

Mathematics

Kindergarten

Purpose

Kindergarten students will build problem solving and reasoning skills, sort and classify items, identify and extend patterns. They will identify, print and match quantity for numbers 0-30. They will be introduced to measurement and time, make and use a calendar, identify coins and their value, and also add and subtract facts through 10. They will work with 2 and 3 dimensional figures and be introduced to fractions. Through a variety of activities and the use of manipulatives, Kindergartners will be prepared to meet the academic challenges of math concepts studied.

Outcomes

Sorting and Classifying

The students will

- identify and use positional words (top, middle, bottom, before, after, between, inside, outside, left, right).
- compare objects using same and different.
- identify, sort, and classify by color, shape, and size.

Patterns

The students will

- model, describe, and extend patterns that repeat two and three elements (color, size, shape, position, rhythmic, and growing patterns).
- translate patterns from one form to another.
- identify patterns that repeat in the same way.

Number Readiness

The students will

- use one to one correspondence to compare sets.
- make and identify equal sets.
- make and identify sets that have more or less items than other sets.

Numbers 0-12

The students will

- count, model, draw, write, and name numbers 0-12.
- use ordinal numbers from first to fifth to show positions.
- recognize and represent different arrangements for the numbers 2-12.
- order numbers 0-12.
- sort groups by number.
- compare sets of objects and numbers to 12 using more and less.
- make reasonable estimates for numbers to 12.
- learn correct form for printing numbers 0-9.

Calendars and Clocks

The students will

- classify activities by time of day.
- name and order days of the week.
- determine if activities take shorter or longer lengths of time.
- order three events with respect to time.
- read and write time to the hour for analog and digital clocks.
- relate time to events.

Measurement and Money

The students will

- compare, sort, and order objects by length.
- estimate and measure length in non-standard units.
- compare and order by weight and capacity.
- identify the coins, penny, nickel, dime and their values.
- count coin sets to 12 cents.
- relate equivalent sets of pennies to a nickel/dime.

Addition

The students will

- identify plus and equal signs
- model and record addition sentences that add one or two to numbers 0-9, sums to 10
- model and use the strategy add doubles, sums to 10
- add both vertically and horizontally

Subtraction

The students will

- identify the minus sign.
- model and record subtraction sentences that subtract one or two from numbers 2-10.
- subtract in vertical or horizontal form from 10 or less.

Geometry and Fractions

The students will

- identify, sort, and draw plane shapes (circle, square, rectangle, triangle).
- identify, sort, describe, compare three dimensional shapes (sphere, pyramid, cylinder, cone, rectangular solid, cube).
- match the faces of three dimensional shapes to plane shapes.
- identify shapes with line symmetry.
- identify shapes that show halves.
- divide shapes into halves.

Numbers 13-31

The students will

- model, count, identify, and write numbers to 31.
- order numbers 0-30.
- use numbers to 31 on the calendar.
- estimate the quantity in a group of objects to 30 using ten as a benchmark.

Problem Solving

The students will

- identify and extend patterns to solve problems.
- use logical thinking to solve problems.
- draw picture to solve problem.
- interpret graph to solve problem.
- make a graph to solve problem.
- identify and extend number pattern to solve problem.
- use information from the calendar to solve problem.
- use models and act it out to solve problem.
- use correct number operation to solve problem.

Graphs

The students will

- make real and picture graphs.

Teaching Strategies

- Play “grab a handful” of coins and sort
- Go on a “shopping spree.” Pay for objects with pennies, nickels, and dimes
- Use cubes and paper clip chains for measuring
- Use math puzzles and games
- Make a calendar
- Provide opportunities to explore the attributes and properties of three-dimensional shapes
- Using clocks, demonstrate telling time to the hour
- Graph birthdays, favorite colors, favorite activities, and length of names
- Student demonstration of patterns, clapping patterns, continuing pattern with shapes, colors and numbers
- Provide opportunities for students to demonstrate, use manipulatives and draw representations of simple addition and subtraction sentences
- Teacher presentation, videos and the text
- Children working in cooperative groups
- Use fingerplays, songs, literature and poetry relating to topic
- Set up a classroom numberline; add a new number each day

