3rd Grade TEKS
(1) Within a well-balanced mathematics curriculum, the primary focal points are multiplying and dividing whole numbers, connecting fraction symbols to fractional quantities, and standardizing language and procedure in geometry and measurement.
(2) Throughout mathematics in Grades 3-5, students build a foundation of basic understandings in number, operation, and quantitative reasoning; patterns, relationships, and algebraic thinking; geometry and spatial reasoning; measurement; and probability and statistics. Students use algorithms for addition, subtraction, multiplication, and division as generalizations connected to concrete experiences; and they concretely develop basic concepts of fractions and decimals. Students use appropriate language and organizational structures such as tables and charts to represent and communicate relationships, make predictions, and solve problems. Students select and use formal language to describe their reasoning as they identify, compare, and classify two- or three-dimensional geometric figures; and they use number, standard units, and measurement tools to describe and compare objects, make estimates, and solve application problems. Students organize data, choose an appropriate method to display the data, and interpret the data to make decisions and predictions and solve problems.
(3) Throughout mathematics in Grades 3-5, students develop numerical fluency with conceptual understanding and computational accuracy. Students in Grades 3-5 use knowledge of the base ten place value system to compose and decompose numbers in order to solve problems requiring precision, estimation, and reasonableness. By the end of Grade 5, students know basic addition, subtraction, multiplication, and division facts and are using them to work flexibly, efficiently and accurately with numbers during addition, subtraction, multiplication, and division.
(4) Problem solving, language and communication, connections within and outside mathematics, and formal and informal reasoning underlie all content areas in mathematics. Throughout mathematics in Grades 3-5 students use these processes together with technology and other mathematical tools such as manipulative materials to develop conceptual understanding and solve meaningful problems as they do mathematics.

(3.1) Number, operation, and quantitative reasoning. The student uses place value to communicate about increasingly large numbers in verbal and written form, including money.

3.1(A) use place value to read, write (in symbols and words), and describe the value of whole numbers through 999,999

Include:
* Convert from standard to written - digits to words
* Convert from written to standard -words to digits
* Write numbers in expanded notation - ex. 357 = 300 + 50 + 7 and 3 hundreds 5 tens 7ones
* Read and describe place and value (such as 31,465 – the four is in the hundreds place and the value is 400)
* Use symbols and words for "greater than" (>), "less than: (<) and "equal" (=)

Helpful manipulatives:
Base Ten Pieces are recommended for understanding, place value charts

Note:
Expanded notation is introduced in 3rd grade.

3.1(B) use place value to compare and order whole numbers through 9,999

Include:
* Numbers and groups of numbers
* Words
* Tables (vertical and horizontal) that include data in various orders (descending, ascending, and no order)
* Number lines (whole numbers)
* Money
* Concrete models
* Pictorial models
* Use both symbols and words for "greater than" (>), "less than: (<) and "equal" (=).
* Compare and order groups of numbers, include numbers with units ex. 4 ft. and 6 ft.
* Sequence numbers/words (such as populations and names of cities from least to greatest)
* Include non-examples

Helpful manipulatives:
Base ten pieces, unifix cubes, counters

3.1(C) determine the value of a collection of coins and bills

Include:
* Pennies
* Nickels
* Dimes
* Quarters
* Half-dollars (Seldom used)
* Dollar Bills $1, $5, $10, and $20 (seldom used)

Note:
Recognize currency (such as two one dollar bills equals $2.00 and 3 quarters with 4 pennies equals 79 cents)

(3.2) Number, operation, and quantitative reasoning. The student uses fraction names and symbols (with denominators of 12 or less) to describe fractional parts of whole objects or sets of objects.

3.2(A) construct concrete models of fractions

Include:
* Halves
* Thirds
* Fourths
* Fifths
* Sixths
* Eighths
* Tenths
* Twelfths

Helpful manipulatives:
• Tiles, overhead fraction pieces (circles and strips), pattern blocks, fraction strips, Cuisenaire rods

Note:
Students must draw pictures of the models they construct and write the fraction symbol of the drawing.
"Constructing" fractions is a new concept. In previous grades, fractions have been pre-constructed.
The fraction symbol is new to 3rd.

3.2(B) compare fractional parts of whole objects or sets of objects in a problem situation using [concrete] models

Include:
* Compare fractions using the terminology and symbols: equal to, less than, and greater than.

Helpful manipulatives:
Cuisenaire rods, tiles, pattern blocks, fraction strips

Note:
Students need to work with circles, rectangles, sets, and multiple examples in solving problems using models.

