Unit Benchmarks

Students will be able to:

1. Define, use and explain set notation.
2. Create and define different sets.
3. Find the union and intersection of sets.
4. Read, draw and interpret Venn Diagrams.
5. Use Venn Diagrams to solve real life problems.

B. Unit Assessment

Quizzes/ tests
Informal checks for understanding through use of oral and written questions
Observation/ dialogue
Academic prompt
Extended Response Questions

C. Rubric

D. Activities

1. Teacher Constructed Activities:

Activity	Benchmark	Standard	Application Level
a. Worksheet 1: Using Set Notation *Materials: unit worksheets on file in math department*	**1, 2**	**MST: 3**	**1, 2**
b. Worksheet 2, 3: Union and intersection of sets *Materials: unit worksheets on file in math department*	**1, 2, 3**	**MST: 3**	**1, 2, 3**
c. Worksheet 4, 5, 6, 7 Venn Diagrams *Materials: unit worksheets on file in math department*	**1, 2, 3, 4, 5**	**MST: 3**	**1, 2, 3, 4, 5**
d. *Materials:*			

Application Level:

1: Knowledge
2: Apply in Discipline
3: Apply Across Disciplines
4: Apply to Real World Predictable Situations
5: Apply to Real World Unpredictable Situations

2. Textbook with Teaching Strategies

Activity	Benchmark	Standard	Application Level
a. *Materials:*			
b. *Materials:*			
c. *Materials:*			
d. *Materials:*			

Application Level:

1: Knowledge
2: Apply in Discipline
3: Apply Across Disciplines
4: Apply to Real World Predictable Situations
5: Apply to Real World Unpredictable Situations

3. Computer Assisted Instruction

Activity	Benchmark	Standard	Application Level
a. *Materials:*			
b. *Materials:*			
c. *Materials:*			
d. *Materials:*			

Application Level:

1: Knowledge
2: Apply in Discipline
3: Apply Across Disciplines
4: Apply to Real World Predictable Situations
5: Apply to Real World Unpredictable Situations

4. Cross Disciplinary

Activity	Benchmark	Standard	Application Level
a. *Materials:*			
b. *Materials:*			
c. *Materials:*			
d. *Materials:*			

Application Level:

1: Knowledge
2: Apply in Discipline
3: Apply Across Disciplines
4: Apply to Real World Predictable Situations
5: Apply to Real World Unpredictable Situations

5. Miscellaneous

Activity	Benchmark	Standard	Application Level
a. Extended Response questions: modeling questions similar to the Math 8 assessment. *Materials: see references and resources*	**1-5**	**MST: 3**	**1, 2, 3, 4, 5**
b. *Materials:*			
c. *Materials:*			
d. *Materials:*			

Application Level:

1: Knowledge
2: Apply in Discipline
3: Apply Across Disciplines
4: Apply to Real World Predictable Situations
5: Apply to Real World Unpredictable Situations

E. Vocabulary

Sets
Set notation
Elements
Subset
Equivalent
One to one correspondence
Union
Intersection
Universal set
Null set
Empty set
Venn Diagram

F. References and Resources

Glencoe: Mathematics Applications and Connections, Course 2
Glencoe: Teacher Classroom Resources, Course 2
Buckle Down: Sharpen Up, New York Mathematics, Book 8
Topical Review Book Company: Practice Tests for Grade 8
Glencoe: State Test Practice and Sample Test Workbook, Grade 8 Mathematics
Westsea Publishing Co. Inc.: New York State Intermediate Mathematics 8

Unit Six

Integers

A. Unit Benchmarks

Students will be able to:

1. Read and write integers, and find the opposite and absolute value of an integer.
2. Relate integers to real life.
3. Compare and order integers.
4. Graph points on a coordinate plane.
5. Adding integers using a model, number chips and the number line.
6. Adding integers using the integer rules for addition.
7. Subtracting integers using a model, number chips and the number line.
8. Subtracting integers using the integer rule for subtraction.
9. Multiplying integers using a model, patterns, number chips and the number line.
10. Multiplying integers using the integer rules for multiplication.
11. Dividing integers using a model, patterns, number chips and the number line.
12. Dividing integers using the integer rules for division.
13. Relate the four integer operations to real world situations.
14. Graph transformations on a coordinate plane.

