Mathematics Curriculum

Grade 5

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Fifth grade students extend their understanding of number to billions, including the use of exponential notation; relate number theory concepts to operations on rational numbers; compare, contrast, and define the intent and characteristics of the four operations, including properties; and become proficient in using multiplication and division procedures. They estimate and measure length, volume, and capacity; use measuring tools; investigate circle measures; continue transformational geometry; and identify attributes of solids. Fifth graders also collect, display, and analyze data and make predictions. They organize, record, and interpret results of simple probability experiments; identify and extend growth patterns; and solve equations with one variable.

MTH.G5

Standard 1

READ/WRITE/IDENTIFY PLACE VALUE OF DECIMALS & ROUND

The student will

a) read, write, and identify the place values of decimals through thousandths;

b) round decimal numbers to the nearest tenth or hundredth; and compare the values of two decimals through thousandths, using the symbols >, <, or =.

Benchmark 1.a

Read, Write, Identify Place Values of Decimals Through Thousandths

The student will read, write, and identify the place values of decimals through thousandths.

Indicator 1.a.1

Identify place value for each digit in decimals through thousandths

Identify the place values for each digit in decimals through thousandths.

Indicator 1.a.2

Read decimal numbers through thousandths

Read decimal numbers through thousandths from written words or place-value format.

Indicator 1.a.3

Write decimal numbers through thousandths

Write decimal numbers through thousandths from written words or from decimal numbers presented orally.

Benchmark 1.b

Round Decimals to Nearest Tenth or Hundredth

The student will round decimal numbers to the nearest tenth or hundredth.

Indicator 1.b.1

Round decimal numbers to the nearest tenth or hundredth

Round decimal numbers to the nearest tenth or hundredth.

Indicator 1.b.2

Identify symbols for the terms: greater than, less than, equal to

Identify symbols for the terms: greater than, less than, equal to

Indicator 1.b.3

Read/write/compare/order/round decimals through thousandths

Read, write, compare, order and round decimals through the thousandths place.

Benchmark 1.c

Compare the Value of Two Decimals Through Thousandths

The student will compare the values of two decimals through thousandths, using the symbols >, <, or =.

Indicator 1.c.1

Compare value of two decimals through thousandths

Compare the value of two decimal numbers through thousandths, using the symbols <, >, or =.

MTH.G5

Standard 2

RECOGNIZE/NAME/ORDER FRACTIONS IN DECIMAL FORM AND VICE VERSA

The student will

a) recognize and name commonly used fractions (halves, fourths, fifths, eighths, and tenths) in their equivalent decimal form and vice versa; and

b) order a given set of fractions and decimals from least to greatest. Fractions will include like and unlike denominators limited to 12 or less, and mixed numbers.

Benchmark 2.a

Recognize/Name Fractions in Equivalent Decimal Form and Vice Versa

The student will recognize and name commonly used fractions (halves,fourths, fifths, eighths, and tenths) in their equivalent decimal form and vice versa.

Indicator 2.a.1

Represent fractions in their equivalent decimal form

Represent fractions (halves, fourths, fifths, eighths, and tenths) in their equivalent decimal form.

Indicator 2.a.2

Represent decimals in their equivalent fraction form

Represent decimals in their equivalent fraction form (halves, fourths, fifths, eighths, and tenths).

Benchmark 2.b

Order Given Set of Fractions and Decimals from Least to Greatest

The student will order a given set of fractions and decimals from least to greatest. Fractions will include like and unlike denominators limited to 12 or less, and mixed numbers.

Indicator 2.b.1

Determine equivalent relationships between decimals and fractions

Determine equivalent relationships between decimals and fractions with denominators up to 12.

Indicator 2.b.2

Order given set of decimals, fractions, and mixed numbers

Order from least to greatest a given set of no more than five numbers written as decimals and as fractions and mixed numbers with denominators of 12 or less.

Indicator 2.b.3

Convert one rational number to the other

Convert one rational number to the other, including decimals, ratios, fractions, and percents.

Benchmark 2.c

Explain and Apply Properties of Fractions/Decimals/Percents

The student will explain and apply properties of fractions, decimals, and percents.

Indicator 2.c.1

Estimate, analyze, and find equivalent fractions

Estimate, analyze, and find equivalent fractions.

Indicator 2.c.2

Analyze/rename mixed numbers to fractions > 1 and vice versa

Analyze and rename mixed numbers to fractions greater than one and do the reverse.

Indicator 2.c.3

Investigate positive rational numbers

Investigate positive rational numbers including decimals, ratios, fractions, and percents.

MTH.G5

Standard 3

CREATE AND SOLVE PROBLEMS INVOLVING OPERATIONS WITH WHOLE NUMBERS

The student will create and solve problems involving addition, subtraction, multiplication, and division of whole numbers, using paper and pencil, estimation, mental computation, and calculators.

Benchmark 3.a

Create and Solve Problems Involving Operations with Whole Numbers

The student will create and solve problems involving addition, subtraction, multiplication, and division of whole numbers, using paper and pencil, estimation, mental computation, and calculators.

