Sparta Area School District

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Course Outcome Summary

Course Information: Montessori Third Grade Math

Instruction Level: Montessori Third 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.

Unit

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

1. Geometry

Standards:

- Understand that shapes in different categories (e.g., rhombuses, rectangles, and others) may share attributes (e.g., having four sides), and that the shared attributes can define a larger category (e.g., quadrilaterals). Recognize rhombuses, rectangles, and squares as examples of quadrilaterals, and draw examples of quadrilaterals that do not belong to any of these subcategories.
- Partition shapes into parts with equal areas. Express the area of each part as a unit fraction of the whole. For example, partition a shape into 4 parts with equal area, and describe the area of each art as ¼ of the area of the shape.

Essential Question:

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

- How do we classify geometric shapes?
- Why do we classify geometric shapes?
- How are fractions (including equivalent fractions) used in daily life

Essential Knowledge:

- I can place shapes into categories depending on their attributes.

- I can name a category of many shapes by looking at their attributes.
- I can recognize and draw quadrilaterals.
- I can divide shapes into parts with equal areas and show those areas as fractions.

2. Measurement and Data
Standards:

- Measure and estimate liquid volumes and masses of objects using standard units of grams (g), kilograms (kg), and liters (l). Add, subtract, multiply, or divide to solve one-step word problems involving masses or volumes that are given in the same units, e.g., by using drawings (such as a beaker with a measurement scale) to represent the problem. [Excludes multiplicative comparison problems (problems involving notions of "times as much").]
- Draw a scaled picture graph and a scaled bar graph to represent a data set with several categories. Solve one-and two-step "how many more" and "how many less" problems using information presented in scaled bar graphs. For example, draw a bar graph in which each square in the bar graph might represent 5 pets.
- Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch. Show the data by making a line plot, where the horizontal scale is marked off in appropriate units—whole numbers halves, or quarters.
- Solve real world and mathematical problems involving perimeters of polygons, including finding the perimeter given the side lengths, finding the unknown side length, and exhibiting rectangles with the same perimeter and different areas or with the same area and different perimeters.
- Tell and write time to the nearest minute and measure time intervals in minutes. Solve word problems involving addition and subtraction of time intervals in minutes, e.g., by representing the problem on a number line diagram.

Essential Question:

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

- How do we represent information in a picture graph or bar graph?
- Why do we need standard units of measurement?
- How does what we measure influence how we measure?
- How do we use representations to solve word problems involving liquid volumes and masses of objects?
- Why is it important to tell time accurately?

Essential Knowledge:

- I can measure liquids and solids with grams, kilograms and liters.
- I can use addition, subtraction, multiplication and division to solve word problems about mass or volume.
- I can make a picture or bar graph to show data and solve problems using the information from the graphs.
- I can create a line plot for measurement data where the measured objects have been measured to the nearest whole number, half or quarter.
- I can solve real-world math problems using what I know about how to find the area and perimeter of shapes.

- I can tell and write time to the nearest minute?

3. Number and Operations in Base 10
Standards:

- Multiply one-digit whole numbers by multiples of 10 in the range 10-90 (e.g., 9 x 80, 5 x 60) using strategies based on place value and properties of operations.
- Use place value understanding to round whole numbers to the nearest 10 or 100.

Essential Question:

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

- How can I use strategies to multiply one-digit whole numbers by multiples of 10?
- How can I use my understanding of place value to round whole numbers to the nearest 10 or 100?

Essential Knowledge:

- I can multiply any one-digit whole number by a multiple of ten.
- I can use place value to help me round numbers to the nearest 10 or 100.

4. Operations and Algebraic Thinking
Standards:

- Interpret products of whole numbers, e.g., interpret 5 x 7 as the total number of objects in 5 groups of 7 objects each. For example, describe a context in which a total number of objects can be expressed as 5 x 7.
- Interpret whole-number quotients of whole numbers, e.g., interpret 56 divided by 8 as the number of objects in each share when 56 objects are partitioned equally into 8 shares, or as a number of shares when 56 objects are partitioned into equal shares of 8 objects each. For example, describe a context in which a number of shares or a number of groups can be expressed as 56 divided by 8.
- Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.
- Determine the unknown whole number in a multiplication or division equation relating three whole numbers. For example, determine the unknown number that makes the equation true in each of the equations 8 x ? = 48, 5 - __ / 3, 6 x 6 = ?.
- Solve two-step word problems using the four operations. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding. [Note: This standard is limited to problems posed with whole numbers and having whole-number answers; students should know how to perform operations in the conventional order when there are no parentheses to specify a particular order (Order of Operations)]
- Fluently multiply and divide within 100.

Essential Question:

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

- How do we use multiplication and division to solve problems?
- How are multiplication and division related?
- What are the properties of multiplication?
- What strategies can we use to memorize facts?

Essential Knowledge:

- I can understand multiplication by thinking about groups of objects.
- I can understand division by thinking about how one group can be divided into smaller groups.
- I can use what I know about multiplication and division to solve word problems.
- I can find the missing number in a multiplication or division equation.
- I can multiply and divide within 100 quickly and easily because I know how multiplication and division are related.
- I can solve two-step word problems that involve addition, subtraction, multiplication and division.
- I can solve two-step word problems by writing an equation with a letter in place of the number I don't know.
- I can use mental math to figure out if the answers to two-step word problems are reasonable.

5. Numbers and Operations-Fractions
Standards:

- Understand a fraction 1/b as the quantity formed by 1 part when a whole is partitioned into b equal parts; understand a fraction a/b as the quantity formed by parts of size 1/b.
- Understand a fraction as a number on the number line; represent fractions on a number line diagram.
- Explain the equivalence of fractions in special cases, and compare fractions by reasoning about their size.

Essential Question:

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

- What are different types of fractions?
- What are equivalent fractions?
- How can I label fractions on a number line?
- How do we tell and write time to the nearest minute?

Essential Knowledge:

- I can show and understand that fractions represent equal parts of a whole, where the top number is the part and the bottom number is the total number of parts on the whole.
- I can understand a fraction as a number on the number line by showing fractions on a number line diagram.
- I can understand how different fractions can actually be equal.
- I can understand two fractions as equivalent (equal) if they are the same size or at the same point on a number line.