Diocese of Jefferson City
Mathematics Standards

The spirit of mathematics education described in this document is based on the premise that acquisition of math skills and understanding are a developmental process. To understand and apply math, students will be actively engaged in processes that utilize physical manipulatives, investigations using theoretical and real-world situations, and applications across the curriculum. The developmental progression from concrete to abstract thinking is supported on both an individual and collaborative level within this curriculum.

Standard A Problem Solving

Students in the Diocese of Jefferson City will use a variety of strategies in the problem solving process.

Standard B Properties and Concepts of Numbers

Students in the Diocese of Jefferson City will understand and apply basic and advanced properties of the concepts of numbers.

Standard C Computation

Students in the Diocese of Jefferson City will use basic and advanced procedures while performing the processes of computation.

Standard D Measurement

Students in the Diocese of Jefferson City will understand and apply basic and advanced properties of the concepts of measurement.

Standard E Geometry

Students in the Diocese of Jefferson City will understand and apply basic and advanced properties of the concepts of geometry.

Standard F Probability and Data Analysis

Students in the Diocese of Jefferson City will understand and apply basic and advanced concepts of probability and data analysis.

Standard G Functions and Algebra

Students in the Diocese of Jefferson City will understand and apply basic and advanced properties of functions and algebra.

Curriculum Connection Codes

AR	ART	**MU**	MUSIC
EE	ENVIRONMENTAL EDUCATION	**PE**	PHYSICAL EDUCATION
FL	FOREIGN LANGUAGE	**RE**	RELIGION
HE	HEALTH	**SC**	SCIENCE
IT	INFORMATION TECHNOLOGY	**SR**	COMMUNITY SERVICE
LA	LANGUAGE ARTS	**SS**	SOCIAL STUDIES
MA	MATH		

Note – These grade level performance standards are listed developmentally. However, each school is uniquely organized. Therefore, a specific grade level standard may not be addressed at the grade indicated, but will be addressed within a 4 year time span. (K-4, 5-8).

Grade 4 Exit Level
Performance Standards

By the end of Grade 4

Standard A Problem Solving

Students in the Diocese of Jefferson City will use a variety of strategies in the problem solving process.

Use reasoning strategies.

- Perceive patterns.
- Describe the properties and characteristics of patterns having two or more attributes.
- Extend simple and geometric patterns.
- Identify relationships between multiplication and division.
- Formulate questions for further exploration.
- Justify strategies.

Use a variety of problem solving strategies.

- Use guess and check, modeling and looking for patterns to solve problems.
- Use the 4-step problem solving process.
- Solve 2-step problems.

Communicate mathematical ideas in a variety of ways.

- Communicate mathematical ideas orally.
- Communicate using numbers and symbols.
- Communicate using pictures.
- Communicate using charts, graphs and tables.
- Communicate using diagrams and models.

Connect mathematical learning with other subjects, personal experiences, current events and personal interest.

- See relationships between various kinds of problems and actual events.
- Relate actual time to daily activities.
- Use mathematics as a way to understand other curriculum areas.
- Use numerical data to interpret experimental results.

Use appropriate mathematical vocabulary, symbols, and notation with understanding based on prior conceptual work.

- Use appropriate mathematical symbols for computation, equality and inequality.
- Use appropriate terms when writing about or discussing math.

Explain solutions to problems clearly and logically in oral and written work and support solutions with evidence.

- Use numerical data from experiments to explain results.

Standard B Properties and Concepts of Numbers

Students in the Diocese of Jefferson City will understand and apply basic and advanced properties of the concepts of numbers.

Represent and explain whole numbers and fractions.

- Use physical materials.
- Use number lines and other pictorial models.
- Use verbal descriptions.

Use place value concepts to notation to 100,000.
Use symbolic renaming (e.g. 43=40+3=30+13).

Determine the number of things in a set.
Use number theory principles: identify and continue numerical patterns, skip count odd and even numbers.
Round whole numbers to the nearest tens, hundreds or thousands place.

Read, write and order up to 4-digit whole numbers and simple fractions.
Read, write and order up to 4-digit whole numbers.
Read, write and order unit fractions and non-unit fractions in thirds, fifths, sixths, eighths, tenths and twelfths.

Identify and represent equivalent fractions.
Identify and represent equivalent fractions in halves, thirds, fourths, fifths, sixths, eighths, tenths, and twelfths.

Standard C Computation

Students in the Diocese of Jefferson City will use basic and advanced procedures while performing the processes of computation.

In problem solving situations involving whole numbers, select and efficiently use appropriate computational procedures.
Recall basic facts of addition, subtraction, multiplication and division.
Use mental math.
Use estimation.
Select and apply algorithms for addition, subtraction, multiplication and division.
1) Multiply a 2, 3, or 4-digit number by a 1 or 2 digit number with regrouping.
2) Multiply by 10, 100, and 1000.
3) Divide 3-digits by 1 digit with remainders.

Use opposite operations to check computation.
Use a calculator to assist and check solutions to problems.

Add and subtract fractions with like denominators.
Add and subtract fractions with like denominators.

In problem solving situations involving money, add and subtract decimals.
Use dollar and cents models to add and subtract decimals.

Standard D Measurement

Students in the Diocese of Jefferson City will understand and apply basic and advanced properties of the concepts of measurement.

Recognize and describe measurable attributes such as length, liquid capacity, time, weight (mass), temperature and volume.
Recognize and describe measurable attributes of objects and groups.
Use appropriate standard, non-standard and metric units to describe measurable attributes.

Demonstrate understanding of basic facts, principles and techniques of measurement.
Use appropriate non-standard and standard units (metric and US).
Select appropriate unit of measure (mile/foot/inch).
Use and convert units within a system (yards, feet, inches; kilograms and grams; gallons, quarts, pints and cups; seconds, minutes and hours).
Judge the reasonableness of an obtained measurement as it relates to prior experience and familiar benchmarks.

Determine measurements directly by using standard tools to the suggested degree of accuracy.
- Measure length to the nearest one-fourth inch or centimeter.
- Measure weight to the nearest ounce or gram.
- Measure time to the nearest one-minute interval.
- Measure monetary value of dollars and cents to a total of $20.00.

Determine measurements by using basic relationships (such as perimeter and area) and approximate by using estimation techniques.
- Calculate perimeter of triangles, rectangles, squares and other polygons.
- Calculate area of squares and rectangles.

Standard E Geometry

Students in the Diocese of Jefferson City will understand and apply basic and advanced properties of the concepts of geometry.

Describe two and three-dimensional figures (circles, polygons, trapezoids, prisms, spheres, etc.).
- Identify and state properties.
- Compare, sort and classify.
- Draw and construct physical models for two-dimensional figures.
- Explain how figures relate to objects in the environment.

Use physical materials and motion geometry (slides, flips and turns) to identify properties and relationships.
- Determine symmetry, congruence and similarity of plane figures.
- Describe slides, flips and turns of congruent plane figures.

Identify and use relationships among figures.
- Identify location of figures (between, adjacent to, interior of).
- Identify position of figures (parallel, perpendicular)
- Identify intersections of 2-dimensional figures.

Use simple two-dimensional coordinate systems to find locations on maps and to represent points and simple figures.
- Use x and y to describe a coordinate plane.

Standard F Probability and Data Analysis

Students in the Diocese of Jefferson City will understand and apply basic and advanced concepts of probability and data analysis.

Work with data in the context of real world situations.
- Formulate questions that lead to data collection and analysis.
- Determine what data to collect and how to collect it.
- Collect, organize and display data.
- Draw reasonable conclusions based on data.

Describe a set of data.
- Describe high and low values and range.
- Describe the most frequent value (mode).
- Describe the middle value of a set of ordered data (median).