Indicator 3.a.1

Create problems involving operations with whole numbers

Create problems involving the operations of addition, subtraction, multiplication, and/or division of whole numbers, using real-life situations.

Indicator 3.a.2

Estimate sum/difference/product/quotient of whole number computations

Estimate the sum, difference, product, and quotient of whole-numbercomputations.

Indicator 3.a.3

Solve problems involving operations with whole numbers

Solve problems involving addition, subtraction, multiplication, and division of whole numbers, using paper and pencil, mental computation, and calculators, in which

- sums, differences, and products will not exceed five digits;
- multipliers will not exceed two digits;
- divisors will not exceed two digits; or
- dividends will not exceed four digits.

Benchmark 3.b

Explain and Apply Properties of Whole Numbers

The student will explain and apply properties of whole numbers.

Indicator 3.b.1

Read/write/compare/order numbers to billions

Read, write, compare, and order numbers to billions.

Indicator 3.b.2

Explain relationship among place values of numbers up to one billion

Explain the relationship (including the use of exponential notation) among place values of numbers up to one billion.

Indicator 3.b.3

Explain/show use of distributive property to multiply numbers

Explain/show the use of the distributive property to multiply a one-digit number by a two-or three-digit number.

Indicator 3.b.4

Explain rounding and derive a rule for rounding whole numbers

Explain rounding and derive a rule for rounding whole numbers.

Indicator 3.b.5

Choose an appropriate estimation strategy to fit a given situation

Choose an appropriate estimation strategy (compatible numbers, rounding, front end, clustering, or using a referent) to fit a given situation.

Indicator 3.b.6

Identify/find multiples, common multiples, composite, prime numbers

Identify and find multiples, common multiples, composite, and prime numbers. Find the Greatest Common Factor (GCF) and the Least Common Multiple (LCM). Use the rules of divisibility for 2,3,5, and 10.

Indicator 3.b.7

Investigate/develop/use rules of divisibility for 4, 6, 8, and 9

Investigate, develop and use the rules of divisibility for the numbers 4,6,8 and 9.

Indicator 3.b.8

Use whole number/fraction/decimal properties to solve problems

Use properties of whole numbers, fractions, and decimals to solve real life problems.

MTH.G5

Standard 4

FIND SUM/DIFFERENCE/PRODUCT OF TWO NUMBERS EXPRESSED AS DECIMALS

The student will find the sum, difference, and product of two numbers expressed as decimals through thousandths, using an appropriate method of calculation, including paper and pencil, estimation, mental computation, and calculators.

Benchmark 4.a

Find Sum/Difference/Product of Two Numbers Expressed as Decimals

The student will find the sum, difference, and product of two numbers expressed as decimals through thousandths, using an appropriate method of calculation, including paper and pencil, estimation, mental computation, and calculators.

Indicator 4.a.1

Determine appropriate calculation method to solve probs. w/ decimals

Determine an appropriate method of calculation to find the sum, difference, and product of two numbers expressed as decimals through thousandths, selecting from among paper and pencil, estimation, mental computation, and calculators.

Indicator 4.a.2

Estimate sum/difference/product of two decimal numbers

Estimate the sum, difference, and product of two numbers expressed as decimals through thousandths.

Indicator 4.a.3

Use paper/pencil to find sum/difference/product of two decimal numbers

Find the sum, difference, and product of two numbers expressed as decimals through thousandths, using paper and pencil.

Indicator 4.a.4

Use mental computation to find sum/difference/product of decimals

Find the sum, difference, and product of two numbers expressed as decimals through thousandths, using mental computation.

Indicator 4.a.5

Use a calculator to find sum/difference/product of decimals

Find the sum, difference, and product of two numbers expressed as decimals through thousandths, using calculators.

Indicator 4.a.6

Use estimation to check reasonableness of sum/difference/product

Use estimation to check the reasonableness of a sum, difference, and product.

Indicator 4.a.7

Choose an appropriate estimation strategy to fit a given situation

Choose an appropriate estimation strategy (compatible numbers, rounding, front end, clustering, or using a referent) to fit a given situation.

Indicator 4.a.8

Estimate result of decimal multiplied by 10 and 100

Estimate result of a decimal (tenths, hundredths, and thousandths) multiplied by 10 and 100.

Indicator 4.a.9

Mentally multiply a decimal by 10 and 100

Mentally multiply a decimal (tenths, hundredths, and thousandths) by 10 and 100.

MTH.G5

Standard 5

FIND THE QUOTIENT AND REMAINDER

The student, given a dividend of four digits or fewer and a divisor of two digits or fewer, will find the quotient and remainder.

Benchmark 5.a

Find the Quotient and Remainder

The student, given a dividend of four digits or fewer and a divisor of two digits or fewer, will find the quotient and remainder.

Indicator 5.a.1

Estimate the quotient of two whole numbers

Estimate the quotient of two whole numbers when given a dividend of four digits or fewer and a divisor of two digits or fewer.

