

## ***3-5 Mathematics Georgia Performance Standards***

### **K-12 Mathematics Introduction**

The Georgia Mathematics Curriculum focuses on actively engaging the students in the development of mathematical understanding by using manipulatives and a variety of representations, working independently and cooperatively to solve problems, estimating and computing efficiently, and conducting investigations and recording findings. There is a shift towards applying mathematical concepts and skills in the context of authentic problems and for the student to understand concepts rather than merely follow a sequence of procedures. In mathematics classrooms, students will learn to think critically in a mathematical way with an understanding that there are many different ways to a solution and sometimes more than one right answer in applied mathematics. Mathematics is the economy of information. The central idea of all mathematics is to discover how knowing some things well, via reasoning, permit students to know much else—without having to commit the information to memory as a separate fact. It is the connections, the reasoned, logical connections that make mathematics manageable. As a result, implementation of Georgia's Performance Standards places a greater emphasis on problem solving, reasoning, representation, connections, and communication.

### **Georgia Mathematics Performance Standards Grade 3**

By the end of grade three, students will understand place value. They will further develop their understanding and their skills with addition and subtraction of whole numbers and decimals. They will also expand their knowledge base of multiplication and division of whole numbers. Students will understand the concepts of length, perimeter, area, and time. Students will broaden their understanding of characteristics of previously studied geometric figures. They will solve problems by collecting, organizing, displaying and interpreting data.

Instruction and assessment should include the use of manipulatives and appropriate technology. Topics should be represented in multiple ways including concrete/pictorial, verbal/written, numeric/data-based, graphical, and symbolic. Concepts should be introduced and used in the context of real world phenomena.

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Grade 3

**Concepts/Skills to Maintain**

Comparison of numbers  
Addition & subtraction of multi-digit numbers  
Length (**cm, m, in, ft, yd**) and time  
Geometric shapes  
Money  
Area models (arrays) of multiplication

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**NUMBER AND OPERATIONS**

Students will use decimal fractions and common fractions to represent parts of a whole. They will also understand the four arithmetic operations for whole numbers and use them in basic calculations, and apply them in problem solving situations.

**M3N1. Students will further develop their understanding of whole numbers and decimal fractions and**

**ways of representing them.**

- a. Identify place values from tenths through ten thousands.
- b. Understand the relative sizes of digits in place value notation (10 times, 100 times, 1/10 of a single digit whole number) and ways to represent them including word name, standard form, and expanded form.

**M3N2. Students will further develop their skills of addition and subtraction and apply them in problem solving.**

- a. Use the properties of addition and subtraction to compute and verify the results of —computation.
- b. Use mental math and estimation strategies to add and subtract.
- c. Solve problems requiring addition and subtraction.

**M3N3. Students will further develop their understanding of multiplication of whole numbers and develop the ability to apply it in problem solving.**

- a. Describe the relationship between addition and multiplication, i.e., multiplication is defined as repeated addition.
- b. Know the multiplication facts with understanding and fluency to 10 x 10.

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- c. Use arrays and area models to develop understanding of the distributive property and to determine partial products for multiplication of 2- or 3-digit numbers by a 1- digit number.
- d. Understand the effect on the product when multiplying by multiples of 10.
- e. Apply the identity, commutative and associative properties of multiplication and verify the results.
- f. Use mental math and estimation strategies to multiply.
- g. Solve problems requiring multiplication.

**M3N4. Students will understand the meaning of division and develop the ability to apply it in problem solving.**

- a. Understand the relationship between division and multiplication and between division and subtraction.
- b. Recognize that division may be two situations: the first is determining how many equal parts of a given size or amount may be taken away from the whole as in repeated subtraction, and the second is determining the size of the parts when the whole is separated into a given number of equal parts as in a sharing model.
- c. Recognize problem-solving situations in which division may be applied and write corresponding mathematical expressions.
- d. Explain the meaning of a remainder in division in different circumstances.
- e. Divide a 2 and 3-digit number by a 1-digit divisor.
- f. Solve problems requiring division.
- g. [Use mental math strategies to divide.](#)

**M3N5. Students will understand the meaning of decimal fractions and common fractions in simple cases and apply them in problem-solving situations.**

- a. Understand a decimal fraction (i.e., 0.1) and a common fraction (i.e., 1/10) represent parts of a whole.
- b. Understand the fraction  $a/b$  represents  $a$  equal sized parts of a whole that is divided into  $b$  equal sized parts.
- c. Understand a one place decimal fraction represents tenths, i.e.,  $0.3 = 3/10$ .
- d. Know and use decimal fractions and common fractions to represent the size of parts created by equal divisions of a whole.
- e. Understand the concept of addition and subtraction of decimal fractions-and common fractions with like denominators.
- f. Model addition and subtraction of decimal fractions and common fractions [with like denominators.](#)
- g. [Use mental math and estimation strategies to add and subtract decimal fractions and common fractions.](#)
- g. Solve problems involving [decimal and common](#) fractions.