In problem solving situations, read, extract, interpret and use information presented in graphs, tables or charts.
- Use graphs, tables and charts to answer questions and solve problems.

Determine if future events are more, less or equally likely, impossible or certain to occur.
- Use prior experience to determine the probability that future events will occur.

Predict outcomes of future events and test predictions using data from a variety of sources.
Use numerical data from experiments to predict outcomes.

Standard G Functions and Algebra

Students in the Diocese of Jefferson City will understand and apply basic and advanced properties of functions and algebra.

Use letters, boxes or other symbols to stand for any number, measured quantity, or object in simple situations.
Solve simple equations based on fact families containing variables.

Use the vocabulary, symbols and notation of algebra accurately.
Use the "=" symbol correctly.
Effectively use the associative property of multiplication.
Use variables in equations.

Work with simple linear patterns and relationships in a variety of ways.
Recognize and extend number patterns.
Describe simple patterns verbally.
Represent patterns with pictures, tables, charts, graphs.
Recognize that different models can represent the same pattern or relationship.
Use patterns to describe real-world phenomena.

Recognize variability in simple functional relationships by describing how a change in one quantity can produce a change in another.
Solve problems involving rate.

Use simple equations and inequalities in a variety of ways.
Use simple equations to represent problem situations.
Solve simple equations by different methods.
Record and describe solution strategies.

Recognize and use generalized properties and relationships of arithmetic.
Use the associative and commutative properties of addition and multiplication.

Grade 8 Exit Level
Performance Standards

By the end of Grade 8

Standard A Problem Solving

Students in the Diocese of Jefferson City will use a variety of strategies in the problem solving process.

Use a variety of strategies in the problem solving process.

Use backward and simpler form equations to solve word problems.

Use a variety of strategies to understand problem solving situations and processes.

Construct informal logical arguments to justify reasoning process and methods of solutions to problems and develop more efficient methods.

Standard B Properties and Concepts of Numbers

Students in the Diocese of Jefferson City will understand and apply basic and advanced properties of the concepts of numbers.

Understand the relationship among equivalent number representations and the advantages and disadvantages of each type of representation.

Convert among scientific notations.

Choose appropriate forms among fractions, decimals, percents, whole numbers, integers, ratios, exponents and scientific notation.

Understand the characteristics and properties of the set of real numbers and its subsets.

Distinguish between rational and irrational numbers.

Understand the characteristics and use of scientific notation.

Convert large and small numbers to scientific notation and back for more convenient representation.

Standard C Computation

Students in the Diocese of Jefferson City will use basic and advanced procedures while performing the processes of computation.

Understand the properties of operations with rational numbers.

Apply the distributive property to solve mathematical equations.

Understand the correct order of operations for performing arithmetic computations.

Solve equations involving squares and brackets.

Use proportional reasoning to solve mathematical and real world problems.

Use the constant rate of change to solve mathematical and real world problems.

Add, subtract, multiply and divide rational numbers.

Add, subtract, multiply and divide rational numbers.

Simplify rational expressions.

Standard D Measurement

Students in the Diocese of Jefferson City will understand and apply basic and advanced properties of the concepts of measurement.

Solve problems involving units of measurement and convert answers to a larger or smaller unit within the same system.

Solve problems and convert answers in cubic units within the same system.

Solve problems involving perimeter, circumference and area of various shapes.

Find perimeter, volume and surface area of irregular figures which can be divided into basic geometric shapes.

Select and use appropriate estimation techniques to solve real world problems.

Select and use appropriate estimation techniques to solve real world problems.

Standard E Geometry

Students in the Diocese of Jefferson City will understand and apply basic and advanced properties of the concepts of geometry.

Understand the basic concepts of the Pythagorean theorem.

Use the Pythagorean theorem to identify the third side of a right triangle when given the length of the other two sides.

Understand geometric transformation of figures.

Relate proportions to similarity (i.e. scale drawing).

Standard F Probability and Data Analysis

Students in the Diocese of Jefferson City will understand and apply basic and advanced concepts of probability and data analysis.

Select and use the best method of representing and describing a set of data.

Evaluate and identify valid and skewed data.

Determine probability using mathematical/theoretical simulations or experiments.

Predict outcomes based on experiments, simulations and mathematical calculations.

Standard G Functions and Algebra

Students in the Diocese of Jefferson City will understand and apply basic and advanced properties of functions and algebra.

Know that an expression is a mathematical statement using numbers and symbols to represent relationships and real world situations.

Express written sentences as mathematical expressions using negative exponents and cube roots.

Understand various representations of patterns and functions and the relationships among them and understand the concept of a function.

Understand the basic concept of a function.

Solve linear equations using concrete, formal and informal methods.

Solve linear equations using concrete, formal and informal methods.

Use the rectangular coordinate system to model and to solve problems.

Use the rectangular coordinate system to model and to solve problems.

Grade Level Performance Standards
Kindergarten

*Please refer to the list of **GRADE 4 EXIT LEVEL PERFORMANCE STANDARDS** for numbered competencies listed below.*

WITHIN our Kindergarten math curriculum, students will:

Standard A Problem Solving

Students in the Diocese of Jefferson City will use a variety of strategies in the problem solving process.

K.A.1 Justify the process he or she used to solve a numerical problem.
- a. Demonstrate strategies for solving problems.

K.A.2 Make organized lists, tables, or charts to solve a problem.
- a. Sort a group to find more or less.

K.A.3. Use whole number models to solve a problem.
- a. Match numbers and sets.

K.A.4 Use "guess and check" to solve problems.
- a. Use estimation.
- b. Use guess and check.

Standard B Properties and Concepts of Numbers

Students in the Diocese of Jefferson City will understand and apply basic and advanced properties of the concepts of numbers.

K.B.1 Understand that numbers are symbols used to represent quantities or attributes of real-world objects.
- a. Use one-to-one correspondence.
- b. Form numbers to match the correct amount of objects.

K.B.2 Count whole numbers (cardinal and ordinal).
- a. Count to 10, 20, 50 and 100 orally.
- b. Write numbers to 31.
- c. Count coins.
- d. State position 1-5.

K.B.3 Understand symbolic, concrete, and pictorial representations of numbers.
- a. Make sets of specific numbers of objects.
- b. Write the number related to the set made.
- c. Draw pictorial representations of sets.

K.B.4 Understand basic whole number relationships.
- a. Arrange numbers in sequences.
- b. Recognize more or less.
- c. Recognize numbers that come before, after or between given numbers.

K.B.5 Understand the concept of a unit and its subdivision into equal parts.
- a. Recognize units divided into equal parts.
- b. Identifies one-half of an object or set.

K.B.6 Understand the basic meaning of place value.
- a. Use tens and ones to demonstrate number values.

Standard C Computation

Students in the Diocese of Jefferson City will use basic and advanced procedures while performing the processes of computation.

K.C.1 Add and subtract whole numbers.
- a. Add numbers to six.
- b. Subtract numbers from six.
- c. Identify symbols of addition and subtraction (+, -, =)
- d. Demonstrate ability to add to or subtract from six in vertical and horizontal formats.

K.C.2 Solve real-world problems involving addition and subtraction of whole numbers.
- a. Solve simple problems using money.

K.C.3 Understand the inverse relationship between addition and subtraction.
- a. Recognize inverse in relational work.

Standard D Measurement

Students in the Diocese of Jefferson City will understand and apply basic and advanced properties of the concepts of measurement.

K.D.1 Understand the concept of time and how it is measured.
- a. Understand that certain activities require more or less time.
- b. Order events by picture cards (use first, next, or last).
- c. Participate in calendar activities.
- d. Use three picture cards to arrange sequence.