Indicator 5.a.2

Determine the quotient with no remainder of two whole numbers

Determine the quotient with no remainder of two whole numbers when given a dividend of four

digits or fewer and a divisor of two digits or fewer.

Indicator 5.a.3

Determine the quotient and remainder of two whole numbers

Determine the quotient and remainder of two whole numbers when given a dividend of four digits or fewer and a divisor of two digits or fewer.

Indicator 5.a.4

Use estimation to check reasonableness of a quotient

Use estimation to check the reasonableness of a quotient.

Indicator 5.a.5

Investigate and interpret remainders in problem-solving settings

Investigate and interpret remainders in problem-solving settings.

MTH.G5

Standard 6

FIND THE QUOTIENT OF A DECIMAL DIVIDEND & A SINGLE-DIGIT DIVISOR

The student, given a dividend expressed as a decimal through thousandths and a single-digit divisor, will find the quotient.

Benchmark 6.a

Find the Quotient of a Decimal Dividend & a Single-Digit Divisor

The student, given a dividend expressed as a decimal through thousandths and a single-digit divisor, will find the quotient.

Indicator 6.a.1

Find the quotient of a decimal dividend & a single-digit divisor

Determine the quotient, given a dividend expressed as a decimal through thousandths (and no annexing of zeros during the division process) and a single-digit divisor. All dividends should be evenly divisible by the divisor.

Indicator 6.a.2

Estimate quotients for a decimal divided by a whole number

Estimate quotients for a decimal through thousandths by a whole number.

Indicator 6.a.3

Find unit prices & determine best buys by using estimation & division

Find unit prices and determine best buys by using estimation and division.

Indicator 6.a.4

Mentally divide a decimal by 10 and 100

Mentally divide a decimal number by 10 and 100.

MTH.G5

Standard 7

ADD & SUBTRACT WITH FRACTIONS & MIXED NUMBERS WITH & W/O REGROUPING

The student will add and subtract with fractions and mixed numbers, with and without regrouping, and express answers in simplest form. Problems will include like and unlike denominators limited to 12 or less.

Benchmark 7.a

Add & Subtract with Fractions & Mixed Numbers with & W/O Regrouping

The student will add and subtract with fractions and mixed numbers, with and without regrouping, and express answers in simplest form. Problems will include like and unlike

denominators limited to 12 or less.

Indicator 7.a.1

Add and subtract fractions having like and unlike denominators

Add and subtract fractions having like and unlike denominators. Denominators should be limited to 12 or less, and answers should be expressed in simplest form.

Indicator 7.a.2

Add & subtract with mixed numbers having like and unlike denominators

Add and subtract with mixed numbers having like and unlike denominators, with and without regrouping. Denominators should be limited to 12 or less, and answers should be expressed in simplest form.

Indicator 7.a.3

Use estimation to check reasonableness of a sum or difference

Use estimation to check the reasonableness of a sum or difference.

Benchmark 7.b

Explore Multiplication with Fractions

The student will explore multiplication with fractions.

Indicator 7.b.1

Estimate products of fractions by whole numbers and by fractions

Estimate products of fractions by whole numbers and fractions by fractions.

Indicator 7.b.2

Explore multiplication of fractions and whole numbers by a fraction

Explore the concept of multiplication of fractions and whole numbers by a fractions.

MTH.G5

Standard 8

FIND PERIMETER OF A POLYGON & AREA OF SQUARE, RECT., & RIGHT TRIANGLE

The student will describe and determine the perimeter of a polygon and the area of a square, rectangle, and right triangle, given the appropriate measures.

Benchmark 8.a

Find Perimeter of a Polygon & Area of Square, Rect., & Right Triangle

The student will describe and determine the perimeter of a polygon and the area of a square, rectangle, and right triangle, given the appropriate measures.

Indicator 8.a.1

Determine the perimeter of a polygon

Determine the perimeter of a polygon, with or without diagrams, when

–the lengths of all sides of a polygon that is not a rectangle or a square are given;
–the length and width of a rectangle are given; or
-the length of a side of a square is given.

Indicator 8.a.2

Determine the area of a square when the side length is given

Determine the area of a square, with or without diagrams, when the length of a side is given.

Indicator 8.a.3

Determine the area of a rectangle when length and width are given

Determine the area of a rectangle, with or without diagrams, when the length and width are given.

Indicator 8.a.4

Determine the area of a right triangle when base & height are given

Determine the area of a right triangle, with or without diagrams, when the base and the height are given.

Indicator 8.a.5

Label perimeter and area with appropriate units of measure

Determine the perimeter of a polygon and area of a square, rectangle, and triangle, following the parameters listed above, using only whole number measurements given in metric or U.S. Customary units, and record the solution with the appropriate unit of measure *(e.g., 24 square inches)*.

Indicator 8.a.6

Develop formulas for perimeter and area

Develop formulas for perimeter and area.

MTH.G5

Standard 9

IDENTIFY & DESCRIBE DIAMETER/RADIUS/CHORD/CIRCUMFERENCE OF A CIRCLE

The student will identify and describe the diameter, radius, chord, and circumference of a circle.