3.2(C) use fraction names and symbols to describe fractional parts of whole objects or sets of objects

Include:
* Vocabulary numerator and denominator
* Fractions equal to or less than one whole
* Sets of objects
* Halves
* Thirds
* Fourths
* Fifths
* Sixths
* Eighths
* Tenths
* Twelfths

Helpful manipulatives:
tiles, pattern blocks, Cuisenaire rods, fraction strips

Note:
The fraction symbols new concept for 3rd grade.
Students must connect the concrete to the pictorial to the abstract (numbers).

3.2(D) construct concrete models of equivalent fractions for fractional parts of whole objects

Include:
* Pattern blocks
* Tiles
* Fraction strips
* Cuisenaire rods
* Sets of objects

Note:
This concept is introduced in 3rd grade.
Students will build models and compare arrangements.
Emphasis on this concept is essential for success in working with fractions.

(3.3) Number, operation, and quantitative reasoning. The student adds and subtracts to solve meaningful problems involving whole numbers.

3.3(A) model addition and subtraction using pictures, words, and numbers

Examples: three kinds of problems that address subtraction
* Take away (John had 5 pieces and gave Sue 2. How many did he have left?)
* Comparison (John has 5 pieces and Sue has 2. How many more does John have than Sue?)
* Partition (John has 8 cookies and he puts 5 in the lunch box. How many did he not put in the lunch box?)

Levels of difficulty from easiest to hardest:
5 - 3 = _____ Result unknown (John has 8 toys and he gives Sue 5 toys. How many toys does John have now?)
5 - __ = 2 Change unknown (John had 8 toys, he gave some away and now he only has two toys. How many did he give away?)
__ - 3 = 5 Start unknown (John had some toys, he gave 3 away and now he has 5 toys. How many toys did John have in the beginning?)

Vocabulary:
subtraction, difference, take away, comparison, partition

Helpful manipulatives:
*Base 10 pieces, snap cubes

Note:
Addition and subtraction need to be taught together in problem solving situations; as both fact families and inverse operations.
Use pictures, words and numbers together in order to build concepts.

3.3(B) Select addition or subtraction and use the operation to solve problems involving whole numbers through 999

Include:
*Multi-step problems for both addition and subtraction

(3.4) Number, operation, and quantitative reasoning. The student recognizes and solves problems in multiplication and division situations.
3.4(A) learn and apply multiplication facts through 12 x 12 using concrete models and objects **Include:** * Area arrays with linear dimensions * Pictorial models **Vocabulary**: * factor, product, divisor, dividend, and quotient **Helpful manipulatives**: • Tiles, base 10 pieces, grid paper, linear pieces **Note:** 3rd grade is held accountable for "learning and applying" not memorizing facts. Timed test (multiplication facts) are not appropriate in third grade. Concrete arrays should be built and drawn before moving to the abstract numbers. Students should use models to demonstrate the relationship between multiplication and division.
3.4(B) solve and record multiplication problems (up to 2 digits by 1 digit) **Include:** * Multiplication/division concepts * Concrete objects to model, bridge to the abstract (number) by drawing pictorial representations **Helpful manipulatives:** *Tiles, base 10 pieces, linear pieces **Note:** This TEKS is sometimes tested gradable answers and may include extra information.
3.4(C) use models to solve division problems and use number sentences to record the solutions **Include:** * Apply multiplication/division concepts with the concrete models and pictorial drawings * Students create number sentences/express the answers to their concrete models **Helpful manipulatives:** * Color tiles, base 10 pieces, linear pieces

(3.5) Number, operation, and quantitative reasoning. The student estimates to determine reasonable results.

3.5(A) round whole numbers to the nearest ten or hundred to approximate reasonable results in problem situations

Include:
* Word problems with real life application
* Rounding to estimate before solving problems
* Single digit numbers are not rounded
* One strategy is front-end estimation (237-46 would be 200-50)
* Another strategy for addition (of 2 numbers) and subtraction round to the highest place value of the smallest number used in computation (237-46 would be 240-50)

Helpful manipulatives:
* Base ten pieces, number lines

Note:
* This concept is introduced in 3rd grade.
* There are no definite rules for rounding in all situations. Students need to practice rounding using different strategies and be able to determine which place value to round based on the real life situation.
* Include rounding and reasonableness in solving problems. The purpose of rounding is to estimate reasonable answers in problem situations; therefore students should encounter many different types of problems and determine what to round numbers to according to the situation and not a specific rule. Ex. in a store the costs of items are $57, $29.98 $2.38, and $0.23 Here it would be appropriate to round numbers to different places.

