

# Clinton-Glen Gardner School District



## Curriculum Management System

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Mathematics

Grade 6

July 2013

**\* For adoption by all regular education programs as specified and for adoption or adaptation by all Special Education Programs in accordance with Board of Education Policy #2200.**

Board Approved: August 21, 2013

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# **CLINTON-GLEN GARDNER SCHOOL DISTRICT**

## **ADMINISTRATION**

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**Mrs. Christine Steiner, Assistant Principal**  
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## Acknowledgments

During the 2012-2013 school year, the Clinton-Glen Gardner School District continued working with the curriculum consortium we developed with seven other North-Voorhees sending districts, including Califon, Clinton Township, Hampton, High Bridge, Lebanon Borough, Lebanon Township, and Union Township. This consortium represents a collaborative effort that created an opportunity to bring together math expertise from each of the participating districts. The following individuals are acknowledged for their assistance in the preparation of this Curriculum Management System:

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# **Clinton-Glen Gardner School District**

## **Mission**

The mission of Clinton Public School is to inspire our students to become contributing members of society who are independent, innovative, life-time learners equipped with the necessary skills to meet the demands of our ever-changing world.

## **Philosophy**

The economy in which graduates of our schools will seek employment is more competitive than ever and is rapidly changing in response to advances in technology. To compete in today's global, information-based economy, students must be able to solve real problems, reason effectively, and make logical connections. In this changing world those who have a good understanding of mathematics will have many opportunities and doors open to them throughout their lives. Today's workforce requires mathematical knowledge and skills in areas such as data analysis, problem-solving, pattern recognition, statistics and probability; therefore, our school's curriculum must prepare students for these expectations.

The Clinton-Glen Gardner School is committed to providing all students with the opportunity and the support necessary to learn significant mathematics with depth and understanding. To that end, students will engage in a wide variety of learning activities designed to develop their ability to reason and solve complex problems. Calculators, computers, manipulatives, technology, and the Internet will be used as tools to enhance learning and assist in problem solving. Group work, projects, literature, and interdisciplinary activities will make mathematics more meaningful and aid understanding. Classroom instruction will be designed to meet the learning needs of all children and will reflect a variety of learning styles.

The math curriculum fosters students who:

- Develop computational, conceptual, problem-solving and reasoning skills
- Demonstrate their understanding of mathematical concepts based on higher levels of mathematical thought
- Use technology and other tools as an integral part of solving mathematical problems

**New Jersey State Department of Education  
Common Core State Standards**

**A note about Common Core State Standards for Mathematics.**

The Common Core State Standards for Mathematics were adopted in 2010. The standards referenced in this curriculum guide refer to the progress indicators in these newly adopted standards. A complete copy of the Common Core State Standards for Mathematics may be found at:

<http://www.corestandards.org/the-standards/mathematics> (by grade level)

<http://www.corestandards.org/the-standards> (in their entirety)

Mathematics: Standards for Mathematical Practice Interpreted for Kindergarten Through Second Grade

The Standards for Mathematical Practice describe varieties of expertise that mathematics educators at all levels should seek to develop in their students. These practices rest on important “processes and proficiencies” with long standing importance in mathematics education. The first of these are the NCTM process standards of problem solving, reasoning and proof, communication, representation and connections. The second are the strands of mathematical proficiency specified in the National Research Council’s report *Adding It Up*: adaptive reasoning, strategic competence, conceptual understanding (comprehension of mathematical concepts, operations and relations), procedural fluency (skill in carrying out procedures flexibly, accurately, efficiently and appropriately) and productive disposition (habitual inclination to see mathematics as sensible, useful and worthwhile, coupled with a belief in diligence and one’s own efficacy).

The Standards for Mathematical Practice are:

**1. MAKE SENSE OF PROBLEMS AND PERSEVERE IN SOLVING THEM.**

As you look at or read a mathematical problem, think about what it means and what it is asking you to do. Also think about what would be a good way to start solving it. Ask yourself:

- What does the problem tell me?
  - What information is given?
  - What are the relationships among parts of the problem?
  - What is the goal of solving the problem?
  - Have I seen other problems similar to this one?
- What does the problem ask me to find out (solve)?
- How should I start solving the problem?
- Can pictures or a drawing help me to figure out how to solve the problem?
- Does how I'm answering the problem make sense with what the problem is asking?
- What are some other ways to solve the problem?
- Can I use another way to check if my answer is correct?
- Does my answer make sense?

**2. REASON ABSTRACTLY AND QUANTITATIVELY.**

Understand the relationship of numbers and number problems and represent them using pictures, drawings or symbols. Talk about the parts of number problems using pictures, drawings or symbols as well as how the pictures, drawings or symbols represent and help explain the problem. Show how using different numbers or operations in the same problem changes it.

**3. CONSTRUCT VIABLE ARGUMENTS AND CRITIQUE THE REASONING OF OTHERS.**

Use objects, drawings, diagrams or actions to construct arguments about math problems with understanding and using appropriate vocabulary to explain the reasoning process. Build a local argument, communicate it with others, justify your reasoning process and respond to the reasoning process someone else uses. Express agreement if both arguments are correct and explain why an argument is flawed if it is.

**4. MODEL WITH MATHEMATICS.**

Apply mathematical skills to everyday life, society, the workplace and other situations; identify important quantities in practical situations; write an equation to describe a situation; revise solutions; use tools such as diagrams, two-way tables, graphs, flowcharts and formulas to show relationships; analyze relationships to draw conclusions, interpret results in context and reflect on whether the results make sense.

**5. USE APPROPRIATE TOOLS STRATEGICALLY.**

Identify and make decisions regarding which tool, such as paper and pencil, models, rulers, spreadsheets, etc., to use to help solve mathematical problems as well as know when a tool is not the right one to use. Use technological and other tools to deepen understanding.

**6. ATTEND TO PRECISION.**

Communicate precisely when discussing math incorporating the following:

- Use clear definitions.

