

Student Learning Expectations and Benchmarks

Math–Grade K

Catholic Social Teaching

In keeping with the mission of the Catholic school, teachers will infuse Catholic Social Teaching into lessons and assist students in applying this teaching in a developmentally appropriate manner. To facilitate this, we have included a brief statement of each principle that grounds the teaching. The statements are paraphrased from *Sharing Catholic Social Teaching Challenges and Directions* published by the United States Catholic Conference, 1998.

Principles of Catholic Social Teaching

- Each person is sacred.
- Each person is social.
- We care for creation.
- All people have rights and responsibilities.
- We take care of the poor and vulnerable.
- Workers have rights; work has dignity.
- Solidarity is our call; we are the keepers of our brothers and sisters.

GRADE K

The student understands and applies the concepts and procedures of mathematics.

1.1 The student understands and applies the concepts and procedures from number sense.

The student will:

- demonstrate an understanding of whole numbers and their place value
 - recognize and state numbers
 - count forward to 20
 - count backward from 10
 - identify and describe two sets using one-to-one correspondence
- identify, compare and order whole numbers
- order objects from largest to smallest
- identify and describe two sets using:
 - more than
 - less than
 - as many as
- identify a math function to solve a problem
- use manipulatives and words to solve a problem
- demonstrate relationship between addition and subtraction when using manipulatives or telling a story
- identify and describe two settings using “as many as” and determine the number of objects if less than ten
- use a known quantity to estimate an unknown quantity

**MATH
EALR 1**

1.1

GRADE K

1.2 The student understands and applies concepts and procedures from measurement

The student will:

- compare two objects or events, using direct comparisons or nonstandard units of measure according to the following attributes:
 - length (shorter, longer)
 - height (taller, shorter)
 - weight (heavier, lighter)
 - temperature (hotter, colder)
 - nonstandard units include foot length, handspan, paperclip, pencil, block, etc.
- tell time to the hour using an analog clock

**MATH
EALR 1**

1.2

1.3 The student understands and applies concepts and procedures from geometric sense

The student will:

- describe and compare size and shape of geometric figures
- identify describe and make geometric figures (circle, square, triangle, etc.)
- recognize shapes in a surrounding
- classify tangible objects (ball, box, etc.)
- Construct geometric figures

**MATH
EALR 1**

1.3

GRADE K

1.4 The student understands and applies concepts and procedures from probability and statistics

The student will:

- discriminate between impossible, probable, and certain events
- investigate the probability that an event will occur (using multi-colored counters or spinners)
- gather data by counting and tallying
- organize and clarify mathematical information in at least one way
- display objects and information, using object and pictorial graphs and tables

**MATH
EALR 1**

1.4

1.5 The student understands and applies concepts and procedures from algebraic sense

The student will:

- sort and classify objects according to similar attributes (shape, size, and color)
- create, identify, describe, and copy a repeating pattern found in objects, sounds, and movements
- recognize mathematical patterns in familiar situations in other disciplines

**MATH
EALR 1**

1.5

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MATH—GRADE 1

The student understands and applies the concepts and procedures of mathematics.

1.1 The student understands and applies the concepts and procedures from number sense

The student will:

- recognize and write numerals 0-100
- count by twos, fives, and tens to 100
- identify and represent the concepts of one-half, one-fourth, and one-third, using concrete and pictorial materials
- identify place value to two digits (ones and tens)
- identify many uses of numbers in the world
- identify and use a number line
- compare, sequence, and order objects and numerals (count forward and backward)
- use concrete materials to model and solve mathematical problems
- explain and demonstrate the concepts of addition and subtraction using pictures and manipulatives
- use estimation to determine reasonableness of answers
- use estimation to predict computation results

MATH EALR 1

1.1

1.2 The student understands and applies concepts and procedures from measurement.

The student will:

- use nonstandard units to measure length and weight
- compare and order objects according to height, weight, length, and size
- recognize and analyze penny, dime, and nickel
- estimate measurements
- sequence events in time
- tell time to half hour and read calendar
- identify tools used to find measurements

MATH EALR 1

1.2

MATH—GRADE 1

1.3 The student understands and applies concepts and procedures from geometric sense.

The student will:

- recognize two and three-dimensional objects
- identify and describe objects in his/her environment that depict geometric figures (architecture, art, nature, etc.)
- compare two and three-dimensional objects
- draw and describe triangles, squares, rectangles, and circles
- describe the proximity of objects in space (near, far, below, up, down, beside, etc.)