K.D.2 Know the processes for telling time, counting coins and measuring length, weight, and temperature, using basic standard and non-standard units.
- a. Tell time to the hour using analog and digital clock.
- b. Identify name and value of penny, nickel, dime and quarter.
- c. Measure weight and length of a given object.
- d. Compare 3 or more objects in length to determine shortest and longest.
- e. Use balance scale for weight to determine heaviest, lightest object.
- f. Distinguish between hot and cold temperatures.

Standard E Geometry

Students in the Diocese of Jefferson City will understand and apply basic and advanced properties of the concepts of geometry.

K.E.1 Understand the common language of spatial sense.
- a. Identify and draw plane figures—triangle, circle, rectangle, square.
- b. Identify solid figures by attributes.

Standard F Probability and Data Analysis

Students in the Diocese of Jefferson City will understand and apply basic and advanced concepts of probability and data analysis.

K.F.1 Understand that observations about objects or events can be organized and displayed in simple graphs.
   a. Identify and use position words.
   b. Sort objects by color, size, shape and use.
   c. Organize data into simple bar graphs.
   d. Use a number line to locate and sequence numbers.

K.F.2 Organize and display data in simple bar graphs, pie charts and line graphs.
   a. Sort objects by color, size, shape and use.
   b. Organize data into simple bar graphs.

Standard G Functions and Algebra

Students in the Diocese of Jefferson City will understand and apply basic and advanced properties of functions and algebra.

K.G.1 Recognize regularities in a variety of contexts.
   a. Find patterns in everyday life—clothes, nature, tile, etc.
   b. Sort objects by color, size, shape and use.

K.G.2 Extend simple patterns.
   a. Complete a pattern of objects.
   b. Create and extend an original pattern.

Grade Level Performance Standards
Grade One

*Please refer to the list of **GRADE 4 EXIT LEVEL PERFORMANCE STANDARDS** for numbered competencies listed below.*

WITHIN our First Grade math curriculum, students will:

Standard A Problem Solving

Students in the Diocese of Jefferson City will use a variety of strategies in the problem solving process.

1.A.1 Justify the process used to solve a numerical problem.
- a. Demonstrate and reproduce strategies for solving problems.
- b. Provide simple explanation for use of a strategy.

1.A.2 Make organized lists, tables, or charts to solve a problem.
- a. Sort a group and record information.
- b. Use information gathered to answer questions.

1.A.3 Use whole number models to solve a problem.
- a. Match numbers and sets.

1.A.4 Use "guess and check" to solve problems.
- a. Use estimation.
- b. Use guess and check to solve a problem.

Standard B Properties and Concepts of Numbers

Students in the Diocese of Jefferson City will understand and apply basic and advanced properties of the concepts of numbers.

1.B.1 Understand that numbers are symbols used to represent quantities or attributes of real-world objects.
- a. Compare groups to identify more and less.
- b. Form numbers to match the correct amount of objects.

1.B.2 Count whole numbers (cardinal and ordinal).
- a. Count and write numbers to 100.
- b. Identify even and odd numbers.
- c. Count mixed coins.
- d. Count by 2, 5, 10 and 20.
- e. State position 1-10.

1.B.3 Understand symbolic, concrete and pictorial representations of numbers.
- a. Make sets of specific numbers of objects.
- b. Draw pictorial representations of sets to solve computation problems.
- c. Build sets of 10's and 1's to demonstrate place value.

1.B.4 Understand basic whole number relationships.
- a. Arrange numbers in sequences.
- b. Recognize more or less.
- c. Recognize numbers that come before, after or between given numbers.

1.B.5 Understand the concept of a unit and its subdivision into equal parts.
   a. Recognize units divided into 2, 3, and 4 equal parts.
   b. Identify ½, 1/3, ¼ of an object or set.
   c. Compare fractional parts.

1.B.6 Understand the basic meaning of place value.
   a. Use tens and ones to determine place value.
   b. Relate standard number to expanded form with 10's and 1's. (i.e. 13 = one ten and three ones.)

Standard C Computation

Students in the Diocese of Jefferson City will use basic and advanced procedures while performing the processes of computation.

1.C.1 Add and subtract whole numbers.
   a. Add and subtract numbers to and from 12, in vertical and horizontal format.
   b. Add and subtract 2-digit numbers without regrouping.

1.C.2 Solve real-world problems involving addition and subtraction of whole numbers.
   a. Add and subtract real world problems in word problems.
   b. Determine math strategy to find a solution.
   c. Add and subtract money with and without regrouping.

1.C.3 Understand the inverse relationship between addition and subtraction.
   a. Use inverse relationships between addition and subtraction with fact families.

Standard D Measurement

Students in the Diocese of Jefferson City will understand and apply basic and advanced properties of the concepts of measurement.

1.D.1 Understand the concept of time and how it is measured.
   a. Understand that certain activities require more or less time for completion.
   b. Order events by picture cards, up to six cards.
   c. Participate in calendar activities.
   d. Use six picture cards to arrange sequences.

1.D.2 Know the processes for telling time, counting coins and measuring length, weight, and temperature, using basic standard and non-standard units.
   a. Tell time to the hour and half-hour using analog and digital clocks.
   b. Identify name and value of penny, nickel, dime and quarter.
   c. Count mixed coins.
   d. Apply knowledge of money to real life situations.
   e. Measure length using inches and centimeters.
   f. Measure weight using pounds and grams.
   g. Measure volume using cup, pint, quart and liter.
   h. Measure temperature using a thermometer.

Standard E Geometry

Students in the Diocese of Jefferson City will understand and apply basic and advanced properties of the concepts of geometry.

No performance standards for mastery at this level.

Standard F Probability and Data Analysis

Students in the Diocese of Jefferson City will understand and apply basic and advanced concepts of probability and data analysis.

1.F.1 Understand that observations about objects or events can be organized and displayed in simple graphs.
   a. Organize data in simple bar and pictographs.
   b. Use number lines to aid in computation.
   c. Use experiments to test probability when there are 2, 3 or 4 options.

1.F.2 Organize and display data in simple bar graphs, pie charts and line graphs.
   a. Sort objects by color, size, shape and use.
   b. Organize data into simple bar graphs.

Standard G Functions and Algebra

Students in the Diocese of Jefferson City will understand and apply basic and advanced properties of functions and algebra.

1.G.1 Recognize regularities in a variety of contexts.
   a. Identify patterns in sequences of letters and numbers.
   b. Count in intervals greater than one.

1.G.2 Extend simple patterns.
   a. Complete a pattern of objects, letters and numbers.
   b. Create and extend an original pattern.

Grade Level Performance Standards
Grade Two

*Please refer to the list of **GRADE 4 EXIT LEVEL PERFORMANCE STANDARDS** for numbered competencies listed below.*

WITHIN our Second Grade math curriculum, students will:

Standard A Problem Solving

Students in the Diocese of Jefferson City will use a variety of strategies in the problem solving process.

2.A.1 Justify the process used to solve a numerical problem.
- a. Demonstrate and reproduce strategies for solving problems.
- b. Provide a simple explanation for the use of a strategy.
- c. Provide a simple explanation for the use of a strategy using proper technology and/or vocabulary.

2.A.2 Make organized lists, tables or charts to solve a problem.
- a. Sort a group and record information.
- b. Use information gathered to answer questions.
- c. Chart information from a verbal survey to answer questions using a bar or pictograph (1:1 correspondence).

2.A.3 Use whole number models to solve a problem.
- a. Solve problems using fact families, counting on, and relating to the nearest ten.
- b. Use place value models to solve problems.

2.A.4 Use appropriate strategies to solve problems.
- a. Use estimation before solving.
- b. Use guess and check to solve problems.
- c. Check subtraction by addition.
- d. Create original problems.

Standard B Properties and Concepts of Numbers

Students in the Diocese of Jefferson City will understand and apply basic and advanced properties of the concepts of numbers.

