Heartland Community Schools
Kindergarten Mathematics Curriculum

1.1 NUMERATION/NUMBER SENSE

1.1.1 Students will communicate the sequential nature of the number system.
-Count orally 0-20
-Write numbers 0-20
-Write the numeral corresponding with the objects 1-20
-Count orally objects using one-to-one correspondence 1-20

1.1.2 Students will communicate the mathematical relations of the number system.
-Count the items on a graph and write the numeral corresponding with the number of items
-Identify whole and half
-Use appropriate forms to identify comparative terms (taller/shorter, heavier/lighter, more/less)
-Identify ordinal numbers to fifth position

1.1.3 Students will recognize numbers and applications in everyday situations.
-Identify birthday, telephone number, and address
-Identify penny, dime, and dollar

1.1.4 Students will demonstrate the value of numbers (0-20) using concrete objects.
-Identify and represent the value of numbers 1-20

1.2 COMPUTATION/ESTIMATION

1.2.1 Students will demonstrate the concepts of addition and subtraction up to 10.
-Manipulate objects to write addition equations up to 10
-Identify and apply addition, subtraction, and equal signs to solve equations up to 10

1.2.2 Student will determine the reasonableness of proposed solutions to mathematical problems.
-Estimate the quantity of objects to 10 and verify by counting

1.3 MEASUREMENT

1.3.1 Student will compare two or more items or sets using direct comparisons or nonstandard units of measure for the following attributes: length (shorter/longer), height (taller/shorter), weight (heavier/lighter), temperature (hotter/colder).
Nonstandard unit examples are: length of a human foot, hand span, new pencil, a toothpick, block, etc.
-Use vocabulary to describe temperature

-Compare measurement of objects using greater/less than, shorter/longer, heavier/lighter, taller/shorter

1.3.2 Students will recognize tools of measurement and their appropriate use, such as clocks, calendar, ruler, balance scale, and thermometer.
-Use a 12 inch ruler and count to 12 inches
-Use a calendar to identify specific days of the week and month
-Weigh objects and record data

1.3.3 Students will tell time to the half-hour using and analog and digital clock.
-Tell time to the hour using an analog clock

1.3.4 Student will identify the different units of measurement used in their environment, such as cents, dollars, pounds, gallons, liters, meters, miles, minutes, and hours.

1.3.5 Students will demonstrate and understanding of orientation in time for past, present, future, earlier and later.
-Order or sequence past, present, future, yesterday or tomorrow

1.4 GEOMETRY/SPATIAL

1.4.1 Students will compare relative position and spatial relationships, such as left/right, above/below, over/under, up/down, and near/far.
-Identify left and right

1.4.2 Student will identify, describe, and create circles, squares, triangles, and rectangles.
-Identify a square, rectangle, triangle, circle, and oval.
-Identify three dimensional shapes (sphere/balls, cylinder/can, rectangular cubes/boxes)

1.5 DATA ANALYSIS, PROBABILITY, AND STATISTICAL CONCEPTS

1.5.1 Students will count and collect information about objects and events in their environment, such as what is your favorite candy bar, who has a brother, how many pets, and who is going to the library.

1.5.2 Students will organize and display collected information using objects and pictures.
-Identify and participate in designing and reading a simple bar graph.

1.5.3 Students will make comparisons from displayed data, such as more, less, and fewer.
-Read, discuss, and interpret data using graphs, tables, and diagrams.

1.5.4 Students will describe the steps used in collecting and analyzing information.

1.6 ALGEBRAIC CONCEPTS

1.6.1 Students will identify, describe extend, and create a variety of patterns, such as objects, sounds, movements, shapes, numbers, and colors.
-Identify, describe, and create a variety of patterns using shapes, colors, letters, and numbers (one and two variables).

1.6.2 Students will sort and classify objects according to one or more attributes, such as size, shape, color, and thickness.
-Sort and classify objects with like and different attributes.

1.6.3 Students will identify and describe patterns in their environment.
-Identify and repeat simple patterns

Heartland Community Schools
First Grade Mathematics Curriculum

1.1 NUMERATION/NUMBER SENSE

1.1.1 Students will recognize, write, and orally express the sequential order of the number system.
-Write the number before and after a given number 0-100
-Write the numbers 0-100 in order
-Read numbers 0-100
-Order numbers 0-100
-Identify and write number words 0-10
-Compare numbers using greater than, less than, and equal
-Group objects 0-100 by 10s and 1s
-Skip count by 2s, 5s, and 10s to 100

1.1.2 Students will demonstrate ways of representing numbers and compare relations among numbers.
-Identify objects to show ½, *1/3, ¼, *1/5, etc. of a shape or set
-Manipulate object to show ½, *1/3, ¼, *1/5, etc. of a shape or set
-Identify ordinal numbers through the tenth position
-Identify and demonstrate one-to-one correspondence of numbers

1.1.3 Students will identify numbers and applications in everyday situations.
-Verbalize and represent the importance of numbers
-Determine the value of a collection of pennies and/or nickels and/or dimes and/or quarters
-Demonstrate the number system using one dime = 10 pennies, 10 dime = one dollar, *5 pennies = one nickel

-Compare and contrast the physical attributes and value of the penny, nickel, dime and quarter*

1.1.4 Students will demonstrate the value of numbers (0-20) using concrete objects.
-Identify and use manipulatives to represent the value of numbers 0-100