Benchmark 9.a

Identify & Describe Diameter/Radius/Chord/Circumference of a Circle

The student will identify and describe the diameter, radius, chord, and circumference of a circle.

Indicator 9.a.1

Describe the diameter, radius, chord, and circumference of a circle

Describe the diameter, radius, chord, and circumference of a circle.

Indicator 9.a.2

Describe relationship between diameter/radius & radius/circumference

Describe the relationship between
-diameter and radius; and
-radius and circumference.

Indicator 9.a.3

Identify diameter/radius/chord/circumference of a given circle

Identify the diameter, radius, chord, and circumference of a given circle.

Indicator 9.a.4

Use C = pi times diameter to find the circumference

Use $C = \pi d$ to find circumference.

MTH.G5

Standard 10

DIFFERENTIATE BETWEEN PERIMETER, AREA, AND VOLUME

The student will differentiate between perimeter, area, and volume and identify whether the application of the concept of perimeter, area, or volume is appropriate for a given situation.

Benchmark 10.a

Differentiate Between Perimeter, Area, and Volume

The student will differentiate between perimeter, area, and volume and identify whether the application of the concept of perimeter, area, or volume is appropriate for a given situation.

Indicator 10.a.1

Differentiate between the concepts of area, perimeter, and volume

Differentiate between the concepts of area, perimeter, and volume.

Indicator 10.a.2

Describe real-life situations where area/perimeter/volume are used

Describe real life situations where area, perimeter, and volume are appropriate measures to use, and justify their choices orally or in writing.

Indicator 10.a.3

Apply concepts of area/perimeter/volume appropriately

Identify whether the application of the concept of perimeter, area, or volume is appropriate for a given situation.

Indicator 10.a.4

Use measurement procedures to solve real life problems

Use measurement procedures to solve real life problems.

MTH.G5

Standard 11

CHOOSE APPROPRIATE MEASURING DEVICE AND UNIT TO SOLVE PROBLEMS

The student will choose an appropriate measuring device and unit of measure to solve problems involving measurement of

a) length — part of an inch (1/2, 1/4, and 1/8), inches, feet, yards, miles, millimeters, centimeters, meters, and kilometers;
b) weight/mass — ounces, pounds, tons, grams, and kilograms;
c) liquid volume — cups, pints, quarts, gallons, milliliters, and liters;
d) area — square units; and
e) temperature — Celsius and Fahrenheit units.

Problems also will include estimating the conversion of Celsius and Fahrenheit units relative to familiar situations (water freezes at 0°C and 32°F, water boils at 100°C and 212°F, normal body temperature is about 37° C and 98.6°F).

Benchmark 11.a

Solve Problems Involving Measurement of Length

The student will choose an appropriate measuring device and unit of measure to solve problems involving measurement of length — part of an inch (1/2, 1/4, and 1/8), inches, feet, yards, miles, millimeters, centimeters, meters, and kilometers.

Indicator 11.a.1

Select appropriate device/unit to solve problems involving length

Solve problems involving measurement by selecting an appropriate measuring device and a U.S. Customary or metric unit of measure for the following:

- length: part of an inch ($\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{8}$), inches, feet, yards, miles, millimeters, centimeters, meters, and kilometers;

Benchmark 11.b

Solve Problems Involving Measurement of Weight/Mass

The student will choose an appropriate measuring device and unit of measure to solve problems involving measurement of weight/mass — ounces, pounds, tons, grams, and kilograms.

Indicator 11.b.1

Select appropriate device/unit to solve problems involving weight/mass

Solve problems involving measurement by selecting an appropriate measuring device and a U.S. Customary or metric unit of measure for the following:

-weight: ounces, pounds, and tons;

-mass: grams and kilograms;

Benchmark 11.c

Select Appropriate Device/Unit to Solve Problems Involving Liquid Vol.

The student will choose an appropriate measuring device and unit of measure to solve problems involving measurement of liquid volume- cups, pints, quarts, gallons, milliliters, and liters.

Indicator 11.c.1

Select appropriate device/unit to solve problems involving liquid vol.

Solve problems involving measurement by selecting an appropriate measuring device and a U.S. Customary or metric unit of measure for the following:

- liquid volume: cups, pints, quarts, milliliters, and liters.

Benchmark 11.d

Solve Problems Involving Measurement of Area-Square Units

The student will choose an appropriate measuring device and unit of measure to solve problems involving measurement of area — square units;

Indicator 11.d.1

Select appropriate device/unit to solve problems involving area

Solve problems involving measurement by selecting an appropriate measuring device and a U.S. Customary or metric unit of measure for the following:

-area: square units

Benchmark 11.e

Solve Problems Involving Measurement of Temperature

The student will choose an appropriate measuring device and it of measure to solve problems involving measurement of temperature- Celsius and Fahrenheit units.