- Choose, use and explain symbols correctly, consistently and appropriately.
- Specify units of measure and labels correctly.
- Avoid careless errors.
- Follow formulas to explain thinking to others.

**7. LOOK FOR AND MAKE USE OF STRUCTURE.**

Look for and identify structure and patterns in mathematics (for example, three and seven more is the same amount as seven and three more, or sort shapes according to their number of sides) and see if the pattern or structure changes.

**8. LOOK FOR AND EXPRESS REGULARITY IN REPEATED REASONING.**

Look for repetition in calculations and numeric thinking, such as skip counting. Pay attention to the whole problem and the details and continuously evaluate the accuracy and reasonableness of both intermediate and final answers.

**CONNECTING THE STANDARDS FOR MATHEMATICAL PRACTICE TO THE STANDARDS FOR MATHEMATICS CONTENT**

The Standards for Mathematical Practice describe ways in which developing student practitioners of the discipline of mathematics increasingly ought to engage with the subject matter as they grow in mathematical maturity and expertise throughout the elementary, middle and high school years. Designers of curricula, assessments and professional development should all attend to the need to connect the mathematical practices to mathematical content in mathematical instruction. The Standards for Mathematical Content are a balanced combination of procedure and understanding. Expectations that begin with the word “understand” are often especially good opportunities to connect the practices to the content. Students who lack understanding of a topic may rely on procedures too heavily. Without a flexible base from which to work, they may be less likely to consider analogous problems, represent problems coherently, justify conclusions, apply the mathematics to practical situations, use technology mindfully to work with the mathematics, explain the mathematics accurately to other students, step back for an overview or deviate from a known procedure to find a shortcut. In short, a lack of understanding effectively prevents a student from engaging the mathematical practices. In this respect those content standards, which set an expectation of understanding are potential “points of intersection” between the Standards for Mathematical Content and the Standards for Mathematical Practice. These points of intersection are intended to be weighted toward central and generative concepts in the school mathematics curriculum that most merit time, resources, innovative energies and focus necessary to qualitatively improve the curriculum, instruction, assessment, professional development and student achievement in mathematics.

**Grade 6  
Mathematics**

**Scope and Sequence**

| <b>Quarter I</b>  |  |
|---|--|
| <b>Topic: The Number System</b> <ul style="list-style-type: none"><li>I. Operations<ul style="list-style-type: none"><li>a. Decimals<ul style="list-style-type: none"><li>i. Addition</li><li>ii. Subtraction</li><li>iii. Multiplication</li><li>iv. Division</li></ul></li><li>b. Greatest common factor</li><li>c. Least common multiple</li></ul></li></ul> | <b>Topic: The Number System</b> <ul style="list-style-type: none"><li>II. Statistical Variability<ul style="list-style-type: none"><li>a. Measures of central tendency<ul style="list-style-type: none"><li>i. Median</li><li>ii. Mean</li><li>iii. Interquartile range</li><li>iv. Mean absolute deviation</li><li>v. Overall pattern</li></ul></li><li>b. Probability</li><li>c. Data analysis<ul style="list-style-type: none"><li>i. Dot plots</li><li>ii. Box plots</li><li>iii. Histograms</li></ul></li></ul></li></ul> |
| <b>Quarter II</b>   |  |
| <b>Topic: Expressions and Equations</b> <ul style="list-style-type: none"><li>III. Expressions<ul style="list-style-type: none"><li>a. Read, write and evaluate expressions</li><li>b. Variables</li><li>c. Exponents</li><li>d. Properties of operations</li><li>e. Equivalent expressions</li></ul></li></ul>   |  |

### Quarter III

#### Topic: Expressions and Equations

- IV. Equations, Inequalities and Geometry
  - a. One-step equations
  - b. Substitutions
  - c. Inequalities
  - d. Area
    - i. Triangles
    - ii. Quadrilaterals
    - iii. Polygons
  - e. Volume

#### Topic: The Number System

- V. Rational Numbers
  - a. Positive and negative numbers
  - b. Absolute value
  - c. Inequalities
  - d. Graphing
    - i. Coordinate plane

### Quarter IV

#### Topic: Ratios and Proportional Relationships

- VI. Ratio and Proportions
  - a. Unit rate
  - b. Measurement conversions
  - c. Percent-decimal-fraction conversions
  - d. Variables
    - i. Dependent
    - ii. Independent

| Suggested days of Instruction | Curriculum Management System<br><u>Subject/Grade Level:</u>   | <b>Topic: Operations and Statistical Variability</b>  |   |
|-------------------------------|---|---|---|
|                               | <b>Grade 6<br/>Mathematics</b>  | <b>Goal 1:</b> The Operations and Statistical Variability unit builds on the students' understanding of algebra and number system concepts from previous grades to extend to division of a fraction by a fraction, operations of decimals, and multi-digit division and solve algebraic equation and evaluate expressions.  |   |
|                               | <b>Objectives / Cluster Concepts /<br/>Cumulative Progress Indicators<br/>(CPI's)</b><br><br><b>The student will be able to:</b>  | <b>Essential Questions,<br/>Conceptual Understandings</b>   | <b>Instructional Tools / Materials / Technology /<br/>Resources / Learning Activities /<br/>Interdisciplinary Activities / Assessment Model</b>   |
| 10 wks                        | <p>1.1. Read, write and compare whole numbers and decimals from 10,000 to trillions.<br/>(5.NBT.3.a)</p> <p>1.2. Fluently add, subtract, multiply and divide multi-digit decimals and whole numbers using standard algorithms.<br/>(6.NS.2, 6.NS.3)</p> <p>1.3. Find the greatest common factor of two whole numbers less than or equal to 100 and the least common multiple of two numbers less than or equal to 12.<br/>(6.NS.4)</p> <p>1.4. Construct visual fraction models to represent quotients and explain the relationship between multiplication and division of fractions.<br/>(6.NS.1)</p> <p>1.5. Compute quotients of</p> | <p><b>Essential Questions:</b><br/>In what ways can rational numbers be used?<br/>How can the collection, organization, interpretation, and display of data be used to answer questions?</p> <p><b>Conceptual Understandings:</b><br/>There are specific rules when adding, subtracting, multiplying, and dividing rational numbers.<br/><br/>Numbers allow us to compare and establish relationships between quantities in the real world.</p> | <p><b>NOTE: The assessment models provided in this document are suggestions for the teacher. If the teacher chooses to develop his/her own model, it must be of equal or better quality and at the same or higher cognitive levels.</b><br/><b>Depending upon the needs of the class, the assessment questions may be answered in the form of essays, quizzes, mobiles, PowerPoint, oral reports, booklets, or other formats of measurement used by the teacher.</b></p> <p><b>Unit Vocabulary:</b><br/>exponent, power, base, square units, cubed units, order of operations, sum, difference, product, quotient, factor, multiple, numerator, denominator, least common multiple, common denominator, least common denominator, greatest common factor, prime, composite, evaluate, simplify, simplest form/lowest terms, equivalent fractions, reciprocal (multiplicative inverse), mixed number, improper fraction, proper fraction, terminating decimal, repeating decimal</p> <p><b>Assessment Models:</b><br/>Homework<br/>Quizzes/Test<br/>Classwork<br/>Projects<br/>Portfolio<br/>Skill sheets<br/>Workbook<br/>Teacher Observation</p> |

