Roselle Park School District

Mathematics Department

Course of Study

Math Problem Solving
Grade 6

MATH PROBLEM SOLVING GRADE 6

The purpose of this guide is to provide the instructor with a scope and sequence and the course objectives. In order to understand how these objectives are to be achieved, a sequence of topics is listed for each unit. Space is provided on each page to allow for notes and recommendations. The New Jersey Core Curriculum Content Standards and the New Jersey Core Course Proficiencies are infused throughout the units.

This guide applies to all students and meets the Affirmative Action guidelines.

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ROSELLE PARK PUBLIC SCHOOLS
MATHEMATICS PHILOSOPHY

Our children need to be well prepared for lives and careers in a technological world and in a global economy. They need to be able to solve problem and reason effectively. They need to use complex information and advanced tools. They need to know and understand how to use and apply mathematics. These high standards will benefit both our children and our society.

The Roselle Park High School Mathematics Curriculum will develop students' understanding of concepts and help them to acquire essential skills. Their philosophy is based upon the fact that all students possess the ability to be rational thinkers, independent problem solvers, and efficient users of technology. Each student can achieve success and pride while developing these skills. A comprehensive program has been developed in a spiral and sequential format so those students will learn the many aspects of mathematics and its applications. Emphasis will be placed on being actively involved in learning mathematics, writing and talking about math, using critical thinking skills in problem solving, using calculators, computers, and other mathematical tools of learning, and achieving at a high level.

Consideration will be given to the individual student's needs, interests, and abilities. All students must develop and sharpen their skills, deepen their understanding of mathematical concepts and processes, and hone their problem-solving, reasoning, and communication abilities while using mathematics to make sense of, and solve, compelling problem. For this to occur, rigorous mathematical content must be organized, taught, and assessed in a problem-solving environment. The students will be challenged to use math in meaningful ways, so that they come to realize how useful mathematics will be in their lives. Moreover, the curriculum will also encourage the development of positive attitudes and interests in mathematics, which will last a lifetime.

GOALS

1. Communicate mathematically through written, oral, symbolic, and visual forms of expression.

2. Understand the interrelationships of mathematical ideas and the roles that mathematics plays in other disciplines and in life.

3. Use calculators, computers, manipulatives, and other mathematical tools to enhance mathematical thinking and understanding.

4. Develop the ability to pose and solve mathematical problems in mathematics, other disciplines, and everyday experiences.

5. Develop reasoning ability and become self-reliant, independent mathematical thinkers.

6. Demonstrate high levels of mathematical thought through experiences which extend beyond traditional computation, algebra, and geometry.

7. Develop an understanding of patterns, relationships, and functions, and use them to represent and explain real world phenomena.

MATHEMATICS DEPARTMENT
COURSE PROFICIENCIES
Math Problem Solving 6

I. Descriptions:

The objective of the sixth grade math problem solving is to aid students in further exploring problem solving skills related to standardized testing. The curriculum lays the foundations for the studies of algebra, geometry, and statistics. Basic operations with whole numbers and decimals are reinforced and built upon. Students will also use explorations, manipulatives, and technology to further understand concepts such as operations with fractions, solving basic equations, graphing, geometry, and basic ratios and percents. Students will develop an understanding of operations involving integers. A basic goal is to improve problem-solving strategies while maintaining real-world relevance. The pace of the course and the depth of topics covered will vary in accordance to the level of the class.

Students are identified in Grade 5 through tests and teacher recommendation.

II. Unit Topics:

Tools for Algebra and Geometry
- Test Taking Strategies
- Number Sense and Algebraic Thinking
- Review of Operations with Decimals
- Measurement and Statistics
- Number Patterns and Operations With Fractions
- Equations and Functions
- Ratios, Proportions and Percents
- Geometric Figures
- Geometry and Measurement
- Integers
- Probability

II   Objectives:
Grade 6

Number and Numerical Operations

All students will develop number sense and will perform standard numerical operations and estimations on all types of numbers in a variety of ways.

All students will be able to:
- Define the value of a fraction as a relationship of part of a whole
- Create visual models of fractions to represent the relationship between numerator and denominator
- Locate fractions on a number line
- Compare fraction with denominators that are either the same of different
- Perform basic operations (add, subtract, multiply and divide) fractions with the same or different denominators
- Convert mixed numbers to improper fractions and vice versa
- Perform basic operations (add, subtract, multiply and divide) with mixed numbers
- Use problem solving techniques to solve word problems involving fractions
- Convert fractions to decimals
- Identify the relationship between a fraction and its decimal equivalent

Geometry and Measurement

All students will develop spatial sense and the ability to use geometric properties, relationships, and measurements to model, describe and analyze phenomena.