3.5(B) use strategies including rounding and compatible numbers to estimate solutions to addition and subtraction problems

Include:
*** Must estimate before computation**
* Use compatible numbers
* Real-life situations

Note:
Compatible numbers are a new concept in 3rd grade.
Compatible numbers are "numbers that are easy to compute mentally."
• 25 + 46 + 75...think (25 + 75) + 46 = 100 + 46
• For example: 78 + 96 can be computed as 75 + 100 or 78 + 100
• compatible numbers do not always end in "0"

(3.6) Patterns, relationships, and algebraic thinking. The student uses patterns to solve problems.

3.6(A) identify and extend whole-number and geometric patterns to make predictions and solve problems

Include:
* Use number patterns from a table/"T" chart
* Journal writing must be used to explain the process, thinking, and prediction of students
* Use pictorial drawings
* Use real-life application
* Use problem situations/word problems
* Use growing patterns such as:
  Continuing patterns- adding 1, adding 2, adding 3 etc; doubling
  Repeating patterns such as adding 2 each time
  Doubling patterns

Helpful manipulatives:
* Tiles, pattern blocks, geometric shapes

3.6(B) identify patterns in multiplication using concrete objects, pictorial models, or technology

Include:
* Multiplication patterns presented or recorded in tables
* Identify relationship between paired numbers
* Use bar graphs
* Use concrete models and bridge to the abstract (number) through pictorial representations
* Use real-life applications
* Use problem situations/word problems

Helpful manipulatives
* arrays, tiles, base ten pieces, linear pieces

Note:
Tables do not have to begin with the number "1" or be in numerical order. (Example 3, 6, 10)

3.6(C) identify patterns in related multiplication and division sentences (fact families) such as 2x3=6, 3x2=6, 6÷2=3, 6÷3=2

Include:
* Equations
* Real-life application
* Journal/ include explanations of relationships in fact families

Helpful manipulatives:
• Snap cubes, tiles, base ten pieces

(3.7) Patterns, relationships, and algebraic thinking. The student uses lists, tables, and charts to express patterns and relationships.
3.7(A) generate a table of paired numbers based on a real-life situation such as insects and legs **Include:** * Pictorial models * Tables, lists, and charts * Real-life application **Helpful manipulatives:** * Pattern blocks, tiles, base ten pieces **Note**: Generating a table of paired numbers is introduced in 3rd grade.
3.7(B) identify and describe patterns in a table of related number pairs based on a meaningful problem and extend the table **Include:** * Journal writing describing patterns * Predictions by extending tables * Describe the process of solving the pattern * Analyze the table ("What's the rule?") * Real-life application

(3.8) Geometry and spatial reasoning. The student uses formal geometric vocabulary. The student is expected to

3.8 identify, classify, and describe two-and three-dimensional geometric figures by their attributes. The student compares two-dimensional figures, three-dimensional figures, or both by their attributes using formal geometric vocabulary.

Include:
Two dimensional figures
* Vertices and sides
Three dimensional figures
* Vertices, edges, and faces
*** Two-dimensional vocabulary** (circle, polygon, triangle, square, rectangle, quadrilateral, rhombus, trapezoid, parallelogram, pentagon, hexagon, octagon, side, vertex)
Helpful manipulatives:
* Pattern blocks, tangrams, every day items
*** Three-dimensional vocabulary** (sphere, cone, cylinder, cube, rectangular prism, triangular prism, square pyramid, triangular pyramid, vertex, edge, face)
Helpful manipulatives:
* 3-D geometric shapes
Note:
"Comparing" geometric figures is introduced in third grade; in second grade students "describe attributes" of geometric figures.

(3.9) Geometry and spatial reasoning. The student recognizes congruence and symmetry.
3.9(A) identify congruent two-dimensional figures **Include:** * Journal writing (create definitions of two-dimensional figures using attributes) * Concrete examples * Pictorial representations * Real world application **Two-dimensional vocabulary** (circle, polygon, triangle, square, rectangle, quadrilateral, rhombus, trapezoid, parallelogram, pentagon, hexagon, octagon, side, vertex) **Helpful manipulatives:** * Pattern blocks, tangrams **Note**: The concept of congruency is introduced in 3rd grade.
3.9(B) create two-dimensional figures with lines of symmetry using concrete models and technology **Include:** * Create 2 dimensional figures and show all lines of symmetry * Given the number of lines of symmetry, create the figure * Journal writing-create definitions using attributes * Pictorial representations on geoboard grid paper * Use real-life applications **Helpful manipulatives**: * Tangrams, mirrors, geoboards, pattern blocks **Vocabulary:** horizontal, diagonal, vertical, symmetrical **Note:** The concept of symmetry is introduced in third grade.