2.B.1 Understand that numbers are symbols used to represent quantities or attributes of real-world objects.
- a. Compare groups to identify more and less.
- b. Form numbers to match the correct amount of objects.
- c. Use greater than, less than and equal to compare numbers and groups.

2.B.2 Count whole numbers (cardinal and ordinal).
- a. Count and write to 1000.
- b. Identify even and odd numbers.
- c. Count mixed coins and make change from $1.00 or the nearest 10.
- d. Count by 1, 2, 5, 10, 25, 50, and 100.
- e. State position 1-12.

2.B.3 Understand symbolic, concrete, and pictorial representations of numbers.
   a. Make sets of specific numbers of objects.
   b. Write numbers related to sets made.
   c. Draw pictorial representations of sets to solve computation problems.
   d. Build sets of 100's, 10's and 1's to demonstrate place value.

2.B.4 Understand basic whole number relationships.
   a. Arrange numbers in sequence.
   b. Recognize more or less.
   c. Recognize numbers that come before, after or between given numbers.
   d. Place numbers in sequence using different intervals.

2.B.5 Understand the concept of a unit and its subdivision into equal parts.
   a. Recognize units divided into 2-8 equal parts.
   b. Identify ½, 1/3, ¼, 2/3, 2/4, and ¾ of an object or set.
   c. Compare fractional parts.

2.B.6 Understand the basic meaning of place value.
   a. Use hundreds, tens and ones to determine place value.
   b. Relate standard number to expanded form with 100's, 10's and 1's (e.g. 13=one ten and three ones).
   c. Use 100's, 10's and 1's for addition and subtraction with regrouping.

Standard C Computation

Students in the Diocese of Jefferson City will use basic and advanced procedures while performing the processes of computation.

2.C.1 Add and subtract whole numbers.
   a. Add and subtract numbers to and from 18, in vertical and horizontal format.
   b. Add and subtract 2-digit numbers with and without regrouping.
   c. Perform column addition with three 2-digit numbers including regrouping.

2.C.2 Solve real world problems involving addition and subtraction of whole numbers.
   a. Add and subtract real world problems in word problems.
   b. Determine math strategy to find a solution.
   c. Add and subtract money with and without regrouping.

2.C.3 Understand the inverse relationship between addition and subtraction.
   a. Use inverse relationships between addition and subtraction with fact families.

Standard D Measurement

Students in the Diocese of Jefferson City will understand and apply basic and advanced properties of the concepts of measurement.

2.D.1 Understand the concept of time and how it is measured.
   a. Understand that time elapses from the beginning to the end of an event.
   b. Participate in calendar activities.

2.D.2 Know the process for telling time, counting coins and measuring length, weight and temperature using basic standard and non-standard units.
   a. Tell time to the hour and half-hour, quarter hour and 5-minute intervals using analog and digital clocks.
   b. Solve problems using elapsed time.

c. Apply knowledge of money to real situations—make and count change to $1.00 or to the nearest ten.
d. Identify name and value of penny, nickel, dime, quarter, half dollar and dollar.
e. Count mixed coins.
f. Apply knowledge of money to real life situations.
g. Measure length using inches, centimeters, feet and meters.
h. Measure weight using pounds and grams, kilograms and ounces.
i. Measure volume (capacity) using cup, pint, quart, gallon, liter and milliliter.
j. Measure temperature using Celsium and Fahrenheit.

Standard E Geometry

Students in the Diocese of Jefferson City will understand and apply basic and advanced properties of the concepts of geometry.

No performance standards for mastery at this level.

Standard F Probability and Data Analysis

Students in the Diocese of Jefferson City will understand and apply basic and advanced concepts of probability and data analysis.

2.F.1 Understand that observations about objects or events can be organized and displayed in simple graphs.
a. Use tables and charts to organize data.
b. Use bar graphs, circle graphs, and pictographs to sort and display data.
c. Use experiments to test probability when there are a variety of options.
d. Use number lines for counting and computation.

2.F.2 Organize and display data in simple bar graphs, pie charts and line graphs.
a. Sort objects by color, size, shape and use.
b. Organize data into simple bar and line graphs.

Standard G Functions and Algebra

Students in the Diocese of Jefferson City will understand and apply basic and advanced properties of functions and algebra.

2.G.1 Recognize regularities in a variety of contexts.
a. Recognize words in sequences of letters and numbers.
b. Count in intervals greater than one.

2.G.2 Extend simple patterns.
a. Complete a pattern of objects, letters, and numbers.
b. Create and extend an original pattern.
c. Complete a pattern using letter groups and numbers greater than 10.

Grade Level Performance Standards
Grade Three

*Please refer to the list of **GRADE 4 EXIT LEVEL PERFORMANCE STANDARDS** for numbered competencies listed below.*

WITHIN our Third Grade math curriculum, students will:

Standard A Problem Solving

Students in the Diocese of Jefferson City will use a variety of strategies in the problem solving process.

3.A.1 Use reasoning abilities to perceive patterns, identify relationships between addition and multiplication, formulate questions for further exploration, justify strategies, check if results are reasonable.
- a. Identify the properties or characteristics of patterns.
- b. Extend geometric and numerical patterns.
- c. Use a variety of strategies to solve problems.
- d. Create a physical example.
- e. Use the four-step problem solving method (understand question, determine a strategy, solve the problem, and evaluate the solution.)

3.A.2 Communicate mathematical ideas in a variety of ways.
- a. Use words.
- b. Use numbers or symbols.
- c. Use pictures.
- d. Use charts, graphs or tables.
- e. Use diagrams and models.

3.A.3 Connect mathematical learning with other subjects, personal experiences, current events and personal interest.
- a. See relationship between various kinds of problems and actual events.
- b. Relate actual time to daily activities.
- c. Use mathematics as a way to understand other curriculum areas.

3.A.4 Use appropriate mathematical vocabulary, symbols, and notation with understanding based on prior conceptual work.
- a. Use +, -, =, <, >, x, and ÷.

3.A.5 Explain solutions to problems clearly and logically in oral and written work and support solutions with evidence.
- a. Use sentences to explain solutions.
- b. Use drawings or pictures to explain solutions.

Standard B Properties and Concepts of Numbers

Students in the Diocese of Jefferson City will understand and apply basic and advanced properties of the concepts of numbers.

3.B.1 Represent and explain whole numbers and fractions with a variety of models.
- a. Use physical materials.

b. Use number lines and other pictorial models.
c. Use verbal descriptions.
d. Use place-value concepts to notation to 100,000.
e. Use symbolic renaming (e.g. 43=40+3=30+13).

3.B.2 Determine the number of objects in a set.
a. Group and count objects.
b. Use number theory principles; identify and continue numerical patterns, skip count odd and even numbers.
c. Combine and arrange numbers; compare equivalent and non-equivalent money amounts.
d. Estimate, including rounding; round whole numbers to the nearest tens and hundreds places.

3.B.3 Read, write and order up to 4-digit whole numbers and simple fractions.
a. Read, write and order fourths, tenths, and unit fractions (which have one as the numerator).

3.B.4 Identify and represent equivalent fractions.
a. Recognize equivalence between half, fourths and eighths.

Standard C Computation

Students in the Diocese of Jefferson City will use basic and advanced procedures while performing the processes of computation.

3.C.1 In problem solving situations involving whole numbers, select and efficiently use appropriate computational procedures.
a. Recall basic facts of addition, subtraction, multiplication and division (multiplication and division facts 0-9).
b. Use mental math.
c. Use estimation.
d. Select and apply algorithms for addition, subtraction, multiplication and division. (Add and subtract 3 and 4-digit numbers with regrouping.)
e. Use a calculator to assist and check solutions to problems.

Standard D Measurement

Students in the Diocese of Jefferson City will understand and apply basic and advanced properties of the concepts of measurement.