1.2 COMPUTATION/ESTIMATION

1.2.1 Students will demonstrate the concepts of addition and subtraction up to 10.
-Recall basic addition facts 0-10 in the horizontal and vertical forms
-Demonstrate and recognize the names of addition and subtraction symbols
-Complete addition and subtraction sentences to 12 in vertical and horizontal form and from assessing information in story problems
-Choose the operation (+ -) necessary to solve an addition or subtraction story problem
-Recall basic subtraction facts with differences 0-10 in horizontal and vertical forms
-Solve problems involving addition and subtraction of money (up to $.99)*
-Add or subtract two-digit numbers without using the regrouping process*
-Add or subtract two-digit numbers without regrouping in vertical form*
-Add three one-digit numbers to sums of ten*

1.2.2 Student will justify estimations to mathematical problems.
-Estimate the quantity of objects to 100 and verify by counting

1.3 MEASUREMENT

1.3.1 Student will measure two or more items or sets using nonstandard units of measure and compare attributes.
-Measure objects using nonstandard units (Unifix cubes, paperclips, human foot, etc.)
-Compare two or more objects regarding length, height, weight and temperature directly or using nonstandard measurement

1.3.2 Students will identify tools of measurement and their appropriate use (clocks, calendar, ruler, balance scale, and thermometer).
-Match the tools of measurement with their appropriate use
-Use a ruler to measure the length of an object to the nearest inch
-Use a metric ruler to measure the length of an object to the nearest centimeter*

1.3.3 Students will tell time to the half-hour using and analog and digital clock.
-Tell time to the hour and half-hour using an analog and digital clock
-Differentiate and verbalize the position of the hour and minute hand in relationship to the time*

1.3.4 Student will identify the different units of measurement used in their environment (cents, dollars, pounds, gallons, liters, meters, miles, minutes, and hours).

-Identify the different units of measurement used in their environment such as cents, dollars, pounds, gallons, liter, meters, miles, minutes and hours

1.3.5 Students will identify past, present, future as orientations in time.
-Sequence events to show an understanding of past, present, future, earlier or later

1.4 GEOMETRY/SPATIAL

1.4.1 Students will compare relative position (left/right, above/below, over/under, up/down, and near/far).
-Compare relative position and spatial relationships (above/below, over/under, up/down, near/far)

1.4.2 Student will identify, describe, and create circles, squares, triangles, and rectangles.
-Identify, describe and create squares, rectangles, triangles, circles, and ovals.
-Identify three-dimensional shapes (spheres, cylinders, cubes, and cones)*

1.5 DATA ANALYSIS, PROBABILITY, AND STATISTICAL CONCEPTS

1.5.1 Students will collect information about objects and events in their environment (favorite candy bar, number of siblings, and number of pets).
-Count and collect information about objects and events in their environment (surveys about favorites etc.)

1.5.2 Students will organize and display collected information using objects and pictures.
-Organize and display collected information using objects and pictures

1.5.3 Students will compare and interpret information from displayed data (more, less, and fewer).
-Read, discuss, and interpret data using graphs, tables, and diagrams.

1.5.4 Students will describe the process used in data collection and analysis.
-Describe the steps used in collecting and analyzing information.

1.6 ALGEBRAIC CONCEPTS

1.6.1 Students will identify, describe, extend, and create patterns (objects, sounds, movements, shapes, numbers, and colors).
-Identify, describe, and create a variety of patterns using shapes, colors, letters, and numbers

1.6.2 Students will sort and classify objects according to one or more attributes (size, shape, color, and thickness).

-Sort and classify objects according to one or more attributes (size, shape, color)

1.6.3 Students will identify and describe patterns in their environment.
-Identify and describe patterns in their environment

Heartland Community Schools
Second Grade Mathematics Curriculum

4.1 NUMERATION/NUMBER SENSE

4.1.1 Students will demonstrate an understanding of place value through the millions and decimals to the hundredths
- read, write, and order numbers to 100.

4.1.2 Students will represent numbers in equivalent forms.
- write a three-digit number in expanded form.

4.1.3 Students will describe and apply relationships between numbers by order, comparison, and across the operation, such as subtraction as the opposite of addition and multiplication as repeated addition.
- compare numbers from 0-999 using greater than and less than.
- complete a family of facts using addition and subtraction.

4.1.4 Students will identify and demonstrate positive and negative numbers and zero.
- use a number line to demonstrate the addition and subtraction process with positive numbers.

4.1.5 Students will make change and count out in amounts up to $20.00.
- determine the value of a set of coins and bills using dollar and cent notation.

4.2 COMPUTATION/ESTIMATION

4.2.1 Students will estimate and accurately calculate without and with calculators and solve problems involving addition, subtraction, multiplication, and division of whole numbers and understand the relationships among the operations
- recall addition and subtraction facts to 18.
- add and subtract two-digit numbers with regrouping.
- use a calculator in appropriate computational situations.

4.2.2 Student will estimate and accurately calculate without and with calculators and solve problems involving addition and subtraction of decimals and understand the relationships among these two operations.

- estimate the quantity of objects under 100, verify it by counting and compute the difference.
- add and subtract money to $9.99.

4.2.3 Students will estimate and accurately calculate without and with calculators and solve problems involving addition and subtraction and understand the relationships among these two operations.
- identify and create simple fractions as a part of a whole and a set.

4.3 MEASUREMENT

4.3.1 Student will estimate, measure, and solve problems using metric units for linear measure, area, mass/weight, and capacity.
- estimate and measure using metric units of centimeter, gram, and liter.

4.3.2 Students will estimate, measure, and solve problems using standard units for linear measure, area, mass/weight, and capacity.
- estimate and measure using standard units of inches, feet, pounds, cups, quarts, gallons and degrees.

4.3.3 Students will tell correct time to the minute on an analog clock.
- verbalize and write time to 5 minute intervals using digital and analog clocks.