B. Unit Assessment

Quizzes/ tests
Informal checks for understanding through use of oral and written questions
Observation/ dialogue
Academic prompt
Extended Response Questions

C. Rubric

D. Activities

1. Teacher Constructed Activities:

Activity	Benchmark	Standard	Application Level
a. Walking the number line: Students add and subtract integers by walking along a life size number line drawn on the blackboard or wall. Students through discussions and comparing results develop the rules for addition and subtraction of integers. *Materials:*	**5, 6, 7, 8**	**MST: 3**	**1, 2**
b. Number line and patterns: Students multiply and divide integers on a number line drawn on the blackboard or wall. Students look at patterns related to multiplication being a shortcut to addition to multiply integers. Students through discussions and comparing results develop the rules for multiplying and dividing of integers. *Materials:*	**9, 10, 11, 12**	**MST: 3**	**1, 2**
c. *Materials:*			
d. *Materials:*			

Application Level:

1: Knowledge
2: Apply in Discipline
3: Apply Across Disciplines
4: Apply to Real World Predictable Situations
5: Apply to Real World Unpredictable Situations

2. Textbook with Teaching Strategies

Activity	Benchmark	Standard	Application Level
a. Textbook pages 182-223 can be used in class and for homework. *Materials:*	**1-14**	**MST: 3**	**1, 2, 3, 4, 5**
b. Worksheets can be used from the Teacher Classroom Resources including the following: **Study Guide Masters** **Practice Masters** **Transparencies masters** *Materials: Teacher's Classroom resources*	**1-14**	**MST: 3**	**1, 2, 3, 4, 5**
c. Number chips (counters): Students can learn adding, subtracting, and multiplying of integers using number chips. **See examples in the book pages 184, 196, 201, 206.** *Materials: Counters (number chips)*	**5, 7, 9**	**MST: 3**	**1, 2**
d. *Materials:*			

Application Level:

1: Knowledge
2: Apply in Discipline
3: Apply Across Disciplines
4: Apply to Real World Predictable Situations
5: Apply to Real World Unpredictable Situations

3. Computer Assisted Instruction

Activity	Benchmark	Standard	Application Level
a. Math Blasters software can be used to reinforce the operations of integers. *Materials: Math Blasters disk, computer lab*	**6, 8, 10, 12**	**MST: 3**	**1, 2**
b. Test and review software available in teacher set. *Materials: Test and review CD*	**1-14**	**MST: 3**	**1, 2, 3, 4, 5**
c. *Materials:*			
d. *Materials:*			

Application Level:

1: Knowledge
2: Apply in Discipline
3: Apply Across Disciplines
4: Apply to Real World Predictable Situations
5: Apply to Real World Unpredictable Situations

4. Cross Disciplinary

Activity	Benchmark	Standard	Application Level
a. *Materials:*			
b. *Materials:*			
c. *Materials:*			
d. *Materials:*			

Application Level:

1: Knowledge
2: Apply in Discipline
3: Apply Across Disciplines
4: Apply to Real World Predictable Situations
5: Apply to Real World Unpredictable Situations

5. Miscellaneous

Activity	Benchmark	Standard	Application Level
a. Extended Response questions: modeling questions similar to the Math 8 assessment. *Materials: see references and resource materials*	**1-14**	**MST: 3**	**1, 2, 3, 4, 5**
b. *Materials:*			
c. *Materials:*			
d. *Materials:*			

Application Level:

1: Knowledge
2: Apply in Discipline
3: Apply Across Disciplines
4: Apply to Real World Predictable Situations
5: Apply to Real World Unpredictable Situations

E. Vocabulary

Integer
Positive
Negative
Opposite
Absolute value
Coordinate system
Origin
X-axis
Y-axis
Quadrant
Ordered pairs
X-coordinate
Y-coordinate
Additive inverse
Transformation
Reflection
Translation

F. References and Resources

Glencoe Mathematics Applications and Connections, Course 2
Glencoe Teacher Classroom Resources, Course 2
Buckle Down: Sharpen Up, New York Mathematics, Book 8
Topical Review Book Company: Practice Tests for Grade 8
Glencoe: State Test Practice and Sample Test Workbook, Grade 8 Mathematics
Westsea Publishing Co. Inc.: New York State Intermediate Mathematics 8

Unit Seven

Algebra – Expressions and Equations with Whole Numbers, Decimals and Integers

A. Unit Benchmarks

Students will be able to:

1. Use models to solve equations. (Hands on Equations)
2. Solve one step addition and subtraction equations using algebraic steps.
3. Solve one step multiplication equations using algebraic steps.
4. Solve one step division equations using algebraic steps.
5. Write simple algebraic expressions and equations from verbal and written phrases and sentences.
6. Solve real life word problems using equations.
7. Write, solve and graph inequalities using algebraic steps and the number line.
8. Represent functions as ordered pairs.
9. Use a function rule to find the output of a function.

