Click-On TEKS

A simple approach to understanding the Texas Essential Knowledge and Skills

GRADE 1 MATH

REGION 13
EDUCATION SERVICE CENTER

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	
1.1	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

1.1 Mathematical Process Standards. The student uses mathematical processes to acquire and demonstrate mathematical understanding. 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 first grade.

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 1.1A.
[Grade Level first grade, Knowledge and Skills statement (1), Student Expectation (A)]

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Strand 1: Mathematical Process Standards

1.1	Mathematical Process Standards. The student uses mathematical processes to acquire and demonstrate mathematical understanding. The student is expected to:
1.1A	apply mathematics to problems arising in everyday life, society, and the workplace.
1.1B	use a problem-solving model that incorporates analyzing given information, formulating a plan or strategy, determining a solution, justifying the solution, and evaluating the problem-solving process and the reasonableness of the solution.
1.1C	select tools, including real objects, manipulatives, paper and pencil, and technology as appropriate, and techniques, including mental math, estimation, and number sense as appropriate to solve problems.
1.1D	communicate mathematical ideas, reasoning, and their implications using multiple representations, including symbols, diagrams, graphs, and language as appropriate.
1.1E	create and use representations to organize, record, and communicate mathematical ideas.
1.1F	analyze mathematical relationships to connect and communicate mathematical ideas.
1.1G	display, explain, and justify mathematical ideas and arguments using precise mathematical language in written or oral communication.

Strand 2: Number and Operations

Click-On 1.2A - 1.2E for Examples

1.2	Number and Operations. The student applies mathematical process standards to represent and [illegible]ve position and magnitude of whole numbers, and relationships within the numeration system related to place value. The student is expected to:
1.2A	recognize instantly the quantity of structured arrangements.
1.2B	use concrete and pictorial models to compose and decompose numbers up to 120 in more than one way as so many hundreds, so many tens, and so many ones.
1.2C	use objects, pictures, and expanded and standard forms to represent numbers up to 120.
1.2D	generate a number that is greater than or less than a given whole number up to 120.
1.2E	use place value to compare whole numbers up to 120 using comparative language.
1.2F	order whole numbers up to 120 using place value and open number lines.
1.2G	represent the comparison of two numbers to 100 using the symbols <, >, or =.
1.3	Number and Operations. The student applies mathematical process standards to develop and use strategies for whole number addition and subtraction computations in order to solve problems. The student is expected to:
1.3A	use concrete and pictorial models to determine the sum of a multiple of 10 and a one-digit number in problems up to 99.
1.3B	use objects and pictorial models to solve word problems involving joining, separating, and comparing sets within 20 and unknowns as any one of the terms in the problem such as 2 + 4 = [ ]; 3 + [ ] = 7; and 5 = [ ] – 3.
1.3C	compose 10 with two or more addends with and without concrete objects.
1.3D	apply basic fact strategies to add and subtract within 20, including making 10 and decomposing a number leading to a 10.
1.3E	explain strategies used to solve addition and subtraction problems up to 20 using spoken words, objects, pictorial models, and number sentences.

1.3F	generate and solve problem situations when given a number sentence involving addition or subtraction of numbers within 20.
1.4	Number and Operations. The student applies mathematical process standards to identify coins, their values, and the relationships among them in order to recognize the need for monetary transactions. The student is expected to:
1.4A	identify U.S. coins, including pennies, nickels, dimes, and quarters, by value and describe the relationships among them.
1.4B	write a number with the cent symbol to describe the value of a coin.
1.4C	use relationships to count by twos, fives, and tens to determine the value of a collection of pennies, nickels, and/or dimes.

Strand 3: Algebraic Reasoning

1.5	Algebraic Reasoning. The student applies mathematical process standards to identify and apply number patterns within properties of numbers and operations in order to describe relationships. The student is expected to:
1.5A	recite numbers forward and backward from any given number between 1 and 120.
1.5B	skip count by twos, fives, and tens to determine the total number of objects up to 120 in a set.
1.5C	use relationships to determine the number that is 10 more and 10 less than a given number up to 120.
1.5D	represent word problems involving addition and subtraction of whole numbers up to 20 using concrete and pictorial models and number sentences.
1.5E	understand that the equal sign represents a relationship where expressions on each side of the equal sign represent the same values.
1.5F	determine the unknown whole number in an addition or subtraction equation when the unknown may be any one of the three or four terms in the equation.
1.5G	apply properties of operations to add and subtract two or three numbers.