**MATH
EALR 1**

1.3

1.4 The student understands and applies concepts and procedures from probability and statistics.

The student will:

- investigate, identify and describe various forms of data collection in his/her world (lunch count, attendance, daily temperature, etc.)
- formulate questions to gather data
- interpret information displayed in a picture or object graph using: more, less, fewer, less than and greater than
- interpret and compare information in familiar situations
- use experiments to predict and investigate uncertain events (coin toss, spinners, etc.)
- check for reasonableness of answers

**MATH
EALR 1**

1.4

MATH—GRADE 1

1.5

The student understands and applies concepts and procedures from algebraic sense.

The student will:

- use repeated shapes, colors, numbers, letters, etc. to create patterns
- recognize, describe, compare, extend, and create a wide variety of patterns, including rhythmic, color, shape, and numeric
- use guesses and check to identify patterns
- sort and classify concrete objects according to one or more attributes, including size, shape and color
- write, read, and solve open sentences
- give examples of how mathematics is used in everyday life

**MATH
EALR 1**

1.5

Student Learning Expectations and Benchmarks

Math–Grade 2

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MATH—GRADE 2

The student understands and applies the concepts and procedures of mathematics.

1.1 The student understands and applies the concepts and procedures from number sense.

The student will:

- count and group using a variety of materials to represent place value (demonstrate relationship between ones, tens, and hundreds)
- identify part of a set or region that represents one-half, one-third, one-fourth, and write corresponding fractions
- count forwards and backwards by tens to 1000
- count, compute, order, estimate and describe using whole numbers and fractions
- choose correct operation (addition, subtraction, or multiplication)
- begin to comprehend the inverse relationship between addition and subtraction
- know and use basic subtraction and addition facts
- choose appropriate strategies and tools for task (estimation, mental arithmetic, pencil and paper, calculator)
- use estimation to predict computation results and determine reasonableness of answer
- describe and justify methods of estimating involving realistic situations

MATH EALR 1

1.1

1.2 The student understands and applies concepts and procedures from measurement.

The student will:

- explore area and perimeter
- use timetables and timelines
- describe and compare objects using length, perimeter, area, weight, volume, money, and temperature
- tell and write time to the quarter hour, using an analog and digital clock
- measure to the nearest whole unit
- recognize penny, nickel, dime, quarter, and dollar
- count, compare, and make change using a collection of coins
- estimate to predict and/or determine reasonable measurements
- explore standard units of measure of length, weight, and temperature
- use appropriate measuring tools

MATH EALR 1

1.2

MATH—GRADE 2

1.3 The student understands and applies concepts and procedures from geometric sense.

The student will:

- classify shapes and objects
- explore relationships between math, art, and other disciplines
- use geometric concepts and relationships to describe objects and features in the environment
- describe, model, draw, create, and classify shapes and objects
- plot ordered pairs and numbers on a grid
- use manipulatives and drawings to describe geometric transformations (slides, flips, and turns)
- use rotations, reflections, and translations to create patterns

MATH EALR 1

1.3

1.4 The student understands and applies concepts and procedures from probability and statistics.

The student will:

- list all possible outcomes of an experiment
- use experiments to investigate the probabilities of uncertain events
- use data to predict an outcome that is more likely to occur if the experiment is repeated (using spinners, etc.)
- collect, organize, and analyze relevant data to investigate situations and problems
- display data on tables, graphs, and charts

MATH EALR 1

1.4

MATH—GRADE 2

1.5

The student understands and applies concepts and procedures from algebraic sense.

The student will:

- identify, create, and extend a wide variety of patterns using symbols and objects
- describe and represent situations with tables and graphs
- use variables, expressions and equations to describe situations
- complete number sentences using +, -, and =
- give examples of how mathematics is used in everyday life
- make connections between different mathematical content areas

**MATH
EALR 1**

1.5

Student Learning Expectations and Benchmarks

Math–Grade 3

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MATH—GRADE 3

The student understands and applies the concepts and procedures of mathematics.