B. Unit Assessment

Quizzes/ tests
Informal checks for understanding through use of oral and written questions
Observation/ dialogue
Academic prompt
Extended Response Questions

C. Rubric

D. Activities

1. **Teacher Constructed Activities:**

Activity	Benchmark	Standard	Application Level
a. Hands on Equations: Use the hands on equations manipulatives to introduce equation solving. *Materials: Hands on equations manipulatives*	**1, 2, 3, 4**	**MST: 3**	**1, 2**
b. *Materials:*			
c. *Materials:*			
d. *Materials:*			

Application Level:

1: Knowledge
2: Apply in Discipline
3: Apply Across Disciplines
4: Apply to Real World Predictable Situations
5: Apply to Real World Unpredictable Situations

2. Textbook with Teaching Strategies

Activity	Benchmark	Standard	Application Level
a. Textbook pages 224-263 can be used in class and for homework. *Materials:*	**1-9**	**MST: 3**	**1, 2, 3, 4, 5**
b. Worksheets can be used from the Teacher Classroom Resources including the following: **Study Guide Masters** **Practice Masters** **Transparencies masters** *Materials: Teacher's Classroom Resources*	**1-9**	**MST: 3**	**1, 2, 3, 4, 5**
c. Hands on equations: The hands on equations method is shown in the book on pages 226, 227, 229, 235, 238 *Materials: Hands on equations manipulatives*	**1, 2, 3, 4**	**MST: 3**	**1, 2**
d. *Materials:*			

Application Level:

1: Knowledge
2: Apply in Discipline
3: Apply Across Disciplines
4: Apply to Real World Predictable Situations
5: Apply to Real World Unpredictable Situations

3. Computer Assisted Instruction

Activity	Benchmark	Standard	Application Level
a. Test and review software available in teacher set. *Materials: test and review CD*	**1-9**	**MST: 3**	**1, 2, 3, 4, 5**
b. *Materials:*			
c. *Materials:*			
d. *Materials:*			

Application Level:

1: Knowledge
2: Apply in Discipline
3: Apply Across Disciplines
4: Apply to Real World Predictable Situations
5: Apply to Real World Unpredictable Situations

4. Cross Disciplinary

Activity	Benchmark	Standard	Application Level
a. *Materials:*			
b. *Materials:*			
c. *Materials:*			
d. *Materials:*			

Application Level:

1: Knowledge
2: Apply in Discipline
3: Apply Across Disciplines
4: Apply to Real World Predictable Situations
5: Apply to Real World Unpredictable Situations

5. Miscellaneous

Activity	Benchmark	Standard	Application Level
a. Extended Response questions: modeling questions similar to the Math 8 assessment. *Materials: see references and resources*	**1-9**	**MST: 3**	**1, 2, 3, 4, 5**
b. *Materials:*			
c. *Materials:*			
d. *Materials:*			

Application Level:

1: Knowledge
2: Apply in Discipline
3: Apply Across Disciplines
4: Apply to Real World Predictable Situations
5: Apply to Real World Unpredictable Situations

E. Vocabulary

Addition property of equality
Subtraction property of equality
Left member
Right member
Variable
Term
Equal sign
Solution
Solution set
Inverse
Additive inverse
Coefficient
Numerical coefficient
Multiplicative inverse
Multiplication property of equality
Division property of equality
Inequality
Function
Linear equation

F. References and Resources

Glencoe Mathematics Applications and Connections, Course 2
Glencoe Teacher Classroom Resources, Course 2
Buckle Down: Sharpen Up, New York Mathematics, Book 8
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Unit Eight

Fractions

A. Unit Benchmarks

Students will be able to:

1. Estimate sums, differences, products, and quotients of fractions and mixed numbers.
2. Add and subtract fractions.
3. Add and subtract mixed numbers.
4. Solve real life problems involving addition and subtractions of fractions and mixed numbers.
5. Use models to multiply fractions and mixed numbers.
6. Multiply fractions and mixed numbers.
7. Dividing fractions and mixed numbers.
8. Solve real life problems involving multiplication and division of fractions and mixed numbers.
9. Measure real life quantities in the customary system.
10. Change units in the customary measurement system.
11. Find and explain perimeter and apply perimeter to real life problems.
12. Find the circumference of circles and apply circumference to real life problems.
13. Use addition and multiplication properties to solve problems.