Assessments

- Observation of students to see how they are working on an activity using manipulatives
- Text assessment worksheets
- Participation in class discussion and group work
- Use checklist to record skills that have been mastered
- Set up activities to check individual student’s understanding of concept

Resources

- Literature
- Songs, tapes, videos, and poems
- Puzzles, games

- Manipulatives – including: scale, beads, counters, coins, clocks, cubes, attribute blocks, number cards, 2 and 3 dimensional shapes
- Transparencies
- Textbook

K Mathematics
Houghton Mifflin 2002

Purpose

Grade One math curriculum uses a systematic approach to develop concepts and skills. The First grade students are taught addition and subtraction facts to 20, graphing, numbers and patterns to 100, money, fractions, measurement, time, calendar, and probability. There is a focus on problem solving that provides students the opportunity to demonstrate and apply the skills and strategies introduced in each chapter. The curriculum is academically challenging and encourages children to develop to their full potential. It displays acceptance and appreciation of others in the word problems that are presented throughout the book.

Outcomes

Addition and Subtraction Concepts

The students will

- add sums to twenty.
- subtract from twenty or less.
- relate addition and subtraction through basic fact families.
- add three addends horizontally and vertically to sums of twenty.
- demonstrate understanding of $+$, $-$, $>$, $<$, $=$, by using them appropriately.
- read number words through twenty.

Data and Graphing

The students will

- record and show data in different ways.
- read and make a picture graph.
- read and make a bar graph.

Numbers and Patterns to 100

The students will

- read and write numbers to 100.
- count by twos, fives, and tens.
- compare and order numbers.
- identify the number before and after a given number or between two numbers.
- read number words through twenty.

- identify and use ordinal numbers to twelfth to describe positions of an object.
- model and express numbers to one hundred as tens and ones.

Money

The students will

- identify the value of pennies, nickels, dimes, and quarters.
- regroup coins into equivalent values.
- count groups of coins and write the total value.

Geometry, Fractions, and Probability

The students will

- describe positions of objects in space using position words.
- identify, sort, and compare plane and solid shapes.
- count the number of sides and corners of plain figures.
- identify and extend patterns.
- identify a fraction as part of a whole.
- identify and write halves, thirds, and fourths.
- give a simple explanation of the meaning of the numerator and denominator.

Measurement

The students will

- measure lengths in customary and metric units.
- read a thermometer in degrees.
- compare the weight or mass of an object to 1 pound or 1 kilogram.
- compare capacities of cup, pint, and quart and capacities of containers to a liter.

Time and Calendar

The students will

- order events and compare times.
- read and write time to the hour and half-hour using a digital and analog clock.
- estimate elapsed time: one minute, one-half hour, and one hour.
- use a calendar by month, week and day.

Two-Digit Addition and Subtraction

The students will

- add with one- and two-digit numbers.
- subtract with one- and two-digit numbers.
- add and subtract whole numbers and money amounts.

Problem Solving

The students will

- formulate a solution by writing a number sentence.
- solve simple problems by using graphs.
- solve problems by using estimation and choosing a sensible answer .
- solve simple money problems.
- analyze and solve problems using skills and strategies presented in each chapter.

Teaching Strategies

- Use of manipulatives
- Teacher demonstrations
- Use of overhead projector to teach a skill
- Cooperative learning groups
- Set up a number chart to count 100 days of school
- Counting coins with pennies, nickels, dimes, and quarters
- Flannelboard stories and demonstrations
- Use of clocks to tell time to the hour and half hour
- Math games that focus on a particular skill

Assessments

- Quizzes and Chapter Tests
- Workbook pages
- Ability to work in cooperative groups

Resources

- A variety of manipulatives such as cubes, counters, coins, clocks
- Transparencies
- Puzzles and games
- Number line and 100 Chart
- Literature
- Songs and poems
- Text:

Mathematics
Houghton Mifflin, 2002

Purpose

Grade two math curriculum reviews standards from earlier grade levels and continues to develop concepts and skills that are grade level. The second grade students are taught addition and subtraction up to three digit numbers, graphing, number patterns to 999, money, fractions , measurement, time, skip counting by 2s, 3s, 5s, and 10s, multiplication by 2, 5, and 10, and geometry.