| Suggested days of Instruction | Curriculum Management System   | Topic: Operations and Statistical Variability   |   |
|-------------------------------|--|---|---|
|                               | Subject/Grade Level:<br>Grade 6<br>Mathematics   | Goal 1: The Operations and Statistical Variability unit builds on the students' understanding of algebra and number system concepts from previous grades to extend to division of a fraction by a fraction, operations of decimals, and multi-digit division and solve algebraic equation and evaluate expressions. |   |
|                               | Objectives / Cluster Concepts / Cumulative Progress Indicators (CPI's)<br>The student will be able to:   | Essential Questions,<br>Conceptual Understandings   | Instructional Tools / Materials / Technology / Resources / Learning Activities / Interdisciplinary Activities / Assessment Model  |
|                               | fractions.<br>(6.NS.1)<br><br>1.6. Solve real-world problems involving quotients of fractions and interpret the solutions in the context given.<br>(6.NS.1)<br><br>1.7. Use positive and negative numbers to describe quantities in real-world situations.<br>(6.NS.5)<br><br>1.8. Use mathematical language to identify parts of an expression and evaluate using orders of operations.<br>(6.EE.2.c)<br><br>1.9. Calculate, compare, and interpret measures of center and variability in a data set to answer a statistical question (including median, mean, interquartile range, mean absolute deviation and overall pattern).<br>(6.SP.1, 6.SP.2, 6.SP.3, 6.SP.5.c, 6.SP.5.d) |   | Discussion<br>Math Minutes<br>Test<br><br><b>Opportunities for Differentiation:</b><br>Hand on materials – manipulative<br>Project based<br>Modified and multiple tests<br>Amount of problems to complete for homework or classwork<br>Small group instruction<br>Peer instruction<br>Active learning<br>Modeling<br>Time allotment<br>Review game<br>Enrichment opportunities<br><br><b>Additional Resources:</b><br>Textbook<br>Smartboard<br>Calculator<br>Teacher-made materials<br>Document readers – elmo<br><br><a href="http://www.khanacademy.org">www.khanacademy.org</a><br><br><a href="http://www.studyisland.com">www.studyisland.com</a><br><br><a href="http://www.itunesu.com">www.itunesu.com</a><br><br><a href="http://www.brainpop.com">www.brainpop.com</a> |

| Suggested days of Instruction | Curriculum Management System  | <b>Topic: Operations and Statistical Variability</b>   |  |
|-------------------------------|---|--|--|
|                               | <u>Subject/Grade Level:</u><br><b>Grade 6</b><br><b>Mathematics</b>   | <b>Goal 1:</b> The Operations and Statistical Variability unit builds on the students' understanding of algebra and number system concepts from previous grades to extend to division of a fraction by a fraction, operations of decimals, and multi-digit division and solve algebraic equation and evaluate expressions. |  |
|                               | <b>Objectives / Cluster Concepts / Cumulative Progress Indicators (CPI's)</b><br><b>The student will be able to:</b>  | <b>Essential Questions, Conceptual Understandings</b>  | <b>Instructional Tools / Materials / Technology / Resources / Learning Activities / Interdisciplinary Activities / Assessment Model</b>  |
|                               | <p>1.10. Display numerical data in plots on the number line (including dot plots, histograms, and box plots) and summarize in relation to their context.<br/>(6.SP.4, 6.SP.5, 6.SP.5.a, 6.SP.5.b)</p> <p>1.11. Make sense of problems and persevere in solving them.<br/>(MP.1)</p> <p>1.12. Reason abstractly and quantitatively.<br/>(MP.2)</p> <p>1.13. Construct viable arguments and critique the reasoning of others.<br/>(MP.3)</p> <p>1.14. Model with mathematics.<br/>(MP.4)</p> <p>1.15. Implement problem-solving strategies to solve a problem in school or the community.</p> |  | <p><a href="http://www.prometheanworld.com">www.prometheanworld.com</a></p> <p><a href="http://www.teachertube.com">www.teachertube.com</a></p> <p><a href="http://www.mathplayground.com">http://www.mathplayground.com</a></p> <p><a href="http://www.explorelearning.com">www.explorelearning.com</a></p> |