4.3.4 Students will determine the perimeter of a many-sided figure (without a formula) using both standard and nonstandard units of measure, such as the six-sided figure measures 30 inches or 15 toothpicks around the edges.

4.4 GEOMETRY/SPATIAL CONCEPTS

4.4.1 Students will identify, describe, and create two- and three-dimensional geometric shapes.
- identify, describe, and model or draw common two- and three-dimensional shapes.

4.4.2 Student will identify and draw points, lines, line segments, rays, and angles.
- identify line segments and angles in common two-dimensional shapes.

4.4.3 Students will analyze, compare, and solve problems with geometric figures using congruence, symmetry, similarity, and simple transformations.
- complete and create symmetrical figures.

4.5 DATA ANALYSIS, PROBABILITY, AND STATISTICAL CONCEPTS

4.5.1 Students will count and collect, organize, represent, and interpret numerical and categorical data and clearly communicate the findings.
- solve problems interpreting information from simple graphs and tables.
- sort, classify, and display information using graphs.
- create, write, and solve their own story problems.

4.6 ALGEBRAIC CONCEPTS

4.6.1 Students will use and interpret variables, mathematical symbols and properties to write and simplify expressions and sentences.
- determine the missing number in an addition or subtraction sentence.

4.6.2 Students will identify, describe, and extend arithmetic patterns, using concrete materials and tables.
- identify, create, and extend patterns in real life and mathematics.

Heartland Community Schools
Third Grade Mathematics Curriculum

4.1 NUMERATION/NUMBER SENSE

4.1.1 Students will demonstrate an understanding of place value through the millions and decimals to the hundredths place.
-Estimate sums and differences
-Identify the place value and the value of a digit in numerals through 6 digits
-Round numbers to the nearest ten, hundred, and thousand
-Read, write (in standard and expanded form) and explain numbers to 999,999

4.1.2 Students will represent numbers in equivalent forms.
-Identify, draw, use manipulatives, or write a fraction for a part of a whole or part

4.1.3 Students will describe and apply relationships between numbers by order, comparison, and across the operation, such as subtraction as the opposite of addition and multiplication as repeated addition.
-Find the missing factors, addends, sums, products, and differences in addition, subtraction, and multiplication
-Produce family facts relating to addition, subtraction, multiplication, and division
-Compare numbers from 1,000-1,000,000 using greater than and less than

4.1.4 Students will identify and demonstrate positive and negative numbers and zero.
-Read and demonstrate the information shown on a thermometer

4.1.5 Students will make change and count out in amounts up to $20.00.
-Determine the value of a collection of bills and coins
-Add, subtract, compare and write money amounts up to and including 4 digits with use of correct money symbols

4.2 COMPUTATION/ESTIMATION

4.2.1 Students will estimate and accurately calculate without and with calculators and solve problems involving addition, subtraction, multiplication, and division of whole numbers and understand the relationships among the operations.
-Recall basic multiplication facts through 9s
-Use written expression to add and subtract up to and including two 4-digit numbers with and without regrouping

4.2.2 Student will estimate and accurately calculate without and with calculators and solve problems involving addition and subtraction of decimals and understand the relationships among these two operations.
-Identify, interpret and write from a fraction to a decimal (e.g. 3/10 = .3)
-Add and subtract decimals through tenths

4.2.3 Students will estimate and accurately calculate without and with calculators and solve problems involving addition and subtraction of fractions and understand the relationships among these two operations.
-Add and subtract decimals

4.3 MEASUREMENT

4.3.1 Student will estimate, measure, and solve problems using metric units for linear measure, area, mass/weight, and capacity.
-Use metric measurement (centimeters, meters, grams, and liters)

4.3.2 Students will estimate, measure, and solve problems using standard units for linear measure, area, mass/weight, and capacity.
-Measure to the nearest one-half inch
-Measure length using feet and yards and volume comparing pints, cups, quarts, and gallons

4.3.3 Students will tell correct time to the minute on an analog clock.
-Identify and write time to the minute using an analog and digital clocks

4.3.4 Students will determine the perimeter of a many-sided figure (without a formula) using both standard and nonstandard units of measure, such as the six-sided figure measures 30 inches or 15 toothpicks around the edges.
-Identify perimeter on simple shapes

4.4 GEOMETRY/SPATIAL CONCEPTS

4.4.1 Students will identify, describe, and create two- and three-dimensional geometric shapes.
-Create geometric shapes (two- and three-dimensional)

4.4.2 Student will identify and draw points, lines, line segments, rays, and angles.
-Identify line, line segments, and ray using plane forms

4.4.3 Students will analyze, compare, and solve problems with geometric figures using congruence, symmetry, similarity, and simple transformations.
-Determine if two figures are congruent or similar

4.5 DATA ANALYSIS, PROBABILITY, AND STATISTICAL CONCEPTS

4.5.1 Students will count and collect, organize, represent, and interpret numerical and categorical data and clearly communicate the findings.
-Write and solve story problems using equations
-Interpret charts, tables, graphs, and diagrams

4.6 ALGEBRAIC CONCEPTS

4.6.1 Students will use and interpret variables, mathematical symbols and properties to write and simplify expressions and sentences.
-Demonstrate and apply mathematical symbols

4.6.2 Students will identify, describe, and extend arithmetic patterns, using concrete materials and tables.
-Describe and extend patterns

Heartland Community Schools
Fourth Grade Mathematics Curriculum

4.1 NUMERATION/NUMBER SENSE

4.1.6 Students will demonstrate place value of whole numbers through the millions and decimals to the hundredth place.
-Identify, compare, and write numerals through nine digits
-Demonstrate recognition and proper application of mathematical symbols according to grade level