The students are challenged and encouraged to analyze and solve word problems using various skills and strategies in each chapter.

Outcomes

Addition and Subtraction Concepts

The students will

- add two and three numbers with sums through 20.
- add tens and estimate sums.
- add two or three two-digit numbers including money.
- add three-digit numbers with and without regrouping.
- subtract a number from 20 or less.
- subtract tens and estimate differences.
- subtract two-digit numbers and money amounts with and without regrouping.
- subtract three-digit numbers with and without regrouping.
- write fact families for sums to 20 and the different names for the same number.
- estimate, add, and subtract whole numbers and money amounts.

Numbers and Patterns

The students will

- count by 2s, 3s, 5s, and 10s.
- identify place value, round, and name numbers in different ways.
- compare and order two-digit numbers.
- read count, and write numbers through 999 and name numbers in different ways.
- identify and use place value through hundreds, write dollars and cents to \$5.50.
- order and compare numbers.

Data and Graphing

The students will

- compare and use data in tables.
- interpret and make bar graphs and pictographs.

Money

The students will

- count groups of pennies, nickels, dimes, quarters, and half-dollars, and write the total value.
- compare and show money amounts and make change.

Geometry and Fractions

The students will

- identify plane shapes, solid shapes, congruent shapes, and shapes with symmetry.
- identify and compare fractions.

Multiplication and Division

The students will

- multiply by 2, 5, and 10.
- show properties of multiplication.
- make equal groups with or without remainders.

Measurement

The students will

- measure lengths in customary and metric units.
- compare the weight (mass) of an object to pounds of kilogram.
- compare capacities of cup, pint, and quart, and capacity of containers to a liter.
- choose the appropriate unit of measurement and tool.

Time

The students will

- read and write time to 5 minute intervals using a clock.
- determine elapsed time.
- identify and compare periods of time using a calendar.

Problem Solving

The students will

- analyze and solve problems using the skills and strategies from each chapter.

Teaching Strategies

- Practice adding and subtracting
- Board work and independent work
- Group work
- Teacher demonstrations
- Modeling mathematics properties
- Use of manipulatives

Assessmemnts

- Quizzes and tests
- Workbook pages
- Observation of group work

Resources

- Manipulatives – a variety such as coins, beads, shapes etc.
- Practice worksheets
- Literature
- Textbook:

Mathematics
Houghton Mifflin, 2002

Purpose

Third grade student will be introduced to various mathematical skills and processes to compute mathematical examples, use measurements (standard and metric), read a thermometer (Fahrenheit and Celsius), tell time on both digital and analog clocks, and count and make change. They will also learn to analyze and solve word problems using different skills and strategies. In an academically challenging environment, this will allow each student to gain knowledge and be able to use the skills and processes needed to compute and solve mathematical problems and use tools relevant in their daily lives.

Outcomes

Place Value

The students will

- read, write, and identify place values of digits in whole numbers through hundred thousands.
- round numbers through four digits.
- compare and order number.

Money and Time

The students will

- count and compare amounts of money.
- read and write time to the minute.
- determined elapsed time using clocks and calendars.
- read and use a schedule.

Whole Numbers

The students will

- add and subtract two-, three-, and four-digit numbers and money amounts with regrouping.
- use addition and subtraction properties.
- compare numbers using the $>$, $<$, or $=$ sign.
- learn multiplication and division facts through ten.
- identify fact families.
- use patterns to multiply as in multiples of 10 and 100.

- multiply up to three digit numbers by one digit number with and without regrouping.
- do simple long division by one digit with or without remainders.
- estimate sum, difference, product, and quotient.

Geometry and Measurement

The students will

- identify and compare lines, line segments, rays, and angles.
- identify and describe plane and solid geometric figures.
- identify congruent figures and a line of symmetry.
- find perimeter, area, and volume.
- estimate the area and volume of a figure using square units.
- use customary units to measure length , capacity, and weight.
- read a temperature in degrees Fahrenheit and degrees Celsius.
- use metric units to measure length, capacity, and mass of an object.