3.9(C) identify lines of symmetry in two-dimensional geometric figures

Include:
* Given any two-dimensional geometric figures, determine all lines of symmetry
* Journal writing (create definitions/attributes)
* Use pictorial representations on geoboard grid paper
* Use real life applications

Vocabulary
* horizontal, diagonal, vertical, symmetrical

Helpful manipulatives:
* Tangrams
* Pattern blocks
* Geoboards

Note:
Symmetry is introduced in 3rd grade.

(3.10) Geometry and spatial reasoning. The student recognizes that a line can be used to represent numbers and fractions and their properties and relationships.

3.10 Locate and name points on a number line using whole numbers and fractions including halves and fourths

Include:
* Whole numbers, halves, and fourths
* Number lines do not always begin with "0"

Note:
* Ruler is considered a number line; “fractions such as halves and fourths” implies rulers could be tested up to “halves and fourths.”
* Ruler is a new concept (tool) introduced in 3rd grade.
* Develop the concept of points on a line.

(3.11) Measurement. The student directly compares the attributes of length, area, weight/mass and capacity, and uses comparative language, to solve problems and answer questions. The student selects and uses standard units to describe length, area, capacity/volume, and weight/mass.

3.11(A) use linear measurement tools to estimate and measure lengths using standard units

Include:
* Ruler--measure to the nearest 1/4 inch
* Always estimate first
* Hands-on application such as (rulers, tape measures, yard and meter sticks)
* Both metric units (centimeter, decimeter, meter, kilometer) and customary (inch, foot, yard, mile)
* Use linear dimensions in solving problems

Note:
* Using standard units and tools (such as rulers) is introduced in 3rd grade.

3.11(B) use standard units to find the perimeter of a shape

Include:
* Always include units with numbers in measurement (ex. emphasis perimeter is linear units)
* Variety of geometric shapes
* Area arrays and include the linear dimensions, connect the linear dimensions with the factors of the area
* Hands-on application (use rulers, meter sticks, yard sticks, and tape measures)
* Customary and metric units of measurement

Note:
* Perimeter is introduced in 3rd grade.
* State assessment models may only have 2 of the dimensions labeled.

3.11(C) use concrete and pictorial models of square units to determine the area of two-dimensional surfaces

Include:
* Always include units with numbers when working with measurement - emphasis area is square units
* Use tiles to form area arrays and use linear pieces to denote linear dimensions (review of multiplication)
* Hands-on application by building area arrays and measuring/determining the area
* Make the connections among the different representations (ex. concrete/pictorial/abstract number
* Include standard units of measurement (Customary and Metric)

Helpful manipulatives:
* geoboards
* tiles and linear pieces

Note:
* Standard measurement is introduced in 3rd grade.

3.11(D) identify concrete models that approximate standard units of weight/mass and use them to measure weight/mass

Include:
* Always include units with numbers when working with measurement
* Use items that approximate units of measurement for hands-on application
* Weight-measures approximate units of customary measurement (ex. beans are approximately an ounce)
* Scales measure weight
* Mass-measures items approximate units of metric measurement (ex. a penny is approximately a gram)
* Balances measure mass
* Always estimate before measuring weight
* Weight=the gravitational pull on an object - use scales to measure in ounces, pounds, and tons
* Mass=the amount of matter something contains - use balances to measure in grams and kilograms

Note:
* In 4th grade the students will explain the difference between weight and mass (4.11 E).

3.11(E) identify concrete models that approximate standard units for capacity and use them to measure capacity

Include:
* Use approximate gallons, quarts, pints, cups (ex. a jar is about a pint)
* Exploration method of instruction (ex. pouring items such as rice into containers, etc.)

Note:
* When working with measurement, numbers should always include units of measurement.

3.11(F) use concrete models that approximate cubic units to determine the volume of a given container or other three-dimensional geometric figure.

Include:
* Volume only assessed with cubic units
* Explore by building 3-dimensional shapes/noting the layers and counting the cubes
* Explore by filling rectangular prisms with cubes and counting the total number of cubes

Helpful manipulatives:
* link cubes
* wooden cubes

Note:
* This is the first time students have counted objects that approximated cubic units to determine volume.
* Will be tested with pictorial model where students are responsible for counting cubes.
* Formula for volume is taught in fifth grade (5.10 B).

(3.12) Measurement. The student reads and writes time and measures temperature in degrees Fahrenheit to solve problems.

3.12(A) use a thermometer to measure temperature

Include:
* Conduct hands-on measuring using tools with increments of 2 degrees
* Fahrenheit only

Vocabulary:
* decrease, increase, drop, rise

Note:
* Measuring temperature is introduced in 3rd grade. (In previous grades students only read the temperature.)
* Celsius will be introduced in 4th grade (4.12).