4.1.7 Students will write and illustrate equivalences of whole numbers in expanded form, decimals, and fractions.
-Demonstrate and/or express fractions and mixed numbers in their simplest forms and equivalent forms
-Identify, write, and compare fractions (whole or mixed numbers) as part of a whole set

4.1.8 Students will describe and apply relationships between whole numbers, decimals, and fractions by order, comparison, and operation.
-Compare numbers (up to one million) and fractions using the symbols >, <, or =

-Simplify improper fractions and change a mixed number into an improper fraction
-Reduce fractions to lowest terms
-Identify equivalent fractions
-Compare, read, write, add, and subtract decimals to the hundredths place

4.1.9 Students will identify examples of positive and negative numbers and zero.
-Identify and demonstrate positive and negative numbers and zero

4.1.10 Students will make change and count out in amounts up to $20.00.
-Add and subtract whole numbers and money amounts with or without regrouping, and count out change up to $20.00

4.2 COMPUTATION/ESTIMATION

4.2.1 Students will estimate, add, subtract, multiply, and divide whole numbers without and with calculators and solve word problems.
-Round and estimate standard numerals through nine digits
-Apply multiplication and division facts to relevant problem solving
-Multiply and divide up to four-digit whole numbers and money amounts by a one-digit number
-Estimate sums, differences, products, and quotients to obtain a reasonable answer
-Add and subtract whole numbers and money amounts with or without regrouping
-Add and subtract up to a six-digit number with or without regrouping

4.2.2 Student will estimate, add, and subtract decimals without and with calculators and solve word problems.
-Compare and equate fractions and decimals to percentages (25%, 50%, 75%, & 100%)

4.2.3 Students will estimate, add, and subtract fractions with like denominators without calculators and solve word problems.
-Add and subtract mixed numbers with like denominators

4.3 MEASUREMENT

4.3.1 Student will estimate, measure, and solve word problems using metric units for linear measure, area, mass/weight, capacity, and temperature.
-Estimate, measure, and problem solve using metric units for linear measure, area, mass/weight, and capacity
-Compute the volume of a cube, and the area of a rectangle
-Rename measures of length, mass, and capacity within the metric and standard systems

4.3.2 Students will estimate, measure, and solve word problems using standard units for linear measure, area, mass/weight, capacity and temperature.
-Select, estimate, and/or use the appropriate unit of measure including mass, length, capacity, temperature, and time

4.3.3 Students will tell and write correct time to the minute using an analog clock.
-Tell correct time to the minute on an analog clock
-Figure elapsed time to the nearest quarter hour

4.3.4 Students will measure and determine the perimeter of a many-sided figure without a formula using both standard and nonstandard units of measure.
-Measure and compare perimeter of polygons

4.4 GEOMETRY/SPATIAL CONCEPTS

4.4.1 Students will identify, describe, and create two- and three-dimensional geometric shapes.
-Identify and draw a parallelogram
-Identify, describe, draw and create two and three-dimensional geometric shapes

4.4.2 Student will identify and draw points, lines, line segments, rays, and angles.
-Identify and draw points, lines, line segments, rays, and angles
-Identify line segments, which are perpendicular or parallel

4.4.3 Students will identify, analyze, compare two-dimensional geometric figures using congruence, symmetry, similarity, and simple transformations.
-Analyze, compare, and problem solve with geometric figures using congruence, symmetry, similarity, and simple transformation

4.5 DATA ANALYSIS, PROBABILITY, AND STATISTICAL CONCEPTS

4.5.1 Students will collect, organize, record, and interpret data and describe the findings.
-Design and interpret bar, line, and circle graphs representing information

4.6 ALGEBRAIC CONCEPTS

4.6.1 Students will use and interpret variables and mathematical symbols to write and solve one-step equations.
-Demonstrate recognition and proper application of mathematical symbols

4.6.2 Students will identify, describe, and extend arithmetic patterns, using concrete materials and tables.
-Identify, describe, and extend arithmetic patterns

Heartland Community Schools

Fifth Grade Mathematics Curriculum

8.1 NUMERATION/NUMBER SENSE

8.1.1 Students will recognize and utilize real numbers such as whole numbers.
-Identify the value of a digit in numerals through 9 digits

-Compare and order numbers through 6 digits

8.1.2 Students will apply relationships among fractions, decimals, and percents in a variety of situations.

-Read, write and explain decimals to the thousandths
-Compare and order fractions and mixed numbers
-Find equivalent fractions

8.1.3 Students will represent and use numbers in a variety of different forms

-Write standard numerals for word names and expanded numerals through 12

8.1.4 Students will apply appropriate use of number theory such as prime and composite, factors and multiples, divisibility, powers properties, and identities.

-Compute the least common multiple and greatest common factor in and up to three numbers
-Identify prime and composite numbers

8.2 COMPUTATION/ESTIMATION

8.2.1 Students will add, subtract, multiply, and divide decimals and proper, improper, and mixed fractions with uncommon and common denominators both with and without the use of technology.

-Find equivalent fractions
-Use opposite operations for checking answers in computations
-Add and subtract fractions and mixed numbers with like and unlike denominators
-Read, write, compare, order, round, estimate, add and subtract decimals through thousandths
-Multiply and divide up to 5-digit whole numbers and money amounts by a 2-digit and 3-digit number using paper and calculator

8.2.2 Student will identify the appropriate operation and do the correct calculations to solve word problems.

-Choose the operation, look for a pattern, and solve multi-step problems for practical applications

8.2.3 Students will solve problems involving whole numbers, integers, and rational numbers (fractions, decimals, ratios, proportions, and percents) both with and without the use of technology. Problems will be of varying complexities and can involve real-life data.