- Develop an understanding of the basic terms point, line plane, segment, and ray.
- Recognize the meaning of various notations as related to line, segment and ray.
- Identify the relationship between lines as being either intersecting, perpendicular or parallel.
- Categorize polygons by the number of sides
- Differentiate between the characteristics of triangles by analyzing the length of the sides and or the measure of the angles and their relationship to each other
- Recognize triangles that are equilateral and examine how the characteristics relate to those of an equiangular triangle
- Differentiate between regular and irregular polygons
- Define the vocabulary as related to the circle: center, radius, diameter, area and circumference
- Calculate the area and circumference of a circle
- Divide figures using lines of symmetry
- Recognize the use of geometry in nature and real world settings
- Convert measurements from a given form to an equivalent form

- Exhibit knowledge of the metric system by converting a given metric measurement to an equivalent measure
- Use mathematical tools such as a ruler and protractor for measurements
- Recognize that all measurements are an estimate within the confines of the desirable precision
- Calculate the area and perimeter of a rectangle, square and parallelogram
- Devise a method to estimate the area of an irregular figure
- Utilize the formulas given on the reference sheet to find the perimeter, area, surface area and or volume of a given figure
- Create a design using tessellations
- Utilize the reference sheet provide by the state of New Jersey to solve problems

Patterns and Algebra

All students will represent and analyze relationships among variable quantities and solve problems involving functions, and algebraic concepts and processes.

- Recognize, describe and extend patterns that are either numerical or visual
- Develop a rule for a given pattern
- Generate an iterative formula for a given pattern (e. g. Next = Now + 3)
- Recognize recursive patterns and generate a rule for said pattern (e.g. The Fibonacci Sequence where Next = Now + Previous)
- Represent an a situation using variables to represent unknown quantities
- Evaluate algebraic expressions for given values
- Model a problem using an algebraic equation
- Use manipulatives to model algebraic equations
- Solve algebraic equations involving whole numbers using inverse operations
- Solve algebraic equations with variables on both sides
- Understand the relationship between the operations as presented in the order of operations
- Utilize the order of operations to evaluate numerical expressions and simplify algebraic expressions
- Show how the distributive property can be used to find the product of a number

Data Analysis, Probability, and Discrete Mathematics

All students will develop an understanding of the concepts and techniques of data analysis, probability, and discrete mathematics, and will use them to model situations, solve problems, and analyze and draw appropriate inferences from data.

- Collect and or generate data
- Organize data appropriately
- Display data in an appropriate form that may include a table, a bar graph, a line graph, a histogram and a circle graph
- Read information presented in graphical form

- Analyze the information presented on a graph in order to make inferences regarding the situation modeled on the graph
- Make prediction based on the information presented in graphical form
- Identify the median mode and range of a given set of data
- Calculate the mean of a given set of data
- Draw conclusions about large groups using surveys and or sampling techniques
- Determine the probability of s single event
- Differentiate between single and compound events
- Recognize the concept of independent outcomes
- Determine the total number of possible combinations within a given data set by constructing organized lists, charts and or tree diagrams
- Develop the multiplication principle by analyzing the organized data to find all possible outcomes
- Determine the total number of combinations using the multiplication principle
- Distinguish between situations where the order of the elements represented is important when it is not important
- Determine the total number of order specific arrangements with a given set of data

Mathematical Process

All students will use mathematical processes of problem solving, communication, reasoning, representation and technology to solve problems and communicate mathematical idea as described in the appropriate grade level New Jersey Core Curriculum Content Standards.

IV   Types of Evaluations:

1. Tests
2. Quizzes
3. Class work/Notebooks
4. Class participation
5. Homework
6. Open ended questions
7. Rubric based assessment
8. Students will be utilizing benchmark assessments.

V   Standards of Evaluation:

1. Tests
2. Quizzes
3. Class notes/Notebooks
4. Class participation
5. Homework
6. Open ended questions
7. Rubric based assessment

8. Students will be utilizing benchmark assessments.

VII   Expectations:

1. Students will be responsible for textbooks and other supplies necessary to complete class work.
2. Students will maintain notes required by the teacher.
3. Students will be expected to list and follow all directions necessary to complete assignments.
4. Students will be responsible for acceptable performance such as class attendance, make up work, and testing.
5. Students will be responsible for efficient use of calculators, computers, manipulatives, and other mathematical tools.
6. Students will review daily homework and concepts.
7. Students will organize review for tests including test-taking and test-preparation strategies.
8. Students will work effectively to complete group/individual assignments.
9. Students will review /take a mid-term and final exam.

STANDARD 4.1 (Number and numerical operations) All students will develop number sense and will perform standard numerical operations and estimations on all types of numbers in a variety of ways.

