

Kindergarten

(1) Within a well-balanced mathematics curriculum, the primary focal points are developing whole-number concepts and using patterns and sorting to explore number, data and shape.

(2) Throughout mathematics in Kindergarten-Grade 2, students build a foundation of basic understanding in number, operation, and quantitative reasoning; patterns, relationships, and algebraic thinking; geometry and spatial reasoning; measurement; and probability and statistics. Students use numbers in ordering, labeling, and expressing quantities and relationships to solve problems and translate informal language into mathematical language and symbols. Students use objects to create and identify patterns and use those patterns to express relationships, make predictions, and solve problems as they build an understanding of number, operation, shape, and space. Students progress from the informal to formal language to describe two- and three-dimensional geometric figures and likenesses in the physical world. Students begin to develop measurement concepts as they identify and compare attributes of objects and situations. Students collect, organize, and display data and use information from graphs to answer questions, make summary statements, and make informal predictions based on their experiences.

(3) Throughout mathematics in K-2, students develop numerical fluency with conceptual understanding and computational accuracy. Students in Kindergarten through grade two use basic number sense to compose and decompose numbers in order to solve problems requiring precision, estimation, and reasonableness. By the end of Grade 2, students know basic addition and subtraction facts and are using them to work flexibly, efficiently and accurately with numbers during addition and subtraction computation.

(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 Kindergarten-Grade 2, 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.

Kindergarten

(K.1) Number, operation, and quantitative reasoning. The student uses numbers to name quantities.

K.1(A) use one-to-one correspondence and language such as more than, same number as, or two less than to describe relative sizes of sets of concrete objects

- * One-to-one correspondence - match one number for each object being counted.
- * One-to-one correspondence-match one object to another related object being counted; ex. one cup for each saucer.
- * Use concrete objects to show more than, same as, or less than.

Note

- * Using the terminology "greater than" , "less than: and "equal to" is introduced in 1st grade.

K.1(B) use sets of concrete objects to represent quantities given in verbal or written form (through 20)

- * Teacher says or shows number and students find/show concrete object (s) to match.
- * Concrete items such as unifix cubes, pattern blocks, etc.
- * The TEKS specifies concrete objects.

K.1 (C) use numbers to describe how many objects are in a set (through 20) using verbal and symbolic descriptions

- * Teacher shows an object or a set of objects and student writes the number (not the word), verbally responds or finds the matching number.

(K.2) **Number, operation, and quantitative reasoning.** The student describes order of events or objects.

K.2(A) use language such as before or after to describe relative position in a sequence of events or objects

* Sequence events using words such as before, after, beginning, end, first, last, middle.

For example:

- * Putting on pants before shoes
- * Three comes before four
- * Eating lunch after breakfast
- * What comes before/after this day/month
- * Johnny is first in line.

K.2(B) name the ordinal positions in a sequence such as first, second, third, etc.

- * Name ordinal positions in a sequence such as first, second, ... fifth.
- * Knows the fifth position ~ can place objects in the fifth position (put the blue bear in the fifth position) or can get into the fifth position in line.
- * Can place objects in positional sequence (apply knowledge of positions).
- * Include the concept of orientation by having students line up at the door, then change direction of the line "Who's in first now?"
- * Use ordinal numbers with the calendar, 25th day of the month.

Note:

This is the only time ordinal numbers are mentioned in the elementary TEKS.

(K.3) Number, operation, and quantitative reasoning. The student recognizes that there are quantities less than a whole.

K.3(A) share a whole by separating it into two equal parts

- * At this level always start with a whole object, such as apple or cookie.
- * The symbol $\frac{1}{2}$ is not used in kindergarten; fraction symbols are first used in 3rd grade according to the TEKS.
- * Terminology used in kindergarten is one half or one out of two.

K.3(B) explain why a given part is half of the whole

- * Always show the two equal halves.

(K.4) Number, operation, and quantitative reasoning. The student models addition (*joining*) and subtraction (*separating*).

K.4 model and create addition and subtraction problems in real situations with concrete objects.

- * Only with concrete objects
- * Join two sets together; separate one set into two or more sets.
- * Students do not write number sentences or symbols.

Note:

The TEKS specify that *students begin* recording addition and subtraction situations using symbols in first grade.

(K.5) Patterns, relationships, and algebraic thinking. The student identifies, extends, and creates patterns.

K.5 identify, extend and create patterns of sounds, physical movement, and concrete objects.

Example -

- * Physical movement: stomp, clap, jump etc.
- * Concrete objects: people (boy, girl), manipulatives, such as pattern blocks
- * Sound: loud/soft, high/low
- * Environmental patterns in prints (wall paper, snakes, etc.)

(K.6) Patterns, relationships, and algebraic thinking. The student uses patterns to make predictions.

K.6(A) use patterns to predict what comes next, including cause-and-effect relationships

* Such as ABAB, ABBABB, patterns as well as growing patterns such as AB, ABB, ABBB...

K.6(B) count by ones to 100

* Start at numbers such as 27 and count up 5 numbers (27, 28, 29, 30, 31, 32) - this is important to developing the add up (count-on) method of addition.

* Recommend using 0-99 board to show patterns.

Note:

This is under PATTERNS. We are looking for patterns as we count to 100. Find patterns in rows and columns. Ex. The first row is all 1 digit numbers, the second row the first digit is 1, etc.

(K.7) Geometry and spatial reasoning. The student describes the relative position of objects.