-Choose the operation, look for a pattern, and solve multi-step problems for practical applications

8.2.4 Students will apply the order of operations to solve problems both with and without the use of technology.

-Choose the operation, look for a pattern, and solve multi-step problems for practical applications

8.2.5 Students will apply strategies of estimation to a variety of problems both with and without the use of technology.

-Round a number to a given digit
-Estimate sums of fractions and mixed numbers
-Read, write, compare, order, round, estimate, add and subtract decimals through thousandths
-Use estimation and rounding techniques

8.3 MEASUREMENT

8.3.1 Students will select appropriate tools and properly measure quantities for temperature, time, money, length and width, area and perimeter, volume and capacity, weight and mass in both standard and metric units at the level of precision required.

-Measure length and weight using metric and standard units
-Measure and compute the area of rectangles

8.3.2 Students will convert units within measurement systems using proper conversion factors (standard and metric).

-Identify the equivalents of seconds, minutes, hours, days, weeks, months, and years
-Select and convert the appropriate unit of measure for a given liquid, volume and mass in customary units (fluid ounce, cup, pint, ounce, pound, ton, quart, and gallon) and solve problems using these measures

8.4 GEOMETRY/SPATIAL

8.4.1 Students will identify, describe, compare, and classify geometric figures such as plane figures like polygons and circles; solid figures like prisms, pyramids, cones, spheres, and cylinders; and lines, line segments, rays, angles, parallel and perpendicular lines.

-Name and measure angles
-Identify polygons and congruent / symmetric figures
-Identify solid, plane figures, points, line segments, lines, rays and angles
-Classify lines and angles

8.4.2 Student will understand and apply the formulas to solve problems involving perimeter and area of a square, rectangle, parallelogram, trapezoid and triangle and area and circumference of circles.

8.4.3 Students will understand and apply the formulas to solve problems involving perimeter and area of a square, rectangle, parallelogram, trapezoid and triangle and area and circumference of circle.

-Find the perimeter and area of rectangles

8.4.4 Students will solve problems using the formulas for volume and surface area of rectangular prisms, cylinders, and cones.

8.4.5 Students will apply transformations to geometric figures such as translations or slides, rotations or turns, reflections or flips, and scale or dilate.

8.4.6 Students will use geometric representations to solve problems and describe the physical world.

8.5 DATA ANALYSIS, PROBABILITY, AND STATISTICAL CONCEPTS

8.5.1 Students will collect, analyze, interpret, and display data.
-Compute the average of a series of numbers
-Use appropriate representations of data such as graphs, tables and charts

8.5.2 Students will read and interpret tables, charts, and graphs to make comparisons, predictions, and inferences.
-Interpret types of graphs (bar, line and pie), charts, diagrams, and illustrations
8.5.3 Students will conduct experiments or simulations to demonstrate and understanding of theoretical probability and relative frequency.

8.5.4 Students will recognize appropriate use of statistical methods and appropriate use of probability as a means for decision making.

8.6 ALGEBRAIC CONCEPTS

8.6.1 Students will demonstrate knowledge and use of the one- and two-dimensional coordinate systems.

-Order numbers on a number line
-Graph ordered pairs on a coordinate plane

8.6.2 Students will apply algebraic concepts and algebraic operations to solving problems.
-Solve simple algebraic equations
8.6.3 Students will apply and solve problems involving systems of equations, and system of inequalities and matrices.

Heartland Community Schools

Sixth Grade Mathematics Curriculum

8.1 NUMERATION/NUMBER SENSE

8.1.1 Students will recognize and utilize real numbers such as whole numbers.
-Read and identify numbers in standard and expanded form from hundred billions to ten thousandths

-Read, write, explain, and compare numbers to 100 billion
-Multiply or divide whole numbers or a money amount by a two or three digit number on paper and use a calculator as a checking tool
-Identify place values three places to the right of the decimal and nine places to the left
-Write a ratio to show a comparison
-Find equivalent ratios

8.1.2 Students will apply relationships among fractions, decimals, and percents in a variety of situations.

-Compare whole and decimal numbers using greater than and less than
-Convert decimals and fractions to percentages and percents to decimals and fractions
-Round decimal numbers to a given digit
-Read, write, explain, and compare decimals through the hundred-thousandths place
-Multiply or divide a decimal by a whole number or by a decimal
-Multiply or divide fractions by whole numbers or fractions
-Compare and order fractions

8.1.3 Students will represent and use numbers in a variety of different forms

-Identify place values three places to the right of the decimal and 9 places to the left
-Read and identify numbers in standard and expanded form from 100 billions to ten-thousandths

8.1.4 Students will apply appropriate use of number theory such as prime and composite, factors and multiples, divisibility, powers properties, and identities.

-Identify powers, exponents, squares, and square roots
-Identify a mixed number as a fraction and a fraction as a mixed number
-Find equivalent fractions to identify least common denominator and to identify a fraction in simplest form
-Compare and order fractions
-Compute greatest common factor
-Identify factors, prime and composite numbers, prime factors, greatest common factor, and least common multiples
-Use the counting principle and tree diagrams to identify the number of possible outcomes

8.2 COMPUTATION/ESTIMATION

8.2.1 Students will add, subtract, multiply, and divide decimals and proper, improper, and mixed fractions with uncommon and common denominators both with and without the use of technology.

-Multiply, divide, add, and subtract mixed numbers
-Multiply or divide a decimal by a whole number or by a decimal
-Write and solve proportions

8.2.2 Student will identify the appropriate operation and do the correct calculations to solve word problems.

-Write and solve story problems according to grade level

8.2.3 Students will solve problems involving whole numbers, integers, and rational numbers (fractions, decimals, ratios, proportions, and percents) both with and without the use of technology. Problems will be of varying complexities and can involve real-life data.