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#### **Grade 3**

#### **MEASUREMENT**

Students will understand and measure time and length. They will also model and calculate perimeter and area of simple geometric figures.

**M3M1. Students will further develop their understanding of the concept of time by determining elapsed time of a full, half and quarter-hour.**

**M3M2. Students will measure length choosing appropriate units and tools.**

- a. Use the units kilometer (km) and mile (mi.) to discuss the measure of long distances.
- b. Measure to the nearest  $\frac{1}{4}$  inch,  $\frac{1}{2}$  inch and millimeter (mm) in addition to the previously learned inch, foot, yard, centimeter, and meter.
- c. Estimate length and represent it using appropriate units.
- d. Compare one unit to another within a single system of measurement.

**M3M3. Students will understand and measure the perimeter of simple geometric figures (squares and rectangles).**

- a. Understand the meaning of the linear unit and measurement in perimeter.
- b. Understand the concept of perimeter as being the boundary of a simple geometric figure.
- c. Determine the perimeter of a simple geometric figure by measuring and summing the lengths of the sides.

**M3M4. Students will understand and measure the area of simple geometric figures (squares and rectangles).**

- a. Understand the meaning of the square unit and measurement in area.
- b. Model (by tiling) the area of a simple geometric figure using square units (square inch, square foot, etc.).
- c. Determine the area of squares and rectangles by counting, addition, and multiplication with models.

#### **GEOMETRY**

Students will further develop their understanding of characteristics of previously studied geometric figures.

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**M3G1. Students will further develop their understanding of geometric figures by drawing them. They will also state and explain their properties.**

- a. Draw and classify previously learned fundamental geometric figures and scalene, isosceles and equilateral triangles.
- b. Identify and explain the properties of fundamental geometric figures.
- c. Examine and compare angles of fundamental geometric figures.
- d. Identify the center, diameter, and radius of a circle.

#### **ALGEBRA**

Students will understand how to express relationships as mathematical expressions.

**M3A1. Students will use mathematical expressions to represent relationships between quantities and interpret given expressions.**

- a. Describe and extend numeric and geometric patterns.
- b. Describe and explain a quantitative relationship represented by a formula (such as the perimeter of a geometric figure).
- c. Use a symbol, such as  $\square$  and  $\Delta$ , to represent an unknown and find the value of the unknown in a number sentence.

#### **DATA ANALYSIS AND PROBABILITY**

Students will gather, organize, and display data and interpret graphs.

**M3D1. Students will create and interpret simple tables and graphs.**

- a. Solve problems by organizing and displaying data in bar graphs and tables.
- b. Construct and interpret bar graphs using scale increments of 1, 2, 5, and 10.
- ~~e. Develop and evaluate mathematical arguments and proofs.~~
- ~~d. Select and use various types of reasoning and methods of proof.~~

#### **Process Skills**

Each topic studied in this course should be developed with careful thought toward helping every student achieve the following process standards.

### ***3-5 Mathematics Georgia Performance Standards*** **Grade 3**

**M3P1. Students will solve problems (using appropriate technology).**

- a. Build new mathematical knowledge through problem solving.
- b. Solve problems that arise in mathematics and in other contexts.
- c. Apply and adapt a variety of appropriate strategies to solve problems.
- d. Monitor and reflect on the process of mathematical problem solving.

**M3P2. Students will reason and evaluate mathematical arguments.**

- a. Recognize reasoning and proof as fundamental aspects of mathematics.
- b. Make and investigate mathematical conjectures.
- c. Develop and evaluate mathematical arguments and proofs.
- d. Select and use various types of reasoning and methods of proof.

**M3P3. Students will communicate mathematically.**

- a. Organize and consolidate their mathematical thinking through communication.
- b. Communicate their mathematical thinking coherently and clearly to peers, teachers, and others.
- c. Analyze and evaluate the mathematical thinking and strategies of others.
- d. Use the language of mathematics to express mathematical ideas precisely.

