



# Sparta Area School District

*Good people, great schools.*

## Course Outcome Summary

**Course Information:** **Montessori Fifth Grade Math**

**Instruction Level:** 5<sup>th</sup> Grade

**Course Standards:** The Montessori approach uses specific Montessori materials to meet the needs of the children at their stage of development. At the end of each level the children will meet these units of study. By using the Montessori approach the children then become active learners and are able to reach their own unique potential because they are learning at their own pace and rhythm focusing on their own particular developmental needs at that moment.

### Units

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1. Geometry
2. Measurement and Data
3. Number and Operations in Base 10
4. Operations and Algebraic Thinking
5. Numbers and Operations-Fractions

### Unit Outlines

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#### 1. Geometry

**Standards:**

- Use a pair of perpendicular number lines to define coordinate systems, with intersection of the lines.
- Represent real world and mathematical problems by graphing points in the coordinate planes.
- Convert among different-sized standard measurement units within a given measurement system, and use these conversions in solving multi-step, real world problems.

**Essential Question:**

Students will be able to answer the question(s):

- What is a coordinate graph and how do I use represent data on the graph?

- How do I convert measurement units within a measurement system?

**Essential Knowledge:**

What are the key concepts/vocabulary/ideas that students will have mastery of by the completion of the unit?

- Students understand intersecting number lines and can map coordinates. Students are able to understand data and graph points on a coordinate plane. Students are able to convert measurements within a given measurement system.

**2. Measurement and Data**

**Standards:**

- Recognize volume as an attribute of solid figures and understand concepts of volume measurement.
- Use a unit cube to measure volume.
- Measure volumes by counting unit cubes, using cubic cm, cubic in, cubic ft, and improvised units.
- Relate volume to operations of multiplication and addition and solve real world and mathematical problems involving volume.
- Find volume of a right rectangular prism with whole-number side lengths by packing it with unit cubes.
- Apply the formulas  $V=l \times w \times h$  and  $V = b \times h$  for rectangular prisms.

**Essential Question:**

Students will be able to answer the question(s):

- What is the volume of a prism when I am given the measurements of the sides?

**Essential Knowledge:**

- Students are able to calculate volume using cubic measurements in both standard and metric measurements.

**3. Number and Operations in Base 10**

**Standards:**

- Explain patterns in the number of zeros of the product when multiplying a number by powers of 10 and explain decimal placement when multiplied by a power of 10.
- Read, write, and compare decimals to thousandths using base-ten numerals number names and expanded form.
- Use  $>$ ,  $=$ , and  $<$  to compare decimals to thousandths based on meanings of the digits in each place value.
- Use place value to understand rounding decimals to any place.
- Calculate whole number quotients with up to four digit dividends and two-digit divisors.

**Essential Question:**

Students will be able to answer the question(s):

- What number is greater when given numbers when compared to each other?
- What is the quotient when I divide by a two digit divisor?

**Essential Knowledge:**

- Students are able to compare and round numbers to the thousandths place. Students can calculate quotients with two digit divisors.

**4. Operations and Algebraic Thinking****Standards:**

- Use and evaluate numerical expressions using parenthesis, brackets or braces.
- Write and interpret numerical expressions that record calculations with numbers without having to calculate the sum or product in order to compare.
- Generate two patterns using two given rules, form pairs from two patterns and graph the ordered pairs on a coordinate plane and explain patterns.

**Essential Question:**

Students will be able to answer the question(s):

- When an equation has parenthesis, brackets or braces, what steps to I take to calculate the correct answers?
- When provided rules, what is the data I will graph and what patterns do I see in the graph?

**Essential Knowledge:**

- Students can calculate data when provided rules and graph data on a coordinate planes. This data can then be used to explain the trends and patterns on the graph.

**5. Numbers and Operations-Fractions****Standards:**

- Add and subtract fractions with unlike denominators by replacing given fractions with equivalent fractions.
- Solve word problems that include cases of unlike denominators by using visual fractions models or equations to represent the problem.
- Interpret a fraction as a division of the numerator by the denominator and solve word problems involving division of whole numbers with answers in the form of fractions.
- Multiply a fraction or whole number by a fraction.
- Solve real world problems involving multiplication of fractions and mixed numbers.
- Apply understandings of division to divide unit fractions by whole numbers and whole numbers by unit fractions.

**Essential Question:**

Students will be able to answer the question(s):

- How do I add or subtract fractions with unlike denominators by calculating common denominators and creating equivalent fractions?
- When I am solving real world problems, how can I use the information I know about working with fractions to solve the problems?

**Essential Knowledge:**

- Students will be able to accurately calculate addition, subtraction, multiplication, and division problems involving fractions.