3.D.1 Recognize and describe measurable attributes and identify the appropriate units and tools to measure them.
a. Measure length.
b. Measure liquid capacity.
c. Measure time.
d. Measure weight (mass).
e. Measure temperature.
f. Measure volume.
g. Measure monetary value.
h. Measure angle size.

3.D.2 Demonstrate understanding of basic facts, principles and techniques of measurement.
   a. Appropriately use non-standard and standard units (metric and U.S.).
   b. Select appropriate unit of measure (mile/foot/inch).
   c. Appropriately use and convert units within a system (yards, feet, inches; kilograms and grams; gallons, quarts, pints and cups).
   d. Judge the reasonableness of an obtained measurement as it relates to prior experience and familiar benchmarks.

3.D.3 Determine measurements directly by using standard tools to the suggested degree of accuracy.
   a. Measure length to the nearest half-inch or centimeter.
   b. Measure temperature to the nearest 5 degrees.
   c. Measure to the nearest one-minute interval.
   d. Measure monetary value of dollars and cents to a total of $10.00.
   e. Measure liquid capacity to the nearest fluid ounce.

3.D.4 Determine measurements by using basic relationships and approximate by using estimation techniques.
   a. Estimate lengths to the nearest inch, foot, centimeter and meter.

Standard E Geometry

Students in the Diocese of Jefferson City will understand and apply basic and advanced properties of the concepts of geometry.

3.E.1 Describe two and tree dimensional figures (circles, polygons, trapezoids, prisms, spheres, etc.).
   a. Identify and name properties of two and three dimensional figures.
   b. Compare, sort and classify two and three-dimensional figures.
   c. Draw and construct physical models for two-dimensional figures.
   d. Explain how figures relate to objects in the environment.

3.E.2 Use physical materials and motion geometry (slides, flips and turns) to identify properties and relationships.
   a. Identify symmetry, congruence, and similarity of figures.

Standard F Probability and Data Analysis

Students in the Diocese of Jefferson City will understand and apply basic and advanced concepts of probability and data analysis.

3.F.1 Work with data in the context of real world situations.
   a. Formulate questions that lead to data collection and analysis.
   b. Determine what data to collect and how to collect it.
   c. Collect, organize and display data.
   d. Draw reasonable conclusions based on data.

3.F.2 In problem solving situations, read, extract, interpret and use information presented in graphs, tables or charts.
   a. Use information in graphs, tables or charts to answer questions and solve problems.

3.F.3 Predict outcomes of future events and test predictions using data from a variety of sources.
   a. Conduct experiments in which numerical data can be collected.
   b. Analyze data for meaning.

Standard G Functions and Algebra

Students in the Diocese of Jefferson City will understand and apply basic and advanced properties of functions and algebra.

3.G.1 Use letters, boxes or other symbols to stand for any number, measured quantity, or object in simple situations.
   a. Use variables in problem solving.

3.G.2 Use the vocabulary, symbols and notation of algebra accurately.
   a. Use the "=" sign correctly to show equality.
   b. Effectively use the associative property of multiplication.
   c. Use variables in problem solving.

3.G.3 Work with simple linear patterns and relationships in a variety of ways.
   a. Recognize and extend number patterns.
   b. Describe number patterns verbally.
   c. Represent number patterns with pictures, tables, charts, or graphs.
   d. Recognize that different models can represent the same pattern or relationship.
   e. Use them to describe real world phenomena.

3.G.4 Recognize variability in simple functional relationships by describing how a change in one quantity can produce a change in another.
   a. Describe the role of both time and distance in rate problems.
   b. Recognize that a change in one quantity affects the other in rate problems.

3.G.5 Use simple equations and inequalities in a variety of ways.
   a. Write number sentences that model real life situations.
   b. Solve equations using different methods.
   c. Record and describe solution strategies.
   d. Solve simple word problems.

3.G.6 Recognize and use generalized properties and relationships of arithmetic.
   a. Demonstrate the commutative property of addition and multiplication of whole numbers.

Grade Level Performance Standards
Grade Four

*Please refer to the list of **GRADE 4 EXIT LEVEL PERFORMANCE STANDARDS** for numbered competencies listed below.*

WITHIN our Fourth Grade math curriculum, students will:

Standard A Problem Solving

Students in the Diocese of Jefferson City will use a variety of strategies in the problem solving process.

4.A.1 Use reasoning strategies.
- a. Perceive patterns.
- b. Describe the properties and characteristics of patterns having two or more attributes.
- c. Extend simple and geometric patterns.
- d. Identify relationships between multiplication and division.
- e. Formulate questions for further exploration.
- f. Justify strategies.

4.A.2 Use a variety of problem solving strategies.
- a. Use guess and check, modeling and looking for patterns to solve problems.
- b. Use the 4-step problem solving process.
- c. Solve 2-step problems.

4.A.3 Communicate mathematical ideas in a variety of ways.
- a. Communicate mathematical ideas orally.
- b. Communicate using numbers and symbols.
- c. Communicate using pictures.
- d. Communicate using charts, graphs and tables.
- e. Communicate using diagrams and models.

4.A.4 Connect mathematical learning with other subjects, personal experiences, current events and personal interest.
- a. See relationships between various kinds of problems and actual events.
- b. Relate actual time to daily activities.
- c. Use mathematics as a way to understand other curriculum areas.
- d. Use numerical data to interpret experimental results.

4.A.5 Use appropriate mathematical vocabulary, symbols, and notation with understanding based on prior conceptual work.
- a. Use appropriate mathematical symbols for computation, equality and inequality.
- b. Use appropriate terms when writing about or discussing math.

4.A.6 Explain solutions to problems clearly and logically in oral and written work and support solutions with evidence.
- a. Use numerical data from experiments to explain results.

Standard B Properties and Concepts of Numbers

Students in the Diocese of Jefferson City will understand and apply basic and advanced properties of the concepts of numbers.

4.B.1 Represent and explain whole numbers and fractions.
   a. Use physical materials.
   b. Use number lines and other pictorial models.
   c. Use verbal descriptions.
   d. Use place value concepts to notation to 100,000.
   e. Use symbolic renaming (e.g. 43=40+3=30+13).

4.B.2 Determine the number of things in a set.
   a. Use number theory principles: identify and continue numerical patterns, skip count odd and even numbers.
   b. Round whole numbers to the nearest tens, hundreds or thousands place.

4.B.3 Read, write and order up to 4-digit whole numbers and simple fractions.
   a. Read, write and order up to 4-digit whole numbers.
   b. Read, write and order unit fractions and non-unit fractions in thirds, fifths, sixths, eighths, tenths and twelfths.

4.B.4 Identify and represent equivalent fractions.
   a. Identify and represent equivalent fractions in halves, thirds, fourths, fifths, sixths, eighths, tenths, and twelfths.

Standard C Computation

Students in the Diocese of Jefferson City will use basic and advanced procedures while performing the processes of computation.

4.C.1 In problem solving situations involving whole numbers, select and efficiently use appropriate computational procedures.
   a. Recall basic facts of addition, subtraction, multiplication and division.
   b. Use mental math.
   c. Use estimation.
   d. Select and apply algorithms for addition, subtraction, multiplication and division.
      1) Multiply a 2, 3, or 4-digit number by a 1 or 2 digit number with regrouping.
      2) Multiply by 10, 100, and 1000.
      3) Divide 3-digits by 1 digit with remainders.
   e. Use opposite operations to check computation.
   f. Use a calculator to assist and check solutions to problems.

4.C.2 Add and subtract fractions with like denominators.
   a. Add and subtract fractions with like denominators.

4.C.3 In problem solving situations involving money, add and subtract decimals.
   a. Use dollar and cents models to add and subtract decimals.

Standard D Measurement

Students in the Diocese of Jefferson City will understand and apply basic and advanced properties of the concepts of measurement.