**M3P4. Students will make connections among mathematical ideas and to other disciplines.**

- a. Recognize and use connections among mathematical ideas.
- b. Understand how mathematical ideas interconnect and build on one another to produce a coherent whole.
- c. Recognize and apply mathematics in contexts outside of mathematics.

**M3P5. Students will represent mathematics in multiple ways.**

- a. Create and use representations to organize, record, and communicate mathematical ideas.
- b. Select, apply, and translate among mathematical representations to solve problems.
- c. Use representations to model and interpret physical, social, and mathematical phenomena.

**Terms / Symbols:**

whole number, , decimal point, place value of 1/10 (tenth), numerator, denominator, second, sign of equality, sign of inequality,  $\div$ ,  $\times$ , decimal fraction, common fraction, elapsed time, scalene triangle, isosceles triangle, equilateral triangle, bar graph, mile, kilometer

### ***3-5 Mathematics Georgia Performance Standards Grade 4***

By the end of grade four, students will add and subtract decimal fractions and common fractions with common denominators. They will also understand how and when it is appropriate to use rounding. Students will use common measurement units to determine weight. Students will develop their understanding of measuring angles with appropriate units and tools. Students will understand the characteristics of geometric plane and solid figures. They will also use tables, graphs, and charts to record and analyze data.

Instruction and assessment should include the use of manipulatives and appropriate technology. Topics should be represented in multiple ways including concrete/pictorial, verbal/written, numeric/data-based, graphical, and symbolic. Concepts should be introduced and used in the context of real world phenomena.

#### **Concepts/Skills to Maintain**

Addition and subtraction of decimals  
[fractions](#)  
Multiplication and Division of whole numbers  
Area  
Perimeter  
Place Value  
[Weight and Length](#)  
[Elapsed Time](#)

### **NUMBER AND OPERATIONS**

Students will further develop their understanding of whole numbers and master the four basic operations with whole numbers by solving problems. They will also understand rounding and when to appropriately use it. Students will add and subtract decimal fractions and common fractions with common denominators.

#### **M4N1. Students will further develop their understanding of how whole numbers and decimal numbers**

**are represented in the base-ten numeration system.**

- a. Identify place value names and places from hundredths through one million.
- b. Equate a number's word name, its standard form, and its expanded form.

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**M4N2. Students will understand and apply the concept of rounding numbers.**

- a. Round numbers to the nearest ten, hundred, or thousand.
- b. Describe situations in which rounding numbers would be appropriate and determine whether to round to the nearest ten, hundred, or thousand.

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- c. Understand the meaning of rounding a decimal fraction to the nearest whole number.
- d. Represent the results of computation as a rounded number when appropriate and estimate a sum or difference by rounding numbers.

**M4N3. Students will solve problems involving multiplication of 2-3 digit numbers by 1 and -2 digit numbers.**

**M4N4. Students will further develop their understanding of division of whole numbers and divide in problem solving situations without calculators.**

- a. Know the division facts with understanding and fluency.
- b. Solve problems involving division by a 2-digit number (including those that generate a remainder).
- c. Understand the relationship between dividend, divisor, quotient, and remainder.
- d. Understand and explain the effect on the quotient of multiplying or dividing both the divisor and dividend by the same number. ( $2050 \div 50$  yields the same answer as  $205 \div 5$ ).

**M4N5. Students will further develop their understanding of the meaning of decimal fractions and use them in computations.**

- a. Understand decimal fractions are a part of the base-ten system.
- b. Understand the relative size of numbers and order two digit decimal fractions.
- c. Add and subtract both one and two digit decimal fractions.
- d. Model multiplication and division of decimal fractions by whole numbers.
- e. Multiply and divide both one and two digit decimal fractions by whole numbers.

**M4N6. Students will further develop their understanding of the meaning of common fractions and use them in computations.**

- a. Understand representations of simple equivalent fractions.
- b. Add and subtract fractions and mixed numbers with common denominators. (Denominators should not exceed twelve.)

- c. Convert and use mixed numbers and improper fractions interchangeably.

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**M4N7. Students will explain and use properties of the four arithmetic operations to solve and check problems.**

- Describe situations in which the four operations may be used and the relationships among them.
- Compute using the order of operations, including parentheses.
- Compute using the commutative, associative, and distributive properties.
- Use mental math and estimation strategies to compute.

#### **MEASUREMENT**

Students will measure weight in appropriate metric and standard units. They will also measure angles.