1.1 The student understands and applies the concepts and procedures from number sense.

The student will:

- read and write numerals and identify the place value of each digit (demonstrate relationship between ones, tens, etc.)
- compare, sequence, and order integers, fractions, and decimals
- compare numerical value of two fractions that have like and unlike denominators, using concrete materials
- recognize and use inverse relationship between addition and subtraction (ex. $5+3=8$, $8-3=$)
- begin to recognize the inverse relationship between multiplication and division
- use a variety of methods (models, symbols, etc.) and describe strategies to solve multiplication and division problems
- add and subtract multi-digit numbers using a variety of methods (estimation, mental math, pencil and paper, computer, and calculator)
- choose appropriate strategies and tools for a task (mental math, estimation, etc.)
- use estimation to predict results and to determine reasonableness of answers

MATH EALR 1

1.1

MATH—GRADE 3

1.2 The student understands and applies concepts and procedures from measurement.

The student will:

- explore surface area and volume of rectangular solids
- use a variety of methods to measure objects and events
- use appropriate units of measurement
- determine perimeter and volume of two-dimensional figures
- compare and describe area and perimeter of similar figures
- tell time to nearest five-minute interval and to the nearest minute using an analog and digital clocks
- measure to the nearest whole or common fractional parts of units
- estimate measurements when appropriate
- determine the reasonableness of measurements (or estimates)
- identify relationships among days, months, and years, as well as minutes and hours
- using money, estimate and demonstrate:
 - making change (up to \$5.00)
 - addition and subtraction
- compare the value of coins and dollar bills

MATH EALR 1

1.2

1.3 The student understands and applies concepts and procedures from geometric sense.

The student will:

- classify objects based on attributes or relevant properties (number of corners, edges, the shape of faces, etc.)
- identify and describe figures and objects in the surrounding environment as containing squares, rectangles, triangles, circles, cubes, spheres, cylinders, etc.
- construct models of three-dimensional shapes
- describe location of objects using coordinate grids and maps, and give/follow directions
- create, predict, and verify geometric patterns using slides, flips, and turns

MATH EALR 1

1.3

MATH—GRADE 3

1.4 The student understands and applies concepts and procedures from probability and statistics.

The student will:

- sequence events in order of likelihood of occurrence
- devise and conduct experiments to determine the probability of events
- pose questions from data and justify the use of one type of graph over another
- read and interpret data represented in bar and picture graphs
- justify the use of one type of graph over another
- analyze data and describe measures of central tendency (mean, median, and mode)
- support conclusions and interpretations with data analysis
- predict and calculate the probability of events using physical objects (dice, coins, etc.)

MATH EALR 1

1.4

1.5 The student understands and applies concepts and procedures from algebraic sense.

The student will:

- recognize and describe patterns formed using concrete objects, tables, and pictures, and extend the pattern (also create patterns)
- use variables to represent unknown or varying quantities
- set up and solve variable equations using concrete, pictorial, and symbolic representations and strategies

MATH EALR 1

1.5

Student Learning Expectations and Benchmarks

Math–Grade 4

Catholic Social Teaching

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MATH—GRADE 4

The student understands and applies the concepts and procedures of mathematics.

1.1 The student understands and applies the concepts and procedures from number sense.

The student will:

- identify orally and in writing, the place value for each digit in a whole number expressed through millions
- round whole numbers expressed through millions to the nearest thousand, ten-thousand, and hundred-thousand
- identify Roman numerals
- use physical models and pictures to demonstrate relationships within fraction families
- identify and represent equivalent fractions and compare the numerical value of fractions
- rename fractions to mixed numbers
- reduce fractions to simplest form
- explain and use commutative and associative properties in addition and multiplication
- find the product of two whole numbers when one factor has two digits or less and the other factor has three digits or less (using paper and pencil)
- find the quotient of two whole numbers given a one-digit divisor
- add and subtract fractions with like and unlike denominators of 12 or less
- recognize when an approach is unproductive and try a new approach
- create and solve problems involving addition, subtraction, multiplication, and division, using various computational methods (mental math, computers, estimation, pencil and paper, etc.)
- describe and justify reasonableness of an estimate to a division problem
- explain and solve story problems
- apply mathematical skills and reasoning to other disciplines

MATH EALR 1

1.1

MATH—GRADE 4

1.2 The student understands and applies concepts and procedures from measurement.

The student will:

- use measuring devices to find perimeter, area, length, in both standard and nonstandard units of measure
- identify and solve problems involving the measurement of area, perimeter, length, weight/mass, time, and temperature
- use language and symbols to compare and contrast perimeter, area, and volume
- determine and justify whether exact or approximate measures are needed when given a realistic situation
- estimate and measure accurately using actual measuring devices
- express data in both metric and U.S. customary units

MATH EALR 1

1.2

1.3 The student understands and applies concepts and procedures from geometric sense.

The student will:

- identify, describe, and classify shapes using geometric terms such as parallel, symmetric, congruent, similar, and perpendicular
- identify, describe, and classify shapes using geometric terms such as symmetric, congruent and similar
- construct geometric models and scale drawings with appropriate tools (compass, protractor, straight edge, etc.)
- identify and describe the location of figures on a coordinate plane

MATH EALR 1

1.3

MATH—GRADE 4

1.4 The student understands and applies concepts and procedures from probability and statistics.

The student will:

- perform experiments (coin toss, spinners, dice, etc.)
- collect data
- organize and display data using graphs and/or tables
- determine and describe mean and median for specific data and associate them with the measurement of central tendency
- use data to support arguments and justify results
- formulate questions and hypotheses
- determine probability of a given simple event using concrete materials
- make inferences based on experiments

**MATH
EALR 1**

1.4

1.5 The student understands and applies concepts and procedures from algebraic sense.

The student will:

- recognize or create, and extend sequential number patterns and generate rules for them
- use manipulatives and pictures to illustrate processes maintaining equality in an equation
- use algebraic notation in representing general properties of numbers and relationships between variables and establish equivalence
- identify the unknown in familiar situations
- organize and clarify mathematical information through reflection and discussion

**MATH
EALR 1**

1.5

Student Learning Expectations and Benchmarks

Math–Grade 5

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MATH—GRADE 5

The student understands and applies the concepts and procedures of mathematics.

1.1 The student understands and applies the concepts and procedures from number sense.

The student will:

- read, write, and identify the place value of decimals through ten-thousandths
- identify Roman numerals through 100
- identify and use: expanded notation
- compare the value of decimals through ten-thousandths using the symbols $<$, $>$, or $=$
- identify and use: factors, greatest common factor, multiples, least common multiple
- explain and use the commutative and associative property in addition and multiplication
- recognize and compute percent and the percent of number
- understand and apply ratios, proportions, and percents in a wide variety of situations
- find the product and quotients of numbers expressed as decimals through thousandths
- add and subtract fractions and mixed numerals, with and without regrouping, and express answers in simplest form
- create and solve problems involving addition, subtraction, multiplication, and division, using paper and pencil, estimation, mental computation, computers, etc.
- explain and solve story problems with the ability to draw a picture, use tables or charts, or relate to an easier problem and determine if too little information is given

MATH EALR 1

1.1

MATH—GRADE 5

1.2 The student understands and applies concepts and procedures from measurement.

The student will:

- recognize, analyze, and compute length, capacity, weight, and temperature
- identify and describe the diameter, radius, and circumference of a circle
- describe perimeter of a polygon, and the area of a square, rectangle, and triangle
- differentiate between area and perimeter
- compute length, capacity, weight, and temperature
- determine the perimeter of a polygon, and the area of a square, rectangle and triangle given the appropriate measures
- choose an appropriate measuring device and unit of measure to solve problems involving measurement

**MATH
EALR 1**

1.2

1.3 The student understands and applies concepts and procedures from geometric sense.

The student will:

- classify angles and triangles as right, acute, or obtuse
- recognize intersecting, parallel, perpendicular, and congruent line segments
- measure and draw right, acute, and obtuse angles and triangles using appropriate tools
- identify the ordered pair for a point and locate that point in the first quadrant of a coordinate plane
- identify applications of transformations to geometric figures (rotations, reflections, translations)

**MATH
EALR 1**

1.3

MATH—GRADE 5

1.4 The student understands and applies concepts and procedures from probability and statistics.

The student will:

- solve problems involving the probability of a single event
- collect numerical data in a variety of forms given a problem situation
- recognize and analyze different types of graphs (bar, picture, circle, etc.)
- organize and display a set of numerical data in a variety of forms, given a problem situation, using bar graphs, stem and leaf plots, and line graphs
- find the mean, median, and mode of a set of data

**MATH
EALR 1**

1.4

1.5 The student understands and applies concepts and procedures from algebraic sense.

The student will:

- investigate, describe, and extend numerical and geometric patterns (perfect squares, factors, multiples, patterns formed by powers of 10, etc.)
- understand how the basic arithmetic operations are related to one another
- investigate and describe the concept of a variable
- write an open sentence, using a variable to represent a given mathematical relationship

**MATH
EALR 1**

1.5

Student Learning Expectations and Benchmarks

Math–Grade 6

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MATH—GRADE 6

The student understands and applies the concepts and procedures of mathematics.