4.D.1 Recognize and describe measurable attributes such as length, liquid capacity, time, weight (mass), temperature and volume.
   a. Recognize and describe measurable attributes of objects and groups.

b. Use appropriate standard, non-standard and metric units to describe measurable attributes.

4.D.2 Demonstrate understanding of basic facts, principles and techniques of measurement.
   a. Use appropriate non-standard and standard units (metric and US).
   b. Select appropriate unit of measure (mile/foot/inch).
   c. Use and convert units within a system (yards, feet, inches; kilograms and grams; gallons, quarts, pints and cups; seconds, minutes and hours).
   d. Judge the reasonableness of an obtained measurement as it relates to prior experience and familiar benchmarks.

4.D.3 Determine measurements directly by using standard tools to the suggested degree of accuracy.
   a. Measure length to the nearest one-fourth inch or centimeter.
   b. Measure weight to the nearest ounce or gram.
   c. Measure time to the nearest one-minute interval.
   d. Measure monetary value of dollars and cents to a total of $20.00.

4.D.4 Determine measurements by using basic relationships (such as perimeter and area) and approximate by using estimation techniques.
   a. Calculate perimeter of triangles, rectangles, squares and other polygons.
   b. Calculate area of squares and rectangles.

Standard E Geometry

Students in the Diocese of Jefferson City will understand and apply basic and advanced properties of the concepts of geometry.

4.E.1 Describe two and three-dimensional figures (circles, polygons, trapezoids, prisms, spheres, etc.).
   a. Identify and state properties.
   b. Compare, sort and classify.
   c. Draw and construct physical models for two-dimensional figures.
   d. Explain how figures relate to objects in the environment.

4.E.2 Use physical materials and motion geometry (slides, flips and turns) to identify properties and relationships.
   a. Determine symmetry, congruence and similarity of plane figures.
   b. Describe slides, flips and turns of congruent plane figures.

4.E.3 Identify and use relationships among figures.
   a. Identify location of figures (between, adjacent to, interior of).
   b. Identify position of figures (parallel, perpendicular)
   c. Identify intersections of 2-dimensional figures.

4.E.4 Use simple two-dimensional coordinate systems to find locations on maps and to represent points and simple figures.
   a. Use x and y to describe a coordinate plane.

Standard F Probability and Data Analysis

Students in the Diocese of Jefferson City will understand and apply basic and advanced concepts of probability and data analysis.

4.F.1 Work with data in the context of real world situations.
   a. Formulate questions that lead to data collection and analysis.
   b. Determine what data to collect and how to collect it.
   c. Collect, organize and display data.
   d. Draw reasonable conclusions based on data.

4.F.2 Describe a set of data.
   a. Describe high and low values and range.
   b. Describe the most frequent value (mode).
   c. Describe the middle value of a set of ordered data (median).

4.F.3 In problem solving situations, read, extract, interpret and use information presented in graphs, tables or charts.
   a. Use graphs, tables and charts to answer questions and solve problems.

4.F.4 Determine if future events are more, less or equally likely, impossible or certain to occur.
   a. Use prior experience to determine the probability that future events will occur.

4.F.5 Predict outcomes of future events and test predictions using data from a variety of sources.
   a. Use numerical data from experiments to predict outcomes.

Standard G Functions and Algebra

Students in the Diocese of Jefferson City will understand and apply basic and advanced properties of functions and algebra.

4.G.1 Use letters, boxes or other symbols to stand for any number, measured quantity, or object in simple situations.
   a. Solve simple equations based on fact families containing variables.

4.G.2 Use the vocabulary, symbols and notation of algebra accurately.
   a. Use the "=" symbol correctly.
   b. Effectively use the associative property of multiplication.
   c. Use variables in equation.

4.G.3 Work with simple linear patterns and relationships in a variety of ways.
   a. Recognize and extend number patterns.
   b. Describe simple patterns verbally.
   c. Represent patterns with pictures, tables, charts, graphs.
   d. Recognize that different models can represent the same pattern or relationship.
   e. Use patterns to describe real-world phenomena.

4.G.4 Recognize variability in simple functional relationships by describing how a change in one quantity can produce a change in another.
   a. Solve problems involving rate.

4.G.5 Use simple equations and inequalities in a variety of ways.
   a. Use simple equations to represent problem situations.
   b. Solve simple equations by different methods.
   c. Record and describe solution strategies.

4.G.6 Recognize and use generalized properties and relationships of arithmetic.
   a. Use the associative and commutative properties of addition and multiplication.

Grade Level Performance Standards
Grade Five

*Please refer to the list of **GRADE 8 EXIT LEVEL PERFORMANCE STANDARDS** for numbered competencies listed below.*

WITHIN our Fifth Grade math curriculum, students will:

Standard A Problem Solving

Students in the Diocese of Jefferson City will use a variety of strategies in the problem solving process.

5.A.1 Use reasoning abilities.
- a. Evaluate information.
- b. Perceive patterns-extend growing numerical and geometric patterns.
- c. Identify relationships between concepts.
- d. Formulate questions for further exploration.
- e. Evaluate strategies.
- f. Use a variety of strategies (using simpler numbers, make tables).
- g. Justify statements.
- h. Check if results are reasonable.
- i. Defend work.

5.A.2 Communicate logical arguments clearly to show why a result makes sense.
- a. Defend answers to problems with multiple solutions.

5.A.3 Analyze non-routine problems by modeling, illustrating, guessing, simplifying, generalizing, or shifting to another point of view.

5.A.4 Develop effective oral and written presentations.
- a. Apply appropriate use of technology including use of formulas in spreadsheets.
- b. Apply the conventions of mathematics (e.g. symbols, definitions, labeled drawings).
- c. Use appropriate mathematical language.
- d. Demonstrate clear organization of ideas and procedures.
- e. Demonstrate an understanding of purpose and audience.

5.A.5 Explain mathematical concepts and procedures, and ideas to others who may not be familiar with them.
- a. Work independently using a written text.
- b. Apply mathematical concepts across the curriculum.

Standard B Properties and Concepts of Numbers

Students in the Diocese of Jefferson City will understand and apply basic and advanced properties of the concepts of numbers.

5.B.1 Read, represent and interpret various rational numbers with verbal descriptions, geometric models and mathematical notation.
- a. Identify place value to billions.
- b. Round numbers to ten thousand.
- c. Write decimals to thousandths.
- d. Write improper fractions for numbers.

e. Write whole numbers in expanded notation.

5.B.2 Generate and explain equivalencies among fractions and decimals.
   a. Find equivalent fractions.
   b. Simplify fractions.
   c. Recognize equalities between fractions and common decimals (e.g. 0.5, 0.25)

5.B.3 Express order relationships among rational numbers (decimals) using appropriate symbols (<, >)
   a. Write inequalities among decimals using appropriate symbols.

5.B.4 Model and solve problems involving number theory concepts.
   a. Identify prime and composite numbers.
   b. Use number theory principles: multiples, factors, prime and composite numbers.

Standard C Computation

Students in the Diocese of Jefferson City will use basic and advanced procedures while performing the processes of computation.

5.C.1 Perform and explain operations using rational numbers.
   a. Multiply 3-digit numbers.
   b. Divide 3-digit numbers by 2 digit divisors with remainders.
   c. Add and subtract fractions having unlike denominators.
   d. Add, subtract, multiply and divide decimals through the thousandths.

5.C.2 In problems solving situations, select and use appropriate computational procedures with rational numbers.
   a. Calculate mentally using a variety of strategies.
   b. Estimate solutions to problems.
   c. Create, use and explain algorithms using technology.

Standard D Measurement

Students in the Diocese of Jefferson City will understand and apply basic and advanced properties of the concepts of measurement.