Data

The students will

- collect data in the form of a survey and record the results.
- read and interpret data in a line plot.
- make and interpret a pictograph and a bar graph.

Fractions and Decimals

The students will

- identify parts of regions and groups.
- write mixed numbers.
- compare and order fractions and decimals.
- add and subtract fractions and decimals.
- use and compare decimals: tenths, hundredths, and decimals greater than one.

Word Problems

The students will

- analyze and solve problems using skills and strategies presented in each chapter.

Teaching Strategies

- Reading of text
- Modeling mathematical operations and problem solving strategies
- Practice solving examples on paper and at the chalkboard
- Practice reading and reproducing graphs and geometric shapes
- Using transparencies
- Using manipulative
- Co-operative group learning

Assessment

- Daily work
- Worksheets and/or workbook pages
- Quizzes and tests
- Solving examples using manipulative

Resources

- Transparencies
- Practice workbook, reteach workbook
- Flashcards (addition, subtraction, multiplication, division)
- Manipulative (ones cubes, tens sticks, hundreds square, blocks, coins, bills, geometric shapes, fraction bars, tangrams)
- Supplemental worksheets
 - Math Steps: Houghton Mifflin
- Textbook
 - Mathematics
Houghton Mifflin, 2002

Purpose

Fourth grade students will continue to work with the four operational skills, addition, subtraction, multiplication, and division. Not only will they work with these operations individually, they will also manipulate them in the use of decimals, fractions, and measurement.

The focus on problem solving and reasoning provides opportunities for students to appreciate and accept the different learning styles of each other as well as demonstrate and apply their understanding of the concepts in an academically challenging environment.

Outcomes**Place Value and Money**

The students will

- read, write, and identify place value of a digit in whole numbers through hundred millions.
- compare, order, and round numbers.
- find and compare values of collections of bills and coins; make change.

Addition and Subtraction

The students will

- use properties of addition.
- add and subtract three-, four-, and five-digit whole numbers.
- estimate sums and differences.

Multiplication

The students will

- multiply and divide by 2, 3, 4, 5, 6, 7, 8, 9, or 10 with regrouping.
- use properties and rules of multiplication and division.
- multiply one-, two-, three-, and four-digit numbers by one-digit numbers and estimate products.
- multiply two- and three-digit numbers by two-digit numbers.

Division

The students will

- divide two-digit, three-digit, and four-digit dividends with two-digit, three-digit, and four-digit quotients and estimate quotients.
- apply divisibility rules for division by 2, 5, and 10.
- identify prime and composite numbers.
- find the average of a set of numbers.

Measurement

The students will

- measure lengths and find perimeters using customary and metric units.
- convert among units of capacity and weight (mass) and choose the most appropriate unit to measure for customary and metric units of capacity and mass.

Fractions and Mixed Numbers

The students will

- represent a fraction of a region, of a set, and of a number.
- write mixed numbers.
- find equivalent fractions.
- compare and order fractions.
- add and subtract with like denominators.

Decimals

The students will

- write fractions and mixed numbers as decimals.
- compare and order fractions, mixed numbers and decimals.
- add and subtract decimals.
- round decimals and estimate sums and differences of decimals.

Statistics

The students will

- find mean, median, and mode of numerical data.
- make, read, and interpret a bar graph.
- read a line graph.

Geometry

The students will

- name and describe the characteristics of points, lines, rays, and angles.
- name and describe the characteristics of polygons and quadrilaterals.
- name and classify triangles.
- identify congruent figures.
- identify line and rotational symmetry.

Word Problems

The students will

- solve problems by logical thinking.
- solve problems involving money.
- decide whether a word problem needs an exact answer or an estimate.
- decide which operation to use.
- solve a word problem by finding a pattern.
- solve multi-step word problems.
- solve a word problem by organizing data in a table.