**M4M1. Students will understand the concept of weight and how to measure [weight](#)**

**it.**

- Use standard and metric units to measure the weight of objects.
- Know units used to measure weight (gram, kilogram, ounces, pounds and tons).
- Compare one unit to another within a single system of measurement.

**M4M2. Students will understand the concept of angles and how to measure [angles](#)**

**it.**

- Use tools, such as a protractor or angle ruler, and other methods such as paper folding, drawing a diagonal in a square, to measure angles.
- Understand the meaning and measure of a half rotation (180°) and a full rotation (360°).

[c. Determine that the sum that the three angles of a triangle is always 180.](#)

#### **GEOMETRY**

Students will understand and construct plane and solid geometric figures. They will also graph points on the coordinate plane.

**M4G1. Students will define and identify the characteristics of geometric figures**

**through examination and construction.**

- a. Examine and compare angles in order to classify and identify triangles by their angles.
- b. Describe parallel and perpendicular lines in plane geometric figures.
- c. Examine and classify quadrilaterals (including parallelograms, squares, rectangles, trapezoids, and rhombi).
- d. Compare and contrast the relationships among quadrilaterals.

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**M4G2. Students will understand fundamental solid figures.**

- a. Compare and contrast a cube and a rectangular prism in terms of the number and shape of their faces, edges, and vertices.
- b. Describe parallel and perpendicular lines and planes in connection with the rectangular prism.
- c. Construct/collect models for solid geometric figures (cubes, prisms, cylinders, pyramids, spheres, cones etc.).

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**M4G3. Students will use the coordinate system.**

- a. Understand and apply ordered pairs in the first quadrant of the coordinate system.
- b. Locate a point in the first quadrant in the coordinate plane and name the ordered pair.
- c. Graph ordered pairs in the first quadrant.

### **ALGEBRA**

Students will investigate and represent mathematical relationships between quantities using mathematical expressions in problem-solving situations.

**M4A1. Students will represent and interpret mathematical relationships in quantitative expressions.**

- a. Understand and apply patterns and rules to describe relationships and solve problems.
- b. Represent unknowns using symbols, such as  $\square$  and  $\Delta$ .
- c. Write and evaluate mathematical expressions using symbols and different values.

### **DATA ANALYSIS AND PROBABILITY**

Students will gather, organize, and display data. They will also compare features of

graphs.

**M4D1. Students will gather, organize, and display data according to the situation and compare related features.**

- a. Represent data in bar, line and pictographs.
- b. Investigate the features and tendencies of graphs.

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**Grade 4**

- c. Compare different graphical representations for a given set of data.
- d. Identify missing information and duplications in data.

**Process Skills**

Each topic studied in this course should be developed with careful thought toward helping every student achieve the following process standards.

**M4P1. Students will solve problems (using appropriate technology).**

- a. Build new mathematical knowledge through problem solving.
- b. Solve problems that arise in mathematics and in other contexts.
- c. Apply and adapt a variety of appropriate strategies to solve problems.
- d. Monitor and reflect on the process of mathematical problem solving.

**M4P2. Students will reason and evaluate mathematical arguments.**

- a. Recognize reasoning and proof as fundamental aspects of mathematics.
- b. Make and investigate mathematical conjectures.
- c. Develop and evaluate mathematical arguments and proofs.
- d. Select and use various types of reasoning and methods of proof.

**M4P3. Students will communicate mathematically.**

- a. Organize and consolidate their mathematical thinking through communication.
- b. Communicate their mathematical thinking coherently and clearly to peers, teachers, and others.
- c. Analyze and evaluate the mathematical thinking and strategies of others.
- d. Use the language of mathematics to express mathematical ideas precisely.

**M4P4. Students will make connections among mathematical ideas and to other disciplines.**

- a. Recognize and use connections among mathematical ideas.

- b. Understand how mathematical ideas interconnect and build on one another to produce a coherent whole.
- c. Recognize and apply mathematics in contexts outside of mathematics.

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### *3-5 Mathematics Georgia Performance Standards* Grade 4

#### **M4P5. Students will represent mathematics in multiple ways.**

- a. Create and use representations to organize, record, and communicate mathematical ideas.
- b. Select, apply, and translate among mathematical representations to solve problems.
- c. Use representations to model and interpret physical, social, and mathematical phenomena.