Strands and Cumulative Progress Indicators

Building upon knowledge and skills gained in preceding grades, by the end of **Grade 6**, students will:

A. Number Sense

1. Use real-life experiences, physical materials, and technology to construct meanings for numbers **(unless otherwise noted, all indicators for grade 6 pertain to these sets of numbers as well).**
   - All integers
   - All fractions as part of a whole, as subset of a set, as a location on a number line, and as divisions of whole numbers
   - All decimals
2. Recognize the decimal nature of United States currency and compute with money.
3. Demonstrate a sense of the relative magnitudes of numbers.
4. Explore the use of ratios and proportions in a variety of situations.
5. Understand and use whole-number percents between 1 and 100 in a variety of situations.
6. Use whole numbers, fractions, and decimals to represent equivalent forms of the same number.
7. Develop and apply number theory concepts in problem solving situations.
   - Primes, factors, multiples
   - Common multiples, common factors
8. Compare and order numbers.

B. Numerical Operations

1. Recognize the appropriate use of each arithmetic operation in problem situations.
2. Construct, use, and explain procedures for performing calculations with fractions and decimals with:
   - Pencil-and-paper
   - Mental math
   - Calculator
3. Use an efficient and accurate pencil-and-paper procedure for division of a 3-digit number by a 2-digit number.
4. Select pencil-and-paper, mental math, or a calculator as the appropriate computational method in a given situation depending on the context and numbers.
5. Find squares and cubes of whole numbers.
6. Check the reasonableness of results of computations.
7. Understand and use the various relationships among operations and properties of operations.
8. Understand and apply the standard algebraic order of operations for the four basic operations, including appropriate use of parentheses.

C. Estimation

1. Use a variety of strategies for estimating both quantities and the results of computations.
2. Recognize when an estimate is appropriate, and understand the usefulness of an estimate as distinct from an exact answer.
3. Determine the reasonableness of an answer by estimating the result of operations.
4. Determine whether a given estimate is an overestimate or an underestimate.

STANDARD 4.2 (Geometry and measurement) All students will develop spatial sense and the ability to use geometric properties, relationships, and measurement to model, describe and analyze phenomena.

Strands and Cumulative Progress Indicators

Building upon knowledge and skills gained in preceding grades, by the end of **Grade 6**, students will:

A. Geometric Properties

1. Understand and apply concepts involving lines and angles.
   - Notation for line, ray, angle, line segment
   - Properties of parallel, perpendicular, and intersecting lines
   - Sum of the measures of the interior angles of a triangle is 180°
2. Identify, describe, compare, and classify polygons and circles.
   - Triangles by angles and sides
   - Quadrilaterals, including squares, rectangles, parallelograms, trapezoids, rhombi
   - Polygons by number of sides.
   - Equilateral, equiangular, regular
   - All points equidistant from a given point form a circle
3. Identify similar figures.
4. Understand and apply the concepts of congruence and symmetry (line and rotational).
5. Compare properties of cylinders, prisms, cones, pyramids, and spheres.
6. Identify, describe, and draw the faces or shadows (projections) of three-dimensional geometric objects from different perspectives.
7. Identify a three-dimensional shape with given projections (top, front and side views).

8. Identify a three-dimensional shape with a given net (i.e., a flat pattern that folds into a 3D shape).

B. Transforming Shapes

1. Use a translation, a reflection, or a rotation to map one figure onto another congruent figure.
2. Recognize, identify, and describe geometric relationships and properties as they exist in nature, art, and other real-world settings.

C. Coordinate Geometry

1. Create geometric shapes with specified properties in the first quadrant on a coordinate grid.

D. Units of Measurement

1. Select and use appropriate units to measure angles, area, surface area, and volume.
2. Use a scale to find a distance on a map or a length on a scale drawing.
3. Convert measurement units within a system (e.g., 3 feet = ___ inches).
4. Know approximate equivalents between the standard and metric systems (e.g., one kilometer is approximately 6/10 of a mile).
5. Use measurements and estimates to describe and compare phenomena.

E. Measuring Geometric Objects

1. Use a protractor to measure angles.
2. Develop and apply strategies and formulas for finding perimeter and area.
   - Triangle, square, rectangle, parallelogram, and trapezoid
   - Circumference and area of a circle
3. Develop and apply strategies and formulas for finding the surface area and volume of rectangular prisms and cylinders.
4. Recognize that shapes with the same perimeter do not necessarily have the same area and vice versa.

5. Develop informal ways of approximating the measures of familiar objects (e.g., use a grid to approximate the area of the bottom of one's foot).

> STANDARD 4.3 (Patterns and algebra) All students will represent and analyze relationships among variable quantities and solve problems involving patterns, functions, and algebraic concepts and processes.

Strands and Cumulative Progress Indicators

Building upon knowledge and skills gained in preceding grades, by the end of **Grade 6**, students will:

A. Patterns

1. Recognize, describe, extend, and create patterns involving whole numbers and rational numbers.
    - Descriptions using tables, verbal rules, simple equations, and graphs
    - Formal iterative formulas (e.g., NEXT = NOW * 3)
    - Recursive patterns, including Pascal's Triangle (where each entry is the sum of the entries above it) and the Fibonacci Sequence: 1, 1, 2, 3, 5, 8, . . . (where NEXT = NOW + PREVIOUS)

B. Functions and Relationships

1. Describe the general behavior of functions given by formulas or verbal rules (e.g., graph to determine whether increasing or decreasing, linear or not).