Problems also include estimating the conversion of Celsius and Fahrenheit units relative to familiar situations (water freezes at 0°C and 32°F, water boils at 100°C and 212°F, normal body temperature is about 37°C and 98.6°F.

Indicator 11.e.1

Select appropriate device/unit to solve problems involving temperature

Solve problems involving measurement by selecting an appropriate measuring device and a U.S. Customary or metric unit of measure for the following:

-Temperature: Celsius and Fahrenheit units.

Indicator 11.e.2

Estimate the conversion of Celsius and Fahrenheit units

Estimate the conversion of Celsius and Fahrenheit units relative familiar situations: 32°

-Water freezes at 0°C and 32°F.
-Water boils at 100°C and 212°F
-Normal body temperature is about 37°C and 98.6°F.

MTH.G5

Standard 12

DETERMINE AN AMOUNT OF ELAPSED TIME IN HOURS AND MINUTES

The student will determine an amount of elapsed time in hours and minutes within a 24-hour period.

Benchmark 12.a

Determine an Amount of Elapsed Time in Hours and Minutes

The student will determine an amount of elapsed time in hours and minutes within a 24-hour period.

Indicator 12.a.1

Determine elapsed time in hours and minutes within 24-hour period

Determine elapsed time in hours and minutes within a 24-hour period.

Indicator 12.a.2

Solve problems involving elapsed time in hours, minutes, & seconds

Solve problems involving elapsed time in hours, minutes, and seconds.

MTH.G5

Standard 13

MEASURE AND DRAW RIGHT/ACUTE/OBTUSE ANGLES AND TRIANGLES

The student will measure and draw right, acute, and obtuse angles and triangles, using appropriate tools.

Benchmark 13.a

Measure and Draw Right/Acute/Obtuse Angles and Triangles

The student will measure and draw right, acute, and obtuse angles and triangles, using appropriate tools.

Indicator 13.a.1

Identify appropriate tools used to measure & draw angles and triangles

Identify the appropriate tools (e.g., protractor and straightedge or angle ruler as well as available software) used to measure and draw angles and triangles.

Indicator 13.a.2

Draw right, acute, and obtuse angles, using appropriate tools

Draw right, acute, and obtuse angles, using appropriate tools.

Indicator 13.a.3

Measure right, acute, and obtuse angles, using appropriate tools

Measure right, acute, and obtuse angles, using appropriate tools, and identify their measures in degrees.

Indicator 13.a.4

Measure the angles of right, acute, and obtuse triangles

Measure the angles of right, acute, and obtuse triangles, using appropriate tools, and identify

their measures in degrees.

MTH.G5
Standard 14
CLASSIFY ANGLES AND TRIANGLES AS RIGHT, ACUTE, OR OBTUSE

The student will classify angles and triangles as right, acute, or obtuse.

Benchmark 14.a
Classify Angles and Triangles as Right, Acute, or Obtuse

The student will classify angles and triangles as right, acute, or obtuse.

Indicator 14.a.1
Classify angles as right, acute, or obtuse

Classify angles as right, acute, and obtuse.

Indicator 14.a.2
Classify triangles as right, acute, or obtuse

Classify triangles as right, acute, and obtuse.

Indicator 14.a.3
Classify and illustrate acute, right, or obtuse angles

Classify and illustrate acute, right, or obtuse angles.

Indicator 14.a.4
Classify and illustrate triangles by angles and/or sides

Classify and illustrate triangles by angles and/or sides.

MTH.G5
Standard 15
RECOGNIZE/IDENTIFY/DESCRIBE/ANALYZE PROPERTIES OF PLANE FIGURES

The student, using two-dimensional (plane) figures (square, rectangle, triangle, parallelogram, rhombus, kite, and trapezoid) will

a) recognize, identify, describe, and analyze their properties in order to develop definitions of these figures;

b) identify and explore congruent, non-congruent, and similar figures;

c) investigate and describe the results of combining and subdividing shapes;

d) identify and describe a line of symmetry; and

e) recognize the images of figures resulting from geometric transformations such as translation (slide), reflection (flip), or rotation (turn).

Benchmark 15.a
Analyze Properties of Plane Figures in Order to Develop Definitions

The student, using two-dimensional (plane) figures (square, rectangle, triangle,

parallelogram, rhombus, kite, and trapezoid) will recognize, identify, describe, and analyze their properties in order to develop definitions of these figures;

Indicator 15.a.1

Recognize and identify properties of quadrilaterals and triangles

Recognize and identify the properties of squares, rectangles, triangles, parallelograms, rhombi, kites and trapezoids.

Indicator 15.a.2

Describe the properties of quadrilaterals and triangles

Describe the properties of squares, rectangles, triangles, parallelograms, rhombi, kites and trapezoids.

Indicator 15.a.3

Analyze the properties of quadrilaterals and triangles

Analyze the properties of squares, rectangles, triangles, parallelograms, rhombi, kites and trapezoids.

Benchmark 15.b

Identify/Explore Congruent, Non-congruent, and Similar Figures

The student, using two-dimensional (plane) figures (square, rectangle, triangle, parallelogram, rhombus, kite, and trapezoid) will identify and explore congruent, non-congruent, and similar figures.