B. Unit Assessment

Quizzes/ tests
Informal checks for understanding through use of oral and written questions
Observation/ dialogue
Academic prompt
Extended Response Questions

C. Rubric

D. Activities

1. Teacher Constructed Activities:

Activity	Benchmark	Standard	Application Level
a. Converting Customary Units: The Metric staircase can be adapted to teach conversions in the customary units. Students will need to know the specific amount for each stair. **Ton** **Pound** **Ounce** **Miles** Yards **Feet** **Inches** **Gallon** **Quart** **Pint** **Cup** **Fl. Ounce** **Go right – multiply Go left – divide** *Materials: spiral notebook*	**9, 10**	**MST: 3**	**1, 2, 3, 4, 5**
b. Circumference: Students measure a variety of circles finding their diameter and circumference and discover the approximate relationship Pi between them. *Materials: circular objects, ruler*			
c. *Materials:*			
d.			

Application Level:

1: Knowledge
2: Apply in Discipline
3: Apply Across Disciplines
4: Apply to Real World Predictable Situations
5: Apply to Real World Unpredictable Situations

2. Textbook with Teaching Strategies

Activity	Benchmark	Standard	Application Level
a. Textbook pages 266-313 can be used in class and for homework. *Materials:*	**1-13**	**MST: 3**	**1, 2, 3, 4, 5**
b. Worksheets can be used from the Teacher Classroom Resources including the following: **Study Guide Masters** **Practice Masters** **Transparencies masters** **Etc.** *Materials:*	**1-13**	**MST: 3**	**1, 2, 3, 4, 5**
c. Fraction Bars: Students can make and use fraction bars to understand the meaning of fractions and to understand the operations of addition and subtraction. Page 268 ex. 1, 2; page 272 Mini Lab; page 273 ex. 1 *Materials:*	**1, 2, 3**	**MST: 3**	**1, 2, 3, 4**
d. Hands on Lab: 7-4A Multiplying Fractions and Mixed Numbers, page 282-283. This lab can be adapted to appropriately meet the needs of the class. *Materials:*	**5, 6**	**MST: 3**	**1, 2, 3, 4**

Application Level:

1: Knowledge
2: Apply in Discipline
3: Apply Across Disciplines
4: Apply to Real World Predictable Situations
5: Apply to Real World Unpredictable Situations

3. Computer Assisted Instruction

Activity	Benchmark	Standard	Application Level
a. Test and review software available in teacher set. *Materials:*	**1-13**	**MST: 3**	**1, 2, 3, 4, 5**
b. *Materials:*			
c. *Materials:*			
d. *Materials:*			

Application Level:

1: Knowledge
2: Apply in Discipline
3: Apply Across Disciplines
4: Apply to Real World Predictable Situations
5: Apply to Real World Unpredictable Situations

4. Cross Disciplinary

Activity	Benchmark	Standard	Application Level
a. *Materials:*			
b. *Materials:*			
c. *Materials:*			
d. *Materials:*			

Application Level:

1: Knowledge
2: Apply in Discipline
3: Apply Across Disciplines
4: Apply to Real World Predictable Situations
5: Apply to Real World Unpredictable Situations

5. Miscellaneous

Activity	Benchmark	Standard	Application Level
a. Extended Response questions: modeling questions similar to the Math 8 assessment. *Materials: see references and resources*	**1-13**	**MST: 3**	**1, 2, 3, 4, 5**
b. *Materials:*			
c. *Materials:*			
d. *Materials:*			

Application Level:

1: Knowledge
2: Apply in Discipline
3: Apply Across Disciplines
4: Apply to Real World Predictable Situations
5: Apply to Real World Unpredictable Situations

E. Vocabulary

Numerator
Denominator
Fractions
Mixed number
Rational number
Customary measure
Ounce
Pound
Ton
Fluid ounce
Cup
Pint
Quart
Gallon
Inch
Feet
Yard
Mile
Circle
Center
Radius
Diameter
Circumference
Pi
Commutative
Associative
Identity
Reciprocal
Distributive

F. References and Resources

Glencoe Mathematics Applications and Connections, Course 2
Glencoe Teacher Classroom Resources, Course 2
Buckle Down: Sharpen Up, New York Mathematics, Book 8
Topical Review Book Company: Practice Tests for Grade 8
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Westsea Publishing Co. Inc.: New York State Intermediate Mathematics 8