3.12(B) tell and write time shown on analog and digital clocks

Include:
* Using both a digital or analog clock, student tells and writes time
* Tells time to the minute/hour
* Includes range of time (such as given a range of time of 2:00 to 3:00 choose the clock that shows the in-between time)

Note:
* Range of time is introduced in 3rd grade.
* Third grade is responsible telling time to one minute intervals.

Note: 3rd grade measures:
* Customary and metric linear measurements (3.11A)
* Approximate standard units of measurement for capacity (3.11 E)
* Weight (customary)/mass (metric) (3.11D)
* Only Fahrenheit (3.12)

(3.13) Probability and statistics. The student solves problems by collecting, organizing, displaying, and interpreting sets of data.

3.13(A) collect, organize, record, and display data in pictographs and bar graphs where each picture or cell might represent more than one piece of data

Include:
* Use both pictographs and bar graphs
* Use graphs read vertically and horizontally
* Children need to complete portions of graph
* To construct graphs, students must collect data, organize data, record data, and display data

Note:
* "Pictographs" are picture graphs which contain a key such as a picture of an apple represents 5 apples. The key using one object to represent more than one unit is introduced in 3rd grade.

3.13(B) interpret information from pictographs and bar graphs

Include:
* Graphs read vertically and horizontally
* Complete portions of graph
* Interpret graph by combining information on graph
* Pictograph keys show one object representing 2 items, 3 items, 5 items etc.

3.13(C) use data to describe events as more likely than, less likely than, or equally likely as

Include:
* Conduct experiments to model each outcome
* Explain and make generalizations about at least three different outcomes
* lists, tables, graphs

Helpful Manipulatives:
* tiles, two-color counters, coins, spinners

Vocabulary:
* impossible, certain

Note:
* Events that are equally likely are introduced in 3rd grade. (2nd grade does more and/or less likely)

(3.14) Underlying processes and mathematical tools.

3.14(A) identify the mathematics in everyday situations

Note:
* Objective 6 is tested in all strands.
* Engage the students with real life experiences.
* Students should not only solve problems, but create problems when given mathematical expressions.

3.14(B) solve problems that incorporates understanding the problem, making a plan, carrying out the plan, and evaluating the solution for reasonableness

Include:
* Explore problems using concrete manipulatives
* Draw a picture (pictorial)
* Share thoughts with peers
* Create questions
* Journal thoughts
* Record or communicate with words/pictures/numbers
* Justify answer

Note:
* Make sure students process from concrete to pictorial to written computation.

3.14(C) select or develop an appropriate problem-solving plan or strategy, including drawing a picture, looking for a pattern, systematic guessing and checking, acting it out, making a table, working a simpler problem, or working backwards to solve a problem

Include:
* Explore with concrete manipulatives
* Draw a picture (pictorial)
* Share thoughts with peers
* Journal thoughts
* Record or communicate with words/pictures/numbers
* Justify answer

Note:
* This is tested in other strands...such as:
  Student assesses necessary information to solve problems
  Missing information or sequence of steps (process)
  What is the "known" and "unknown" of the problem?
* Make sure students process from concrete to pictorial to written computation.

3.14(D) use tools such as real objects, manipulatives, and technology to solve problems

Include:
* Explore with concrete manipulatives
* Draw a picture (pictorial)
* Share thoughts with peers
* Journal thoughts
* Numerical representation
* Justify answer
* Work with and make connections among the different representations: concrete/pictorial/abstract
* Use calculators

(3.15) Underlying processes and mathematical tools. The student communicates about mathematics using informal language.

3.15(A) explain and record observations using objects, words, pictures, numbers, and technology

Include:
* Describe the process in words (written and/or orally)
* Journal writing/drawing is imperative
* Oral explanation is a must
* Calculators

Note:
* This is tested in other objectives. Solutions to problems may include the solution process in words.

3.15(B) relate informal language to mathematical language and symbols **Include:** * Students write and understand words, numbers, and symbols * Journal writing is imperative * Oral explanation is a must (students should talk to other students, the teacher, and to the class) **Note:** ***** This is tested in other objectives.
(3.16) Underlying processes and mathematical tools. The student uses logical reasoning to make sense of his or her world.
3.16(A) make generalizations from patterns or sets of examples and non examples **Include:** * Identify attributes of examples * Identify examples false to statement given * Examples may have nonsense words
3.16(B) justify why an answer is reasonable and explain the solution process **Include:** • Students justify and prove their solutions in written/spoken words, pictures, concrete objects, and/or numbers • Journal writing (may include process or explanation, etc.) • Peer explanations • Classroom discussions