Click-On TEKS

A simple approach to understanding the Texas Essential Knowledge and Skills

GRADE K MATH

REGION 13

These explanations of the new state math standards are designed to help you understand what the standards mean and how the models of teaching math help students understand mathematics more deeply. Others may interpret the standards differently and may have different ideas for how to teach them. It is the hope of the authors that this deconstruction of the Texas Essential Knowledge and Skills (TEKS) for mathematics makes teaching math more rigorous, more fun, and a little less confusing.

The goal of this document is to be responsive to updated information about the new Mathematics TEKS. Specificity and/or activities may be adjusted over time as more information becomes available from the state.

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Strand 1: Mathematical Process Standards	
K.1	Mathematical Process Standards. The student uses mathematical processes to acquire and demonstrate mathematical understanding. The student is expected to:

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Structure of the TEKS

The Texas Essential Knowledge and Skills (TEKS) consists of four parts.

Part 1: The Introduction

The state standards, or TEKS, for each grade level begin with an Introduction. The Introduction gives an overview of the focal areas for each grade and provides general information about numerical fluency and the processing skills. While the Introduction has not been reprinted in this product, information from the Introduction has been included in the explanations of the TEKS where appropriate.

Part 2: Strands

The standards are broken into groups or categories called Strands. The TEKS for elementary mathematics are divided into six strands:

1. Mathematical Process Standards: This strand contains the process standards for mathematics which are the same from Kindergarten through Pre-Cal. The process standards are the ways that students acquire math content through the use of models and tools, communication, problem solving, reasoning and analysis, and making connections. These standards should be woven consistently throughout the content strands (2–6). The dual coded questions on STAAR will be coded with a content standard and a process standard.
2. Number and Operations
3. Algebraic Reasoning
4. Geometry and Measurement
5. Data Analysis
6. Personal Financial Literacy

Example

K.2 Number and Operations. The student applies mathematical process standards to understand how to represent and compare whole numbers, the relative position and magnitude of whole numbers, and relationships within the numeration system. The student is expected to:

(A) count forward and backward to at least 20 with and without objects.

Part 3: Knowledge and Skills Statements

Immediately following the strand is the **Knowledge and Skills** statement (K&S). It provides the context for the student expectations which follow it.

Numbering: The first number is the grade level. The second number is the Knowledge and Skills number. The K&S statement shown is from kindergarten.

Part 4: Student Expectations

Immediately following each Knowledge and Skills statement is a list of **Student Expectations** (SE).

The letters, such as (A), refer to what students are expected to do with regard to a particular Knowledge and Skills statement. We often refer to this example as K.2A. [Grade Level kindergarten, Knowledge and Skills statement (2), Student Expectation (A)]

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Strand 3: Algebraic Reasoning	
K.5	Algebraic Reasoning. The student applies mathematical process standards to identify the pattern in the number word list. The student is expected to:
K.5	A recite numbers up to at least 100 by ones and tens beginning with any given number.

Strand 4: Geometry and Measurement	
K.6	Geometry and Measurement. The student applies mathematical process standards to analyze attributes of two-dimensional shapes and three-dimensional solids to develop generalizations about their properties. The student is expected to:
K.6A	identify two-dimensional shapes, including circles, triangles, rectangles, and squares as special rectangles.
K.6B	identify three-dimensional solids, including cylinders, cones, spheres, and cubes, in the real world.
K.6C	identify two-dimensional components of three-dimensional objects.
K.6D	identify attributes of two-dimensional shapes using informal and formal geometric language interchangeably.
K.6E	classify and sort a variety of regular and irregular two- and three-dimensional figures regardless of orientation or size.
K.6F	create two-dimensional shapes using a variety of materials and drawings.
K.7	Geometry and Measurement. The student applies mathematical process standards to directly compare measurable attributes. The student is expected to:
K.7A	give an example of a measurable attribute of a given object, including length, capacity, and weight.
K.7B	compare two objects with a common measurable attribute to see which object has more of/less of the attribute and describe the difference.

Strand 5: Data Analysis	
K.8	Data Analysis. The student applies mathematical process standards to collect and organize data to make it useful for interpreting information. The student is expected to:
K.8A	collect, sort, and organize data into two or three categories.
K.8B	use data to create real-object and picture graphs.
K.8C	draw conclusions from real-object and picture graphs.