C. Modeling

1. Use patterns, relations, and linear functions to model situations.
    - Using variables to represent unknown quantities
    - Using concrete materials, tables, graphs, verbal rules, algebraic expressions/equations/inequalities

2. Draw freehand sketches of graphs that model real phenomena and use such graphs to predict and interpret events.
   - Changes over time
   - Relations between quantities
   - Rates of change (e.g., when is plant growing slowly/rapidly, when is temperature dropping most rapidly/slowly)

D. Procedures

1. Solve simple linear equations with manipulatives and informally.
   - Whole-number coefficients only, answers also whole numbers
   - Variables on one or both sides of equation
2. Understand and apply the properties of operations and numbers.
   - Distributive property
   - The product of a number and its reciprocal is 1
3. Evaluate numerical expressions.
4. Extend understanding and use of inequality.
   - Symbols ($\geq, \neq, \leq$)

STANDARD 4.4 (Data analysis, probability, and discrete mathematics) All students will develop an understanding of the concepts and techniques of data analysis, probability, and discrete mathematics, and will use them to model situations, solve problems, and analyze and draw appropriate inferences from data.

Strands and Cumulative Progress Indicators

Building upon knowledge and skills gained in preceding grades, by the end of **Grade 6**, students will:

A. Data Analysis (or Statistics)

1. Collect, generate, organize, and display data.

- Data generated from surveys
2. Read, interpret, select, construct, analyze, generate questions about, and draw inferences from displays of data.
    - Bar graph, line graph, circle graph, table, histogram
    - Range, median, and mean
    - Calculators and computers used to record and process information
3. Respond to questions about data, generate their own questions and hypotheses, and formulate strategies for answering their questions and testing their hypotheses.

B. Probability

1. Determine probabilities of events.
    - Event, complementary event, probability of an event
    - Multiplication rule for probabilities
    - Probability of certain event is 1 and of impossible event is 0
    - Probabilities of event and complementary event add up to 1
2. Determine probability using intuitive, experimental, and theoretical methods (e.g., using model of picking items of different colors from a bag).
    - Given numbers of various types of items in a bag, what is the probability that an item of one type will be picked
    - Given data obtained experimentally, what is the likely distribution of items in the bag
3. Explore compound events.
4. Model situations involving probability using simulations (with spinners, dice) and theoretical models.
5. Recognize and understand the connections among the concepts of independent outcomes, picking at random, and fairness.

C. Discrete Mathematics—Systematic Listing and Counting

1. Solve counting problems and justify that all possibilities have been enumerated without duplication.
    - Organized lists, charts, tree diagrams, tables

- Venn diagrams

2. Apply the multiplication principle of counting.
   - Simple situations (e.g., you can make 3 x 4 = 12 outfits using 3 shirts and 4 skirts).
   - Number of ways a specified number of items can be arranged in order (concept of permutation)
   - Number of ways of selecting a slate of officers from a class (e.g., if there are 23 students and 3 officers, the number is 23 x 22 x 21)

3. List the possible combinations of two elements chosen from a given set (e.g., forming a committee of two from a group of 12 students, finding how many handshakes there will be among ten people if everyone shakes each other person's hand once).

D. Discrete Mathematics—Vertex-Edge Graphs and Algorithms

1. Devise strategies for winning simple games (e.g., start with two piles of objects, each of two players in turn removes any number of objects from a single pile, and the person to take the last group of objects wins) and express those strategies as sets of directions.

2. Analyze vertex-edge graphs and tree diagrams.
   - Can a picture or a vertex-edge graph be drawn with a single line? (degree of vertex)
   - Can you get from any vertex to any other vertex? (connectedness)

3. Use vertex-edge graphs to find solutions to practical problems.
   - Delivery route that stops at specified sites but involves least travel
   - Shortest route from one site on a map to another

STANDARD 4.5 (Mathematical processes) All students will use mathematical processes of problem solving, communication, connections, reasoning, representations, and technology to solve problems and communicate mathematical ideas.

Strands and Cumulative Progress Indicators

Building upon knowledge and skills gained in preceding grades, by the end of **Grade 6**, students will:

A. Problem Solving

1. Learn mathematics through problem solving, inquiry, and discovery.
2. Solve problems that arise in mathematics and in other contexts (cf. workplace readiness standard 8.3).
   - Open-ended problems
   - Non-routine problems
   - Problems with multiple solutions
   - Problems that can be solved in several ways
3. Select and apply a variety of appropriate problem-solving strategies (e.g., "try a simpler problem" or "make a diagram") to solve problems.
4. Pose problems of various types and levels of difficulty.
5. Monitor their progress and reflect on the process of their problem solving activity.