K.7(A) describe one object in relation to another using informal language such as over, under, above, and below

* Use terms such as: top, middle, bottom, outside, inside, and between.

* This is the only time position is mentioned in the TEKS.

K.7(B) place an object in a specified position

(K.8) Geometry and spatial reasoning. The student uses attributes to determine how objects are alike and different.

K.8(A) describe and identify an object by its attributes using informal language

* Including words: round, sides, corners, flat, circle, triangle, square, rectangle

* Size, shape, and color

K.8(B) compare two objects based on their attributes

- * Including words: round, sides, corners, flat, circle, triangle, square, rectangle
- * Include size, shape and color in comparison
- * Include how the objects are the same and how are they different.

K.8(C) sort a variety of objects including two- and three-dimensional geometric figures according to their attributes and describe how the objects are sorted

- * Objects such as balls, boxes, cans, cones
- * Two dimensional figures including triangles, rectangles, squares, and circles
- * Use describing words such as: round, circle, rectangle, square, corners, sides, flat, etc. (use informal every day language)

(K.9) **Geometry and spatial reasoning.** The student recognizes attributes of two- and three-dimensional geometric figures.

K.9(A) describe and compare the attributes of real-life objects such as balls, boxes, cans, and cones or models of three-dimensional geometric figures

- * Include words: round, circular, rectangular, square, corner, sides, flat, pointed, (use informal every day words)

K.9(B) recognize shapes in real-life three-dimensional geometric figures or models of three-dimensional geometric figures

- * Include items: food boxes, can food, toy boxes, balls, blocks, books (use informal every day words)

K.9(C) describe, identify, and compare circles, triangles, rectangles and squares (a special type of rectangle)

- * Include words as: pointed, round, sides, corners (use informal every day words)

(K.10) **Measurement** The student directly compares the attributes of length, area, weight/mass, capacity, and/or relative temperature. The student uses comparative language, to solve problems and answer questions.

K.10(A) compare and order two or three concrete objects according to length (longer/shorter than, or the same)

K.10(B) compare the area of two flat surfaces, e.g. two-dimensional figures (covers more, covers less, or covers the same)

* Emphasis is on "covers" when discussing area.

* Compare 2 dimensional shapes such as a regular sheet of paper and a post it note; ex. given an 8x11 sheet of paper and a post it note ask which one covers more area?

* Include different shapes when comparing area, ex. large circle/small circle or large triangle/small triangle

K.10(C) compare two containers according to capacity (holds more, holds less, or holds the same)

* Compare containers such as a small frozen orange juice can and a coffee can; regular size cereal box to the small frozen orange juice can.

K.10(D) compare two objects according to weight/mass (heavier than, lighter than, or equal to)

Note:

Weight corresponds to gravity and is found with a spring scales or typical bathroom scales. Mass is the correct term when using a pan balance.

K.10(E) compare situations or objects according to relative temperature (hotter/colder than, or the same as)

Note:

The thermometer is introduced in 2nd grade. Kindergarten students will, for example, compare a bowl of ice cream to a bowl of soup (hotter, colder).

(K.11) **Measurement.** The student uses time to describe and compare and order events and situations.

K.11(A) compare events according to duration such as more time than or less time than

* For example - Does it take more time to wash your hands or take a bath?

K.11(B) sequence events (up to three)

K.11(C) read a calendar using days, weeks, and months

- * Given a calendar, show that a week is 7 days.
- * Given a calendar, student can find the month.
- * Given a date, find the day of the week on the calendar.
- * Know the days of the week in order.
- * Know the months of the year in order.

Note:

This is the only time calendar skills are mentioned in the math TEKS.

Note:

Time/clock is not introduced until 1st grade.

(K.12) **Probability and statistics.** The student constructs and uses graphs of real objects or pictures to answer questions. The student is expected to:

K.12(A) construct graphs using real objects or pictures in order to answer questions

- * Using pictures or real objects students can construct graphs (Include horizontal and vertical).

Note:

Bar-type graphs are introduced in the first grade.

K.12(B) Use information from a graph of real objects or pictures in order to answer questions.

(K.13) **Underlying processes and mathematical tools.** The student applies Kindergarten mathematics to solve problems connected to everyday experiences and activities in and outside of school.

K.13(A) identify mathematics in everyday situations

K.13(B) solve problems with guidance, that incorporates the process of understanding the problem, making a plan, carrying out the plan, and evaluating the solution for reasonableness

- * Use manipulatives to represent problem situations.
- * Encourage different ways to solve a problem.
- * Have students verbalize observations.

K.13(C) select or develop an appropriate problem-solving strategy including drawing a picture, looking for a pattern, systematic guessing and checking, or acting it out in order to solve a problem

* Encourage different ways to solve a problem.

K.13(D) use tools such as real objects, manipulatives, and technology to solve problems

(K.14) Underlying processes and mathematical tools. The student communicates about Kindergarten mathematics using informal language. The student is expected to:

K.14(A) communicate mathematical ideas using objects, words, pictures, numbers, and technology

* Use manipulatives to communicate problems/solutions and have students verbalize observations and ideas.

K.14(B) relate everyday language to mathematical language and symbols

(K.15) Underlying processes and mathematical tools.

K.15The student uses logical reasoning. The student is expected to justify his or her thinking using objects, words, pictures, numbers, and technology.

* Ask, "How do you know that is the answer?"