1.1 The student understands and applies the concepts and procedures from number sense.

The student will:

- identify Roman numerals through 1000
- identify and use expanded notation
- identify and use integers
- identify and use exponents
- compare and order whole numbers, fractions, and decimals, using a variety of methods (drawings or pictures, symbols, concrete materials, etc.)
- rename fractions to mixed numbers
- reduce fractions to simplest form
- recognize and work with improper fractions, reciprocals, inequalities, equivalent fractions, like fractions, and unlike fractions
- explain orally and in writing the concepts of prime and composite numbers
- identify and use: factors, greatest common factor, multiples, greatest common multiple
- explain and use the commutative and associative property in addition and multiplication
- explain and use the distributive property in multiplication
- solve problems that involve addition, subtraction, multiplication, and division with fractions and mixed numbers, that include like and unlike denominators of 12 or less
- explain and solve story problems (use an equation, formula, diagram, trial and error, and a multi-step process)
- estimate and compute multi-step, practical problems using money, time, units of measure, etc., and present data and conclusions in paragraphs, tables or charts

MATH EALR 1

1.1

MATH—GRADE 6

1.2 The student understands and applies concepts and procedures from measurement.

The student will:

- discriminate between perimeter and area
- create and solve problems by finding circumference and/or area of a circle when given the diameter or radius
- use appropriate tools to measure angles
- apply the appropriate formula to a given problem with perimeter and area
- identify and use ratio and proportions
- estimate and then determine length, weight/mass, area, and liquid volume using standard and nonstandard units of measure
- compare and convert units of measure for length, weight/mass, and volume within the U.S. customary system and within the metric system

MATH EALR 1

1.2

1.3 The student understands and applies concepts and procedures from geometric sense.

The student will:

- identify, classify, and describe the characteristics of plane figures (giving both similarities and differences)
- classify three dimensional figures, angles, and triangles
- compare and determine the congruence of segments, angles, and polygons
- sketch and construct line segments, angles, and quadrilaterals
- identify and use symmetry, congruence, and transformation (rotations, etc.)

MATH EALR 1

1.3

MATH—GRADE 6

1.4 The student understands and applies concepts and procedures from probability and statistics.

The student will:

- determine and interpret the probability of an event occurring
- identify and describe the number of possible arrangements of several objects or events
- collect data in a variety of ways
- analyze, display, and interpret data in a variety of methods (line, bar, and circle graphs)
- describe mean, median, and mode as measures of central tendency, and determine their meaning for a set of data
- determine the fairness of games of chance

MATH EALR 1

1.4

1.5 The student understands and applies concepts and procedures from algebraic sense.

The student will:

- investigate and describe concepts of exponents, perfect squares, and square roots
- recognize and work with positive and negative numbers
- add and subtract integers using a number line (involving negative numbers)
- solve one-step linear equations in one variable (involving whole number coefficients and positive, rational solutions)
- solve proportions by equivalent fractions and cross products

MATH EALR 1

1.5

MATH—GRADE 6

2 The student uses mathematics to define and solve problems.

The student will:

- search systematically for patterns in simple situations
- organize relevant information
- identify missing/extraneous information
- define the problem to be solved
- determine known information and identify unknowns and questions to be answered
- design and conduct systematic and open-ended explorations
- use a variety of strategies to solve problems
- select appropriate tools, strategies, concepts, and procedures to construct solutions

MATH EALR 2

2.1

2.2

2.3

3 The student uses mathematical reasoning.

The student will:

- interpret, compare, and contrast information from a variety of sources
- make conjectures and inferences based on analysis of problem situations
- test conjectures and inferences
- validate thinking and mathematical ideas
- support arguments and justify results
- check for reasonableness of results
- evaluate and reflect on procedures and results by using models, known facts, patterns, relationships, counterexamples, proportional reasoning, and inductive reasoning

MATH EALR 3

3.1

3.2

3.3

MATH—GRADE 6

4 The student communicates knowledge and understanding in both everyday and mathematical language.

The student will:

- describe a process for collecting information
- extract mathematical information from multiple sources (pictures, diagrams)
- clarify mathematical understanding and organize mathematical information within given parameters
- clearly and effectively express/present ideas and situation using both everyday and mathematical language appropriate to the audience

MATH EALR 4

4.1

4.2

4.3

5 The student understands how mathematical ideas connect within mathematics, to other subject areas, and to real-life situations.

The student will:

- link conceptual and procedural understanding within and among a variety of mathematical content areas
- relate and use more than one mathematical model and representation for the same situation

MATH EALR 5

5.1

Student Learning Expectations and Benchmarks

Math–Grade 7

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MATH—GRADE 7

The student understands and applies the concepts and procedures of mathematics.