Strand 6: Personal Financial Literacy	
K.9	Personal Financial Literacy. The student applies mathematical process standards to manage one's financial resources effectively for lifetime financial security. The student is expected to:
K.9A	identify ways to earn income.
K.9B	differentiate between money received as income and money received as gifts.
K.9C	list simple skills required for jobs.
K.9D	distinguish between wants and needs and identify income as a source to meet one's wants and needs.

K.2 Number and Operations. The student applies mathematical process standards to understand how to represent and compare whole numbers, the relative position and magnitude of whole numbers, and relationships within the numeration system. The student is expected to:

K.2C count a set of objects up to at least 20 and demonstrate that the last number said tells the number of objects in the set regardless of their arrangement or order.

K.2C involves two extremely important concepts in counting—cardinality and conservation of number. A student has cardinality when he or she can count a set of objects and knows that the last number that is said is the number of objects in the set. This critical foundational skill goes beyond being able to count. Without understanding cardinality, students may have difficulty understanding the concept of "counting on," which is an important strategy for remembering math facts and counting money.

Once a student has mastered cardinality, then he or she can begin working toward conservation of number.

The student also needs to understand conservation of number. Conservation of number involves knowing that the number of objects in a set does not change even when the set is mixed up or put in a different order.

Example/Activity

To demonstrate cardinality, a student must understand that the last number they say in the counting sequence is inclusive of all the objects they counted. In other words, the last number stated is the same as the number of objects in the set without having to recount them.

Example: A student is given 9 squares and is asked to count them.

Then the teacher should ask, "How many do you have?" The student should be able to answer "9." This might mean that the student has cardinality. However, the teacher needs to provide several other challenges to be sure.
Once the student has counted the squares and said that there are 9, the teacher should try several of the following processes with the student:

- mixes the squares up

- spreads the squares out

- moves them closer together, or covers them up

Then the teacher should ask, "How many are in the set?" If the student cannot answer "9" without recounting, then the student has NOT mastered the concept of conservation of number.

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K.2 Number and Operations. The student applies mathematical process standards to understand how to represent and compare whole numbers, the relative position and magnitude of whole numbers, and relationships within the numeration system. The student is expected to:

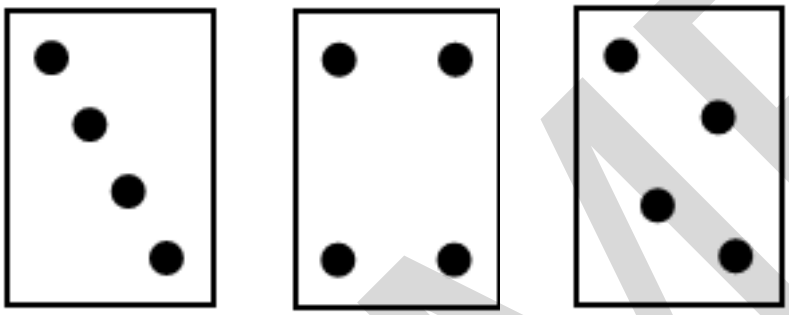
K.2D recognize instantly the quantity of a small group of objects in organized and random arrangements.

K.2D involves another concept in counting called subitizing. A student can subitize when he or she instantly recognizes a quantity of a small group of objects. Subitizing is "instantly seeing how many" rather than having to count them. Subitizing helps students form mental pictures of numbers, such as the pips on a die. Kindergartners should be able to recognize small quantities (up to 4) to show mastery of this state standard. Understanding cardinality (K.2C) is directly related to subitizing.