Strand 4: Geometry and Measurement

1.6	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:
1.6A	classify and sort regular and irregular two-dimensional shapes based on attributes using informal geometric language.
1.6B	distinguish between attributes that define a two-dimensional or three-dimensional figure and attributes that do not define the shape.
1.6C	create two-dimensional figures, including circles, triangles, rectangles, and squares, as special rectangles, rhombuses, and hexagons.
1.6D	identify two-dimensional shapes, including circles, triangles, rectangles, and squares, as special rectangles, rhombuses, and hexagons and describe their attributes using formal geometric language.
1.6E	identify three-dimensional solids, including spheres, cones, cylinders, rectangular prisms (including cubes), and triangular prisms, and describe their attributes using formal geometric language.
1.6F	compose two-dimensional shapes by joining two, three, or four figures to produce a target shape in more than one way if possible.

1.6G	partition two-dimensional figures into two and four fair shares or equal parts and describe the parts using words.
1.6H	identify examples and non-examples of halves and fourths.
1.7	Geometry and Measurement. The student applies mathematical process standards to select and use units to describe length and time. The student is expected to:
1.7A	use measuring tools to measure the length of objects to reinforce the continuous nature of linear measurement.
1.7B	illustrate that the length of an object is the number of same-size units of length that, when laid end-to-end with no gaps or overlaps, reach from one end of the object to the other.
1.7C	measure the same object/distance with units of two different lengths and describe how and why the measurements differ.
1.7D	describe a length to the nearest whole unit using a number and a unit.
1.7E	tell time to the hour and half hour using analog and digital clocks.

Strand 5: Data Analysis

1.8	Data Analysis. The student applies mathematical process standards to organize data to make it useful for interpreting information and solving problems. The student is expected to:
1.8A	collect, sort, and organize data in up to three categories using models/representations such as tally marks or T-charts
1.8B	use data to create picture and bar-type graphs.
1.8C	draw conclusions and generate and answer questions using information from picture and bar-type graphs.

Strand 6: Personal Financial Literacy

1.9	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:
1.9A	define money earned as income.
1.9B	identify income as a means of obtaining goods and services, oftentimes making choices between needs and wants.
1.9C	distinguish between spending and saving.
1.9D	consider charitable giving.

Strand 2: Numbers and Operations

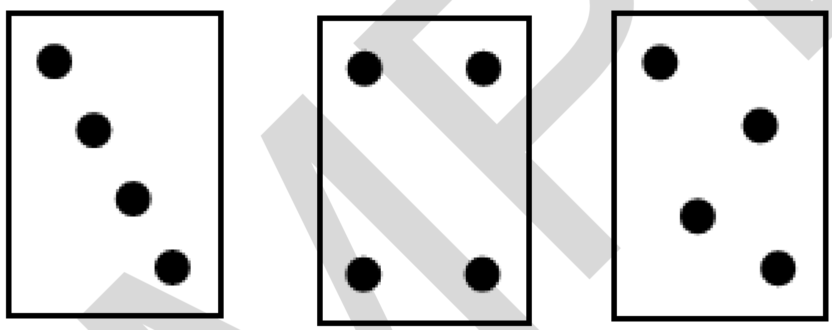
1.2 Number and Operations. The student applies mathematical process standards to represent and compare whole numbers, the relative position and magnitude of whole numbers, and relationships within the numeration system related to place value. The student is expected to:

1.2A recognize instantly the quantity of structured arrangements.

