Bud Carlson Academy
Fundamental Math

The study of irrational numbers and the real number system to develop an in-depth conceptual understanding of fractions, decimals, and to recognize which operation(s) to apply to a given problem situation they encounter. A firm understanding of numbers as well as operations and their properties will provide a good foundation for the study of algebra. Imaginary and complex numbers are introduced and continued conceptual development of integers to quantify sets, identify location, measure, quantify the probability of an event, analyze data, and describe and interpret real-world phenomenal.

- Applications of arithmetic
- Consumer and career math
- Budgeting, banking, credit, and taxes.
- Arithmetic skills
- An overview of statistical measures
- Scatter plots, probability
- Measuring and estimating, distance
- Time graphs and using graphs to solve problems.

Fundamental Math COURSE CONTENT COMPETENCIES

1. Students will create and use representations to communicate mathematical ideas and to solve problems
2. Students will understand that patterns, relations, and functions can be used to describe, interpret, and predict real world phenomena.
3. Students will recognize, explore, and develop mathematical connections
4. Students will understand that tables, graphs, and equations are ways for depicting and analyzing patterns of change in data.
5. Students will demonstrate understanding of relative magnitude of real numbers
6. Students will accurately solves problems
7. Applies properties of numbers and field properties

Fundamental Math COURSE PROCESS COMPETENCIES

1. Students will understand that a variety of problem-solving strategies can be used to investigate everyday as well as increasingly complex mathematical situations.
2. Students will understand that exploring, justifying, and synthesizing mathematical conjectures are part of systemic reasoning which is common to all content areas and a defining feature of mathematics.
3. Students will understand that actively exploring, investigating, describing, and explaining mathematical ideas promotes communication which leads to a greater comprehension of mathematical concepts.
4. Students will understand that mathematical connections will help them become aware of the usefulness of mathematics, serve to bridge the concrete and the abstract, and enable deeper understanding of important ideas.
5. Students will understand that representing ideas and connecting the representations lies at the heart of understanding mathematics.
6. Students will understand that progress is made by asking relevant questions, conducting careful investigations evaluating the validity of results and developing models to explain what has been found.
7. Students will understand that when analyzing data to draw conclusions about the questions or hypotheses being tested, limitations of the data must be considered that could affect interpretations.
8. Students will understand that appropriate representations and mathematical language is used to present ideas clearly and logically for a given situation.

Topics	➢ Applications of arithmetic ➢ Consumer and career math ➢ Budgeting, banking, credit, and taxes. ➢ Arithmetic skills ➢ An overview of statistical measures ➢ Scatter plots, probability ➢ Measuring and estimating, distance ➢ Time graphs and using graphs to solve problems.

Competencies	1. Demonstrates understanding of the relative magnitude of real numbers by solving problems involving ordering or comparing rational numbers, common irrational numbers, rational bases with integer exponents, square roots, absolute values, integers, or numbers represented in scientific notation using number lines or equality and inequality symbols. 2. Accurately solves problems involving rational numbers within mathematics, across content strands, disciplines or contexts (with emphasis on, but not limited to, proportions, percents, ratios, and rates). 3. Uses a variety of mental computation strategies to solve problems (e.g., using compatible numbers, applying properties of operations, using mental imagery, using patterns) and to determine the reasonableness of answers. 4. Makes estimates in a given situation (e.g., tips, discounts, tax, the value of a non-perfect square root or cube root) by identifying when estimation is appropriate, selecting the appropriate method of estimation; determining the level of accuracy needed given the situation; analyzing the effect of the estimation method on the accuracy of results; evaluating the reasonableness of solutions appropriate to GSEs across content strands. 5. Applies properties of numbers and field properties (including determining whether a given subset of numbers is closed under a given arithmetic operation) to solve problems or to simplify computations; and compares and contrasts the properties of numbers and number systems; adds and multiplies numerical matrices with attention to the arithmetic properties of these operations.

Knowledge/Skills	M:N&O:10:2 **Demonstrates understanding of the relative magnitude of real numbers** by solving problems involving ordering or comparing rational numbers, common irrational numbers (e.g., $\sqrt{2}$, π), rational bases with integer exponents, square roots, absolute values, integers, or numbers represented in scientific notation using number lines or equality and inequality symbols.. M:N&O:10:4 **Accurately solves problems involving** rational numbers within mathematics, across content strands, disciplines or contexts (with emphasis on, but not limited to, proportions, percents, ratios, and rates). M:N&O:HS:6 **Uses a variety of mental computation strategies to solve problems** (e.g., using compatible numbers, applying properties of operations, using mental imagery, using patterns) and to **determine the reasonableness of answers.** M:N&O:HS:7 **Makes estimates** in a given situation (e.g., tips, discounts, tax, the value of a non-perfect square root or cube root) by identifying when estimation is appropriate, selecting the appropriate method of estimation; determining the level of accuracy needed given the situation; analyzing the effect of the estimation method on the accuracy of results; evaluating the reasonableness of solutions appropriate to GSEs across content strands. M:N&O:HS:8 **Applies properties of numbers** and **field properties** (including determining whether a given subset of numbers is closed under a given arithmetic operation) **to solve problems or to simplify computations**; and **compares and contrasts the properties of numbers and number systems**; adds and multiplies numerical matrices with attention to the arithmetic properties of these operations.

Process Skills	Students will understand that a variety of problem-solving strategies can be used to investigate everyday as well as increasingly complex mathematical situations. Students will understand that exploring, justifying, and synthesizing mathematical conjectures are part of systemic reasoning which is common to all content areas and a defining feature of mathematics. Students will understand that actively exploring, investigating, describing, and explaining mathematical ideas promotes communication which leads to a greater comprehension of mathematical concepts. Students will understand that mathematical connections will help them become aware of the usefulness of mathematics, serve to bridge the concrete and the abstract, and enable deeper understanding of important ideas. Students will understand that representing ideas and connecting the representations lies at the heart of understanding mathematics.

Performance Assessment	Student evidence will demonstrate mastery of concepts, broad themes, and individual proficiency standards. Student assessment is based on progress of individual mastery of set lesson objectives, research projects, and power point presentations and in depth student response journals and student portfolios.