-Divide a decimal to thousandths by a three-digit whole number
-Write a ratio to show a comparison
-Find equivalent ratios
-Add, subtract, multiply, divide mixed numbers
-Multiply or divide fractions by a whole number or by a fraction
-Write and solve proportions
-Convert decimals and fractions to percentages and percents to decimals and fractions
-Multiply five and six digit decimals

8.2.4 Students will apply the order of operations to solve problems both with and without the use of technology.

-Demonstrate recognition and proper application of mathematical symbols according to grade level
-Solve problems using order of operations
-Identify power, exponents, squares, and square roots

8.2.5 Students will apply strategies of estimation to a variety of problems both with and without the use of technology.

-Use estimation and rounding techniques according to grade level

8.3 MEASUREMENT

8.3.1 Students will select appropriate tools and properly measure quantities for temperature, time, money, length and width, area and perimeter,volume and capacity, weight and mass in both standard and metric units at the level of precision required.

-Add, subtract, or change between all units of time and measurement
-Read a thermometer and record temperatures using Fahrenheit and Celsius
-Determine lapsed time
-Select and apply appropriate metric and customary units of length, capacity, and mass

8.3.2 Students will convert units within measurement systems using proper conversion factors (standard and metric).

-Convert standard units of volume, length, and weight
-Compute using customary and metric measure and intervals of time

8.4 GEOMETRY/SPATIAL

8.4.1 Students will identify, describe, compare, and classify geometric figures such as plane figures like polygons and circles; solid figures like prisms, pyramids, cones, spheres, and cylinders; and lines, line segments, rays, angles, parallel and perpendicular lines.

8.4.2 Student will understand and apply the formulas to solve problems involving perimeter and area of a square, rectangle, parallelogram, trapezoid and triangle and area and circumference of circles.

8.4.3 Students will understand and apply the formulas to solve problems involving perimeter and area of a square, rectangle, parallelogram, trapezoid and triangle and area and circumference of circle.
-Apply the principles of area and perimeter

8.4.4 Students will solve problems using the formulas for volume and surface area of rectangular prisms, cylinders, and cones.

8.4.5 Students will apply transformations to geometric figures such as translations or slides, rotations or turns, reflections or flips, and scale or dilate.

8.4.6 Students will use geometric representations to solve problems and describe the physical world.

8.5 DATA ANALYSIS, PROBABILITY, AND STATISTICAL CONCEPTS

8.5.1 Students will collect, analyze, interpret, and display data.

8.5.2 Students will read and interpret tables, charts, and graphs to make comparisons, predictions, and inferences.

8.5.3 Students will conduct experiments or simulations to demonstrate an understanding of theoretical probability and relative frequency.
-Determine the probability of events

8.5.4 Students will recognize appropriate use of statistical methods and appropriate use of probability as a means for decision making.
-Find the range, mean, median, and mode for collection of data
-Determine the probability of events

8.6 ALGEBRAIC CONCEPTS

8.6.1 Students will demonstrate knowledge and use of the one- and two-dimensional coordinate systems.

8.6.2 Students will apply algebraic concepts and algebraic operations to solving problems.

-Solve problems using order of operations
-Compute basic algebraic equations

8.6.3 Students will apply and solve problems involving systems of equations, and system of inequalities and matrices.

Heartland Community Schools

Seventh Grade Mathematics Curriculum

8.1 NUMERATION/NUMBER SENSE

8.1.1 Students will recognize natural numbers, whole numbers, integers, and rational numbers.
- Compute with whole numbers
- Round whole numbers
- Write whole numbers and decimal numbers into words

8.1.2 Students will determine equivalences among fractions, decimals, and percents.
- Convert among fractions, decimals, and percents
- Calculate percent problems
- Compute with fractions, decimals, and integers

8.1.3 Students will write and use numbers in expanded exponential form and scientific notation.
- Write whole and decimal numbers in expanded form using exponents
- Understand bases, exponents, and powers

8.1.4 Students will identify and display numbers including prime and composite, factors and multiples, divisibility, powers and properties.
- Develop and apply number theory concepts (primes, factors, multiples) in real world and mathematical problem situations
- Distinguish prime and composite numbers for numbers
- Factor a number into its prime number factors

8.2 COMPUTATION/ESTIMATION

8.2.1 Students will add, subtract, multiply, and divide decimals and proper, improper, and mixed fractions with uncommon and common denominators with and without the use of technology.
- Add, subtract, multiply, and divide whole numbers, fractions, decimals, and positive and negative numbers
- Change fractions to decimals and decimals to fractions

8.2.2 Students will identify the appropriate operation and do the correct calculations to solve word problems.
-Write and solve story problems

8.2.6 Students will solve problems involving whole numbers, integers, and rational numbers (fractions, decimals, ratios, proportions, and percents) with and without the use of technology.
- Use computation, estimation, proportions, and percents in a wide variety of situations

8.2.7 Students will apply the order of operations to solve problems with and without the use of technology.

8.2.8 Students will apply strategies of estimation when solving problems with and without the use of technology.

8.3 MEASUREMENT

8.3.3 Students will select measurement tools measure quantities for temperature, time, money, distance, angles, area, perimeter, volume, capacity, weight/mass in standard and metric units at the designated level of precision.

8.3.4 Students will convert units within measurement systems using standard and metric, given conversion factors.
-Convert standard units of volume, length, and weight
-Compute using customary and metric measure and intervals of time

8.4 GEOMETRY/SPATIAL

8.4.1 Students will identify, describe, compare, and classify two- and three-dimensional geometric figures such as plane figures like polygons and circles; solid figures like prisms, pyramids, cones, spheres, and cylinders; and lines, line segments, rays, angles, parallel and perpendicular lines.