B. Communication

1. Use communication to organize and clarify their mathematical thinking.
   - Reading and writing
   - Discussion, listening, and questioning
2. Communicate their mathematical thinking coherently and clearly to peers, teachers, and others, both orally and in writing.
3. Analyze and evaluate the mathematical thinking and strategies of others.
4. Use the language of mathematics to express mathematical ideas precisely.

C. Connections

1. Recognize recurring themes across mathematical domains (e.g., patterns in number, algebra, and geometry).

2. Use connections among mathematical ideas to explain concepts (e.g., two linear equations have a unique solution because the lines they represent intersect at a single point).
3. Recognize that mathematics is used in a variety of contexts outside of mathematics.
4. Apply mathematics in practical situations and in other disciplines.
5. Trace the development of mathematical concepts over time and across cultures (cf. world languages and social studies standards).
6. Understand how mathematical ideas interconnect and build on one another to produce a coherent whole.

D. Reasoning

1. Recognize that mathematical facts, procedures, and claims must be justified.
2. Use reasoning to support their mathematical conclusions and problem solutions.
3. Select and use various types of reasoning and methods of proof.
4. Rely on reasoning, rather than answer keys, teachers, or peers, to check the correctness of their problem solutions.
5. Make and investigate mathematical conjectures.
   - Counterexamples as a means of disproving conjectures
   - Verifying conjectures using informal reasoning or proofs.
6. Evaluate examples of mathematical reasoning and determine whether they are valid.

E. Representations

1. Create and use representations to organize, record, and communicate mathematical ideas.
   - Concrete representations (e.g., base-ten blocks or algebra tiles)
   - Pictorial representations (e.g., diagrams, charts, or tables)
   - Symbolic representations (e.g., a formula)
   - Graphical representations (e.g., a line graph)
2. Select, apply, and translate among mathematical representations to solve problems.

3. Use representations to model and interpret physical, social, and mathematical phenomena.

F. Technology

1. Use technology to gather, analyze, and communicate mathematical information.
2. Use computer spreadsheets, software, and graphing utilities to organize and display quantitative information.
3. Use graphing calculators and computer software to investigate properties of functions and their graphs.
4. Use calculators as problem-solving tools (e.g., to explore patterns, to validate solutions).
5. Use computer software to make and verify conjectures about geometric objects.
6. Use computer-based laboratory technology for mathematical applications in the sciences.

Scope and Sequence

September
- Test Taking Strategies
- Review of Decimal Operations

October
- Number Sense and Algebraic Thinking

November
- Measurement and Statistics

December
- Number Patterns and Fractions

January
- Addition and Subtraction of Fractions

February
- Multiplication and Division of Fractions
- Ratio, Proportion and Percent

March
- Integers

April
- Equations and Functions
- Probability

May/June
- Real World Problem Solving and Applications

UNIT 1   **TEST TAKING STRATEGIES**
                    Duration: September

A.   **Major Objectives:**

     1.   To learn and utilize the skills necessary to answer multiple choice questions.
     2.   To learn and utilize the skills necessary to answer extended response questions.
     3.   To learn and utilize the skills necessary to answer short response questions.
     4.   To review basic mathematical facts, including decimal operations.
     5.   To explore basic calculator skills.

B.   **Sequence of Topics:**

     1.   Answering the question asked (4.5) (p. 2)
     2.   Eliminating answers (4.5) (p. 6)
     3.   Writing a short answer response (4.5) (p. 3)
     4.   Writing extended responses (4.5) (p. 4)
     5.   Working backwards (4.5) (p. 7)
     6.   Review operations with decimals (4.1) (*p. 22, 35, 38)
     7.   Explore basic calculator skills.

C.   **Core Material:**

Test-Taking Strategies
Pearson Prentice Hall 2007

*Measuring Up 6
Brooks, Carlin, McLaughlin, Perry, Vogt
People's Education 2006

D.   **Supplemental Materials:**

     1.   Teacher made transparencies
     2.   Teacher made worksheets
     3.   Power Point Presentations
     4.   Study Island
     5.   Success Maker
     6.   Calculators
     7.   Internet
     8.   NJASK Coach WriteMath

E.   **Suggested Assignments, Projects, Field Trips, Speakers:**

1.   Complete exercises in book for each lesson
2.   Complete practice worksheets
3.   Use calculator/computer to complete classroom and homework problems
4.   Complete/review chapter prior to test/quizzes using text and teacher made materials
5.   NJASK Do Now

F.   Suggested Assessments:

1.   Test
2.   Quizzes
3.   Class Participation
4.   Notebook/Classwork
5.   Homework
6.   Benchmark Tests

UNIT 2   NUMBER SENSE AND ALGEBRAIC THINKING
Duration: September/October

A.   **Major Objectives:**

   1.   To evaluate powers.
   2.   To use the order of operations to evaluate expressions, including expressions that contain variables.
   3.   To learn a plan for problem solving.
   4.   To review operations with decimals.