Indicator 15.b.1

Identify congruent, non-congruent, and similar figures

Identify congruent, non-congruent, and similar figures.

Indicator 15.b.2

Draw congruent polygons

Draw congruent polygons.

Indicator 15.b.3

Draw similar figures by using scale

Draw similar figures by using scale.

Benchmark 15.c

Investigate and Describe the Results of Combining & Subdividing Shapes

The student, using two-dimensional (plane) figures (square, rectangle, triangle, parallelogram, rhombus, kite, and trapezoid) will investigate and describe the results of combining and subdividing shapes;

Indicator 15.c.1

Describe the results of combining and subdividing shapes

Describe the results of combining and subdividing shapes.

Benchmark 15.d

Identify & Describe a Line of Symmetry Using Plane Figures

The student, using two-dimensional (plane) figures (square, rectangle, triangle, parallelogram, rhombus, kite, and trapezoid) will. identify and describe a line of symmetry.

Indicator 15.d.1

Identify and describe a line of symmetry

Identify and describe a line of symmetry.

Indicator 15.d.2

Describe/draw/label lines, line segments, rays, angles, etc.

Describe, draw, and label points, lines, line segments, rays, angles, perpendicular lines, parallel lines, and lines of symmetry.

Benchmark 15.e

Recognize Images of Figures Resulting from Geometric Transformations

The student, using two-dimensional (plane) figures (square, rectangle, triangle, parallelogram, rhombus, kite, and trapezoid) will recognize the images of figures resulting from geometric transformations such as translation (slide), reflection (flip), or rotation (turn).

Indicator 15.e.1

Recognize images of figures resulting from geometric transformations

Recognize the images of figures resulting from geometric transformations such as translation, reflection, or rotation.

Indicator 15.e.2

Build tesselations with congruent shapes using slides, flips, & turns

Build tessellations with congruent shapes using slides, flips, and turns.

Benchmark 15.f

Locate and Name Points Using Coordinates and a Grid

The student will locate and name points using coordinates and a grid.

Indicator 15.f.1

Locate and name points using coordinates and a grid

Locate and name points using coordinates and a grid.

Indicator 15.f.2

Englarge and/or reduce an image using ratios and a grid

Enlarge and/or reduce an image using ratios and a grid.

Benchmark 15.g

Solve Problems Involving Geometric Figures

The student will solve problems involving geometric figures.

Indicator 15.g.1

Use geometric properties to solve real-life problems

Use geometric properties to solve real-life problems.

MTH.G5

Standard 16

IDENTIFY, COMPARE, AND ANALYZE PROPERTIES OF SOLID GEOMETRIC SHAPES

The student will identify, compare, and analyze properties of three-dimensional (solid) geometric shapes (cylinder, cone, cube, square pyramid, and rectangular prism).

Benchmark 16.a

Identify, Compare, and Analyze Properties of Solid Geometric Shapes

The student will identify, compare, and analyze properties of three-dimensional (solid) geometric shapes (cylinder, cone, cube, square pyramid, and rectangular prism).

Indicator 16.a.1

Identify properties of three-dimensional (solid) geometric shapes

Identify properties of three-dimensional (solid) geometric shapes (cylinder, cone, cube, square pyramid, and rectangular prism).

Indicator 16.a.2

Analyze and compare properties of solid geometric shapes

Analyze and compare properties of three-dimensional (solid) geometric shapes (cylinder, cone, cube, square pyramid, and rectangular prism).

Indicator 16.a.3

Classify solids and identify the number of faces, edges, and vertices

Classify solids and identify the number of faces, edges, and vertices.

Indicator 16.a.4

Investigate/explain relationship of polyhedrons' faces/edges/vertices

Investigate and explain the relationship between faces, edges, and vertices of polyhedrons (e.g., prisms, pyramids, and cylinders).

MTH.G5

Standard 17

SOLVE PROBLEMS INVOLVING PROBABILITY AND PREDICT OUTCOMES

The student will:

a) solve problems involving the probability of a single event by using tree diagrams or by constructing a sample space representing all possible results;

b) predict the probability of outcomes of simple experiments, representing it with fractions or decimals from 0 to 1, and test the prediction; and

c) create a problem statement involving probability based on information from a given problem situation. Students will not be required to solve the created problem statement.

Benchmark 17.a

Solve Problems Involving the Probability of a Single Event

The student will solve problems involving the probability of a single event by using tree diagrams or by constructing a sample space representing all possible results.

Indicator 17.a.1

Identify all possible outcomes of a single event

Construct a sample space, using a tree diagram to identify all possible outcomes of a single event.

Indicator 17.a.2

Construct a sample space to represent all possible outcomes of event

Construct a sample space, using a list or chart to represent all possible outcomes of a single event.

Benchmark 17.b

Predict Probability of Outcomes of Simple Experiments

The student will predict the probability of outcomes of simple experiments, representing it with fractions or decimals from 0 to 1, and test the prediction.