8.4.4 Student will use geometric properties, like Pythagorean theorem, and the relationships of congruence, similarity, and symmetry.

8.4.5 Students will use formulas to solve problems involving perimeter and area of a square, rectangle, parallelogram, trapezoid and triangle as well as the area and circumference of circles.
- Use formulas to find perimeter and area of geometric figures

8.4.6 Students will solve problems given formulas for volume and surface area of rectangular prisms, cylinders, and cones.
- Find volume and surface area of rectangular prisms, cylinders, and cones

8.4.7 Students will apply transformations to two- and three-dimensional geometric figures.
- Create drawings using rotations, translations, and rotations

8.4.8 Students will use geometric terms and representations to describe the physical world.
- Apply algebraic methods to solve a variety of real-world and mathematical problems

8.5 DATA ANALYSIS, PROBABILITY, AND STATISTICAL CONCEPTS

8.5.1 Students will collect, construct, and interpret and data displays and compute mean, median, and mode.
- Find the mode, median, and mean from collected data
- Create charts and graphs from collected data

8.5.2 Students will read and interpret tables, charts, and graphs to make comparisons and predictions.
- Read and interpret tables, graphs and charts

8.5.3 Students will conduct experiments or simulations to demonstrate theoretical probability and relative frequency.

8.5.5 Students will identify statistical methods and probability for making decisions.
- Recognize misleading charts and graphs
- Use measures of central tendency
- Use and reorganize appropriate sampling techniques

8.6 ALGEBRAIC CONCEPTS

8.6.1 Students will demonstrate knowledge and use of the one- and two-dimensional coordinate systems.
- Solve and graph both equations and inequalities
- Graph ordered pairs on a coordinate plane

8.6.2 Students will apply algebraic concepts and operations to solve linear equations and word problems.

8.6.2 Students will describe and represent relations, using tables, graphs and rules.

Heartland Community Schools
Mathematics Curriculum

Course: Algebra I

Grade(s): 8^{th} – 12^{th}

12.2 COMPUTATION/ESTIMATION

12.2.3 Students will perform estimations and computations of real numbers mentally, with paper and pencil, and with technology.

- Develop, analyze, and explain the use of rations, proportions, and percents in a wide variety of everyday life situations.
- Utilize technology tools effectively to estimate and solve real-world problems.
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12.6 ALGEBRAIC CONCEPTS

12.6.1 Students will graph and interpret algebraic relations and inequalities.

12.6.2 Students will solve problems involving equations and inequalities.

12.6.3 Students will solve problems involving systems of two equations, and systems of two or more inequalities.

12.6.4 Students will solve problems using patterns and functions.

- Create, write, and solve practical everyday life situation problems using algebraic concepts.
- Develop, communicate, and justify solutions with appropriate algebraic symbols and terminology.
- Apply trigonometry to problem situations involving right triangles.
- Solve and graph both equations and inequalities.
- Simplify rational expressions involving quadratic equations (involving two solutions).
- Compute and solve problems involving square roots, radicals, and quadratic functions.
- Investigate and analyze real situations (discounts, tax, interest, increase/decrease percentages) that allow for algebraic solutions.
- Solve systems of linear equations, relating to practical problems, graphing, substitutions, and the addition-subtraction method.
- Simplify, factor, add, subtract, multiply, and divide monomials and polynomials.
- Evaluate mathematical expressions.
- Solve one- step or multiple steps equations.
- Add, subtract, multiply, divide, and simplify radicals.

Heartland Community Schools
Mathematics Curriculum

Course: Algebra II

Grade(s): 10th – 12th

12.1 NUMERATION/NUMBER SENSE

12.1.1 Students will describe and compare the relationships among all subsets of real numbers.

12.1.2 Students will express the equivalent forms of numbers using exponents, radicals, scientific notation, absolute values, fractions, decimals, and percents.

-Differentiate between relations and functions using both direct and inverse variation methods, in related practical applications.

12.6 ALGEBRAIC CONCEPTS

12.6.1 Students will interpret algebraic equations and inequalities graphically and describe geometric relationships algebraically.

12.6.2 Students will apply and solve problems involving equations and inequalities.

12.6.3 Students will apply and solve problems involving systems of equations, and system of inequalities and matrices.

12.6.4 Students will apply and solve problems involving using patterns, algebraic expression, functions, and regression analysis.

- Explain both the real number system and the complex number system.
- Solve and graph both algebraic equations and inequalities.
- Create, write, and solve word problems that relate to everyday problems.
- Use technological tools to analyze and solve practical problems.
- Compute and solve equations with radicals, rational exponents, and problems using the quadratic formula.
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Heartland Community Schools

Mathematics Curriculum

Course: Geometry

Grade(s): 9th – 12th

12.4 GEOMETRY/SPATIAL

12.4.1 Students will calculate perimeter, area, and volume for two- and three- dimensional shapes.

12.4.2 Student will utilize geometric relationships and terms to describe the physical world.

12.4.3 Students will analyze relationships among geometric forms.

12.4.4 Students will apply coordinate geometry to locate objects and to describe objects and to describe objects algebraically.

12.4.5 Students will apply right triangle trigonometry to solve problems.

12.4.6 Students will understand and apply geometric properties to solve problems.

12.4.7 Students will apply deductive reasoning to arrive at valid conclusions.

Heartland Community Schools
Mathematics Curriculum

Course: Pre-Calculus

Grade(s): 11th – 12th

12.1 NUMERATION/NUMBER SENSE

12.1.1 Students will describe and compare the relationships among all subsets of real numbers.

12.1.2 Students will express the equivalent forms of numbers using exponents, radicals, scientific notation, absolute values, fractions, decimals, and percents.