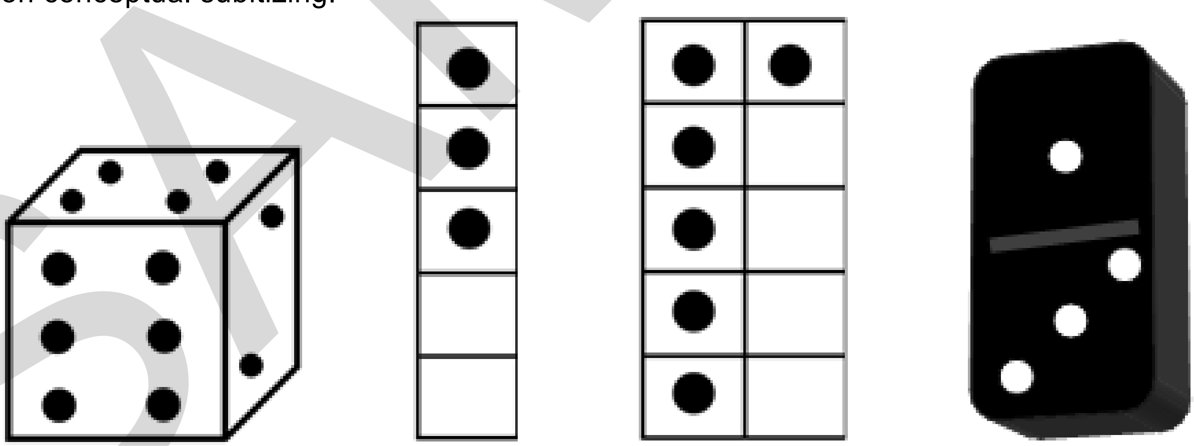
1.2A involves a concept in counting called “subitizing.” A student can subitize when he or she instantly recognizes a quantity of a small group of objects. It is “instantly seeing how many,” rather than having to count them. Subitizing helps students form mental pictures of numbers, such as the pips on a die. Use manipulatives that support understanding of a quantity of 10, such as a ten-frame, or that are common in everyday life, such as number cubes or an egg carton.

Example/Activity

Perceptual subitizing is instantly recognizing quantities that are in organized or random patterns. Examples: Quantities may be arranged in organized or random patterns. Students focus on mainly on perceptual subitizing in Kindergarten.



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. First grade focuses on conceptual subitizing.



1.2 Number and Operations. The student applies mathematical process standards to represent and compare whole numbers, the relative position and magnitude of whole numbers, and relationships within the numeration system related to place value. The student is expected to:

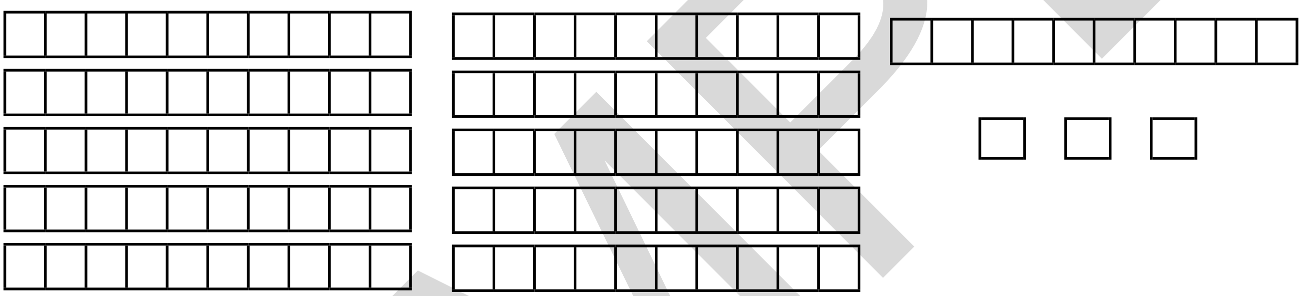
1.2B use concrete and pictorial models to compose and decompose numbers up to 120 in more than one way as so many hundreds, so many tens, and so many ones.

1.2B provides a critical foundation for numerical fluency and flexibility with numbers. This Student Expectation also provides a foundation for understanding place value and may be students' introduction to place value.