5.D.1 Demonstrate understanding of basic measurement facts, principles and techniques.
   a. Demonstrate understanding of basic measurement facts, principles and techniques.

5.D.2 Determine measurement directly using standard units (metric and US).
   a. Measure length to the nearest one-eighth inch, centimeter, meter, millimeter.

5.D.3 Determine measurements indirectly by using various strategies.
   a. Estimate measurements.
   b. Use geometric formulas to derive perimeter and area of rectangles and squares.

Standard E Geometry

Students in the Diocese of Jefferson City will understand and apply basic and advanced properties of the concepts of geometry.

5.E.1 Describe two-dimensional figures.
   a. Name, define and give examples.
   b. Identify different types of quadrilaterals.
   c. Name polygons having 3 to 10 sides.

d. Compare, sort and classify polygons.
e. Draw and construct physical models to specifications.
f. Measure and draw angles.
g. Explain how figures relate to objects in the environment.

5.E.2 Locate objects using the rectangular coordinate system.
a. Use ordered pair notation to describe points in the coordinate plane.

Standard F Probability and Data Analysis

Students in the Diocese of Jefferson City will understand and apply basic and advanced concepts of probability and data analysis.

5.F.1 Organize and display data from statistical investigations using appropriate tables, graphs and/or charts.
a. Construct appropriate tables, charts and graphs to display data.
b. Use technology to construct tables, charts and graphs.

5.F.2 Extract, interpret, and analyze information from organized and displayed data.
a. Determine central tendencies of data (mean, median, mode and range).

5.F.3 Use the results of data analysis.
a. Make predictions.
b. Develop convincing arguments.
c. Draw conclusions.

5.F.4 Determine the likelihood of occurrence of simple events.
a. Apply theoretical notions of probability (e.g. that four equally likely events have a 25% chance of happening).

Standard G Functions and Algebra

Students in the Diocese of Jefferson City will understand and apply basic and advanced properties of functions and algebra.

5.G.1 Work with algebraic expressions in a variety of ways.
a. Evaluate expressions through numerical substitution of whole numbers.

5.G.2 Use the vocabulary, symbols, and notation of algebra accurately.
a. Use the "=" symbol correctly.
b. Effectively use the associative property of multiplication.

5.G.3 Work with simple linear patterns and relationships in a variety of ways.
a. Recognize and extend number patterns.
b. Verbally describe patterns and relationships.
c. Represent patterns and relationships with pictures, tables, charts and graphs.
d. Recognize that different models can represent the same pattern or relationship.
e. Use patterns and relationships to describe real world phenomena.

5.G.4 Recognize variability in simple functional relationships by describing how a change in one quantity can produce a change in another.
a. Solve problems involving rate and unit price.

5.G.5 Use simple equations and inequalities in a variety of ways.
   a. Use equations to represent problem situations.
   b. Solve equations by different methods.
   c. Record and describe solution strategies.

5.G.6 Recognize and use generalized properties and relationships of arithmetic.
   a. Explain, model, and use the commutative properties of addition and multiplication.
   b. Explain, model and use the associative properties of addition and multiplication.

Grade Level Performance Standards
Grade Six

*Please refer to the list of **GRADE 8 EXIT LEVEL PERFORMANCE STANDARDS** for numbered competencies listed below.*

WITHIN our Sixth Grade math curriculum, students will:

Standard A Problem Solving

Students in the Diocese of Jefferson City will use a variety of strategies in the problem solving process.

6.A.1 Use a variety of strategies in the problem solving process.
- a. Formulate a problem.
- b. Determine information necessary to solve a problem.
- c. Select methods to obtain information.
- d. Set limits for acceptable solutions.

6.A.2 Use a variety of strategies to understand problem solving situations and processes.
- a. Use guess and check, listing and diagramming to solve word problems.

Standard B Properties and Concepts of Numbers

Students in the Diocese of Jefferson City will understand and apply basic and advanced properties of the concepts of numbers.

6.B.1 Understand the relationship among equivalent number representations.
- a. Convert among fractions, decimals, percents and whole numbers.

6.B.2 Understand the characteristics and properties of the set of real numbers and its subsets.
- a. Distinguish and order whole numbers, fractions, decimals and integers.

6.B.3 Understand basic number theory concepts.
- a. Use number theory concepts (e.g. divisibility, remainders, factors, multiples, prime and composite numbers) to solve problems.

Standard C Computation

Students in the Diocese of Jefferson City will use basic and advanced procedures while performing the processes of computation.

6.C.1 Understand the properties of operations with rational numbers.
- a. Apply the commutative and associative properties of multiplication and addition to solve problems.

6.C.2 Understand the correct order of operations for performing arithmetic computations.
- a. Use the proper order of operations involving addition, subtraction, multiplication, division and parentheses.

6.C.3 Use proportional reasoning to solve mathematical and real world problems.
- a. Use equivalent fractions to solve mathematical and real world problems.

6.C.4 Add, subtract, multiply and divide whole numbers, fractions and decimals.
- a. Add, subtract, multiply and divide whole numbers, fractions and decimals.

Standard D Measurement

Students in the Diocese of Jefferson City will understand and apply basic and advanced properties of the concepts of measurement.

6.D.1 Solve problems involving units of measurement and convert answers to a larger or smaller unit within the same system.
- a. Solve problems involving units of measurement and convert answers to a larger or smaller unit within the same system.
- b. Add and subtract inches, yards, miles and time.

6.D.2 Solve problems involving perimeter, circumference and area of various shapes.
- a. Use appropriate formulas to find perimeter of polygons and area of rectangles, parallelograms and triangles.

6.D.3 Select and use standard and non-standard units and tools, depending on the degree of accuracy required to find measurements for real world problems.
- a. Select and use standard and nonstandard units and tools dependent on the degree of precision required to measure.

Standard E Geometry

Students in the Diocese of Jefferson City will understand and apply basic and advanced properties of the concepts of geometry.

6.E.1 Understand the defining properties of basic three-dimensional figures.
- a. Define the properties of basic three-dimensional figures (i.e. cube, rectangular prism) and identify other three-dimensional figures.

6.E.2 Understand geometric transformation of figures.
- a. Perform slides, flips and turns on polygons.

6.E.3 Understand the mathematical concepts of similarity and congruency.
- a. Identify congruency of two-dimensional figures.

6.E.4 Understand geometric constructions.
- a. Construct congruent angles and line segments.
- b. Bisect angles and line segments.

Standard F Probability and Data Analysis

Students in the Diocese of Jefferson City will understand and apply basic and advanced concepts of probability and data analysis.

6.F.1 Understand measures of central tendency, frequency distribution, and variability and their applications to specific situations.
- a. Identify and compute mean, median, mode and range.

6.F.2 Select and use the best method of representing and describing a set of data.
- a. Read and interpret charts, tables, and plots (i.e. stem and leaf, box and whisker, and scatter).

6.F.3 Determine probability using mathematical/theoretical models and simulations or experiments.
- a. Determine probability using simulations and experiments.

Standard G Functions and Algebra

Students in the Diocese of Jefferson City will understand and apply basic and advanced properties of functions and algebra.

6.G.1 Know that an expression is a mathematical statement using numbers and symbols to represent relationships and real world situations.

a. Express written sentences as mathematical expressions using numbers and symbols (x, ÷, +, -, <, >, =),

6.G.2 Understand various representations of patterns and functions and the relationships among them.

a. Use various patterns and relationships among representations of functions.

Grade Level Performance Standards
Grade Seven

*Please refer to the list of **GRADE 8 EXIT LEVEL PERFORMANCE STANDARDS** for numbered competencies listed below.*

WITHIN our Seventh Grade math curriculum, students will:

Standard A Problem Solving

Students in the Diocese of Jefferson City will use a variety of strategies in the problem solving process.