Teaching Strategies

- Using transparencies to model and clarify procedures
- Allowing students to complete examples with careful direction using chalkboard or overhead
- Teacher presentation of curriculum material
- Guided and independent practice of lesson concepts
- Using familiar and created games to reinforce lesson concepts
- Working in pairs or small groups to provide peer support
- Producing graphs and charts (whole group and individual)

Assessments

- Ability to participate in classroom discussion
- Understanding of how Math applies to daily life
- Evaluation of ability to work through concepts
- Individual classwork
- Chapter quizzes
- Chapter Tests

Resources

- Overhead projector with materials to use:
 - Money
 - Calculator
 - Tens blocks
 - Fraction bars
- Transparencies
- Teacher assessment workbooks
- Other sources of practice, including worksheets and skill pages
- Variety of manipulatives
- Text
 - Mathematics,
Houghton Mifflin, 2002

Purpose

Fifth grade students will continue to build on basic operational skills, use of decimals, fractions, measurement, and be introduced to Algebra. They will continue to grow in their mastery of word problems that involve more details and multiple steps. They will gain knowledge about how to use their current academic understanding of the subject to further investigate deeper concepts in a challenging classroom environment.

Outcomes

Place Value

The students will

- read and write numbers in standard, expanded, and word form.
- read, write, and order numbers through billions.
- compare, order, and round whole numbers through hundred thousandths.
- round numbers to the nearest million and billion.
- read, write, compare, and order decimals through thousandths.
- round decimals to the nearest tenth and hundredth.
- compare and order decimals and whole numbers.

Addition and Subtraction

The students will

- estimate sums and add whole numbers with up to five digits.
- add decimals to thousandths.
- subtract whole numbers with up to five digits.
- subtract decimals.

Multiplication

The students will

- use the Distributive Property to multiply.
- multiply by one-digit numbers.
- multiply numbers that contain zeros by one-digit numbers.
- multiply any whole number by a multiple of 10.
- multiply by a two-digit number.

- decide when an estimate is enough to solve a problem.
- write equations to solve word problems.
- choose an operation to solve a word problem.

Division

The students will

- put zeros in the quotient when needed.
- find the mean for a group of numbers.
- use patterns and mental math to divide whole numbers by multiples of 10, 100, 1,000.
- divide by a two-digit number and estimate the first digit of the quotient.
- divide four- and five-digit whole numbers by two-digit divisors.

Measurement

The students will

- measure to the nearest fraction of an inch.
- find the perimeter and the area of rectangular figures.
- change one customary unit of weight or capacity to another.
- measure in metric units.

Statistics

The students will

- compare data sets by using a double bar graph.
- make and interpret a histogram.
- find the mean, mode, median, and range of a set of data.
- analyze line graphs that do not have numbers.
- interpret and make line graphs and double line graphs.
- choose a type of graph to use according to the data.

Fractions

The students will

- identify prime and composite numbers.
- write the prime factorization of a number.
- find common factors and the greatest common factor of two or more numbers.
- find common multiples and the least common multiple.
- write a fraction to represent some part of a whole amount or part of a group of objects.
- use multiplication to find equivalent fractions.

- use division or prime factorization to write fractions in simplest form.
- compare fractions, mixed numbers, and decimals.
- compare unlike fractions.
- add and subtract fractions with like and unlike denominators.
- add and subtract mixed numbers having like and unlike denominators

Multiplication and Division of Decimals

The students will

- find the product of a whole number and a decimal.
- use rounding to estimate products of decimal factors.
- find the product of two decimal factors.
- write zero in the decimal factors when needed.
- divide a decimal by a whole number.
- write one or more zeros in the dividend.

Geometry

The students will

- identify and draw points, lines, line segments, and rays.
- name, measure, and draw angles.
- classify triangles and find missing angle measures.
- identify congruent figures.
- classify quadrilaterals.
- construct a line that is parallel or perpendicular to a given line.
- identify rotational and line symmetry.

Word Problems

The students will

- use word problems to determine whether an amount is an estimated amount or an exact amount.
- find the information needed to solve a problem.
- solve word problems involving remainders.
- solve problems that involve more than one step.
- make a table to help solve a problem.
- decide what information is needed from a graph.