| Suggested days of Instruction | Curriculum Management System  |  |  |
|-------------------------------|---|--|--|
|                               | <b>Topic: Operations and Statistical Variability</b>  |  |  |
|                               | <b>Subject/Grade Level:</b>   |  |  |
|                               | <b>Grade 6 Mathematics</b>  | <b>Goal 1:</b> The Operations and Statistical Variability unit builds on the students' understanding of algebra and number system concepts from previous grades to extend to division of a fraction by a fraction, operations of decimals, and multi-digit division and solve algebraic equation and evaluate expressions. |  |
|                               | Objectives / Cluster Concepts / Cumulative Progress Indicators (CPI's)<br>The student will be able to:  | Essential Questions,<br>Conceptual Understandings  | Instructional Tools / Materials / Technology / Resources / Learning Activities / Interdisciplinary Activities / Assessment Model |
|                               | (9.1.8.A.2)<br><br>1.16. Assess data gathered to solve a problem for which there are varying perspectives (e.g., cross-cultural, gender-specific, generational), and determine how the data can best be used to design multiple solutions.<br>(9.1.8.B.2) |  |  |

| Suggested days of Instruction | Curriculum Management System<br><b>Subject/Grade Level:</b>  | <b>Topic: Expressions</b>   |  |
|-------------------------------|--|---|--|
|                               | <b>Grade 6<br/>Mathematics</b>   | <b>Goal 2:</b> The Expressions unit employs the students' understanding of the concepts involving integers in Unit 1 to understand and apply rational number concepts. The standards from the Geometry and Statistics and Probability domains are included as a means of providing real world contexts.       |  |
|                               | <b>Objectives / Cluster Concepts /<br/>Cumulative Progress Indicators<br/>(CPI's)</b><br><br><b>The student will be able to:</b>   | <b>Essential Questions,<br/>Conceptual Understandings</b>   | <b>Instructional Tools / Materials / Technology /<br/>Resources / Learning Activities /<br/>Interdisciplinary Activities / Assessment Model</b>  |
| 8 wks                         | <p>2.1. Use mathematical language to identify parts of an expression.<br/>(6.EE.2.b)</p> <p>2.2. Read, write and evaluate expressions in which letters stand for numbers, including formulas that arise from real-world contexts.<br/>(6.EE.2, 6.EE.2.a)</p> <p>2.3. Use variables to represent numbers and write expressions when solving real world mathematical problems.<br/>(6.EE.6)</p> <p>2.4. Write and evaluate numerical expressions involving whole number exponents.<br/>(6.EE.1)</p> <p>2.5. Apply properties of operations to generate equivalent expressions, including the distributive property; for example,</p> | <p><b>Essential Questions:</b><br/>How can algebraic expressions be used to model and analyze mathematical situations?</p> <p><b>Conceptual Understandings:</b><br/>Algebraic expressions are used to model real-life problems and situations, and make sense of quantitative relationships and patterns.</p> | <p><b>NOTE: The assessment models provided in this document are suggestions for the teacher. If the teacher chooses to develop his/her own model, it must be of equal or better quality and at the same or higher cognitive levels (as noted in parentheses).</b></p> <p><b>Depending upon the needs of the class, the assessment questions may be answered in the form of essays, quizzes, mobiles, PowerPoint, oral reports, booklets, or other formats of measurement used by the teacher.</b></p> <p><b>Unit Vocabulary:</b><br/>expression, equivalent expressions, evaluate expressions, algebraic expression, variable, distributive property, associative property, commutative property, identity properties, properties of equality, terms, coefficient, constant term, like terms, inverse operations, multiplicative inverse, solve, solution, substitute</p> <p><b>Assessment Models:</b><br/>Skill sheets<br/>Quizzes/Tests<br/>Homework<br/>Portfolio<br/>Projects<br/>Classwork<br/>District/School benchmarks</p> |

| Suggested days of Instruction | Curriculum Management System   | <b>Topic: Expressions</b>   |   |
|-------------------------------|--|---|---|
|                               | <u>Subject/Grade Level:</u><br><b>Grade 6</b><br><b>Mathematics</b>  | <b>Goal 2:</b> The Expressions unit employs the students' understanding of the concepts involving integers in Unit 1 to understand and apply rational number concepts. The standards from the Geometry and Statistics and Probability domains are included as a means of providing real world contexts. |   |
|                               | <b>Objectives / Cluster Concepts / Cumulative Progress Indicators (CPI's)</b><br><b>The student will be able to:</b>   | <b>Essential Questions, Conceptual Understandings</b>   | <b>Instructional Tools / Materials / Technology / Resources / Learning Activities / Interdisciplinary Activities / Assessment Model</b>   |
|                               | <p>express <math>36 + 8</math> as <math>4(9 + 2)</math> and <math>y + y + y = 3y</math>.<br/>(6.EE.3, 6.NS.4)</p> <p>2.6. Identify when two expressions are equivalent; for example, Are the two expressions equal? <math>81 + 18</math> and <math>9(9 + 2)</math>.<br/>(6.EE.4)</p> <p>2.7. Construct viable arguments and critique the reasoning of others.<br/>(MP.3)</p> <p>2.8. Model with mathematics.<br/>(MP.4)</p> <p>2.9. Look for and express regularity in repeated reasoning.<br/>(MP.8)</p> <p>2.10. Implement problem-solving strategies to solve a problem in school or the community.<br/>(9.1.8.A.2)</p> |   | <p><b>Opportunities for Differentiation:</b><br/>Hand on materials – manipulative<br/>Project based<br/>Modified and multiple tests<br/>Amount of problems to complete for homework or classwork<br/>Small group instruction<br/>Peer instruction<br/>Active learning<br/>Modeling<br/>Time allotment<br/>Review game<br/>Enrichment opportunities</p> <p><b>Additional Resources:</b><br/>Document readers – elmo</p> <p><a href="http://www.khanacademy.org">www.khanacademy.org</a></p> <p><a href="http://www.studyisland.com">www.studyisland.com</a></p> <p><a href="http://www.itunesu.com">www.itunesu.com</a></p> <p><a href="http://www.brainpop.com">www.brainpop.com</a></p> <p><a href="http://www.prometheanworld.com">www.prometheanworld.com</a></p> <p><a href="http://www.teachertube.com">www.teachertube.com</a></p> <p><a href="http://www.mathplayground.com">http://www.mathplayground.com</a></p> <p><a href="http://www.explorelearning.com">www.explorelearning.com</a></p> |

