

## Mathematics Curriculum Third Grade

### A. Number Sense

Students will understand the number system is the basis of mathematics. Students extend their understanding of the place value system to count, read, and write numbers up to 10,000. They learn to order and round numbers up to 10,000. They develop the concept of equivalent fractions - fractions that look different, but have the same value - and use their understanding of equivalent fractions to compare the sizes of fractions. They also begin to develop the concept of decimals as a different way of representing fractional numbers.

The students will:

- Count, read, write, compare, and plot on a number line whole numbers up to at least 10,000.
- Use words, models, standard form and expanded form to represent place value and to show equivalent forms of whole numbers up to at least 10,000.
- Round numbers to the nearest ten and hundred to estimate.
- Identify odd and even numbers and describe their characteristics.
- Interpret and model fractions as parts of a whole, parts of a group, and points and distances on a number line for numbers less than, equal to, or greater than one.
- Compare and order fractions by using models, benchmark fractions, or common numerators or denominators.
- Given a set of objects or a picture, name and write a decimal to represent tenths and hundredths.

### B. Computation

Students will understand that fluency in computation is essential. As students learn about the whole numbers up to 10,000, they learn how to add and subtract them. They develop the concepts of multiplication and division from addition and subtraction and learn basic multiplication and division facts. They also start to add and subtract fractions with the same denominator.

The students will:

- Show proficiency in multiplication facts up to  $10 \times 10$ .
- Be exposed to and learn division facts.
- Know and use the inverse relationships between multiplication and division facts (fact families).
- Solve problems involving addition, subtraction, multiplication, and division of whole numbers fluently using a standard algorithmic approach.
- Use mental arithmetic to add or subtract with numbers less than 100.

- Represent the concept of multiplication of whole numbers with models as repeated addition, equal-sized groups, arrays, area models, and equal “jumps” on a number line and explain the result of multiplying by zero.
- Represent the concept of division of whole numbers with models as successive subtraction, partitioning, sharing, and an inverse of multiplication. Show that division by zero is not possible.
- Add or subtract fractions with like denominators.

### C. Algebra and Functions

Students will understand that algebra is a language of patterns, rules, and symbols. Students at this level represent relationships with numeric equations and use those equations to solve problems. They continue number patterns involving multiplication and use some of the rules for multiplication to check results. They begin to develop the concept of a function.

The students will:

- Write and solve equations using ( $=$ ) to show equivalence and use variables to express mathematical relationships involving multiplication.
- Create, extend, and give a rule for number patterns using multiplication.
- Solve problems using the identity principle of multiplication.
- Understand and use the commutative and associative rules of multiplication.

### D. Geometry

Students will learn about geometric shapes and develop a sense of space. They identify quadrilaterals and learn about right angles as a basis for comparing other angles. They describe and classify three-dimensional shapes. They use basic terms point, line, and line segment to describe shapes. They also develop the concept of mirror-image symmetry and draw lines of symmetry.

The students will:

- Identify and name, describe, compare, and draw two-dimensional shapes: triangle, quadrilaterals (trapezoid, parallelogram, rectangle, rhombus, square), pentagon, hexagon, and octagon in terms of their attributes.
- Identify and name, describe, compare geometric solids: cube, sphere, rectangular prism, pyramid, cone, and cylinder.
- Identify and draw congruent shapes.
- Identify angles that are right angles and other angles that are greater than (obtuse) or less than (acute) a right angle.
- Identify, describe and draw points, lines and line segments and use these terms when describing two-dimensional shapes.
- Identify and draw lines of symmetry in geometric shapes and recognize symmetrical shapes in the environment.

- Identify transformations of geometric shapes – translation, rotation, and reflection.
- Identify and graph points on a coordinate plane.

#### E. Measurement

Students will understand that the study of measurement is essential because of its uses in many aspects of everyday life. Students measure lengths, add units of length, and find the perimeters and areas of shapes. They estimate, measure, and compare weights, capacities, and temperatures in standard units. They also learn about money: the value of any collection of coins and dollars, writing money using the \$ symbol, and deciding whether they have enough money to make a purchase.

The students will:

- Estimate and find the perimeter and area of polygons.
- Estimate and find volume.
- Choose and use appropriate units and tools to estimate and measure length and weight. Estimate and measure length in centimeters and to  $\frac{1}{4}$  inch, weight in pounds and kilograms, and temperature in Celsius and Fahrenheit selecting appropriate units for the given situation. Use the relationship between the units to express answers in different units.
- Add units of length that may require regrouping of inches to feet or centimeters to meters.
- Estimate and measure capacity using teaspoons, tablespoons, cups, pints, quarts, half gallons, and gallons.
- Using an analog clock tell time to the nearest minute.
- Figure elapsed time.
- Find the value of any collection of coins and bills. Write amounts using cent symbol and dollar sign with decimal point.

#### F. Data Analysis and Probability

The students will understand that data are all around us - in newspapers and magazines, in television news and commercials. Students need to learn how to understand data.

The students will:

- Interpret data displayed in a circle graph and answer questions about the situation.
- Construct and analyze frequency tables, bar graphs, and line graphs from data, including data collected through observations, surveys and experiments.
- Identify events on a continuum from impossible to unlikely, equally likely, likely or certain. Determine a simple probability in a context using pictures.

## G. Problem Solving

The students will use problem solving skills. They will choose how to approach a problem, explain their reasoning, and check their results. As they develop their skills with numbers, geometry, or measurement, students move from simple ideas to more complex ones by taking logical steps that build a better understanding of mathematics.

The students will:

- Use the Super Seven Strategies: guess & check, draw a picture, make an organized list, look for a pattern, make a table or chart, use logical reasoning, work backward.
- Analyze problems by identifying relationships, telling relevant from irrelevant information, sequencing and prioritizing information, and observing patterns.
- Decide when and how to break a problem into simpler parts.
- Decide whether a solution is reasonable in the context of the original situation.
- Decide whether an exact answer or estimation is appropriate.
- Use technology as a tool to support or extend problem solving strategies.
- Understand and use grade level appropriate math vocabulary and symbols.