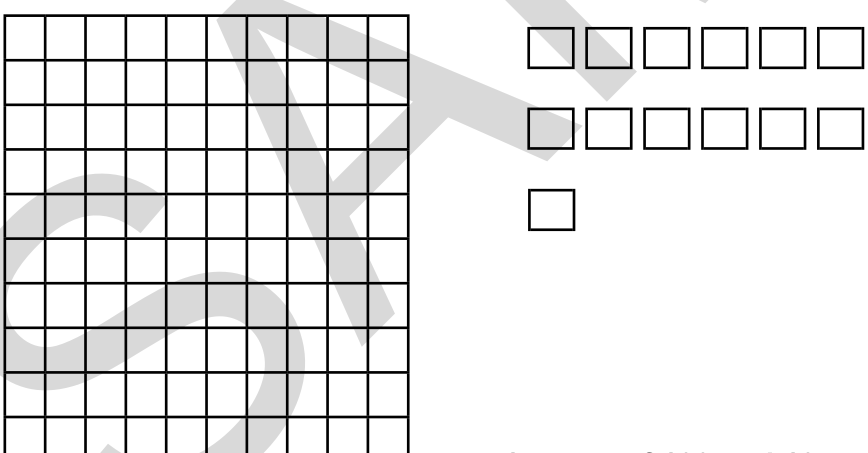
Compose: Sets of objects may be joined together to make a larger group. The two sets are the parts, and the whole is the larger set that is created.
Decompose: Sets of objects can also be broken into smaller subsets and still contain the total amount.

Example/Activity

Students should be able to think of numbers in many different ways. Students should realize that, for example, the number 113 is more than 1 one-hundred, 1 set of ten, and 3 ones. It can be made with many arrangements. Here are two examples based on the place value system.



11 groups of 10 and 3 ones
or
11 longs and 3 units



1 group of 100 and 13 ones
or
1 flat and 13 units

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1.2 Number and Operations. The student applies mathematical process standards to represent and compare whole numbers, the relative position and magnitude of whole numbers, and relationships within the numeration system related to place value. The student is expected to:

1.2B use concrete and pictorial models to compose and decompose numbers up to 120 in more than one way as so many hundreds, so many tens, and so many ones.

While place value understanding should be a target, students should also be able to make the number using sets that are not based on ten, such as 112 and 1. Because this is more abstract, understanding of this will probably happen later in the year. The more flexible that students are with numbers, the easier they will be able to recall their math facts and perform the operations.

To bring in the concept of place value, teachers should ask:

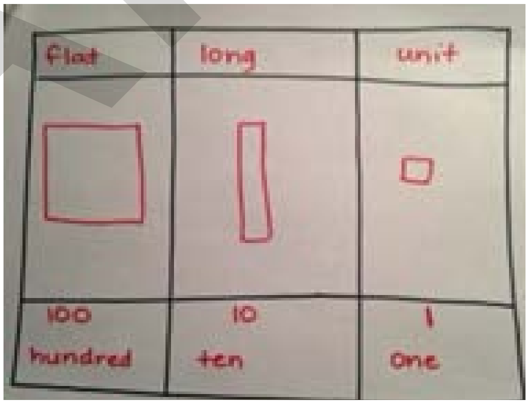
- "How many hundreds are in 113?" along with "What number is in the hundreds place?" The answer to both of these questions is the same—1.
- "How many tens are in 113?" along with "What number is in the tens place?" The answer to these questions is different—11 and 1. In order to answer the first question, students need to understand that 100 is 10 tens, plus there is one more ten in the tens place. The second question only asks for identification, but does not build on students' place value understanding.

While learning this standard, students may be exposed to base-ten blocks for the first time, along with place value. Rather than telling students how much each piece is worth, it is critical that students are guided to discover it on their own. They need to use units to build the longs, and then the longs and units to build the flat. While investigating, they should find that:

- 1 flat = 10 longs, which is the same as 100 = 10 tens
- 1 flat = 100 units, which is the same as 100 = 100 ones
- 1 long = 10 units, which is the same as 10 = 10 ones

They should begin to exchange groups of ten units for a long and groups of 10 longs for a flat. As students become comfortable with trading 10 units for 1 long and 10 longs for one flat, you can begin to use the words "ones," "tens," and "hundreds."

