**Stockbridge Middle School**
6th Grade Mathematics Syllabus

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Georgia Performance Standards Site: https://www.georgiastandards.org

**Course Description:**
The overall goal of the 6th grade Common Core Georgia Performance Standards (CCGPS) is to assist each student in developing sound mathematical practices that reflect the need to connect the mathematical practices to the mathematical content in instruction. The following eight (8) mathematical practices will assist students in developing their Higher Order Thinking Skills (or as we like to say…they are getting the H.O.T.S for math☺).

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics.
5. Use appropriate tolls strategically.
6. Attend to precision.
7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning.

In Grade 6, instructional time should focus on four critical areas: (1) connecting ratio and rate to whole number multiplication and division and using concepts of ratio and rate to solve problems; (2) completing the understanding of division of fractions and extending the system of numbers to include the set of rational numbers, which contains negative numbers; (3) writing, interpreting, and using expressions and equations; and (4) developing the understanding of statistical thinking.

1. Students use reasoning about multiplication and division to solve ratio and rate problems about quantities. By viewing equivalent ratios and rates as deriving from, and extending, pairs of rows (or columns) in the multiplication table, and by analyzing simple drawings that indicate the relative size of quantities, students connect their understanding of multiplication and division with ratios and rates. Thus, students expand the scope of problems for which they can use multiplication and division to solve problems, and they connect ratios and fractions. Students solve a wide variety of problems involving ratios and rates.

2. Students use the meaning of fractions, the meanings of multiplication and division, and the relationship between multiplication and division to understand and explain why the procedures for dividing fractions make sense. Students use these operations to solve problems. Students extend their previous understandings of number and the ordering of numbers to the full system of rational numbers, which includes negative rational numbers, and in particular negative integers. They reason about the order and absolute value of rational numbers and about the location of points in all four quadrants of the coordinate plane.

3. Students understand the use of variables in mathematical expressions. They write expressions and equations that correspond to given situations, evaluate expressions, and use expressions and formulas to solve problems. Students understand that expressions in different forms can be equivalent, and they use the properties of operations to rewrite expressions in equivalent forms. Students know that the solutions of an equation are the values of the variables that make the equation true. Students use properties of operations and the idea of maintaining the equality of both sides of an equation to solve simple one-step equations. Students construct and analyze tables, such as tables of quantities that are in equivalent ratios, and they use equations (such as 3x = y) to describe relationships between quantities.

4. Building on and reinforcing their understanding of numbers, students begin to develop their ability to think statistically. Students recognize that a data distribution may not have a definite center and that different ways to measure center yield different values. The median measures center in the sense that it is roughly the middle value. The mean measures center in the sense that it is the value that each data point would take on if the total of the data values were redistributed equally, and also in the sense that it is a balance point. Students recognize that a measure of variability (interquartile range or mean absolute deviation) can also be useful for summarizing data because two very different sets of data can have the same mean and median yet be distinguished by their variability.

Students learn to describe and summarize numerical data sets, identifying clusters, peaks, gaps, and symmetry, considering the context in which the data were collected. Students in Grade 6 also build on their work with area from elementary school by reasoning about relationships among shapes to determine area, surface area, and volume. They find areas of right triangles, other triangles, and special quadrilaterals by decomposing these shapes, rearranging or removing pieces, and relating the shapes to rectangles. Using these methods, students discuss, develop, and justify formulas for areas of triangles and parallelograms. Students find areas of polygons and surface areas of prisms and pyramids by decomposing them into pieces whose area they can determine. They reason about right rectangular prisms with fractional side lengths to extend formulas for the volume of a right rectangular prism to fractional side lengths. They prepare for work on scale drawings and constructions in Grade 7 by drawing polygons in the coordinate plane.

Units have been developed to cover each domain of the Common Core Georgia Performance Standards. To gain a deeper understanding of the complexity for the four critical areas please visit www.georiastandards.org/Common-Core.

## First Semester Overview

Unit 1: **Number System Fluency** (approximately 4 weeks)
The enduring understandings for unit one:

1. Find the GCF of 2 whole numbers < 100.
2. Find the LCM of 2 whole numbers < 12.
3. Use the distributive property to express a sum of 2 whole numbers 1-100 with a common factor as multiple of a sum of 2 whole numbers with no common factor.
4. Interpret and compute quotients of fractions.
5. Solve word problems involving division of fractions by fractions using visual fraction models and equations to represent the problem.
6. **Fluently** divide multi-digit numbers using the standard algorithm.
7. **Fluently** add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation.