Indicator 17.b.1

Determine the probability of a single event

Determine the probability of a single event when the total number of possible outcomes is 12 or less.

Indicator 17.b.2

Determine outcome of an event with a probability of 0 or 1

Determine the outcome of an event that is least likely to occur (0) or most likely to occur (1) when the number of possible outcomes is 12 or less.

Indicator 17.b.3

Conduct experiments to verify the predicted probabilities

Conduct experiments to verify the predicted probabilities.

Indicator 17.b.4

Use probability of events to solve real-life problems

Use probability of events to solve rea- life problems.

Benchmark 17.c

Create a Problem Statement Involving Probability

The student will create a problem statement involving probability based on information from a given problem situation. Students will not be required to solve the created problem statement.

Indicator 17.c.1

Create a problem statement involving probability

Create a problem statement involving probability based on information from a given problem situation. Students will not be expected to solve the problem.

MTH.G5

Standard 18

COLLECT, ORGANIZE, AND DISPLAY A SET OF NUMERICAL DATA

The student will, given a problem situation, collect, organize, and display a set of numerical data in a variety of forms, using bar graphs, stem-and-leaf plots, and line graphs, to draw conclusions and make predictions.

Benchmark 18.a

Collect, Organize, and Display a Set of Numerical Data

The student will, given a problem situation, collect, organize, and display a set of numerical data in a variety of forms, using bar graphs, stem-and-leaf plots, and line graphs, to draw conclusions and make predictions.

Indicator 18.a.1

Collect data using observations/measurement/surveys/experiments

Collect data, using observations (e.g., weather), measurement (e.g., shoe sizes), surveys (e.g., favorite television shows), or experiments (e.g., plant growth).

Indicator 18.a.2

Organize the data into a chart or table

Organize the data into a chart or table.

Indicator 18.a.3

Construct bar graphs

Construct bar graphs, labeling one axis with equal whole-number or decimal increments and the other axis with attributes of the topic (categorical data) (e.g., skiing, basketball, ice hockey, skating, and sledding as the categories of “Favorite Winter Sports”). Bar graphs will have no more than six categories.

Indicator 18.a.4

Display data in line graphs/bar graphs/stem-and-leaf plots

Display data in line graphs, bar graphs, and stem-and-leaf plots.

Indicator 18.a.5

Construct line graphs

Construct line graphs, labeling the vertical axis with equal whole-number, decimal, or fractional increments and the horizontal axis with continuous data commonly related to time (e.g., hours, days, months, years, and age). Line graphs will have no more than six identified points along a continuum for continuous data (e.g., the decades: 1950s, 1960s, 1970s, 1980s, 1990s, and 2000s).

Indicator 18.a.6

Construct a stem-and-leaf plot

Construct a stem-and-leaf plot to organize and display data, where the stem is listed in ascending order and the leaves are in ascending order, with or without commas between leaves.

Indicator 18.a.7

Title the given graph, or identify the title

Title the given graph, or identify the title.

Indicator 18.a.8

Interpret the data to compare the answer to the prediction

Interpret the data to compare the answer to the prediction

Indicator 18.a.9

Write a few sentences to describe the interpretation of the data

Write a few sentences to describe the interpretation of the data.

Indicator 18.a.10

Display data using a variety of graphs and graphing technologies

Display data by making bar graphs, multi-bar graphs, stem-and-leaf plots, line plots, and line graphs. Data can be presented using graphing technologies.

Indicator 18.a.11

Solve real-life problems by applying skills involving data analysis

Solve real life problems by applying the skills of data gathering, graphing, and computation.

MTH.G5

Standard 19

FIND THE MEAN, MEDIAN, MODE, AND RANGE OF A SET OF DATA

The student will find the mean, median, mode, and range of a set of data.

Benchmark 19.a

Find the Mean, Median, Mode, and Range of a Set of Data

The student will find the mean, median, mode, and range of a set of data.

Indicator 19.a.1

Calculate the mean of a group of numbers

Calculate the mean of a group of numbers representing data from a given context.

Indicator 19.a.2

Determine the median of a group of numbers

Determine the median of a group of numbers representing data from a given context.

Indicator 19.a.3

Determine the mode of a group of numbers

Determine the mode of a group of numbers representing data from a given context.

Indicator 19.a.4

Determine the range of a group of numbers

Determine the range of a group of numbers representing data from a given context.

Indicator 19.a.5

Explain the concept of average

Explain the concept of average; find the mean, median, mode, and range of a set of data.

MTH.G5

Standard 20

ANALYZE STRUCTURE/EXPRESS RELATIONSHIP OF NUMERICAL/GEOMETRIC PATTERNS

The student will analyze the structure of numerical and geometric patterns (how they change or grow) and express the relationship, using words, tables, graphs or a mathematical sentence. Concrete materials and calculators will be used.

Benchmark 20.a

Analyze Structure/Express Relationship of Numerical/Geometric Patterns

The student will analyze the structure of numerical and geometric patterns (how they change or grow) and express the relationship, using words, tables, graphs or a mathematical sentence. Concrete materials and calculators will be used.

