Math Grade Level Standards
Grades K-3

Kindergarten

- Counting objects
- Comparing quantities
    - Which group of objects has more?
    - Which number is greater?
- Addition and subtraction word problems
    - Adding two numbers with a sum of 10 or less
    - subtracting from the number 10 or less
    - Adding small numbers quickly and accurately
- Naming shapes

First Grade

- Addition and subtraction word problems
    - There were 6 tomatoes on the counter. I took some tomatoes. Then there were 2 tomatoes on the counter. How many tomatoes did I take?
    - My friend had five hats. I gave him six more hats. How many hats does my friend have now?
- Adding two numbers with a sum of 20 and subtracting from the number 20 or less
    - Base number 10 strategy
        - Ex. 13 - 4. Start with 13 - 3 to get to 10, then subtract 1 more to reach 9
- Quickly and accurately adding to the number 10 or less and subtracting from 10 or less
- Understanding place value- What does each digit mean in the 10s place, 1s place?
- Using place value to aid in addition and subtraction
    - Ex. 38 + 5; knowing to add the 5 to the 1s place
    - 80 - 50; vertical form, subtract the 1s place first then the 10s place
- Measuring the length of an object by using a shorter object as a unit of length
    - Ex. how many erasers make up the length of this pencil?
- Making composite shapes by joining shapes together, dividing circles and rectangles into halves or fourths

Second Grade

- Solving challenging addition and subtraction word problems with one or two steps
    - 1 step problem ex. "Lucy has 23 fewer apples than Julie. Julie has 47 apples. How many apples does Lucy have?"
- Quickly and accurately adding to a sum ≤ 20 and subtracting from the number 20 or less

- Understanding place value in three digit numbers- 100s place, 10s place, 1s place
- Using place value to solve addition and subtraction word problems with three digit numbers
  - Ex. 510   you can't subtract 0 - 4, so borrow from the 5 because you also
    - 274   can't subtract 1 - 7. This will change the 5 to a 4. Carry the 1 over
    - 236   to the 10s place, making the "1" an "11." Then borrow from the 11 and make it 10, and carry the 1 to the 1s place, making the "0" a "10." Then subtract 10 - 4 which is 6, 10 - 7 which is 3, and 4 - 2 which is 2. The final answer is 236.
- Adding and subtracting two digit numbers quickly and accurately
- Measuring and estimating unit in standard units
  - cm, in, ft
  - 12 inches in 1 foot
- Solving addition and subtraction word problems with length
  - Ex. "The pen is 2 cm longer than the pencil. If the pencil is 7 cm long, how long is the pen?"
- Building, drawing, and analyzing 2-D and 3-D shapes to develop foundations for area, volume, and geometry in later grades

Third Grade

- Multiplying and dividing up to 10 x 10 quickly and accurately, memorizing times tables
- Word problems for addition, subtraction, multiplication, and division
- Multiplying numbers with more than one digit
  - Ex. 4 x 60
  - 4 x 6 = 24, add the 0 to make 240
- Understanding and recognising fractions
  - 3/1 and 3 are the same value
- Measuring and estimating weights and liquid volumes, and solving word problems involving these quantities
- Reasoning about shapes
  - All squares are rectangles but not all rectangles are squares
- Finding area
  - A = base x height

Math Grade Level Standards
Grades 4-5

Fourth Grade
- Using word problems with whole numbers to solve problems with remainders and measurements
- Adding and subtracting numbers up to 1 million quickly and accurately
- Multiplying and dividing multi digit numbers (lattice/ long division guides on back)
    - Ex. 1,638 x 7, Ex. 6,966 ÷ 6
- Understanding and applying equivalent fractions
    - 1/4 is less than 3/8 because 2/8 is less than 3/8
    - 1/4 = 2/8
- Adding/ subtracting fractions with common denominators, and multiplying fractions
- Understanding simple conversions between decimals and fractions
    - Ex. 0.62 = 62/100
- Measuring angles and finding unknown angles in a diagram

Fifth Grade:
- Adding and subtracting fractions with different denominators (need to find common denominator);
    solving world problems
- Multiplying and dividing fractions
    - Finding the area of a shape with sides that have a fractional value
- Understanding place value of decimals with 10ths place and 100ths place
- Understanding and being able to solve for volume with V = length x width x height
- Graphing points on a coordinate plane
    - DRY MIX (mnemonic device/ acronym for remembering how to label a graph) = Dependent variable, Responding, Y axis, and Manipulated, Independent variable, X axis
- Analyzing mathematical patterns and relationships
- Ratios: used to compare two numbers (can be written three different ways)
    - 6: 1, 6/1, or 6 to 1
    - Ex: In Mrs. Smith's classroom, the ratio of teachers to students is 1: 24.
- Proportions: comparing two ratios that are equal to each other
    - Ex. If it takes 1 jar of peanut butter to make 6 peanut butter sandwiches, how many jars of peanut butter are needed to make 24 sandwiches?
    - Set up a proportion
        - 1/6 = x/24 –> 6 times what equals 24?
        - Answer: 4 jars of peanut butter
- Percentage: 100% = 1/1, 50% = 1/2, 25% = 1/4
    - Ex. You have 12 rulers. 25% of the rulers broke. How many rulers broke?
    - Take 25%, or 1/4 of 12

- 12/4 = 3; so 3 rulers broke

LATTICE METHOD: (for multiplication)

Lattice Multiplication

Solve: 49 x 19

Answer: 49 x 19 = 931

Step 1: Write the numbers you're multiplying along the top and side of the grid.

Step 2: Multiply the single digits on the top by the single digits on the side to fill in the squares.

Step 3: Add diagonally to find your answer.
Note: When adding, you may have to carry double digit sums to the net place.

Why does this work? By separating place values, you are essentially doing the same thing as you would do when adding multi-digit values. You are doing the same steps as traditional multiplication, only the columns are inverted and in table form. This creates a "chart" format, so it is easier to see which digits to multiply together, as well as which digits to add together in each row. By breaking each number into a sum of terms, one term for each digit, the final product will be the sum of all possible products of each term.

LONG DIVISION:

Long division

This is the traditional way of doing long division, which you may have been taught at school.

Have a look at the calculation: **8,640 ÷ 15**

```
15 | 8  6  4  0
```
15 into 8 doesn't go, so look at the next digit.

```
        5
15 | 8  6  4  0
  -  7  5
     1  1
```
15 goes into 86 five times, so put a 5 above the 6.
15 x 5 = 75
Take that 75 away from the 86 to get your remainder.
86 − 75 = 11

```
         5  7
15 | 8  6  4  0
     7  5  ↓
     1  1  4
  -  1  0  5
           9
```
Next, carry the 4 down to make 114.
15 goes into 114 seven times, so put a 7 above the 4.
15 x 7 = 105
Take 105 from the 114 to get your remainder
114 − 105 = 9

```
         5  7  6
15 | 8  6  4  0
     7  5
     1  1  4
  -  1  0  5
           9  0
```
Carry the 0 down to make 90
15 goes into 90 exactly 6 times, so put a 6 above the 0
15 x 6 = 90

8,640 ÷ 15 = 576