Content Standard Addressed:

- MCCGPS6.NS.1
- MCCGPS6.NS.2
- MCCGPS6.NS.3
- MCCGCPS6.NS.4

Unit 2: **Rate, Ratio and Proportional Reasoning Using Equivalent Fractions** (approximately 4 weeks)
The enduring understandings for unit two:

1. Gain a deeper understanding of proportional reasoning through instruction and practice.
2. Will develop and use multiplicative thinking.
3. Develop a sense of proportional reasoning.
4. Develop the understanding that ratio is a comparison of two numbers or quantities.
5. Find percents using the same processes for solving rates and proportions.
6. Solve real-life problems involving measurement units that need to be converted.

Content Standard Addressed:

- MCCGPS6.RP.1
- MCCGPS6.RP.2
- MCCGPS6.RP.3a
- MCCGPS6.RP.3b
- MCCGPS6.RP.3c
- MCCGPS6.RP.3d

Unit 3: **Expressions** (approximately 4 weeks)
The enduring understandings for unit three:

1. Represent repeated multiplication with exponents.
2. Evaluate expressions containing exponents to solve mathematical and real world problems.
3. Translate verbal phrases and situations into algebraic expressions.
4. Identify the parts of a given expression.
5. Use the properties to identify equivalent expressions.
6. Use the properties and mathematical models to generate equivalent expressions.

Content Standard Addressed:

- MCCGPS6.EE.1
- MCCGPS6.EE.2
- MCCGPS6.EE.2a
- MCCGPS6.EE.2b
- MCCGPS6.EE.2c
- MCCGPS6.EE.3
- MCCGPS6.EE.4

Unit 4: **One-Step Equations and Inequalities…Functional Relationships** (approximately 5 weeks)
The enduring understandings for unit four:

1. Determine if an equation or inequality is appropriate for a given situation.
2. Represent and solve mathematical and real world problems with equations and inequalities.
3. Interpret the solutions to equations and inequalities.
4. Represent the solutions to inequalities on a number line.
5. Analyze the relationship between dependent and independent variables through the use of tables, equations and graphs.

Content Standard Addressed:

- MCCGPS6.EE.5
- MCCGPS6.EE.6
- MCCGPS6.EE.7
- MCCGPS6.EE.8
- MCCGPS6.EE.9
- MCCGPS6.RP.3a
- MCCGPS6.RP.3b
- MCCGPS6.RP.3c
- MCCGPS6.RP.3d

## Second Semester Overview

Unit 5: **Area and Volume** (approximately 4-5 weeks)
The enduring understandings for unit five:

1. Find areas of right, equilateral, isosceles, and scalene triangles, and special quadrilaterals.
2. Find areas of composite figures and polygons by composing into rectangles and decomposing into triangles and other shapes.
3. Solve real-world and mathematical problems involving area.
4. Decipher and draw views of rectangular and triangular prisms from a variety of perspectives.
5. Recognize and construct nets for rectangular and triangular prism.
6. Find the surface area of rectangular and triangular prisms by using manipulatives and by constructing nets.
7. Determine the surface area of rectangular and triangular prisms by substituting given values for their dimensions into the correct formulas.
8. Solve real-world that requires determining the surface area of rectangular and triangular prisms.
9. Measure and compute volume with fractional edge length using cubic units of measure.
10. Find the volumes of right rectangular prisms by substituting given values for their dimensions into the correct formulas.
11. Make the connection that finding the volume given the length (l) x width (w) is the same as the base (B).
12. Solve real-world problems that require determining the volume of right rectangular prism.

Content Standard Addressed:

- MCCGPS6.G.1
- MCCGPS6.G.2
- MCCGPS6.G.4

Unit 6: **Statistics** (approximately 4-5 weeks)
The enduring understandings for unit six:

1. Analyze data from many different sources such as organized lists, box-plots, bar graphs and stem-and-leaf plots.
2. Understand that responses to statistical questions may vary.
3. Understand that data can be described by a single number.
4. Determine quantitative measures of center (median and/or mean).
5. Determine quantitative measures of variability (interquartile range and/or mean absolute deviation.