#### **Terms / Symbols:**

sum, difference, product, quotient, **mixed fraction**, proper fraction, improper fraction, point, ray, line, line segment, parallel, perpendicular, diagonal line, plane, weight, ounce, pound, ton, gram, kilogram, protractor, degree, rotation, parallelogram, trapezoid, rhombus, quadrilateral, congruent, cube, rectangular prism, pyramid, coordinate system, ordered pair, ratio, proportion, variable, line graph, pictograph, right triangle, acute triangle, obtuse triangle

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### ***3-5 Mathematics Georgia Performance Standards*** **Grade 5**

By the end of grade five, students will further develop their understanding of multiplication and division of whole numbers and decimal fractions. They will also understand and investigate algebraic mathematical expressions. Students will also expand their understanding of computing area and volume of simple geometric figures. Students will understand the meaning of congruent geometric shapes and the relationship of the circumference of a circle to its diameter. They will also use percentages and circle graphs to interpret statistical data.

Instruction and assessment should include the use of manipulatives and appropriate technology. Topics should be represented in multiple ways including concrete/pictorial, verbal/written, numeric/data-based, graphical, and symbolic. Concepts should be introduced and used in the context of real world phenomena.

<p><b>Concepts/Skills to Maintain</b> Add and subtract decimal fractions Whole numbers and decimal fraction computation Angle measurement Length, area, and weight Number sense Add and subtract common fractions with like denominators Data usage and representation Characteristics of 2D and 3D shapes Order of Operations <a href="#">Properties of addition and multiplication</a></p>
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#### **NUMBER AND OPERATIONS**

Students will further develop their understanding of the concept of whole numbers.

They will also understand the meanings of multiplication and division of decimal fractions and use decimal fractions and common fractions in computation, as well as in problem solving situations.

**M5N1. Students will further develop their understanding of whole numbers.**

- a. Classify the set of counting numbers into subsets with distinguishing characteristics (odd/even, prime/composite).
- b. Find multiples and factors.
- c. Analyze and use divisibility rules.

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**M5N2. Students will further develop their understanding of decimal fractions as part of the base-ten number system.**

- a. Understand place value.
- b. Analyze the effect on the product when a number is multiplied by 10, 100, 1000, 0.1, and 0.01, **1001**???

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**M5N3. Students will further develop their understanding of the meaning of multiplication and division with decimal fractions and use them.**

- a. Model multiplication and division of decimal fractions by another decimal fraction.
- b. Explain the process of multiplication and division, including situations in which the multiplier and divisor are both whole numbers and decimal fractions.
- c. Multiply and divide with decimal fractions including decimal fractions less than one and greater than one.
- d. Understand the relationships and rules for multiplication and division of whole numbers also apply to decimal fractions.

**M5N4. Students will continue to develop their understanding of the meaning of common fractions and compute with them.**

- a. Understand division of whole numbers can be represented as a fraction ( $a/b = a \div b$ ).
- b. Understand the value of a fraction is not changed when both its numerator and denominator are multiplied or divided by the same number because it is the same as multiplying or dividing by one.
- c. Find equivalent fractions and simplify fractions.
- d. Model the multiplication and division of common fractions.
- e. Explore finding common denominators using concrete, pictorial, and computational models.

- f. Use  $<$ ,  $>$ , or  $=$  to compare fractions and justify the comparison.
- g. Add and subtract common fractions and mixed numbers with unlike denominators.
- h. Use fractions (proper and improper) and decimal fractions interchangeably.
- i. Estimate products and quotients.

**M5N5. Students will understand the meaning of percentage.**

- a. ~~Model percent on 10 by 10 grids.~~ [Explore and model percents using multiple representations.](#)
- b. Apply percentage to circle graphs.

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**MEASUREMENT**

Students will compute the area of geometric plane figures. They will also understand the concept of volume and compute the volume of simple geometric solids and measure capacity. Students will convert from one unit to another within one system of measurement.

**M5M1. Students will extend their understanding of area of fundamental geometric plane figures.**

- a. Estimate the area of fundamental geometric plane figures.
- b. Derive the formula for the area of a parallelogram (e.g., cut the parallelogram apart and rearrange it into a rectangle of the same area).
- c. Derive the formula for the area of a triangle (e.g. demonstrate and explain its relationship to the area of a rectangle with the same base and height).
- d. Find the areas of triangles and parallelograms using formulae.
- e. Estimate the area of a circle through partitioning and tiling and then with formula (let  $\pi = 3.14$ ). (Discuss square units as they apply to circles.)
- f. Find the area of a polygon (regular and irregular) by dividing it into squares, rectangles, and/or triangles and find the sum of the areas of those shapes.