|                                      |  |   |   |
|--------------------------------------|--|---|---|
| <b>Suggested days of Instruction</b> | <b>Curriculum Management System</b>  | <b>Topic: Expressions</b>   |   |
|                                      | <b>Subject/Grade Level:</b><br><b>Grade 6</b><br><b>Mathematics</b>  | <b>Goal 2:</b> The Expressions unit employs the students' understanding of the concepts involving integers in Unit 1 to understand and apply rational number concepts. The standards from the Geometry and Statistics and Probability domains are included as a means of providing real world contexts. |   |
|                                      | <b>Objectives / Cluster Concepts / Cumulative Progress Indicators (CPI's)</b><br><b>The student will be able to:</b> | <b>Essential Questions, Conceptual Understandings</b>   | <b>Instructional Tools / Materials / Technology / Resources / Learning Activities / Interdisciplinary Activities / Assessment Model</b> |
|                                      | 2.11. Demonstrate the ability to understand inferences.<br>(9.1.8.D.2)   |   |   |

| Suggested days of Instruction | Curriculum Management System<br><b>Subject/Grade Level:</b><br><b>Grade 6</b><br><b>Mathematics</b>  | <b>Topic: Equations, Inequalities and Geometry</b>   |  |
|-------------------------------|--|--|--|
|                               | <b>Objectives / Cluster Concepts / Cumulative Progress Indicators (CPI's)</b><br><b>The student will be able to:</b>   | <b>Essential Questions, Conceptual Understandings</b>  | <b>Instructional Tools / Materials / Technology / Resources / Learning Activities / Interdisciplinary Activities / Assessment Model</b>  |
| 5 wks                         | <p>3.1. Write and solve one step equations that represent real world or mathematical problems. (6.EE.7)</p> <p>3.2. Solve an equation or inequality to answer the question: which values from a specified set, if any, make the equation or inequality true? And check the solution using substitution to determine whether a given number in a specified set makes an equation or inequality true. (including formulas <math>V=lwh</math> and <math>V=bh</math>). (6.EE.5)</p> <p>3.3. Write an inequality of the form <math>x &gt; c</math> or <math>x &lt; c</math> to represent a constraint or condition in a real world or mathematical problem and represent them on a number line diagram. (6.EE.8)</p> <p>3.4. Find the area of right</p> | <p><b>Essential Questions:</b><br/>How can we explore the relationship between two-dimensional and three-dimensional geometric objects?<br/>How do you explain the relationships between the quantities in algebraic equations?</p> <p><b>Conceptual Understandings:</b><br/>By applying properties and interpreting notation one can determine what is known and unknown in an algebraic equation.<br/><br/>Analyzing geometric relationship provide a means to interpret our physical environment.</p> | <p><b>NOTE: The assessment models provided in this document are suggestions for the teacher. If the teacher chooses to develop his/her own model, it must be of equal or better quality and at the same or higher cognitive levels (as noted in parentheses).</b></p> <p><b>Depending upon the needs of the class, the assessment questions may be answered in the form of essays, quizzes, mobiles, PowerPoint, oral reports, booklets, or other formats of measurement used by the teacher.</b></p> <p><b>Unit Vocabulary:</b><br/>perimeter, area, volume, square units, cubic units, nets, surface area, right rectangular prism, vertex, vertices, degrees, right, acute, obtuse, straight, isosceles, scalene, equilateral, supplementary, complimentary, congruent, interior angles, exterior angles, polygons, face, base, edge, side, adjacent, two-dimensional shapes, three-dimensional shapes, diagonal, irregular polygon/regular polygon, concave/convex, inequality</p> <p><b>Assessment Models:</b><br/>Homework<br/>Quizzes/Test<br/>Classwork<br/>Projects<br/>Portfolio<br/>Skill sheets<br/>Workbook</p> |

| Suggested days of Instruction | Curriculum Management System<br><b>Subject/Grade Level:</b><br><b>Grade 6</b><br><b>Mathematics</b>  | <b>Topic: Equations, Inequalities and Geometry</b>    |  |
|-------------------------------|--|---|--|
|                               | <b>Objectives / Cluster Concepts / Cumulative Progress Indicators (CPI's)</b><br><b>The student will be able to:</b>   | <b>Essential Questions, Conceptual Understandings</b> | <b>Instructional Tools / Materials / Technology / Resources / Learning Activities / Interdisciplinary Activities / Assessment Model</b>  |
|                               | <p>triangles, other triangles, special quadrilaterals and polygons by composing into rectangles or decomposing into triangles and other shapes to solve real world or mathematical problems. (6.G.1)</p> <p>3.5. Find the volume of a right rectangular prism with fractional edge lengths by packing it with unit cubes. Show that the volume is the same as it would be if found by multiplying the edge lengths. (6.G.2)</p> <p>3.6. Represent three dimensional figures using nets made of rectangles and triangles, and use the nets to find the surface area of the figures in the context of solving real world and mathematical problems. (6.G.4)</p> <p>3.7. Construct viable arguments and critique the reasoning of others.</p> |   | <p>Test</p> <p><b>Opportunities for Differentiation:</b><br/>Hand on materials – manipulative<br/>Project based<br/>Modified and multiple tests<br/>Amount of problems to complete for homework or classwork<br/>Small group instruction<br/>Peer instruction<br/>Active learning<br/>Modeling<br/>Time allotment<br/>Review game<br/>Enrichment opportunities</p> <p><b>Additional Resources:</b><br/>Textbook<br/>Smartboard<br/>Calculator<br/>Teacher-made materials<br/>Document readers - elmo</p> <p><a href="http://www.khanacademy.org">www.khanacademy.org</a></p> <p><a href="http://www.studyisland.com">www.studyisland.com</a></p> <p><a href="http://www.itunesu.com">www.itunesu.com</a></p> <p><a href="http://www.brainpop.com">www.brainpop.com</a></p> <p><a href="http://www.prometheanworld.com">www.prometheanworld.com</a></p> |