As they discover this, it is appropriate to create an anchor chart for the wall for their reference. But building and understanding should come before the anchor chart is displayed. Anchor charts for base-ten blocks and place value are readily available in teacher supply stores. However it is much more powerful if the chart that is displayed comes from student discovery, instead of a premade chart. Here is an example of a simple anchor chart. Students should also draw this in their math journals.



Some possible concrete model manipulatives are base-ten blocks or popsicle sticks wrapped in groups of ten. Grid paper is the most commonly used pictorial model. See 1.2C for an example of grid paper. This standard provides the concrete and pictorial models that are critical to understanding expanded forms of numbers in 1.2C.

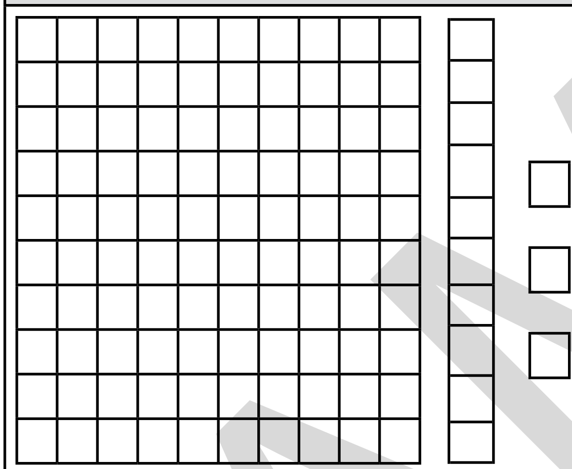
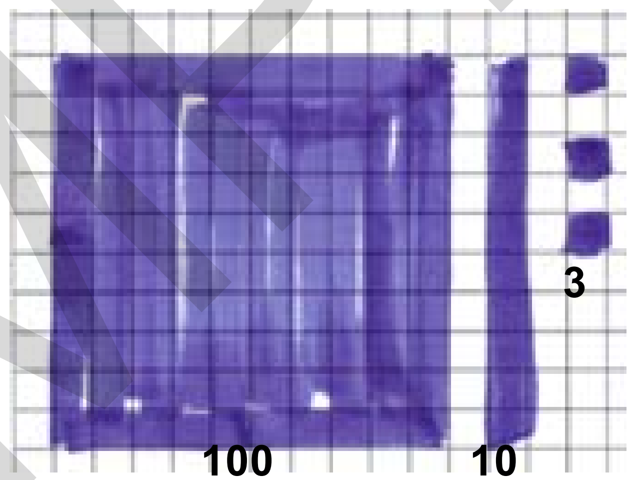
1.2 Number and Operations. The student applies mathematical process standards to represent and compare whole numbers, the relative position and magnitude of whole numbers, and relationships within the numeration system related to place value. The student is expected to:

1.2C use objects, pictures, and expanded and standard forms to represent numbers up to 120.

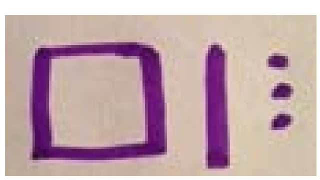
This Student Expectation has students using concrete and pictorial models of numbers to understand abstract forms of numbers, such as expanded and standard notation. Through student experiences of composing and decomposing numbers, making concrete models, and drawing pictorial models, students gain an in-depth understanding of how numbers work together to create other numbers. This, in turn, paves the way for students to develop fluency with operations.

Example/Activity

In the table below, notice how the concrete model shown exactly mirrors the pictorial model. As students are learning to write the expanded notation, they should write the numbers on top of the pictorial model so that the more abstract expanded notation is merely an extension of the pictorial model that they've drawn.

Concrete Model	Pictorial Model
	
Expanded Notation	**Standard Notation**
100 + 10 + 3	113

Students may use this model once they have a firm understanding of 100s, 10s, and 1s.