12.2 COMPUTATION/ESTIMATION

12.2.1 Students will solve theoretical and applied problems using numbers in equivalent forms, radicals, exponents, scientific notation, absolute values, fractions, decimals, and percents, ratios and proportions, order of operations, and properties of real numbers.

12.2.2 Student will justify the reasonableness of solutions.

12.2.3 Students will perform estimations and computations and computations mentally, with paper and pencil, and with technology.

-Use graphing calculators for advanced graphing and other types of math related problems.

12.3 MEASUREMENT

12.3.1 Student will select and use appropriate measuring units, tools, and/or technology to achieve a specified degree of accuracy and precision.

12.3.2 Students will convert between metric and standard units of measurement.

12.4 GEOMETRY/SPATIAL

12.4.1 Students will calculate perimeter, area, and volume for two- and three- dimensional shapes.

12.4.2 Student will utilize geometric relationships and terms to describe the physical world.

12.4.3 Students will analyze relationships among geometric forms.

12.4.4 Students will apply coordinate geometry to locate objects and to describe objects and to describe objects algebraically.

12.4.5 Students will apply right triangle trigonometry to solve problems.

12.4.6 Students will understand and apply geometric properties to solve problems.

12.4.7 Students will apply deductive reasoning to arrive at valid conclusions.

12.5 DATA ANALYSIS, PROBABILITY, AND STATISTICAL CONCEPTS

12.5.1 Students will apply sampling techniques to gather data, organize, display, and interpret data to solve complex problems.

12.5.2 Students will apply sampling techniques to gather data, organize, display and interpret data to solve complex problems.

12.5.3 Students will interpret theoretical probability to represent problems, solve problems, and make informal decisions.

12.5.4 Students will analyze the effects of data transformation on measures of central tendency and variability such as linear and non-linear relationships.

12.5.5 Students will formulate conclusions based on the interpretation of data represented by the normal distribution.

12.5.6 Students will calculate probabilities of independent events and counting problems.

12.6 ALGEBRAIC CONCEPTS

12.6.1 Students will interpret algebraic equations and inequalities graphically and describe geometric relationships algebraically.

12.6.2 Students will apply and solve problems involving equations and inequalities.

12.6.3 Students will apply and solve problems involving systems of equations, and system of inequalities and matrices.

12.6.4 Students will apply and solve problems involving using patterns, algebraic expression, functions, and regression analysis.

Heartland Community Schools
Mathematics Curriculum

Course: Probability & Statistics

Grade(s): 10^{th} – 12^{th}

12.1 NUMERATION/NUMBER SENSE

12.1.1 Students will describe and compare the relationships among all subsets of real numbers.

12.1.2 Students will express the equivalent forms of numbers using exponents, radicals, scientific notation, absolute values, fractions, decimals, and percents.

-Compare and contrast the real number system and its various subsystems with regard to their structural characteristics.
-Model real-world phenomena with a variety of functions.

12.2 COMPUTATION/ESTIMATION

12.2.1 Students will solve theoretical and applied problems using numbers in equivalent forms, radicals, exponents, scientific notation, absolute values, fractions, decimals, and percents, ratios and proportions, order of operations, and properties of real numbers.

12.2.2 Student will justify the reasonableness of solutions.

12.2.3 Students will perform estimations and computations and computations mentally, with paper and pencil, and with technology.

- Utilize technology tools effectively to estimate and solve real-world problems.

12.5 DATA ANALYSIS, PROBABILITY, AND STATISTICAL CONCEPTS

12.5.1 Students will apply sampling techniques to gather data, organize, display, and interpret data to solve complex problems.

12.5.2 Students will apply sampling techniques to gather data, organize, display and interpret data to solve complex problems.

12.5.3 Students will interpret theoretical probability to represent problems, solve problems, and make informal decisions.

12.5.4 Students will analyze the effects of data transformation on measures of central tendency and variability such as linear and non-linear relationships.

12.5.5 Students will formulate conclusions based on the interpretation of data represented by the normal distribution.

12.5.6 Students will calculate probabilities of independent events and counting problems.

- Calculate probabilities to evaluate whether statistical inferences are correct.
- Analyze various rules of probability through hands-on and technological applications.
- Apply hypothesis testing procedures to wide-ranging problems.
- Apply linear regression and correlations to real-life situations.
- Analyze normal distributions and apply them to many different situations.
- Apply mathematical thinking and modeling to solve problems that arise in other disciplines, such as art, music, science, business, and economics.
- Organize data from personal surveys and present the results graphically (freguency chart, histogram, bar graph, pictograph, line graph, and circle graph).
- Compute various numbers such as the mean and standard deviation.
- Conduct random sampling and determine how these results can be used to make inferences.
- Describe the general nature of statistics and numerous examples of how they are used. Statistics from other cultures and ethnic groups will be analyzed.

12.6 ALGEBRAIC CONCEPTS

12.6.1 Students will interpret algebraic equations and inequalities graphically and describe geometric relationships algebraically.

12.6.2 Students will apply and solve problems involving equations and inequalities.

12.6.3 Students will apply and solve problems involving systems of equations, and system of inequalities and matrices.

12.6.4 Students will apply and solve problems involving using patterns, algebraic expression, functions, and regression analysis.

- Determine the maximum and minimum points of a graph and interpret the results in problem situations.
- Analyze the complex number system and demonstrate understanding with its operations.
- Understand the conceptual foundations of limit, the rate of change, the slope of a tangent line, and their applications to other disciplines.