

**OAK LAWN-HOMETOWN SCHOOL DISTRICT 123
FOURTH GRADE MATH ESSENTIAL OUTCOMES**

STATE GOAL 6: DEMONSTRATE AND APPLY A KNOWLEDGE AND SENSE OF NUMBERS, INCLUDING NUMERATION AND OPERATIONS (ADDITION, SUBTRACTION, MULTIPLICATION, DIVISION) PATTERNS, RATIOS, AND PROPORTIONS.

Why this goal is important: Numbers and operations on numbers play fundamental roles in helping us make sense of the world around us. Operations such as addition, subtraction, multiplication, and division as well as the ability to find powers and roots, extend the notion of numbers to create tools to model situations and solve problems in our everyday lives.

GOAL 6 - STANDARD A: Demonstrate knowledge and use numbers and their representations in a broad range of theoretical and practical settings.

- Use area models, benchmark fractions, and analyses of numerators and denominators to compare and order fractions.
- Divide regions or sets to represent a fraction and identify and locate $\frac{1}{4}$ and $\frac{1}{8}$ on a number line.
- Describe and explain strategies used to identify the “whole” when give a fractional part.
- Translate between whole numbers and decimals represented in words and in base-ten notation.
- Use area models to represent equivalent decimals (e.g., $0.4 = 0.40$).

GOAL 6 - STANDARD B: Investigate, represent, and solve problems using number facts, operations (addition, subtraction, multiplication, division) and their properties, algorithms, and relationships.

- Solve problems involving the value of a collection of bills and coins whose total value is \$100 or less.
- Demonstrate automaticity with multiplication facts through $10 * 10$ and proficiency with related division facts; use basic facts to compute fact extensions such as $30 * 60$.
- Use the inverse relationship between division and multiplication using the commutative and distributive properties to complete number sentences and solve problems (e.g., $5x4=20$; $20/4=?$).
- Use mental arithmetic, paper and pencil algorithms, and calculators to solve problems involving the division of multi-digit whole numbers by 1-digit whole numbers; describe the strategies used and how they work.
- Use repeated addition, skip counting, arrays, area, and proof drawings to model multiplication and division.

GOAL 6 - STANDARD C: Compute and estimate using mental mathematics, paper- and pencil methods, calculators, and computers.

- Discuss estimation strategies for multiplying and dividing whole numbers and money.

GOAL 6 - STANDARD D: Solve problems using comparison of quantities, ratios, proportions, and percents.

- Understand “percent” is another way to say “hundredths” (e.g., $50\%=50/100=1/2$).

STATE GOAL 7: ESTIMATE, MAKE, AND USE MEASUREMENTS OF OBJECTS, QUANTITIES, AND RELATIONSHIPS AND DETERMINE ACCEPTABLE LEVELS OF ACCURACY.

Why this goal is important: Measurement provides a way to answer questions about “how many,” “how much,” and “how far.” It is an indispensable component of business, manufacturing, art medicine, and many other aspects of life. All people must be able to choose an appropriate level of accuracy for a measurement, to select what measuring instruments to use, and to correctly determine the measures of objects, space, and time.

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GOAL 7 - STANDARD A: Measure and compare quantities using appropriate units, instruments and methods.

- Select and use appropriate standard units and tools to measure length to the nearest $\frac{1}{2}$ inch or $\frac{1}{2}$ centimeter.
- Select and use appropriate standard units and tools to measure the mass/weight or capacity of an object.
- Select and use appropriate tools to measure angles of a polygon.

GOAL 7 - STANDARD B: Estimate measurements and determine acceptable levels of accuracy.

- Develop benchmarks that can serve as aids in estimating customary measurements of objects and events.

GOAL 7 - STANDARD C: Select and use appropriate technology, instruments, and formulas to solve problems, interpret results, and communicate findings.

- Demonstrate proficient use of calculator for the four basic operations.
- Determine appropriate application of technological tools.

STATE GOAL 8: USE ALGEBRAIC AND ANALYTICAL METHODS TO IDENTIFY AND DESCRIBE PATTERNS AND RELATIONSHIPS IN DATA, SOLVE PROBLEMS, AND PREDICT RESULTS.