1.1 The student understands and applies the concepts and procedures from number sense.

The student will:

- explore exponents
- compare, order, and determine equivalent relationships between fractions, decimals, and percents—including scientific notation
- identify fractions as terminating and repeating decimals
- find common multiples and factors (including least common multiple and greatest common factor)
- explain the following properties:
 - commutative and associative
 - distributive
 - additive and multiplicative identities
 - additive and multiplicative inverse properties
 - multiplicative property of zero
- use proportions to solve practical problems
- identify and use common multiples, common factors, prime factors, scientific notation, ordered pairs, and square roots
- simplify and/or solve equations with fractions
- choose the correct operation in a variety of problems (dealing with fractions, mixed numbers, decimals, integers, rational numbers, etc.)
- simplify expressions using the order of operations, mental math, and appropriate tools
- explain and solve story problems using a variety of methods (draw a picture, use graphs, diagrams, a formula, an equation, trial and error, etc.)
- estimate and compute multi-step problems containing fractions, decimals, percent, time, money, integers, proportion, units of measure, rational numbers, etc.

MATH EALR 1

1.1

MATH—GRADE 7

1.2 The student understands and applies concepts and procedures from measurement.

The student will:

- estimate and find the area of polygons by subdividing them into rectangles and right triangles
- investigate and solve problems involving the volume and surface area of rectangular triangular prisms and cylinders
- estimate and demonstrate ratios, proportions, and percent
- identify and use ratio and proportions
- recognize, analyze, and compute length, capacity, weight, and temperature in the metric system and in customary U.S. units
- identify, describe, and verify the relationships between vertical, supplementary, and complimentary angles
- explore and explain money matters (checkbook, interest, sales tax)

MATH EALR 1

1.2

1.3 The student understands and applies concepts and procedures from geometric sense.

The student will:

- recognize and analyze plane figures, solid figures, line segments, angles, rays, and points
- classify angles, triangles and three dimensional figures
- define, estimate and demonstrate perimeter, area, volume, surface area, and circumference of a circle
- identify and employ the Pythagorean theorem
- compare, contrast, and classify quadrilaterals (rectangle, square, parallelogram, rhombus, trapezoid)
- determine if geometric figures are similar and write proportions to express relationships between corresponding parts

MATH EALR 1

1.3

MATH—GRADE 7

1.4 The student understands and applies concepts and procedures from probability and statistics.

The student will:

- determine the probability of a given simple event (express as a ratio, decimal or percent)
- identify and describe the number of possible arrangements of several objects or events
- recognize and analyze different types of graphs (bar, picture, line, circle, etc.)
- display data, using frequency distributions, line plots, stem and leaf plots, and box and whisker plots
- solve problems involving the mean, median, mode, range, and standard deviation

MATH EALR 1

1.4

1.5 The student understands and applies concepts and procedures from algebraic sense.

The student will:

- recognize and work with positive and negative numbers, rational, irrational, and real numbers, and absolute value
- understand the difference between: equation, inequality, variable, expression, term, coefficient
- estimate and explain (demonstrate):
 - addition and subtraction of integers with the same and different signs
 - multiplication and division of integers with the same and different signs
- define and demonstrate the distributive property in equations
- change phrases into algebraic expressions
- solve linear equations and inequalities

MATH EALR 1

1.5

MATH-GRADE 7

2 The student uses mathematics to define and solve problems.

The student will:

- search systematically for patterns in simple situations
- identify missing/extraneous information
- define the problem to be solved and organize relevant information
- determine known information and identify unknowns and questions to be answered
- use a variety of strategies to solve problems
- select appropriate tools, strategies, concepts, and procedures to construct solutions
- design and conduct systematic and open-ended explorations

MATH EALR 2

2.1

2.2

2.3

3 The student uses mathematical reasoning.

The student will:

- interpret, compare, and contrast information from a variety of sources
- make conjectures and inferences based on analysis of problem situations
- test conjectures and inferences
- validate thinking and mathematical ideas
- support arguments and justify results
- check for reasonableness of results
- evaluate and reflect on procedures and results by using models, known facts, patterns, relationships, counterexamples, proportional reasoning, and inductive reasoning

MATH EALR 3

3.1

3.2

3.3

MATH—GRADE 7

4 The student communicates knowledge and understanding in both everyday and mathematical language.

The student will:

- describe a process for collecting information
- extract mathematical information from multiple sources (pictures, diagrams)
- clarify mathematical understanding and organize mathematical information within given parameters
- clearly and effectively express/present ideas and situation using both everyday and mathematical language appropriate to the audience

MATH EALR 4

4.1

4.2

4.3

5 The student understands how mathematical ideas connect within mathematics, to other subject areas, and to real-life situations.