Teaching Strategies

- Using transparencies to model and clarify procedures
- Allowing students to complete examples with careful direction using chalkboard or overhead
- Teacher presentation of curriculum material
- Guided and independent practice of lesson concepts
- Using familiar and created games to reinforce lesson concepts
- Working in pairs or small groups to provide peer support
- Producing graphs and charts (whole group and individual)

Assessments

- Ability to participate in classroom discussion
- Understanding of how Math applies to daily life
- Evaluation of ability to work through concepts
- Individual classwork
- Chapter quizzes
- Chapter tests

Resources

- Overhead projector with materials to use:
 - Transparencies
 - Calculator
 - Fraction bars
- Supplemental activity sheets and skill pages
- Variety of manipulatives
- Teacher assessment workbooks
- Text
 - Mathematics,
Houghton Mifflin, 2002

Purpose

Sixth grade students will review basic operational mathematics with respect to whole numbers and fractions. Integers will be introduced as will addition, subtraction, multiplication, and division equations. Applications in Geometry will be included in each area of study.

Outcomes

Number Patterns and Algebra

The students will

- find the prime factorization of a composite number.
- use powers and exponents in expressions.
- evaluate expressions using the order of operations.
- evaluate algebraic expressions.
- find the areas of rectangles.

Statistics and Graphs

The students will

- make and interpret frequency tables.
- make and interpret bar graphs and line graphs.
- interpret circle graphs.
- make predictions from line graphs.
- construct and interpret stem-and leaf-plots.
- find the mean of a set of data.
- find the median, mode, and range of a set of data.
- recognize when statistics and graphs are misleading.

Adding and Subtracting Decimals

The students will

- represent decimals in word form, standard form, and expanded form.
- compare and order decimals.
- round decimals.
- estimate sums and differences.

- add and subtract.
- solve problems using decimals.

Multiplying and Dividing Decimals

The students will

- estimate and find the product of decimals and whole numbers.
- multiply decimals by decimals.
- divide decimals by whole numbers and decimals.
- determine if an answer is reasonable.
- find the perimeter of rectangles and squares.
- find the circumference of a circle.

Fractions and Decimals

The students will

- find the greatest common factor of two or more numbers.
- express fractions in simplest form.
- write mixed numbers as improper fractions and vice versa.
- find the least common multiple of two or more numbers.
- compare and order fractions.
- write decimals as fractions or mixed numbers in simplest form.
- write fractions as terminating or repeating decimals.

Adding and Subtraction Fractions

The students will

- round fractions to 0, 1/2, and 1.
- round fractions and mixed numbers.
- estimate sums and differences of fractions and mixed numbers.
- add and subtract fractions with common denominators.
- add and subtract fractions with unlike denominators.
- add and subtract mixed numbers.
- subtract mixed numbers involving renaming.

Multiplying and Dividing Fractions

The students will

- estimate products using compatible numbers and rounding.
- multiply fractions.
- multiply mixed numbers.

- divide fractions.
- divide mixed numbers.
- solve problems by looking for a pattern.
- recognize and extend sequence.

Algebra: Integers

The students will

- identify, compare, and order integers.
- add integers.
- subtract integers.
- multiply integers.
- divide integers.
- graph ordered pairs of numbers on a coordinate plane.

Algebra: Solving Equations

The students will

- use the Commutative, Associative, Identity, and Distributive properties.
- solve addition equations.
- solve subtraction equations.
- solve multiplication equations.
- solve two-step equations.
- solve problems by writing an equation.
- complete function tables and find function rules.
- graph functions from function tables.

Ratio, Proportion, and Percent

The students will

- express ratios and rates in fraction form.
- solve proportions by using cross products.
- use scale drawings and models to find actual measurements.
- express percents as fraction and vice versa.
- find the percent of a number.

Probability

The students will

- find and interpret the theoretical probability of an event.
- find the probability of independent events.

Measurement

The students will

- change units of length and measure in customary system.
- change units of capacity and weight in customary system.
- use metric measurements of length, capacity, and mass.
- change units within the metric system.
- add and subtract measures of time.

Geometry

The students will

- classify and measure angles.
- draw angles and estimate measures of angles.
- bisect line segments.
- name two-dimensional figures.
- classify and draw triangles and quadrilaterals.
- describe lines of symmetry.
- investigate transformations.
- determine congruence and similarity.