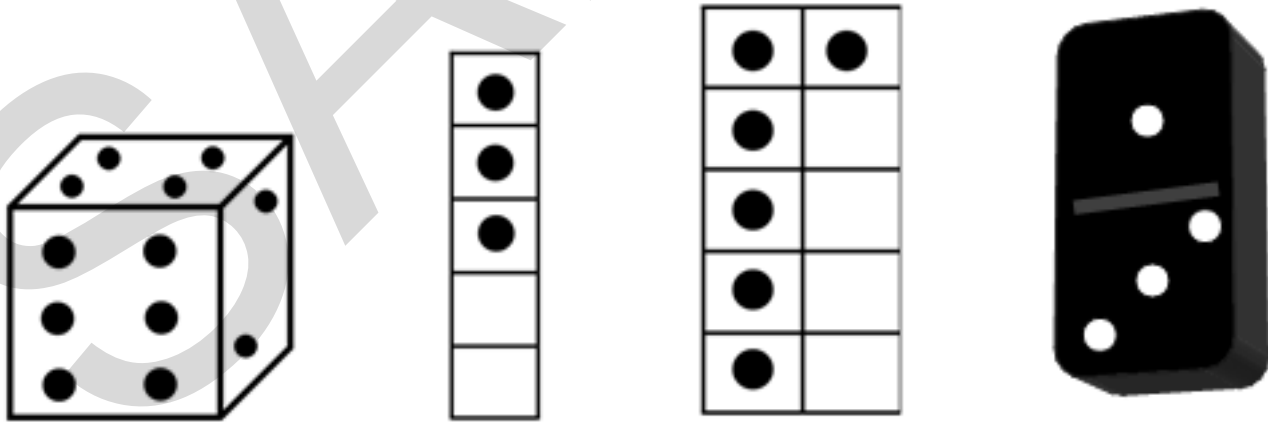
Example/Activity

Perceptual subitizing is instantly recognizing quantities that are in organized or random patterns. Kindergarten students focus mainly on perceptual subitizing.

Examples: Quantities may be arranged in organized or random patterns.



Conceptual subitizing is recognizing larger amounts based on known patterns and arrangements. Examples of conceptual subitizing are dice patterns, five frames, ten frames, and dominoes. Kindergarten students may do some conceptual subitizing, but it is a larger focus in first grade.



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K.2 Number and Operations. The student applies mathematical process standards to understand how to represent and compare whole numbers, the relative position and magnitude of whole numbers, and relationships within the numeration system. The student is expected to:

K.2E generate a set using concrete and pictorial models that represents a number that is more than, less than, and equal to a given number up to 20.

Given a number, students should be able to make three different sets of concrete objects or choose pictures to represent a number that is:

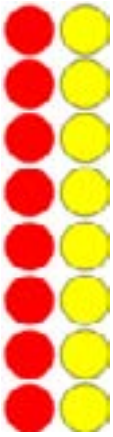
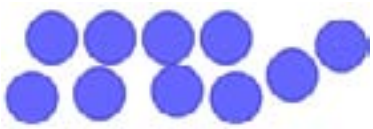
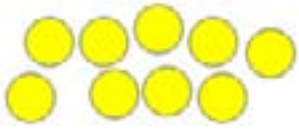
- more than,
- less than, and
- equal to a given number.

They should be able to do this up to the number 20.

Example/Activity

The following examples show teacher and student actions to help build the skills of creating sets that are equal, more than, or less than.

Understanding "Equal"

Teacher Directions and/or Actions	Student Actions and/or Statements
1. Teacher gives student 8 counters and asks student to count them.	
2. Teacher asks student to make another set of 8 using yellow counters. Teacher asks student to line the two sets up side by side and explain why they are equal.	Student lines up each yellow counter with a red counter. Student says that he or she knows the sets are equal because each red counter has a matching yellow counter. Since each counter has a partner, the sets are the same, or equal. That means that there are also 8 yellow counters. 
3. Teacher makes a set of 10 red counters and gives student a handful of blue counters. Teacher asks, "Can you make a set that is equal to mine?" 	Student makes a set of 10 counters while teacher watches. 
4. Teacher asks, "How many are in each set?" 5. Teacher asks, "Why are the sets equal?"	Student responds that there are 10 blue counters and that the sets are equal because each blue counter matches a red counter.
6. Teacher gives student a number, such as 9. Teacher asks student to make a set that is equal to the number 9.	

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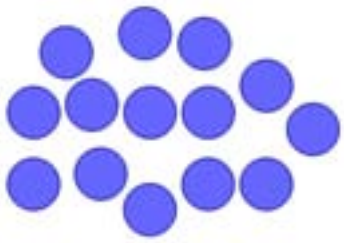
K.2 Number and Operations. The student applies mathematical process standards to understand how to represent and compare whole numbers, the relative position and magnitude of whole numbers, and relationships within the numeration system. The student is expected to:

K.2E generate a set using concrete and pictorial models that represents a number that is more than, less than, and equal to a given number up to 20.