B.   **Sequence of Topics:**

   1.   Using Mental Math (4.1) (p. 89)
   2.   Using Operations to Solve Problems (4.1) (p. 92)
   3.   Choosing a Reasonable Answer (4.1) (p. 95)
   4.   Using Different Methods for Estimating (4.1) (p. 98)
   5.   Estimating Solutions (4.1) (p. 102)
   7.   Measuring Up (4.1) (p. 3-50) (Chapters 1 & 2)

C.   **Core Material:**

   New Jersey ASK Coach
   Kaplan
   Triumph Learning 2005

   Measuring Up 6
   Brooks, Carlin, McLaughlin, Perry, Vogt
   People's Education 2006

   D.   **Supplemental Materials:**

   1.   Teacher made transparencies
   2.   Teacher made worksheets
   3.   Power Point Presentations
   4.   Study Island
   5.   Success Maker
   6.   Calculators
   7.   Internet
   8.   NJASK Coach WriteMath

E.   **Suggested Assignments, Projects, Field Trips, Speakers:**

   1.   Complete exercises in book for each lesson
   2.   Complete practice worksheets
   3.   Use calculator/computer to complete classroom and homework

problems

    4.   Complete/review chapter prior to test/quizzes using text and teacher made materials

    5.   NJASK Do Now

F.   Suggested Assessments:

    1.   Test

    2.   Quizzes

    3.   Class Participation

    4.   Notebook/Classwork

    5.   Homework

    6.   Benchmark Tests

UNIT 3   **MEASUREMENT AND STATISTICS**
                 Duration: October/November

A.   **Major Objectives:**

1.   To find area and perimeter of geometric figures.
2.   To create and interpret frequency tables and line plots, and display data in bar graphs.
3.   To plot points in the first quadrant to make line plots.
4.   To interpret circle graphs, and describe data using mean, median and mode.

B.   **Sequence of Topics:**

1.   Mean, Median and Range (4.4) (p. 240)
2.   Displaying Data with Graphs (4.4) (p. 245)
3.   Frequency Tables and Histograms (4.4) (p. 252)
4.   Counting Problems (4.4) (p. 258)
5.   Arrangements (4.4) 264
6.   Measuring Up (4.4) (p. 191-237) (Chapters 8 & 9)

C.   **Core Material:**

New Jersey ASK Coach
Kaplan
Triumph Learning 2005

Measuring Up 6
Brooks, Carlin, McLaughlin, Perry, Vogt
People's Education 2006

D.   **Supplemental Materials:**

1.   Teacher made transparencies
2.   Teacher made worksheets
3.   Power Point Presentations
4.   Study Island
5.   Success Maker
6.   Calculators
7.   Internet
8.   NJASK Coach WriteMath

E.   **Suggested Assignments, Projects, Field Trips, Speakers:**

1.   Complete exercises in book for each lesson
2.   Complete practice worksheets

3.   Use calculator/computer to complete classroom and homework problems
4.   Complete/review chapter prior to test/quizzes using text and teacher made materials
5.   NJASK Do Now

F.   Suggested Assessments:

1.   Test
2.   Quizzes
3.   Class Participation
4.   Notebook/Classwork
5.   Homework
6.   Benchmark Tests

UNIT 4   NUMBER PATTERNS AND FRACTIONS
                Duration: November/December

A.   Major Objectives:

    1.   To investigate prime factorization and fractions.
    2.   To use prime factorization to find the GCF and LCM.
    3.   To convert between mixed numbers and improper fractions.

B.   Sequence of Topics:

    1.   Factors and Prime Factorization (4.1) (p. 51)
    2.   Multiples and Common Multiples (4.1) (p. 54)
    3.   Understand Fractions and Mixed Numbers (4.1) (p. 57)
    4.   Find Equivalent Fractions (4.1) (p. 61)
    5.   Use Greatest Common Factor and Least Common Denominator (4.1) (p. 64)
    6.   Compare and Order Fractions and Mixed Numbers (4.1, 4.5) (p. 67)

C.   Core Material:

Measuring Up 6
Brooks, Carlin, McLaughlin, Perry, Vogt
People's Education 2006

D.   Supplemental Materials:

    1.   Teacher made transparencies
    2.   Teacher made worksheets
    3.   Power Point Presentations
    4.   Study Island
    5.   Success Maker
    6.   Calculators
    7.   Internet
    8.   NJASK Coach WriteMath

E.   Suggested Assignments, Projects, Field Trips, Speakers:

    1.   Complete exercises in book for each lesson
    2.   Complete practice worksheets
    3.   Use calculator/computer to complete classroom and homework problems
    4.   Complete/review chapter prior to test/quizzes using text and teacher made materials
    5.   NJASK Do Now

F. **Suggested Assessments:**

    1.   Test
    2.   Quizzes
    3.   Class Participation
    4.   Notebook/Classwork
    5.   Homework
    6.   Benchmark Tests