The student will:

- link conceptual and procedural understanding within and among a variety of mathematical content areas
- relate and use more than one mathematical model and representation for the same situation

MATH EALR 5

5.1

Student Learning Expectations and Benchmarks

Pre-Algebra Grade 7 and 8

Catholic Social Teaching

In keeping with the mission of the Catholic school, teachers will infuse Catholic Social Teaching into lessons and assist students in applying this teaching in a developmentally appropriate manner. To facilitate this, we have included a brief statement of each principle that grounds the teaching. The statements are paraphrased from *Sharing Catholic Social Teaching Challenges and Directions* published by the United States Catholic Conference, 1998.

Principles of Catholic Social Teaching

- Each person is sacred.
- Each person is social.
- We care for creation.
- All people have rights and responsibilities.
- We take care of the poor and vulnerable.
- Workers have rights; work has dignity.
- Solidarity is our call; we are the keepers of our brothers and sisters.

PRE-ALGEBRA-GRADE 7 AND 8

The student understands and applies the concepts and procedures of mathematics.

1.1 The student understands and applies the concepts and procedures from number sense.

The student will:

- simplify numerical expressions involving exponents, using the order of operations
- identify and describe the relationship between the subsets of the real number system
- use proportions to solve problems with fractions and decimals
- identify and describe:
 - reciprocal or multiplicative inverse
 - additive inverse
 - coordinates on a number line
 - x-axis, y-axis, origin, four quadrants
 - slope of a line
- use the Pythagorean theorem when appropriate
- apply the order of operations to evaluate expressions for given replacement values of the variables
- recognize and use grouping symbols to evaluate expressions
- solve linear equations with variables on both sides of the equation
- use the appropriate properties when simplifying or solving linear equations (reflexive, transitive, addition and subtraction, multiplication and division)
- graph ordered pairs on a coordinate plane (in all four quadrants)

**MATH
EALR 1**

1.1

1.2 The student understands and applies concepts and procedures from measurement.

The student will:

- identify, describe, and verify the relationships between vertical, supplementary, and complementary angles
- investigate and solve problems involving volume of cones and pyramids
- find the area of polygons by subdividing them into rectangles and right triangles
- identify and use ratios and proportions

**MATH
EALR 1**

1.2

PRE-ALGEBRA-GRADE 7 AND 8

1.3 The student understands and applies concepts and procedures from geometric sense.

The student will:

- identify applications of transformations to geometric figures (rotations, reflections, translations)
- describe, classify, and draw plane figures and solid figures (including prisms, pyramids, cylinders, and cones)
- apply the Pythagorean theorem to find the missing length of a side of a right triangle
- classify angles and triangles

**MATH
EALR 1**

1.3

1.4 The student understands and applies concepts and procedures from probability and statistics.

The student will:

- analyze problem situations (games of chance, board games, etc.) and make predictions
- interpret and use information displayed in graphs and histograms to make comparisons and predictions
- identify mean, median, mode and range

**MATH
EALR 1**

1.4

1.5 The student understands and applies concepts and procedures from algebraic sense.

The student will:

- investigate functional relationships (number of sides of a regular polygon and maximum number of possible diagonals)
- solve multi-step equations with one variable
- graph linear equation with two variables on the coordinate plane (using ordered pairs)
- solve problems using formulas and functions

**MATH
EALR 1**

1.5

PRE-ALGEBRA-GRADE 7 AND 8

2 The student uses mathematics to define and solve problems.

The student will:

- design and conduct systematic and open-ended explorations
- use a variety of strategies to solve problems
- identify missing/extraneous information
- search systematically for patterns in simple situations
- define the problem to be solved and organize relevant information
- determine known information and identify unknowns and questions to be answered
- select appropriate tools, strategies, concepts, and procedures to construct solutions

MATH EALR 2

2.1

2.2

2.3

3 The student uses mathematical reasoning.

The student will:

- interpret, compare, and contrast information from a variety of sources
- make conjectures and inferences based on analysis of problem situations
- validate thinking and mathematical ideas
- test conjectures and inferences
- support arguments and justify results
- check for reasonableness of results
- evaluate and reflect on procedures and results by using models, known facts, patterns, relationships, counterexamples, proportional reasoning, and inductive reasoning

MATH EALR 3

3.1

3.2

3.3

PRE-ALGEBRA-GRADE 7 AND 8

4

The student communicates knowledge and understanding in both everyday and mathematical language.