Indicator 20.a.1

Describe numerical/geometric patterns formed using manips/calculators

Describe numerical and geometric patterns formed by using concrete materials and calculators.

Indicator 20.a.2

Express the relationship found in numerical and geometric patterns

Express the relationship found in numerical and geometric patterns, using words, tables, graphs, or a mathematical sentence.

Indicator 20.a.3

Complete a chart showing input/output when given a function rule

Express the relationships of numerical and geometric patterns using words, tables, graphs, or mathematical sentences. Complete a chart showing input and output when given a function rule.

Indicator 20.a.4

Represent growth patterns by using variables and expressions

Represent growth patterns by using variables and expressions.

Indicator 20.a.5

Use patterns and functions to solve real-life problems

Use patterns and functions to solve real life problems.

MTH.G5

Standard 21

INVESTIGATE/DESCRIBE CONCEPT OF VARIABLE & USE A VARIABLE EXPRESSION

The student will

a) investigate and describe the concept of variable;

b) use a variable expression to represent a given verbal quantitative expression involving one operation; and

c) write an open sentence to represent a given mathematical relationship, using a variable.

Benchmark 21.a

Investigate and Describe the Concept of Variable

The student will investigate and describe the concept of variable;

Indicator 21.a.1

Describe the concept of a variable

Describe the concept of a variable (presented as boxes, letters, or other symbols) as a representation of an unknown quantity.

Benchmark 21.b

Use Variable Expression to Represent Verbal Quantitative Expression

The student will use a variable expression to represent a given verbalquantitative expression involving one operation.

Indicator 21.b.1

Use variable expression to represent a verbal quantitative expression

Use a variable expression to represent a given verbal expression involving one operation (e.g., “5 more than a number” can be represented by $x + 5$).

Indicator 21.b.2

Solve simple equations for missing addends or missing factors

Solve simple equations for missing addends or missing factors.

Benchmark 21.c

Write an Open Sentence to Represent a Mathematical Relationship

The student will write an open sentence to represent a given mathematicalrelationship, using a variable.

Indicator 21.c.1

Write an open sentence using a variable to represent a missing number

Write an open sentence with addition, subtraction, multiplication, or division, using a variable to represent a missing number.

MTH.G5

Standard 22

CREATE A PROBLEM SITUATION BASED ON A GIVEN OPEN SENTENCE

The student will create a problem situation based on a given open sentence using a single variable.

Benchmark 22.a

Create a Problem Situation Based on a Given Open Sentence

The student will create a problem situation based on a given open sentence using a single variable.

Indicator 22.a.1

Create and write a word problem to match a given open sentence

Create and write a word problem to match a given open sentence with a single variable and one operation.

MTH.G5

Standard 23

USE PROBLEM-SOLVING APPROACHES TO UNDERSTAND NUMERICAL RELATIONSHIPS

The student will use problem-solving approaches to understand concepts and skills involving numerical relationships. Students pose problems; solve routine, non-routine and multi-step problems.

Benchmark 23.a

Use Problem-Solving Approaches to Understand Numerical Relationships

The student will use problem-solving approaches to understand concepts and skills involving numerical relationships. Students pose problems; solve routine, non-routine and multi-step problems.

Indicator 23.a.1

Develop/apply operations and strategies to solve a variety of problems

Develop and apply operations and strategies (e.g., act it out, build a model, draw a picture or diagram, guess and check, make a chart or table, make a list, make a graph, use a pattern, use logical reasoning, solve a simpler problem, work backward) to solve a wide variety of routine and non-routine problems.

Indicator 23.a.2

Solve problems using a logical procedure (a plan)

Solve problems using logical procedure (a plan).

Indicator 23.a.3

Solve problems and present data/conclusions in a variety of formats

Solve problems and present data and conclusions in a variety of formats, including paragraphs, tables, and graphs.

Indicator 23.a.4

Identify and/or pose problems from everyday life

Identify and/or pose problems from everyday life and mathematical situations including problems to fit a given equation.

Indicator 23.a.5

Simplify and/or solve a problem using appropriate materials and tools

Simplify and/or solve a problem using appropriate materials and tools (e.g., calculator, grid paper, collectibles, manipulatives, computer software).

Indicator 23.a.6

Identify excess or deficient information needed to solve a problem

Identify information that is available but not needed. Identify additional information needed to solve a problem.

Indicator 23.a.7

Work collaboratively to solve problems

Solve problems by working collaboratively with peers; entertain others' point of view.

Indicator 23.a.8

Share and explain thinking during and after solving a problem

Share and explain (verbalize/ record) thinking during and after solving a problem. Verify and interpret results with respect to the original problem situation to determine if answers are reasonable.

Indicator 23.a.9

Investigate alternative ways of solving a problem

Investigate alternative ways of solving a problem.

Indicator 23.a.10

Generalize solutions and strategies to new problem situations

Generalize solutions and strategies to new problem situations including problems without numbers.