UNIT 5   **ADDITION AND SUBTRACTION OF FRACTIONS**
                 Duration: December/January

A.   **Major Objectives:**

    1.   To add and subtract fractions and mixed numbers.
    2.   To add and subtract measures of time.

B.   **Sequence of Topics:**

    1.   Add and Subtract Fractions and Mixed Numbers
          (4.1) (p. 70)
    2.   Solving Problems by Adding and Subtracting Fractions (4.1)
          (Coach p. 82)

C.   **Core Material:**

New Jersey ASK Coach
Kaplan
Triumph Learning 2005

Measuring Up 6
Brooks, Carlin, McLaughlin, Perry, Vogt
People's Education 2006

D.   **Supplemental Materials:**

    1.   Teacher made transparencies
    2.   Teacher made worksheets
    3.   Power Point Presentations
    4.   Study Island
    5.   Success Maker
    6.   Calculators
    7.   Internet
    8.   NJASK Coach WriteMath

E.   **Suggested Assignments, Projects, Field Trips, Speakers:**

    1.   Complete exercises in book for each lesson
    2.   Complete practice worksheets
    3.   Use calculator/computer to complete classroom and homework
          problems
    4.   Complete/review chapter prior to test/quizzes using text and
          teacher made materials
    5.   NJASK Do Now

F. **Suggested Assessments:**

1. Test
2. Quizzes
3. Class Participation
4. Notebook/Classwork
5. Homework
6. Benchmark Tests

UNIT 6   MULTIPLICATION AND DIVISION OF FRACTIONS
Duration: January/February

    A.   **Major Objectives:**

        1.   To multiply and divide fractions and mixed numbers.
        2.   To use models for multiplying and dividing fractions.
        3.   To explore customary units for weight, capacity and length, and changing units of measures.

    B.   **Sequence of Topics:**

        1.   Multiply Fractions (4.1) (p. 73)
        2.   Divide Fractions (4.1) (p. 76)
        3.   Multiplying and Dividing Fractions and Mixed Numbers (4.1) (Coach p. 85)
        4.   Estimate to Solve Problems with Fractions and Mixed Numbers (4.1, 4.5) (p. 79)

    C.   **Core Material:**

    New Jersey ASK Coach
    Kaplan
    Triumph Learning 2005

    Measuring Up 6
    Brooks, Carlin, McLaughlin, Perry, Vogt
    People's Education 2006

    D.   **Supplemental Materials:**

        1.   Teacher made transparencies
        2.   Teacher made worksheets
        3.   Power Point Presentations
        4.   Study Island
        5.   Success Maker
        6.   Calculators
        7.   Internet
        8.   NJASK Coach WriteMath

  E.   **Suggested Assignments, Projects, Field Trips, Speakers:**

        1.   Complete exercises in book for each lesson
        2.   Complete practice worksheets
        3.   Use calculator/computer to complete classroom and homework problems

4. Complete/review chapter prior to test/quizzes using text and teacher made materials
5. NJASK Do Now

F. **Suggested Assessments:**

1. Test
2. Quizzes
3. Class Participation
4. Notebook/Classwork
5. Homework
6. Benchmark Tests

UNIT 7   RATIO, PROPORTION AND PERCENT
Duration: February

A.   **Major Objectives:**

    1.   To simplify and find equivalent ratios and rates.
    2.   To calculate and use unit rates, and solve and apply proportions.
    3.   To write fractions and decimals as percents.

B.   **Sequence of Topics:**

    1.   Ratios and Proportions (4.1) (p. 52)
    2.   Percents (4.1) (p. 39)
    3.   Operations with Money (4.1) (p. 49)
    4.   Computing the Percent of a Total and Discounts (4.1) (p. 57)
    5.   Measuring Up (4.1, 4.5, 4.2) (p. 86-107) (Chapter 4)

C.   **Core Material:**

New Jersey ASK Coach
Kaplan
Triumph Learning 2005

Measuring Up 6
Brooks, Carlin, McLaughlin, Perry, Vogt
People's Education 2006

    D.   **Supplemental Materials:**

    1.   Teacher made transparencies
    2.   Teacher made worksheets
    3.   Power Point Presentations
    4.   Study Island
    5.   Success Maker
    6.   Calculators
    7.   Internet
    8.   NJASK Coach WriteMath

E.   **Suggested Assignments, Projects, Field Trips, Speakers:**

    1.   Complete exercises in book for each lesson
    2.   Complete practice worksheets
    3.   Use calculator/computer to complete classroom and homework
        problems
    4.   Complete/review chapter prior to test/quizzes using text and
        teacher made materials
    5.   NJASK Do Now

F.   **Suggested Assessments:**

    1.   Test
    2.   Quizzes
    3.   Class Participation
    4.   Notebook/Classwork
    5.   Homework
    6.   Benchmark Tests

UNIT 8   INTEGERS
         Duration: March

   A.   Major Objectives:

         1.   To compare and order integers.
         2.   To add, subtract, multiply and divide integers.
         3.   To use the knowledge of integers to plot points on a coordinate
                 plane.
         4.   To do translations, reflections and rotations on a coordinate plane.