Content Standard Addressed:

- MCCGPS6.SP.1
- MCCGPS6.SP.2
- MCCGPS6.SP.3
- MCCGPS6.SP.4
- MCCGPS6.SP.5

Unit 7: **Rational Explorations: Numbers and their Opposite** (approx. 3- 4 weeks)
The enduring understandings for unit seven:

1. Understand that positive and negative numbers are used together to describe quantities having opposite directions or values.
2. Understand a rational number as a point on the number line. Extend number line diagrams and coordinate axes familiar from previous grades to represent points on the line and in the plane with negative number coordinates.
3. Recognize opposite signs of numbers as indicating locations on opposite sides of 0 on the number line.
4. Recognize that the opposite of the opposite of a number is the number itself.
5. Understand signs of numbers in ordered pairs as indicating locations in quadrants of the coordinate plane.
6. Recognize that when 2 ordered pairs differ only by signs, the locations of the points are related by reflections across one or both axes.
7. Find and position integers and other rational numbers on a horizontal or vertical number line diagram.
8. Find and position pairs of integers and other rational numbers on a coordinate plane.
9. Understand ordering and absolute value of rational numbers.
10. Interpret statements of inequality as statements about the relative position of 2 numbers on a number line diagram.
11. Write, interpret, and explain statements of order for rational numbers in real-world contexts.
12. Understand the absolute value of a rational number as its distance from 0 on the number line
13. Interpret absolute value as magnitude for a positive or negative quantity in a real-world situation.
14. Distinguish comparisons of absolute value from statements about order.
15. Solve real-world and mathematical problems by graphing points in all four quadrants of the coordinate plane.

Content Standards Addressed:

- MCCGPS6.NS.5
- MCCGPS6.NS.6a
- MCCGPS6.NS.6b
- MCCGPS6.NS.6c
- MCCGPS6.NS.7a
- MCCGPS6.NS.7b
- MCCGPS6.NS.7c
- MCCGPS6.NS.7d
- MCCGPS6.NS.8
- MCCGPS6.G.3

**Material List (for students use only):**

- Two 1 ½ " three-ring binders
- Dividers
- One 70-page spiral notebook
- Notebook paper
- Graph paper
- Pencil Pouch with the following:
  - Pencils
  - Colored pencils and crayons
  - Highlighter
  - Dry Erase Markers **BLACK ONLY**

**Time Outside of Class:**
Mathematics is learned by practice. Therefore, you cannot expect to accomplish what you should learn from this course without spending time with mathematics outside of class. Homework is an integral part of a student's academic and personal development. Homework is formative and will not be used as a grade. Use your time outside of class to complete homework assignments, to stay organized, to review notes and assignments, and to reflect on problems missed on quizzes and tests. Homework can be a risk-free chance for students to experiment with new standards, to apply what they have learned in class, and to demonstrate their level of understanding. Please communicate as soon as possible if you are having trouble managing your time or you find you are spending significant amounts of time each evening reviewing the lesson.

**Grading Policy**

Assessments make up the students' **entire grade**. There are no homework grades, daily grades, or **Extra Credit** grades. Assessments are always completed individually and recorded as individual scores relative to the standard assessed. Assessments are separated by standards, with a limited number of standards on each assessment. Students receive a separate grade for each standard assessed on each assessment.

*We will document homework and other procedural essentials; however, it will have a **0%** weight of the student's overall grade.*

As defined by the county and the SMS mathematics department grading policy, the final grades for the school year will be calculated using the following percentages:

- **22% Number System Fluency**
  - ✓ Find the least Common Multiples (LCM) of 2 whole numbers ≤ 100
  - ✓ Find the greatest Common Factors (GCF) of 2 whole numbers ≤ 12
  - ✓ Use the distributive property to express a sum of 2 whole numbers 1-100 with a common factor as a multiple of a sum of 2 whole numbers with no common factor
  - ✓ Interpret and compute quotients of fractions
  - ✓ Solve word problems involving division of fractions by fractions using visual models and equations to represent the problem
  - ✓ **FLUENTLY** divide multi-digit numbers using standard algorithm