| Suggested days of Instruction | Curriculum Management System<br><b>Subject/Grade Level:</b><br><b>Grade 6</b><br><b>Mathematics</b>   | <b>Topic: Equations, Inequalities and Geometry</b>   |  |
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|                               |   | <b>Goal 3:</b> 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. Two – and three-dimensional objects with or without curved surfaces can be described, classified, and analyzed by their attributes. Objects can be measured in different ways using perimeter, area, surface area, and volume. |  |
|                               | <b>Objectives / Cluster Concepts / Cumulative Progress Indicators (CPI's)</b><br><b>The student will be able to:</b>  | <b>Essential Questions, Conceptual Understandings</b>  | <b>Instructional Tools / Materials / Technology / Resources / Learning Activities / Interdisciplinary Activities / Assessment Model</b>  |
|                               | <p>(MP.3)</p> <p>3.8. Model with mathematics.<br/>(MP.4)</p> <p>3.9. Attend to precision.<br/>(MP.6)</p> <p>3.10. MP.7 Look for and make use of structure.<br/>(MP.7)</p> <p>3.11. Look for and express regularity in repeated reasoning.<br/>(MP.8)</p> <p>3.12. Implement problem-solving strategies to solve a problem in school or the community.<br/>(9.1.8.A.2)</p> |  | <p><a href="http://www.teachertube.com">www.teachertube.com</a></p> <p><a href="http://www.mathplayground.com">http://www.mathplayground.com</a></p> <p><a href="http://www.explorellearning.com">www.explorellearning.com</a></p> |

| Suggested days of Instruction | Curriculum Management System<br><u>Subject/Grade Level:</u><br><b>Grade 6<br/>Mathematics</b>   | <b>Topic: Rational Numbers</b>  |  |
|-------------------------------|---|---|--|
|                               |   | <b>Goal 4:</b> Through the Rational Numbers unit students extend their previous understandings of numbers and their order 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. Students will utilize location and integers on two lines (x-axis and y-axis to locate points). The skills and concepts students learn in this unit are further developed throughout algebra, geometry, trigonometry, and calculus. Identifying the location in the coordinate system as well as placing a point in the system is very important for the study of algebraic equations. |  |
|                               | Objectives / Cluster Concepts /<br>Cumulative Progress Indicators<br>(CPI's)<br><b>The student will be able to:</b>   | <b>Essential Questions,<br/>Conceptual Understandings</b>   | <b>Instructional Tools / Materials / Technology /<br/>Resources / Learning Activities /<br/>Interdisciplinary Activities / Assessment Model</b>  |
| 6 wks                         | <p>4.1. Locate positive and negative rational numbers on the number line and explain the meaning of absolute value of a rational number as indicating locations on opposite sides of zero on the number line.<br/>(6.NS.6, 6.NS.6.a, 6.NS.6.c, 6.NS.7, 6.NS.7.a)</p> <p>4.2. Interpret and explain absolute value as magnitude from a positive or negative quantity in a real world situation.<br/>(6.NS.7, 6.NS.7.c)</p> <p>4.3. Order rational numbers.<br/>(6.NS.7)</p> <p>4.4. Write, interpret and explain statements of order.<br/>(6.NS.7.b)</p> <p>4.5. Write and compare rational numbers using inequality</p> | <p><b>Essential Questions:</b><br/>How can we compare and contrast rational numbers?<br/>How can we use a model to show the relationship of rational numbers?</p> <p><b>Conceptual Understandings:</b><br/>Integers can be used to represent relationships between quantities in multiple representations.<br/><br/>Coordinate geometry can be used to represent and verify geometric/algebraic relationships.<br/><br/>The coordinate system is a scheme that uses two perpendicular lines intersecting at 0 to name the location of points in a plane.</p>  | <p><b>NOTE: The assessment models provided in this document are suggestions for the teacher. If the teacher chooses to develop his/her own model, it must be of equal or better quality and at the same or higher cognitive levels (as noted in parentheses).</b></p> <p><b>Depending upon the needs of the class, the assessment questions may be answered in the form of essays, quizzes, mobiles, PowerPoint, oral reports, booklets, or other formats of measurement used by the teacher.</b></p> <p><b>Unit Vocabulary:</b><br/>positive integer, negative integer, opposite, absolute value, coordinate grid, x-axis, y-axis, origin, quadrant, ordered pair, x-coordinate, y-coordinate, additive inverse, rational number system, irrational number system, transformation, reflection, rotation, translation</p> <p><b>Assessment Models:</b><br/>Skill sheets<br/>Quizzes/Tests<br/>Homework<br/>Portfolio<br/>Projects<br/>Classwork<br/>District/School benchmarks</p> |