Understanding "More Than"

Teacher Directions and/or Actions	Student Actions and/or Statements
1. Teacher takes away the yellow counters leaving only 8 red counters. Then teacher gives student blue counters and has student line them up.	
2. Teacher asks, "Are the sets equal? Why or why not?"	Student says that the sets are not equal because not every red counter has a blue partner. There are more blue counters than red counters. There are 8 red counters and 9 blue counters.
3. Teacher asks, "How many more blue counters are there than red counters?"	Student responds that there is one more blue counter than red counters.
4. Teacher asks, "What can you tell me about the numbers 8 and 9?"	Student says that 9 is more than 8, and 8 is less than 9.
5. Teacher checks to see if student can create a set that is more than a given set. Teacher lays out 11 red counters and gives student a handful of blue counters. 	Student uses blue counters to make a set that is more than 11. Student does not have to make only a set of 12 counters and should be encouraged to create several sets that are larger than 11. Student must be able to explain why the set is larger and tell how many are in the set. 

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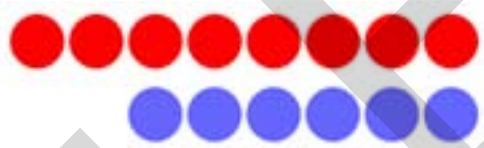
K.2 Number and Operations. The student applies mathematical process standards to understand how to represent and compare whole numbers, the relative position and magnitude of whole numbers, and relationships within the numeration system. The student is expected to:

K.2E generate a set using concrete and pictorial models that represents a number that is more than, less than, and equal to a given number up to 20.

Understanding "Less Than"

Teacher Directions and/or Actions	Student Actions and/or Statements
1. Teacher starts with 8 red counters. She gives student 6 blue counters and asks student to line them up side by side.	
2.Teacher asks, "Are the sets equal? Why or why not?"	Student says that there are fewer blue counters than red counters. There are not enough blue counters for each red counter. There are not enough blue counters for each red counter to have a partner.
3.Teacher asks, "How many more red counters are there than blue counters?"	Student responds that there are two more red counters than blue counters.
4.Teacher asks, "What can you tell me about the numbers 8 and 6?"	Student says that 8 is more than 6, and 6 is less than 8.
5. Teacher checks to see if student can create a set that is less than a given set. Teacher lays out 11 red counters and gives student a handful of blue counters. 	Student uses blue counters to make a set that is less than 11. Student does not have to make only a set of 10 counters and should be encouraged to create several sets that are smaller than 11. Student must be able to explain why the set is smaller and tell how many are in the set. 

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K.2 Number and Operations. The student applies mathematical process standards to understand how to represent and compare whole numbers, the relative position and magnitude of whole numbers, and relationships within the numeration system. The student is expected to:

K.2F generate a number that is one more than or one less than another number up to at least 20.

The focus of K.2F is slightly different from K.2E. While K.2E had students tell whether a number is smaller, larger, or equal to another number, this standard has students generate a number. In other words, they have to figure out a number themselves that is one more than or one less than the original number.

Example/Activity

In order for students to attain mastery of K.2F, they must have a solid understanding of K.2E. The students' experiences in K.2E will have provided them with the ability to generate a number that is one more or one less than a number given.

Because students worked with concrete and pictorial models in K.2E, they should begin their work in K.2F using concrete and pictorial models, too.

Below is a sample classroom discussion. Students may not automatically respond with the sample responses given. The teacher may need to work with students to have them respond in complete sentences and to explain their thinking.

Sample Classroom Discussion

Teacher Directions and/or Actions	Student Actions and/or Statements
Teacher puts out 8 cubes and asks students to put out the same number of cubes and count them. "How many are there?"	Students put out 8 cubes and count them. "There are 8 cubes."
Teacher adds one cube and asks students to do the same. Teacher asks, "How many cubes are there now?"	Students add one cube and count them. "There are 9 cubes."
"There were 8 cubes and we added one cube. Now there is one more cube than we started with. That makes 9 cubes, and 9 is one more than 8. What number is one more than 8? How do you know?"	"Nine is one more than 8. We know this because we added 1 to a set of 8 and got 9."

After some experience, students should be able to tell the number that is one more than and one less than a given number.