The student will:

- describe a process for collecting information
- extract mathematical information from multiple sources (pictures, diagrams)
- clarify mathematical understanding and organize mathematical information within given parameters
- clearly and effectively express/present ideas and situation using both everyday and mathematical language appropriate to the audience

**MATH
EALR 4**

4.1

4.2

4.3

5

The student understands how mathematical ideas connect within mathematics, to other subject areas, and to real-life situations.

The student will:

- link conceptual and procedural understanding within and among a variety of mathematical content areas
- relate and use more than one mathematical model and representation for the same situation

**MATH
EALR 5**

5.1

5.2

Student Learning Expectations and Benchmarks

Algebra–Grade 8

Catholic Social Teaching

In keeping with the mission of the Catholic school, teachers will infuse Catholic Social Teaching into lessons and assist students in applying this teaching in a developmentally appropriate manner. To facilitate this, we have included a brief statement of each principle that grounds the teaching. The statements are paraphrased from *Sharing Catholic Social Teaching Challenges and Directions* published by the United States Catholic Conference, 1998.

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- We take care of the poor and vulnerable.
- Workers have rights; work has dignity.
- Solidarity is our call; we are the keepers of our brothers and sisters.

ALGEBRA—GRADE 8

1

The student understands and applies the concepts and procedures from number sense.

The student will:

- identify and describe the relationship between the subsets of the real number system
- identify and graph ordered pairs in a coordinate plane (all four quadrants)
- identify the x-axis, y-axis, origin, and four quadrants
- identify and describe:
domain and range of a relation
domain and range of a function
locate the zeros of a function
- determine the slope of a line when given an equation of the line, the graph of the line, or two points on the line
- write an equation of a line when given the graph of the line, two points on the line, or the slope and a point
- solve systems of linear equations
- solve quadratic equations in one variable
- find the value of a function (give a rule) for elements in its domain
- identify and use the correct formula for a given problem
- justify steps used in simplifying expressions and solving equations and inequalities
- apply the laws of exponents to perform operations on expressions
- add, subtract, and multiply polynomials, and divide polynomials with monomial divisors
- factor completely binomials and trinomials
- recognize and use grouping symbols to evaluate expressions
- identify and describe radicals, radicands, and irrational numbers
- find the solution of linear equations with variables in more than one term and with variables on both sides of the equation
- solve equations and inequalities involving absolute value
- recognize and use the commutative, associative, and distributive properties
- identify and graph the slope-intercept form of linear equation
- simplify square roots and the square roots of variable expressions
- analyze the quadratic formula
- identify and use ratios, simple proportions, and the cross-product theorem
- introduce simple trig functions

**MATH
EALR 1**

1.1

1.2

1.3

1.4

1.5

ALGEBRA—GRADE 8

2 The student uses mathematics to define and solve problems.

The student will:

- design and conduct systematic and open-ended explorations
- use a variety of strategies to solve problems
- identify missing/extraneous information
- search systematically for patterns in simple situations
- define the problem to be solved and organize relevant information
- determine known information and identify unknowns and questions to be answered
- select appropriate tools, strategies, concepts, and procedures to construct solutions

MATH EALR 2

2.1

2.2

2.3

3 The student uses mathematical reasoning.

The student will:

- interpret, compare, and contrast information from a variety of sources
- make conjectures and inferences based on analysis of problem situations
- validate thinking and mathematical ideas
- test conjectures and inferences
- support arguments and justify results
- check for reasonableness of results
- evaluate and reflect on procedures and results by using models, known facts, patterns, relationships, counterexamples, proportional reasoning, and inductive reasoning

MATH EALR 3

3.1

3.2

3.3

ALGEBRA—GRADE 8

4

The student communicates knowledge and understanding in both everyday and mathematical language.

The student will:

- describe a process for collecting information
- extract mathematical information from multiple sources (pictures, diagrams)
- clarify mathematical understanding and organize mathematical information within given parameters
- clearly and effectively express/present ideas and situation using both everyday and mathematical language appropriate to the audience

**MATH
EALR 4**

4.1

4.2

4.3

5

The student understands how mathematical ideas connect within mathematics, to other subject areas, and to real-life situations.

The student will:

- link conceptual and procedural understanding within and among a variety of mathematical content areas
- relate and use more than one mathematical model and representation for the same situation

**MATH
EALR 5**

5.1

5.2