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| <b>Suggested days of Instruction</b> | <b>Curriculum Management System</b><br><b>Subject/Grade Level:</b><br><b>Grade 6</b><br><b>Mathematics</b>  | <b>Topic: Rational Numbers</b>  |  |
|                                      |   | <b>Goal 4:</b> Through the Rational Numbers unit students extend their previous understandings of numbers and their order 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. Students will utilize location and integers on two lines (x-axis and y-axis to locate points). The skills and concepts students learn in this unit are further developed throughout algebra, geometry, trigonometry, and calculus. Identifying the location in the coordinate system as well as placing a point in the system is very important for the study of algebraic equations. |  |
|                                      | <b>Objectives / Cluster Concepts / Cumulative Progress Indicators (CPI's)</b><br><b>The student will be able to:</b>  | <b>Essential Questions, Conceptual Understandings</b>   | <b>Instructional Tools / Materials / Technology / Resources / Learning Activities / Interdisciplinary Activities / Assessment Model</b>  |
|                                      | <p>signs.<br/>(6.NS.7.a)</p> <p>4.6. Plot ordered pairs in all four quadrants on the coordinate plane and describe their reflections.<br/>(6.NS.6, 6.NS.6.b, 6.NS.6.c)</p> <p>4.7. Distinguish between absolute value expressions and order statements.<br/>(6.NS.7.d)</p> <p>4.8. Solve real world problems mathematically by graphing points in all four quadrants of the coordinate plane. Use the absolute value of the differences of their coordinates to find the distances between points with the same first coordinate or the same second coordinate.<br/>(6.NS.8)</p> <p>4.9. Draw polygons in the</p> |   | <p><b>Opportunities for Differentiation:</b><br/> Hand on materials – manipulative<br/> Project based<br/> Modified and multiple tests<br/> Amount of problems to complete for homework or classwork<br/> Small group instruction<br/> Peer instruction<br/> Active learning<br/> Modeling<br/> Time allotment<br/> Review game<br/> Enrichment opportunities</p> <p><b>Additional Resources:</b><br/> Document readers – elmo</p> <p><a href="http://www.khanacademy.org">www.khanacademy.org</a></p> <p><a href="http://www.studyisland.com">www.studyisland.com</a></p> <p><a href="http://www.itunesu.com">www.itunesu.com</a></p> <p><a href="http://www.brainpop.com">www.brainpop.com</a></p> <p><a href="http://www.prometheanworld.com">www.prometheanworld.com</a></p> <p><a href="http://www.teachertube.com">www.teachertube.com</a></p> |

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| <b>Suggested days of Instruction</b> | <b>Curriculum Management System</b><br><b>Subject/Grade Level:</b><br><b>Grade 6</b><br><b>Mathematics</b>  | <b>Topic: Rational Numbers</b>  |  |
|                                      |   | <b>Goal 4:</b> Through the Rational Numbers unit students extend their previous understandings of numbers and their order 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. Students will utilize location and integers on two lines (x-axis and y-axis to locate points). The skills and concepts students learn in this unit are further developed throughout algebra, geometry, trigonometry, and calculus. Identifying the location in the coordinate system as well as placing a point in the system is very important for the study of algebraic equations. |  |
|                                      | <b>Objectives / Cluster Concepts / Cumulative Progress Indicators (CPI's)</b><br><b>The student will be able to:</b>  | <b>Essential Questions, Conceptual Understandings</b>   | <b>Instructional Tools / Materials / Technology / Resources / Learning Activities / Interdisciplinary Activities / Assessment Model</b>                      |
|                                      | <p>coordinate plane given the coordinates of the vertices and use the coordinates to solve real world distance, perimeter, and area problems.<br/>(6.G.3)</p> <p>4.10. Reason abstractly and quantitatively.<br/>(MP.2)</p> <p>4.11. Model with mathematics.<br/>(MP.4)</p> <p>4.12. Use appropriate tools strategically.<br/>(MP.5)</p> <p>4.13. Implement problem-solving strategies to solve a problem in school or the community.<br/>(9.1.8.A.2)</p> |   | <p><a href="http://www.mathplayground.com">http://www.mathplayground.com</a></p> <p><a href="http://www.explorelearning.com">www.explorelearning.com</a></p> |

| Suggested days of Instruction | Curriculum Management System<br><u>Subject/Grade Level:</u><br><b>Grade 6<br/>Mathematics</b>  | <b>Topic: Ratio and Proportion</b>   |  |
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|                               | Objectives / Cluster Concepts /<br>Cumulative Progress Indicators<br>(CPI's)<br><b>The student will be able to:</b>  | <b>Essential Questions,<br/>Conceptual Understandings</b>  | <b>Instructional Tools / Materials / Technology /<br/>Resources / Learning Activities /<br/>Interdisciplinary Activities / Assessment Model</b>  |
| 6 wks                         | <p>5.1. Explain the relationship of two quantities or measures of a given ratio and use ratio language to describe the relationship between the two quantities. For example, "The ratio of wings to beaks in the bird house at the zoo was 2:1, because for every 2 wings there was 1 beak." "For every vote candidate A received, candidate C received nearly three votes." (6.RP.1)</p> <p>5.2. Use rate language in the context of a ratio relationship to describe a unit rate <math>a/b</math> associated with a ratio <math>a:b</math> with <math>b</math> does not equal. For example, "This recipe has a ratio of 3 cups of flour to 4 cups of sugar, so there is <math>\frac{3}{4}</math> cup of flour for each cup of sugar." "We paid \$75 for 15 hamburgers, which is a unit rate of \$5 per</p> | <p><b>Essential Questions:</b><br/>How does comparing quantities describe the relationship between them?</p> <p><b>Conceptual Understandings:</b><br/>Proportional relationships express how quantities change in relationship to each other.</p> <p>A ratio is a special relationship between two quantities where for every <math>x</math> units of one quantity there are <math>y</math> units of another quantity.</p> <p>A percent is a special kind of ratio in which a part is compared to a whole with 100 parts.</p> <p>You can find the percent of a number by changing the percent to a decimal and multiplying or using a proportion.</p> <p>The whole can be found when you are given a percent and a part.</p> <p>A part of a whole or a part of a set can be represented by a fraction, a decimal, and a percent.</p> | <p><b>NOTE: The assessment models provided in this document are suggestions for the teacher. If the teacher chooses to develop his/her own model, it must be of equal or better quality and at the same or higher cognitive levels (as noted in parentheses).</b></p> <p><b>Depending upon the needs of the class, the assessment questions may be answered in the form of essays, quizzes, mobiles, PowerPoint, oral reports, booklets, or other formats of measurement used by the teacher.</b></p> <p><b>Unit Vocabulary:</b><br/>unit rate, unit price, rate, ratio, equivalent ratios, proportion, scale, cross-products, percent, base, percent proportion, function, function table (input/output), unit conversion, tax, tip, interest</p> <p><b>Assessment Models:</b><br/>Homework<br/>Quizzes/Test<br/>Classwork<br/>Projects<br/>Portfolio<br/>Skill sheets<br/>Workbook</p> |