**M5M3. Students will measure capacity with appropriately chosen units and tools.**

- a. Use milliliters, liters, fluid ounces, cups, pints, quarts, and gallons to measure capacity.
- b. Compare one unit to another within a single system of measurement (e.g., 1 quart = 2 pints).

**M5M4. Students will understand and compute the volume of a simple geometric solid.**

- a. Understand a cubic unit ( $u_3$ ) is represented by a cube in which each edge has

- the length of 1 unit.
- b. Identify the units used in computing volume as cubic centimeters ( $\text{cm}^3$ ), cubic meters ( $\text{m}^3$ ), cubic inches ( $\text{in}^3$ ), cubic feet ( $\text{ft}^3$ ), and cubic yards ( $\text{yd}^3$ ).
  - c. Derive the formula for finding the volume of a cube and a rectangular prism using manipulatives.
  - d. Compute the volume of a cube and a rectangular prism using formulae.
  - e. Estimate the volume of a simple geometric solid.
  - f. Understand the similarities and differences between volume and capacity.

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### *3-5 Mathematics Georgia Performance Standards* Grade 5

#### **GEOMETRY**

Students will further develop their understanding of geometric figures.

**M5G1. Students will understand congruence of geometric figures and the correspondence of their vertices, sides, and angles.**

**M5G2. Students will understand the relationship of the circumference of a circle to its diameter is pi ( $\pi \approx 3.14$ ).**

#### **ALGEBRA**

Students will represent and investigate mathematical expressions algebraically by using variables.

**M5A1. Students will represent and interpret the relationships between quantities algebraically.**

- a. Use variables, such as  $n$  or  $x$ , for unknown quantities in algebraic expressions.
- b. Investigate simple algebraic expressions by substituting numbers for the unknown.
- c. Determine that a formula will be reliable regardless of the type of number (whole numbers or decimal fractions) substituted for the variable.

#### **DATA ANALYSIS AND PROBABILITY**

Students will gather, organize, and display data and interpret graphs.

**M5D1. Students will analyze graphs.**

- a. Analyze data presented in a graph.
- b. Compare and contrast multiple graphic representations (circle graphs, line graphs, bar graphs, etc.) for a single set of data and discuss the advantages/disadvantages of each.

**M5D2. Students will collect, organize, and display data using the most appropriate graph.**

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### *3-5 Mathematics Georgia Performance Standards* Grade 5

#### **Process Skills**

Each topic studied in this course should be developed with careful thought toward helping every student achieve the following process standards.

**M5P1. Students will solve problems (using appropriate technology).**

- a. Build new mathematical knowledge through problem solving.
- b. Solve problems that arise in mathematics and in other contexts.
- c. Apply and adapt a variety of appropriate strategies to solve problems.
- d. Monitor and reflect on the process of mathematical problem solving.

**M5P2. Students will reason and evaluate mathematical arguments.**

- a. Recognize reasoning and proof as fundamental aspects of mathematics.
- b. Make and investigate mathematical conjectures.
- c. Develop and evaluate mathematical arguments and proofs.
- d. Select and use various types of reasoning and methods of proof.

**M5P3. Students will communicate mathematically.**

- a. Organize and consolidate their mathematical thinking through communication.
- b. Communicate their mathematical thinking coherently and clearly to peers, teachers, and others.
- c. Analyze and evaluate the mathematical thinking and strategies of others.
- d. Use the language of mathematics to express mathematical ideas precisely.

**M5P4. Students will make connections among mathematical ideas and to other disciplines.**

- a. Recognize and use connections among mathematical ideas.
- b. Understand how mathematical ideas interconnect and build on one another to produce a coherent whole.
- c. Recognize and apply mathematics in contexts outside of mathematics.

**MSP5. Students will represent mathematics in multiple ways.**

- a. Create and use representations to organize, record, and communicate mathematical ideas.

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- b. Select, apply, and translate among mathematical representations to solve problems.
- c. Use representations to model and interpret physical, social, and mathematical phenomena.

**Terms / Symbols:**

simplify, common denominator, greatest common factor, least common multiple, congruence, %, percent, improper fraction, divisibility, multiple, factor, estimate, volume, tiling, irregular polygon, polygon, capacity, circumference, diameter, pi, circle graph, cup, pint, quart, gallon

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