1.2 Number and Operations. The student applies mathematical process standards to represent and compare whole numbers, the relative position and magnitude of whole numbers, and relationships within the numeration system related to place value. The student is expected to:

1.2D generate a number that is greater than or less than a given whole number up to 120.

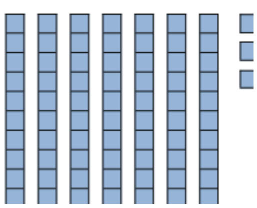
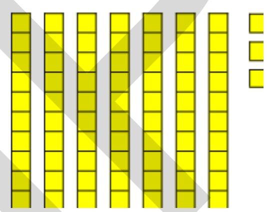
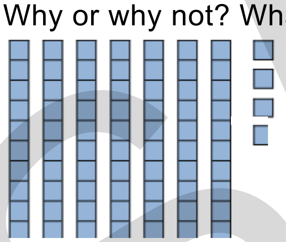
1.2D is an easy extension of 1.2C. The following example shows how the teacher can help students build the idea of numbers that are more than or less than.

Note: Generating numbers that are larger or smaller is specifically separated in the TEKS from telling which numbers are larger or smaller (1.2E and G) and ordering numbers (1.2F) so that students have plenty of opportunities to reason about the magnitude of numbers.

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 "More Than"

Teacher Directions and/or Actions	Student Actions and/or Statements
1. Teacher creates a number using base ten blocks and asks the students to create the same number with their own base ten blocks. 	Students create the same number. 
2. Teacher asks, "Are the sets equal? Why or why not?"	Students say that the sets are equal because there are 7 blue longs and 7 yellow longs. There are 3 blue units and 7 yellow units.
3. Teacher asks, "What number does this represent?"	Students respond, "This is the number 73."
4. Teacher adds one unit to her base ten blocks. Teacher asks, "Do we still have the same number? Why or why not? What number do I have now?" 	Students respond that the numbers are different because the teacher has one more unit than they do and that the teacher has 74.
5. Teacher asks, "Which number is larger, 73 or 74? Why?"	Students respond that 74 is larger because 73 has 7 longs and 3 units, while 74 has 7 longs and 4 units. Note: In students' responses, prompt them to talk about the longs and the units, not just the units. Sentence stems may be helpful in teaching children to verbalize their thoughts. *_______ is larger than (smaller than) ______. I know this because _______ has _______hundreds, ______ tens, and _______ ones. _______ has _______ hundreds, _______ has _______ tens, and _______*

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1.2 Number and Operations. The student applies mathematical process standards to represent and compare whole numbers, the relative position and magnitude of whole numbers, and relationships within the numeration system related to place value. The student is expected to:

1.2E use place value to compare whole numbers up to 120 using comparative language.

1.2E expands on the experiences in 1.2D. To show mastery of this Student Expectation, students should be able to verbalize their comparisons of two sets of objects using the language “more than,” “less than,” and “equal to.”

Note: Students do NOT have to use the symbols for greater than or less than to show master of this Student Expectation.

Example/Activity

An example of using comparative language with place value is “47 has 4 sets of ten and 52 has 5 sets of ten. Therefore, 47 is less than 53.” Another example is “101 has 1 set of one hundred and 103 also has 1 set of one hundred. But 103 has 2 more ones than 101 does, so 103 is larger than 101.” Students might also say, “101 is closer to 100 than 103 is. Therefore, 103 is larger than 101.” Both of these explanations build on place value to tell which number is larger or smaller.

Students should have opportunities to compare numbers that have the same digits, such as 70, 7, and 77. While comparing these numbers in first grade might be fairly simple, in second and third grade, where there are more digits, place value begins to confuse students. Comparisons at this level may help mitigate that in the upper grades.

Sentence stems may be helpful in teaching children to verbalize their thoughts.

______ is more than (less than) ______. I know this because ______ has ______hundreds and ______ tens, and ______ ones and ______ has ______hundreds and ______ tens, and ______ ones.
These two sets are equal. I know this because…
The ______ set is smaller (or less than) the ______ set. I know this because…
There are less (fewer) ______ than ______. I know this because…

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