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| <b>Suggested days of Instruction</b> | <b>Curriculum Management System</b><br><b>Subject/Grade Level:</b><br><b>Grade 6</b><br><b>Mathematics</b>  | <b>Topic: Ratio and Proportion</b>   |   |
|                                      | <b>Objectives / Cluster Concepts / Cumulative Progress Indicators (CPI's)</b><br><b>The student will be able to:</b>  | <b>Goal 5:</b> 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 go beyond to convert to percents and decimals. Students solve a wide variety of problems involving ratios and rates. Students will explore how to find a percent of a number, finding the whole or finding the part of a set. 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. | <b>Essential Questions, Conceptual Understandings</b>   |
|                                      | <p>hamburger.”<br/>(6.RP.2)</p> <p>5.3. Create equivalent ratios tables, finding missing values.<br/>(6.RP.3.a)</p> <p>5.4. Use ratio and rate reasoning to solve real world and mathematical problems which include making tables of equivalent ratios, solving unit rate problems, finding percent of a quantity as a rate per 100.<br/>(6.RP.3.b, 6.RP.3.c)</p> <p>5.5. Use ratio and rate reasoning to convert measurement units (manipulate and transform units appropriately when multiplying or dividing quantities).<br/>(6.RP.3, 6.RP.3.d)</p> |  | <p>Test</p> <p><b>Opportunities for Differentiation:</b><br/> Hand on materials – manipulative<br/> Project based<br/> Modified and multiple tests<br/> Amount of problems to complete for homework or classwork<br/> Small group instruction<br/> Peer instruction<br/> Active learning<br/> Modeling<br/> Time allotment<br/> Review game<br/> Enrichment opportunities</p> <p><b>Additional Resources:</b><br/> Textbook<br/> Smartboard<br/> Calculator<br/> Teacher-made materials<br/> Document reader – Elmo</p> <p><a href="http://www.khanacademy.org">www.khanacademy.org</a></p> <p><a href="http://www.studyisland.com">www.studyisland.com</a></p> |

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| <b>Suggested days of Instruction</b> | <b>Curriculum Management System</b><br><b>Subject/Grade Level:</b><br><b>Grade 6</b><br><b>Mathematics</b>   | <b>Topic: Ratio and Proportion</b>   |   |
|                                      | <b>Objectives / Cluster Concepts / Cumulative Progress Indicators (CPI's)</b><br><b>The student will be able to:</b>   | <b>Goal 5:</b> 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 go beyond to convert to percents and decimals. Students solve a wide variety of problems involving ratios and rates. Students will explore how to find a percent of a number, finding the whole or finding the part of a set. 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. | <b>Essential Questions, Conceptual Understandings</b>   |
|                                      | 5.6. Convert between percents, decimals, and fractions.<br><br>5.7. Use variables to represent two quantities that change in relationship to one another in a real world problem and write an equation to express one quantity, thought of as the dependent variable, in terms of another quantity, thought of as the independent variable. (6.EE.9)<br><br>5.8. Analyze the relationship between the dependent and independent variables in an equation using graphs and tables. For example, in a problem involving motion at constant speed, list and graph ordered pairs of distances and times on a linear graph, and write the equation $d = 65t$ to represent the relationship between distance and time. |  | <a href="http://www.itunesu.com">www.itunesu.com</a><br><a href="http://www.brainpop.com">www.brainpop.com</a><br><a href="http://www.prometheanworld.com">www.prometheanworld.com</a><br><a href="http://www.teachertube.com">www.teachertube.com</a><br><a href="http://www.mathplayground.com">http://www.mathplayground.com</a><br><a href="http://www.explorelearning.com">www.explorelearning.com</a> |

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| <b>Suggested days of Instruction</b> | <b>Curriculum Management System</b><br><b>Subject/Grade Level:</b><br><b>Grade 6</b><br><b>Mathematics</b>  | <b>Topic: Ratio and Proportion</b>   |   |
|                                      | <b>Objectives / Cluster Concepts / Cumulative Progress Indicators (CPI's)</b><br><b>The student will be able to:</b>  | <b>Goal 5:</b> 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 go beyond to convert to percents and decimals. Students solve a wide variety of problems involving ratios and rates. Students will explore how to find a percent of a number, finding the whole or finding the part of a set. 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. | <b>Essential Questions, Conceptual Understandings</b> |
|                                      | (6.EE.9)<br><br>5.9. Make sense of problems and persevere in solving them.<br>(MP.1)<br><br>5.10. Reason abstractly and quantitatively.<br>(MP.2)<br><br>5.11. Model with mathematics.<br>(MP.4)<br><br>5.12. Attend to precision.<br>(MP.6)<br><br>5.13. Implement problem-solving strategies to solve a problem in school or the community.<br>(9.1.8.A.2)<br><br>5.14. Determine an individual's responsibility for personal |  |   |

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| <b>Suggested days of Instruction</b> | <b>Curriculum Management System</b><br><b>Subject/Grade Level:</b><br><b>Grade 6</b><br><b>Mathematics</b>   | <b>Topic: Ratio and Proportion</b>                    |   |
|                                      | <b>Objectives / Cluster Concepts / Cumulative Progress Indicators (CPI's)</b><br><b>The student will be able to:</b>   | <b>Essential Questions, Conceptual Understandings</b> | <b>Instructional Tools / Materials / Technology / Resources / Learning Activities / Interdisciplinary Activities / Assessment Model</b> |
|                                      | <p>actions and contributions to group activities.<br/>(9.1.8.C.1)</p> <p>5.15. Demonstrate the use of compromise, consensus, and community building strategies for carrying out different tasks, assignments, and projects.<br/>(9.1.8.C.2)</p> <p>5.16. Model leadership skills during classroom and extra-curricular activities.<br/>(9.1.8.C.3)</p> |   |   |