- # Overview of Math-U-See levels

- *Primer*
    - *Primer* is for students that are just beginning to show interest in math and beginning to count. This book is a non-mastery book. It is not essential that students master everything in this book before moving to the next level. The concepts covered in *Primer* will be covered again in the next levels. This is the only level where we say that mastery is not required. In the *Primer* level children will learn writing numerals, adding and subtracting, basic counting, skip counting, geometric shapes, telling time; also, they will be introduced to the manipulative block system. It's a gentle introduction to "doing math."
- **Major concepts and skills include:**
    - Counting objects and developing numeracy
    - Understanding place value
    - Recognizing number names and symbols
    - Reading and writing numerals
    - Understanding addition and subtraction with concrete and representational models
    - Understanding and writing the symbols +, –, and =
    - Addition and subtraction of select numbers
- **Additional concepts and skills:**
    - Telling and writing time by hours and minutes
    - Recognizing and drawing rectangles, squares, and circles
    - Measuring length by repeating units
    - Introducing halves and fourths
    - Counting by 2s, 5s, 10s, and 100s
    - Reading, writing and interpreting word problems

- *Alpha*
    - This is our first formal instruction book. We really want to move at the child's pace. Each book going forward has approximately 30 lessons which generally last one week each, but that doesn't mean that is how long a lesson will take. If a student needs two weeks to master the concepts in the lesson, then the parent should take that much time, but if they master it in 3 days, that is fine, too. *Alpha* focuses on teaching the concepts of single-digit addition and subtraction. We use systematic teaching strategies to help students commit the addition and subtraction facts to memory.
- **Major concepts and skills include:**
    - Understanding place value
    - Extending the counting sequence
    - Fluently adding all single-digit numbers
    - Solving for an unknown addend
    - Understanding the relationship between addition and subtraction
    - Fluently subtracting all single-digit numbers
- **Additional concepts and skills:**
    - Telling and writing time by hours and minutes
    - Recognizing and drawing rectangles, squares, and circles
    - Measuring length by repeating units
    - Introducing halves and fourths
    - Counting by 2s, 5s, 10s, and 100s
    - Reading, writing, and interpreting word problems

- *Beta*
    - This level covers addition and subtraction for multiple-digit numbers and other topics. *Beta* builds on the foundation in *Alpha* by applying students' mastery of single-digit addition and subtraction to multiple-digit addition and subtraction. One of the stepping stones between these two levels is the concept of place value, which is an important milestone for truly grasping any multiple-digit operation.
- **Major concepts and skills include:**
    - Understanding place value and using it to add or subtract
    - Fluently adding any combination of whole numbers
    - Solving for an unknown addend
    - Fluently subtracting any combination of whole numbers
    - Solving abstract and real-world problems involving addition and subtraction
- **Additional concepts and skills:**
    - Telling and writing time by hours and minutes
    - Understanding, adding, and subtracting U.S. currency
    - Measuring and estimating length with inches, feet, centimeters, and meters
    - Comparing numbers and lengths
    - Expressing differences between numbers as inequalities
    - Finding the perimeter of any polygon
    - Representing and interpreting data in plots and graphs

- *Gamma*
    - This level covers multiplication for single and multiple-digit numbers and other topics. Once students have mastered the concepts of addition and subtraction (covered in *Alpha* and *Beta*), they are ready for multiplication. *Gamma* teaches single-digit facts and multiple-digit multiplication skills.
- **Major concepts and skills include:**
    - Using strategies based on place value and properties of operations to multiply
    - Fluently multiplying any combination of whole numbers
    - Solving for an unknown factor
    - Solving abstract and real-world problems involving addition, subtraction, and multiplication
    - Measuring and computing area
    - Relating concepts of area to addition and multiplication
- **Additional concepts and skills:**
    - Skip counting as a precursor to multiplication
    - Adding and subtracting time in hours and minutes
    - Multiplying, adding, and subtracting U.S. currency and standard units of measure
    - Representing, recording, and interpreting data
    - Understanding of basic fractions
    - Estimating and solving measurement problems

- *Delta*
    - *Delta* covers *division* for single and multiple-digit numbers and other topics. Division is presented as the inverse of multiplication. Single-digit division facts are learned, and the concepts of division and place value are applied when solving long division problems.
- **Major concepts and skills include:**
    - Using strategies based on place value and properties of operations to divide
    - Understanding division as solving for an unknown factor
    - Fluently dividing any combination of whole numbers
    - Solving abstract and real-world problems involving all four operations
    - Interpreting remainders in short and long division
    - Understanding fraction notation in light of division
- **Additional concepts and skills:**
    - Reading and writing Roman numerals
    - Dividing, multiplying, adding, and subtracting U.S. currency and standard units of measure
    - Understanding angle measure and geometric shapes including points, segments, rays, and lines
    - Classifying shapes based on defining attributes
    - Understanding and computing area and volume

- *Epsilon*
    - This level covers fractions and other topics. Now that students have learned basic operations with whole numbers, *Epsilon* covers these same operations with fractions. Fractions are presented in an intuitive way with visual explanations of equivalent fractions, common denominators, and fractions and numbers greater than 1. Fractions and operations are illustrated using our proprietary Fraction Overlay manipulatives.
- **Major concepts and skills include:**
    - Recognizing and generating equivalent fractions
    - Understanding addition, subtraction, multiplication, and division of fractions and mixed numbers
    - Fluently adding, subtracting, multiplying, and dividing fractions and mixed numbers
- **Additional concepts and skills:**
    - Using multiple strategies to recognize common factors
    - Understanding grouping symbols and their effect on order of operations
    - Interpreting and solving word problems
    - Comparing, and converting decimal fractions
    - Finding the area and circumference of circles
    - Classifying quadrilaterals
    - Representing fractions and fractional measurements on line plots and number lines
    - Using coordinates to represent ordered relationships

- Zeta
    - *Zeta* covers decimals, percentages, and other topics. *Zeta* extends the student's concept of place value to the right of the decimal point. Students learn to complete core operations with decimals. The connection between fractions and decimals is presented.
- **Major concepts and skills include:**
    - Expanding understanding of place value from positive powers of ten to include decimals
    - Fluently adding, subtracting, multiplying, and dividing multiple digit decimals using place value strategies
    - Solving real-world problems with decimals and percentages
    - Understanding the metric system and converting from one unit of measure to another
- **Additional concepts and skills:**
    - Understanding and simplifying exponents
    - Understanding negative numbers and representing them on the coordinate plane
    - Using properties of operations to simplify and evaluate algebraic expressions
    - Interpreting and graphing relationships between dependent and independent variables
    - Understanding of plane geometry and geometric symbols
    - Using ratio reasoning to solve problems

- *Pre-Algebra*
    - *Pre-Algebra* covers negative numbers, the order of operations, solving for the unknown, and other topics. We lay the foundation for success in *Algebra 1* and *Geometry*. One of the concepts covered is negative numbers.

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- Algebra 1
    - Graphing, simultaneous equations, exponents, polynomials, unit multipliers, and more.

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- *Geometry*
    - Points, lines, planes, angles, circles, triangles, quadrilaterals, the Pythagorean theorem, conic sections, proofs, and more

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- Algebra 2
    - Factoring polynomials, the quadratic formula, graphing conic sections, and other advanced algebra topics

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- *Pre-Calculus*
    - Trigonometry, identities, polar equations, logarithms, sequences, limits and other topics to prepare for calculus

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Calculus

- Derivatives, integrals, calculus applications, differential equations, and more

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