Teaching Strategies

- Modeling mathematical operations
- Producing graphs/charts to relate mathematical relationships
- Using cooperative learning to solve problems using alternative methods
- Teacher presentations, note taking

Assessments

- Text tests
- Projects
- Presentations of mathematics in real-life situations

Resources

- Newspaper advertisements
- Transparencies
- Access to internet quiz sites
- Practice worksheets
- Textbook:
Mathematics, Applications and Concepts, Course 1
Glencoe, 2004

Purpose

Seventh grade students will review the use of one variable and be introduced to the use of more than one variable in basic operational mathematics, which also includes fractions and decimals. Relationships among the parts of basic geometric shapes will be explored.

Outcomes

Patterns

The students will

- recognize and describe number patterns.
- evaluate powers and square roots.
- use the order of operations.
- evaluate expressions containing variables.
- use tables and graphs to organize data.
- identify polygons.

Algebra

The students will

- use the Distributive property.
- simplify expressions by adding like terms.
- simplify expressions in geometry.
- use addition and subtraction to solve equations.
- use multiplication and division to solve equations.
- translate verbal phrases into algebraic expressions.
- solve simple inequalities.
- use two or more operations to solve an equation.
- solve equations by multiplying a reciprocal.
- solve equations with variables on both sides of the equation.
- use equations to model geometry problems.
- round decimals while solving equations.
- use a table to solve problems.
- use geometric shapes to estimate area.

Integers

The students will

- model integers on a number line.
- use integers in problem-solving.
- add three or more integers.
- use opposites to subtract integers.
- multiply and divide integers..
- evaluate expressions using integers.
- plot points in a coordinate plane.

Data and Graphs

The students will

- read and make pictographs.
- read and make time-lines.
- use bar graphs, line graphs, scatter plots, and line plots to represent data.
- recognize misleading graphs.
- calculate probability of an event.

Number Theory

The students will

- factor natural numbers.
- classify natural numbers as prime or composite.
- factor integers and algebraic expressions.
- find greatest common factor and least common multiple of two or more numbers.
- simplify a fraction.
- compare two fractions.
- write a decimal as a fraction.
- evaluate powers that have negative and zero exponents.
- multiply and divide powers.
- use scientific notation to represent numbers.
- evaluate numbers in scientific notation.
- use formulas to recognize numbers in a pattern.

Rational Numbers and Percent

The students will

- add and subtract fractions with like and unlike denominators.
- combine fractions by writing fractions as decimals.
- multiply and divide rational numbers.

- write proportions as percent.
- write percent as decimals, and decimals as percent, and decimals and percents as fractions.
- find the percent of a number.
- calculate interest.
- use percent to organize data.
- find rates and ratios.
- solve proportions.
- write proportions for similar triangles and measure objects indirectly.
- find what percent one number is of another.
- solve percent equations.
- find percent increase/decrease.

Real Numbers and Inequalities

The students will

- solve equations whose solutions are square roots.
- classify numbers as rational or irrational.
- represent real numbers on a number line.
- use the Pythagorean Theorem to solve a right triangle, and measure indirectly.
- use a calculator to approximate square roots.
- graph an inequality.
- write equivalent inequalities.
- use properties to solve inequalities.
- solve multi-step inequalities.
- use the Triangle Inequality to estimate the length of the third side of a triangle.

Geometry

The students will

- identify points, lines, planes.
- measure and identify angles.
- identify angles formed when two parallel lines intersect a third line.
- identify rotational, lateral symmetry.
- classify triangles by their sides and angles.
- identify quadrilaterals.
- recognize congruent and regular polygons.
- identify exterior and interior angles of a polygon.
- find the measure of angles of a polygon.
- translate, rotate, and reflect a figure about a point.
- find trigonometric ratios.
- use trigonometric ratios to solve right triangles.

- find the surface area of prism and cylinder.
- find area of a triangle, quadrilateral, circle.
- find volume of prism, cylinder, pyramid, cone, sphere.

Teaching Strategies

- Modeling mathematical operations
- Producing graphs/charts to relate mathematical relationships
- Using cooperative learning to solve problems with alternative methods
- Teacher presentations, note taking

Assessments

- Text tests
- Daily student class work

Resources

- Transparencies
- Practice worksheets
- Textbook:
Passport to Algebra and Geometry
McDougal/Littell, 1999

Purpose

Eighth grade students will review the use of one and multiple variables in operational mathematics. Students will analyze linear equations, inequalities, polynomials, and quadratic functions.