Why this goal is important: Algebra unites patterns and quantities in patterns with the means of describing change through the use of variables and functions. Its concepts and analytical methods allow people to consider general solutions to problems with common characteristics and develop related formulas. All people must be able to use algebraic methods to construct and examine tables of values; to interpret the relationships expressed by patterns in these tables; to relate change and variation in changes; and to find solutions to everyday problems using algebra's symbolic manipulation and formulas.

GOAL 8 - STANDARD A: Describe numerical relationships using variables and patterns.

- Understand variable as a placeholder.
- Use rules and variables to describe patterns and other relationships (e.g., In-and-Out Box and "What's My Rule?").
- Evaluate algebraic expressions with a whole number variable value (e.g., evaluate $3 + m$ when $m = 4$).

GOAL 8 - STANDARD B: Interpret and describe numerical relationships using tables, graphs, and symbols.

- Identify or represent situations with well-defined patterns using words, tables, and graphs (e.g., represent temperature and time in a line graph).
- Describe how a change in one variable affects the value of a related variable; e.g. as one increases the other increases or as one decreases the other decreases.

GOAL 8 - STANDARD C: Solve problems using systems of numbers and their properties.

- Demonstrate understanding of the distributive property (e.g., multiplication wrestling).

GOAL 8 – STANDARD D: Use algebraic concepts and procedures to represent and solve problems.

- Model situations that involve whole numbers and money using the strategy "make a table."

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STATE GOAL 9: USE GEOMETRIC METHODS TO ANALYZE, CATEGORIZE, AND DRAW CONCLUSIONS ABOUT POINTS, LINES, PLANES, AND SPACE.

Why this goal is important: Geometry provides important methods for reasoning and solving problems with points, lines, planes, and space. While we still use modern technology and employ a wider variety of mathematical tools today, we still study geometry to understand the shapes and dimensions of our world. Historically, geometry is a way to develop skill in forming convincing arguments and proofs. This goal of developing a means to argument and validation remains an important part of our reasons for studying geometry today.

GOAL 9 - STANDARD A: Demonstrate and apply geometric concepts involving points, lines, planes, and space.

- Identify whether or not a figure has one or more lines of symmetry, and sketch or identify all lines of symmetry.
- Identify and sketch parallel and perpendicular lines.
- Identify and sketch right angles.
- Describe, compare, and classify plane and solid figures, including polygons, circles, spheres, cylinders, rectangular prisms, cones, cubes, and pyramids, using appropriate geometric terms including vertex, base, face, edge, and congruent.
- Identify, describe, and sketch examples of reflections.

GOAL 9 - STANDARD B: Identify, describe, classify, and compare relationships using points, lines, planes, and solids.

- Determine the distance between two points on the number line in whole numbers.

STATE GOAL 10: COLLECT, ORGANIZE, AND ANALYZE DATA USING STATISTICAL METHODS; PREDICT RESULTS; AND INTERPRET UNCERTAINTY USING CONCEPTS OF PROBABILITY.

Why this goal is important: The ability to understand and interpret data (e.g., opinion polls, stock prices, tax rates, crime statistics, scientific studies, weather reports) grows more important each day. Students must be able to organize data, make sense of variables and patterns, and judge the logical reasonableness of any claims and interpretations made. All students need to understand and apply the role probability plays in data collection and decision-making. Data analysis and use are important abilities necessary for all careers.

GOAL 10 - STANDARD A: Organize, describe and make predictions from existing data.

- Represent and interpret data using tables, bar graphs, line plots and line graphs.

GOAL 10 - STANDARD B: Formulate questions, design data collection methods, gather, and analyze data and communicate findings.

- Identify the median of a set of data and describe what it indicates about the data.

GOAL 10 - STANDARD C: Determine, describe, and apply the probabilities of events.

- Predict the outcomes of experiments and test the predictions using manipulatives; summarize the results

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and use them to predict future events.

- Describe the chances associated with a context presented visually including the use of the response format “3 out of 4” or $\frac{3}{4}$

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