Unit Nine

Ratios, Percents and Applications of Percents

A. Unit Benchmarks

Students will be able to:

1. Explore the meaning of ratio and proportion.
2. Express ratios as fractions and determine whether two ratios are equivalent.
3. Determine unit rates.
4. Solve proportions.
5. Solve real life problems by drawing a diagram.
6. Solve real life problems involving scale drawings.
7. Express fractions as percents and percents as fractions.
8. Express decimals as percents and percents as decimals.
9. Find the percent of a number.
10. Solve real life problems using the percent proportion.
11. Estimate percents by using fractions and decimals.
12. Construct and interpret circle graphs.
13. Find the rate, base and percentage using the percent proportion.
14. Apply the percent proportion to real life problems involving sales tax, discount, percent on increase and decrease and simple interest.

B. Unit Assessment

Quizzes/ tests
Informal checks for understanding through use of oral and written questions
Observation/ dialogue
Academic prompt
Extended Response Questions

C. Rubric

D. Activities

1. Teacher Constructed Activities:

Activity	Benchmark	Standard	Application Level
a. Percent proportion: **is = %** **of 100** *Materials: spiral notebook*	**9, 10, 13, 14**	**MST: 3**	**1, 2, 3, 4, 5**
b. Percent chart: **fraction | decimal | percent** **1/2 | 0.5 | 50%** *Materials: spiral notebook, worksheets*	**7, 8**	**MST: 3**	**1, 2, 3, 4**
c. *Materials:*			
d.			

Application Level:

1: Knowledge
2: Apply in Discipline
3: Apply Across Disciplines
4: Apply to Real World Predictable Situations
5: Apply to Real World Unpredictable Situations

2. Textbook with Teaching Strategies

Activity	Benchmark	Standard	Application Level
a. Textbook pages 358-403 and 448-485 can be used in class and for homework. *Materials:*		**MST: 3**	**1, 2, 3, 4, 5**
b. Worksheets can be used from the Teacher Classroom Resources including the following: **Study Guide Masters** **Practice Masters** **Transparencies masters** **Etc.** *Materials:*	**1-14**	**MST: 3**	**1, 2, 3, 4, 5**
c. Mini Lab: Estimating Percents, page 450 *Materials:*	**11**	**MST: 3**	**1, 2**
d. *Materials:*			

Application Level:

1: Knowledge
2: Apply in Discipline
3: Apply Across Disciplines
4: Apply to Real World Predictable Situations
5: Apply to Real World Unpredictable Situations

3. Computer Assisted Instruction

Activity	Benchmark	Standard	Application Level
a. Test and review software available in teacher set. *Materials:*	**1-14**	**MST: 3**	**1, 2, 3, 4, 5**
b. Making circle graphs: Students can use computer software to explore making circle graphs as an introduction to constructing circle graphs. *Materials:*	**12**	**MST: 3**	**1, 2, 3, 4**
c. *Materials:*			
d. *Materials:*			

Application Level:

1: Knowledge
2: Apply in Discipline
3: Apply Across Disciplines
4: Apply to Real World Predictable Situations
5: Apply to Real World Unpredictable Situations

4. Cross Disciplinary

Activity	Benchmark	Standard	Application Level
a. *Materials:*			
b. *Materials:*			
c. *Materials:*			
d. *Materials:*			

Application Level:

1: Knowledge
2: Apply in Discipline
3: Apply Across Disciplines
4: Apply to Real World Predictable Situations
5: Apply to Real World Unpredictable Situations

5. Miscellaneous

Activity	Benchmark	Standard	Application Level
a. Extended Response questions: modeling questions similar to the Math 8 assessment. *Materials: see references and resources*	**1-14**	**MST: 3**	**1, 2, 3, 4, 5**
b. *Materials:*			
c. *Materials:*			
d. *Materials:*			

Application Level:

1: Knowledge
2: Apply in Discipline
3: Apply Across Disciplines
4: Apply to Real World Predictable Situations
5: Apply to Real World Unpredictable Situations

E. Vocabulary

Ratio
Equivalent ratios
Rate
Unit rate
Proportion
Cross products
Cross multiplication
Scale drawing
Scale
Percentage
Base
Rate
Percent proportion
Circle graph
Degrees
Percent of increase
Percent of decrease
Sales tax
Discount
Simple interest
Principle
Rate
Time

F. References and Resources

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Glencoe: State Test Practice and Sample Test Workbook, Grade 8 Mathematics
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X. Course Assessment

XI. Curriculum Review Process