   B.   Sequence of Topics:

         1.   Introduction to Integers (4.1) (p. 28)
         2.   Add integers (4.1) (Prentice Hall p. 82)
         3.   Subtract integers (4.1) (Prentice Hall p. 83)
         4.   Multiply integers (4.1) (Prentice Hall p. 84)
         5.   Divide integers (4.1) (Prentice Hall p. 85)
         6.   Graphing on a Coordinate Plane (4.1) (p. 86)
         7.   Application of Integers (4.1) (p. 87)

   C.   Core Material:

         New Jersey ASK Coach
         Kaplan
         Triumph Learning 2005

         Test-Taking Strategies
         Pearson Prentice Hall 2007

         D.   Supplemental Materials:

         1.   Teacher made transparencies
         2.   Teacher made worksheets
         3.   Power Point Presentations
         4.   Study Island
         5.   Success Maker
         6.   Calculators
         7.   Internet
         8.   NJASK Coach WriteMath

E.   Suggested Assignments, Projects, Field Trips, Speakers:

         1.   Complete exercises in book for each lesson
         2.   Complete practice worksheets
         3.   Use calculator/computer to complete classroom and homework

problems
4.   Complete/review chapter prior to test/quizzes using text and teacher made materials
5.   NJASK Do Now

F.   Suggested Assessments:

1.   Test
2.   Quizzes
3.   Class Participation
4.   Notebook/Classwork
5.   Homework
6.   Benchmark Tests

UNIT 9   EQUATIONS AND FUNCTIONS/PROBABILITY
Duration: April/May

A.   **Major Objectives:**

1.   To write variable expressions and equations.
2.   To solve one-step equations.
3.   To understand the concept of a function.
4.   To find the probability of an event.

B.   **Sequence of Topics:**

1.   Use Properties of Operations (4.3) (p. 108)
2.   Order of Operations (4.3) (p. 111)
3.   Evaluate Expressions (4.3) (p. 114)
4.   Solve Equations (4.3) (p. 120)
5.   Model and Graph (4.3) (p. 123)
6.   Explore Inequalities (4.3) (p. 126)
7.   Recognize and Extend Patterns (4.4) (p.129)
8.   Use Recursive Patterns to Solve Problems (4.4) (p. 696)
9.   Probability and Discrete Mathematics (4.4) (p. 238-252)
9.   NJASK Coach Lessons 39-45 (4.4) (p. 258-293)

C.   **Core Material:**

New Jersey ASK Coach
Kaplan
Triumph Learning 2005

Measuring Up 6
Brooks, Carlin, McLaughlin, Perry, Vogt
People's Education 2006

D.   **Supplemental Materials:**

1.   Teacher made transparencies
2.   Teacher made worksheets
3.   Power Point Presentations
4.   Study Island
5.   Success Maker
6.   Calculators
7.   Internet
8.   NJASK Coach WriteMath

E.   **Suggested Assignments, Projects, Field Trips, Speakers:**

1. Complete exercises in book for each lesson
2. Complete practice worksheets
3. Use calculator/computer to complete classroom and homework problems
4. Complete/review chapter prior to test/quizzes using text and teacher made materials
5. NJASK Do Now

F. **Suggested Assessments:**

1. Test
2. Quizzes
3. Class Participation
4. Notebook/Classwork
5. Homework
6. Benchmark Tests

UNIT 10   REAL WORLD PROBLEM SOLVING AND APPLICATIONS
Duration: May/June

A.   Major Objectives:

1.   To apply course knowledge to real-world situations.
2.   To explore project based learning.
3.   To complete a course project.
4.   To review course topics to prepare for math final.

B.   Sequence of Topics:

1.   Work on and complete a project related to a real-world math situation and course units.
2.   Prepare for Course 1/Course 2 final exam.

C.   Core Material:

New Jersey ASK Coach
Kaplan
Triumph Learning 2005

Measuring Up 6
Brooks, Carlin, McLaughlin, Perry, Vogt
People's Education 2006

D.   Supplemental Materials:

1.   Teacher made transparencies
2.   Teacher made worksheets
3.   Power Point Presentations
4.   Study Island
5.   Success Maker
6.   Calculators
7.   Internet
8.   NJASK Coach WriteMath

E.   Suggested Assignments, Projects, Field Trips, Speakers:

1.   Complete exercises in book for each lesson
2.   Complete practice worksheets
3.   Use calculator/computer to complete classroom and homework problems
4.   Complete/review chapter prior to test/quizzes using text and teacher made materials
5.   NJASK Do Now

F.   Suggested Assessments:

      1.   Test
      2.   Quizzes
      3.   Class Participation
      4.   Notebook/Classwork
      5.   Homework
      6.   Benchmark Tests