Outcomes

Language of Algebra

The students will

- write mathematical expressions for verbal expressions and vice versa.
- evaluate numeric and algebraic mathematical expressions using order of operations.
- solve open sentence equations and inequalities using replacement sets.
- recognize and use the properties of identity and equality.
- use the Distributive Property to evaluate and simplify expressions.
- recognize and use the Commutative and Associative Properties.
- interpret graphs of functions.

Real Numbers

The students will

- graph rational numbers on a number line.
- find absolute value of rational numbers.
- add, subtract, multiply, and divide integers and rational numbers.
- interpret and create line plots, and stem-and-leaf plots.
- analyze data using mean, median, and mode.
- find probability of a simple event.
- find square roots.
- order real numbers.

Linear Equations

The students will

- translate verbal sentences into equations and vice versa.
- solve equations using addition, subtraction, multiplication, and division.
- solve equations using more than one operation.

- solve equations with variables on both sides.
- solve equations using grouping symbols.
- determine whether two ratios form a proportion.
- solve proportions.
- find percents of increase and decrease.
- solve equations for given variables.
- solve mixture problems.
- solve uniform motion problems.

Graphing Relations and Functions

The students will

- locate and graph points on the coordinate plane.
- transform figures using reflections, translations, dilations, and rotations.
- represent relations as sets of ordered pairs, tables, mappings, and graphs.
- find the inverse of a relation.
- use an equation to determine the range for a given domain.
- graph the solution set for a given domain.
- determine whether an equation is linear.
- graph linear equations.
- determine whether a relation is a function.
- find function values.
- recognize arithmetic sequences.
- write an equation given some of the solutions.

Analyzing Linear Equations

The students will

- find the slope of a line.
- write and graph direct and indirect variation equations.
- write an equation of a line given the slope and one point on a line.
- write an equation of a line given two points on a line.
- write an equation of a line in point-slope form.
- write an equation of the line that passes through a given point, parallel to a given line.
- write an equation of the line that passes through a given point, perpendicular to a given line.
- interpret points on a scatter plot.

Solving Linear Inequalities

The students will

- solve linear inequalities using addition, subtraction, multiplication, and division.

- solve linear inequalities involving more than one operation.
- solve compound inequalities containing the word *and* and graph their solution sets.
- solve compound inequalities containing the word *or* and graph their solution sets.
- solve absolute value equations and inequalities.
- graph inequalities on the coordinate plane.

Solving Systems of Linear Equations and Inequalities

The students will

- determine whether a system of linear equations has 0, 1, or infinitely many solutions.
- solve systems of equations using substitution, using elimination with addition, elimination with subtraction, elimination with multiplication, or graphing.

Polynomials

The students will

- multiply polynomials.
- simplify expressions involving powers of monomials.
- simplify expressions involving the quotient of monomials.
- simplify expressions containing negative exponents.
- find the degrees of a polynomial.
- arrange the terms of a polynomial in ascending or descending order.
- add and subtract polynomials.
- find the product of a monomial and polynomial.
- solve equations involving polynomials.
- multiply polynomials.

Factoring

The students will

- find prime factorizations of integers and monomials.
- factor polynomials.
- solve quadratic equations.
- factor trinomials.
- factor binomials and trinomials that are the differences of squares.
- factor perfect square trinomials and solve equations.

Quadratic Equations

The students will

- graph quadratic functions.

- find the equations of the axis of symmetry and coordinates of the vertex of a parabola.
- solve quadratic equations by graphing, finding the square root, completing the square, and using the Quadratic Formula.

Teaching Strategies

- Modeling mathematical operations
- Producing graphs/charts to relate mathematical relationships
- Using cooperative learning to solve problems with alternative methods
- Teacher presentations
- Note taking

Assessments

- Daily student class work and homework
- Text test

Resources

- Transparencies
- Access to internet quiz sites
- Practice worksheets
- Textbook:

Algebra 1
Glencoe, 2005