7.A.1 Use a variety of strategies in the problem solving process.
- a. Use tables to solve word problems.
- b. Differentiate between needed and unneeded information to solve word problems.
- c. Express word problems as algebraic equations.

7.A.2 Use a variety of strategies to understand problem solving situations and processes.
- a. Generalize from a pattern of observations.
- b. Make conjectures.
- c. Provide supporting arguments for conjectures.

Standard B Properties and Concepts of Numbers

Students in the Diocese of Jefferson City will understand and apply basic and advanced properties of the concepts of numbers.

7.B.1 Understand the relationship among equivalent number representations.
- a. Convert between integers, ratios and exponents.

7.B.2 Understand the characteristics and properties of the set of real numbers and its subsets.
- a. Distinguish and order integers and rational numbers.

7.B.3 Understand the use of exponents.
- a. Convert between mathematical expressions and exponents.

Standard C Computation

Students in the Diocese of Jefferson City will use basic and advanced procedures while performing the processes of computation.

7.C.1 Understand the properties of operations with rational numbers.
- a. Apply the inverse property to solve equations.

7.C.2 Use proportional reasoning to solve mathematical and real world problems.
- a. Use percent, proportions and ratios to solve mathematical and real world problems.

7.C.3 Add, subtract, multiply and divide whole numbers, fractions and decimals.
- a. Add, subtract, multiply and divide integers.

7.C.4 Understand when an estimate is more appropriate than an exact answer for a variety of problem situations.
- a. Use estimation skills when appropriate in problem solving.

Standard D Measurement

Students in the Diocese of Jefferson City will understand and apply basic and advanced properties of the concepts of measurement.

7.D.1 Solve problems involving units of measurement and convert answers to a larger or smaller unit within the same system.
   a. Solve problems involving units of measurement and convert answers to a larger or smaller unit within the same system.

7.D.2 Solve problems involving perimeter, circumference and area of various shapes.
   a. Find circumference of a circle using a formula.
   b. Find area of trapezoids and circles using formulas.

Standard E Geometry

Students in the Diocese of Jefferson City will understand and apply basic and advanced properties of the concepts of geometry.

7.E.1 Understand the defining properties of more advanced three-dimensional figures.
   a. Define properties of cylinders, pyramids, cones, spheres and all other three dimensional figures.

7.E.2 Understand geometric transformation of figures.
   a. Form combined rotations, translations, reflections (diagonal, vertical, horizontal).
   b. Understand correlation of slides, flips and turns.

7.E.3 Understand the mathematical concepts of similarity and congruency.
   a. Identify congruency and similarities of two-dimensional figures.

7.E.4 Understand geometric constructions.
   a. Use compass and straightedge to construct parallel lines, perpendicular lines and congruent triangles.

Standard F Probability and Data Analysis

Students in the Diocese of Jefferson City will understand and apply basic and advanced concepts of probability and data analysis.

7.F.1 Understand measures of central tendency, frequency distribution, and variability and their applications to specific situations.
   a. Understand and compute central tendency, frequency and distribution.

7.F.2 Select and use the best method of representing and describing a set of data.
   a. Select and use the best method of representing and describing a set of data.
   b. Defend selected method.

7.F.3 Determine probability using mathematical/theoretical models and simulations or experiments.
   a. Determine probability using mathematical/theoretical models and simulations or experiments.

Standard G Functions and Algebra

Students in the Diocese of Jefferson City will understand and apply basic and advanced properties of functions and algebra.

7.G.1 Know that an expression is a mathematical statement using numbers and symbols to represent relationships and real world situations.
   a. Express written sentences as mathematical expressions using pi, brackets and square roots.

7.G.2 Understand various representations of patterns and functions and the relationships among them.
   a. Use various representations of functions.

7.G.3 Solve linear equations using concrete, formal and informal methods.
   a. Solve linear equations using concrete, formal and informal methods.

Grade Level Performance Standards
Grade Eight

*Please refer to the list of **GRADE 8 EXIT LEVEL PERFORMANCE STANDARDS** for numbered competencies listed below.*

WITHIN our Eighth Grade math curriculum, students will:

Standard A Problem Solving

Students in the Diocese of Jefferson City will use a variety of strategies in the problem solving process.

8.A.1 Use a variety of strategies in the problem solving process.
- a. Use backward and simpler form equations to solve word problems.

8.A.2 Use a variety of strategies to understand problem solving situations and processes.
- a. Construct informal logical arguments to justify reasoning process and methods of solutions to problems and develop more efficient methods.

Standard B Properties and Concepts of Numbers

Students in the Diocese of Jefferson City will understand and apply basic and advanced properties of the concepts of numbers.

8.B.1 Understand the relationship among equivalent number representations and the advantages and disadvantages of each type of representation.
- a. Convert among scientific notations.
- b. Choose appropriate forms among fractions, decimals, percents, whole numbers, integers, ratios, exponents and scientific notation.

8.B.2 Understand the characteristics and properties of the set of real numbers and its subsets.
- a. Distinguish between rational and irrational numbers.

8.B.3 Understand the characteristics and use of scientific notation.
- a. Convert large and small numbers to scientific notation and back for more convenient representation.

Standard C Computation

Students in the Diocese of Jefferson City will use basic and advanced procedures while performing the processes of computation.

8.C.1 Understand the properties of operations with rational numbers.
- a. Apply the distributive property to solve mathematical equations.

8.C.2 Understand the correct order of operations for performing arithmetic computations.
- a. Solve equations involving squares and brackets.

8.C.3 Use proportional reasoning to solve mathematical and real world problems.
- a. Use the constant rate of change to solve mathematical and real world problems.

8.C.4 Add, subtract, multiply and divide rational numbers.
- a. Add, subtract, multiply and divide rational numbers.
- b. Simplify rational expressions.

Standard D Measurement

Students in the Diocese of Jefferson City will understand and apply basic and advanced properties of the concepts of measurement.

8.D.1 Solve problems involving units of measurement and convert answers to a larger or smaller unit within the same system.
   a. Solve problems and convert answers in cubic units within the same system.

8.D.2 Solve problems involving perimeter, circumference and area of various shapes.
   a. Find perimeter, volume and surface area of irregular figures which can be divided into basic geometric shapes.

8.D.3 Select and use appropriate estimation techniques to solve real world problems.
   a. Select and use appropriate estimation techniques to solve real world problems.

Standard E Geometry

Students in the Diocese of Jefferson City will understand and apply basic and advanced properties of the concepts of geometry.

8.E.1 Understand the basic concepts of the Pythagorean theorem.
   a. Use the Pythagorean theorem to identify the third side of a right triangle when given the length of the other two sides.

8.E.2 Understand geometric transformation of figures.
   a. Relate proportions to similarity (i.e. scale drawing).

Standard F Probability and Data Analysis

Students in the Diocese of Jefferson City will understand and apply basic and advanced concepts of probability and data analysis.

8.F.1 Select and use the best method of representing and describing a set of data.
   a. Evaluate and identify valid and skewed data.

8.F.2 Determine probability using mathematical/theoretical simulations or experiments.
   a. Predict outcomes based on experiments, simulations and mathematical calculations.

Standard G Functions and Algebra

Students in the Diocese of Jefferson City will understand and apply basic and advanced properties of functions and algebra.

8.G.1 Know that an expression is a mathematical statement using numbers and symbols to represent relationships and real world situations.
   a. Express written sentences as mathematical expressions using negative exponents and cube roots.

8.G.2 Understand various representations of patterns and functions and the relationships among them and understand the concept of a function.
   a. Understand the basic concept of a function.

8.G.3 Solve linear equations using concrete, formal and informal methods.
   a. Solve linear equations using concrete, formal and informal methods.

8.G.4 Use the rectangular coordinate system to model and to solve problems.
   a. Use the rectangular coordinate system to model and to solve problems.