- ✓ **FLUENTLY** add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation

## ➢ 35% Algebra

- ✓ Gain a deeper understanding of proportional reasoning through instruction and practice
- ✓ Develop and use multiplicative thinking
- ✓ Develop a sense of proportional reasoning
- ✓ Develop the understanding that ratio is a comparison of two numbers or quantities
- ✓ Find percents using the same processes for solving rates and proportions
- ✓ Solve real-life problems involving measurements units that need to be converted
- ✓ Represent repeated multiplication with exponents
- ✓ Evaluate expressions containing exponents to solve mathematical and real world problems
- ✓ Translate verbal phrases and situations into algebraic expressions
- ✓ Identify the parts of a given expression
- ✓ Use the properties to identify equivalent expressions
- ✓ Use the properties and mathematical models to generate equivalent expressions
- ✓ Determine if an equation or inequality is appropriate for a given situation
- ✓ Represent and solve mathematical and real world problems with equations and inequalities
- ✓ Interpret the solutions to equations and inequalities on a number line
- ✓ Analyze the relationship between dependent and independent variables through the use of tables, equations and graphs

## ➢ 13% Geometry and Measurement

- ✓ Find area of the following geometric figures:
    - Right, equilateral, isosceles, and scalene triangles, and special quadrilaterals
- ✓ Composite figures and polygons by composing into rectangles and decomposing into triangles and other shapes
- ✓ Solve real-world and mathematical problems
- ✓ Decipher and draw views of rectangular and triangular prisms from a variety of perspectives
- ✓ Recognize and construct nets for rectangular and triangular prism
- ✓ Find surface area of rectangular and triangular prisms by using manipulatives and by constructing nets
- ✓ Determine the surface area of rectangular and triangular prisms by substituting given values of their dimensions into the correct formulas
- ✓ Solve real-world problems that require determining the surface area of rectangular and triangular prisms
- ✓ Measure and compute volume with fractional edge length using cubic units of measure
- ✓ Find the volumes of right prisms by substituting given values for their dimensions into the correct formulas
- ✓ Make the connection that finding the volume given the *length (L) * width (W)* is the same as the *base (B)*
- ✓ Solve real-world problems that require determining the volume of right rectangular prism

## ➢ 15% Statistics

- ✓ Analyze data from many different sources such as organized list, box plots, bar graphs and stem-and leaf plots
- ✓ Understand that responses to statistical questions may vary
- ✓ Understand that data can be described by a single number
- ✓ Determine quantitative measures of center (median and/or mean)
- ✓ Determine quantitative measures of variability (interquartile range and/or mean absolute deviation)

- **15% Semester Exam (mandated by the district)**

Parents/Guardians,

Welcome to the 2014-2015 school year! We are excited to have your child join us on our learning adventure in our classroom. Once again, teachers across all of the districts in Georgia will be focusing instruction and assessment on the Common Core Georgia Performance Standards or CCGPS this year. Additionally, all teachers will be charged with communicating student progress based on the state standards. All teachers of mathematics will use the standards to align assessments and grading practices. Using the Georgia Performance Standards as a guide, teacher committees have established curriculum priorities for the year-long grading period. You will continue to see all student work and feedback connecting to specific standards.

Educational research tells us that effective assessment of student progress must be balanced in terms of format and frequency. One assessment experience cannot reliably and accurately measure student progress for any specific standard. Therefore, teachers design multiple assessments and tasks and collect evidence of student learning throughout the year-long grading period. This evidence may include tests, quizzes, teacher observations, projects, district, state and national assessments, and student work samples. All of these assessment measures will be correlated to the state standards. We will review these assessments for evidence of mastery of learning when marking student progress for the grade book.

When you view your child's grades in Infinite Campus, you will see specific standards linked to each assignment. If at any point you have questions or concerns regarding your child's performance on a standard, please feel free to contact your child's mathematics teacher and we will be happy to assist you.

It is important to keep in mind that the key to making the most of your child's learning experience is an on-going, open dialogue between you, the parent, and us, the teachers. We strongly encourage parents to participate in conferences and other means of communication regarding your child's progress.

Thank you for your support this year. We look forward to working with you and your child in order to ensure that he/she masters the Common Core Georgia Performance Standards for this course.

Mathematically yours,

SMS 6th Grade Mathematics Teachers

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