how what

Grade 2 • Module 3

Place Value, Counting, and Comparison of Numbers to 1,200

what how

OVERVIEW

In Module 2, students added and subtracted measurement units within 100 (**2.9E, 2.9C**), a meaningful application of their work from Module 1 (**2.4A, 2.4B**) and a powerful bridge to the base ten units of Grade 2.

In this 22-day Grade 2 module, students expand their skills with and understanding of units by bundling ones, tens, and hundreds up to a thousand with straws. Unlike the length of 10 centimeters in Module 2, these bundles are discrete sets. One unit can be grabbed and counted—1 hundred, 2 hundred, 3 hundred, etc. (**2.2A**). A number in Grade 1 generally consisted of two different units, tens and ones.

Now, in Grade 2, a number generally consists of four units: thousands, hundreds, tens, and ones (**2.2A**). The bundled units are organized by separating them largest to smallest, ordered from left to right. Over the course of the module, instruction moves from physical bundles that show the proportionality of the units to non-proportional place value disks and to numerals on the place value chart (**2.2B**).

proportion

disks

Furthermore, in this module instruction includes a great deal of counting: by ones, tens, and hundreds (**2.2C**). Counting up using a measuring tape, a meter strip, a ruler, or a classroom number line shows movement from left to right as the numbers increase. Counting up on the place value chart shows movement from right to left as the numbers increase. For example, as 10 ones are renamed as 1 ten, the larger unit is housed in the place directly to the left. The goal is for students to move back and forth fluidly between these two models, the number line and the place value chart, using them to either to rename units and compare numbers (**2.2C, 2.2D, 2.2E**).

look fors

In this module, the place value story has advanced. Along with changing 10 ones for 1 ten, students now also change 10 tens for 1 hundred and 10 hundreds for 1 thousand. This changing leads to the use of counting strategies to solve word problems. In the next module, this change leads to mental math and the formal algorithms for addition and subtraction. Comparison extends into finding 100 more and 100 less, 10 more and 10 less, etc. Just as in Grade 1, *more* and *less* translate into formal addition and subtraction at the onset of Module 4 (**2.7B**).

How is this module's learning foundational to later grades? Understanding 3 tens or 3 units of 10 leads to an understanding of 3 fours or 3 units or groups of four, 3 fourths or 3 units of one-fourth. Learning that 12 tens = 120 and 12 hundreds = 1,200 leads to an understanding of 12 tenths = 1.2,4 thirds = 4/3 = 1 1/3, or even 4 threes = 12. Counting up and down by ones, tens, and hundreds with both the number line and place value chart is essential from Grade 3 forward for rounding and mental math to meaningful understanding of all operations with base ten whole numbers and to understanding place value's extension into decimal fractions and operations.

why its important

Throughout Module 3 students engage with the TEKS mathematical process standards by communicating mathematical ideas when using multiple representations to show numbers in a variety of forms (**2.1D**).

standard for com. with symbols/diagrams graphs + language

look for
process

They analyze mathematical relationships to connect the many representations used throughout the module, and they communicate how these representations are the same or different **(2.1F)**. As students' place value understanding progresses in Topic D, they are tasked with discovering how many tens make 1,000. They formulate a plan, determine a solution, justify it, and evaluate the reasonableness of the solution as they work **(2.1B)**. This process includes selecting appropriate tools such as bills, place value disks, or drawings, and appropriate techniques, to solve **(2.1C)**. Students create and use representations to record numbers in a variety of ways, including bundles, expanded form, unit form, word form, bills, and place value disks **(2.1E)**. These representations support students as they use precise mathematical language when comparing numbers to 1,200 and as they justify their reasoning using place value understanding **(2.1G)**.

DOK 2

Collaboratively Troubleshooting Student Misconceptions

PIt is common for students to make mistakes as they build their understanding of new or difficult concepts. As noted in the Program and Implementation Guide, collaborative troubleshooting is a routine to help teachers address students' misconceptions. The three steps to collaborative troubleshooting are

(1) surface student thinking;

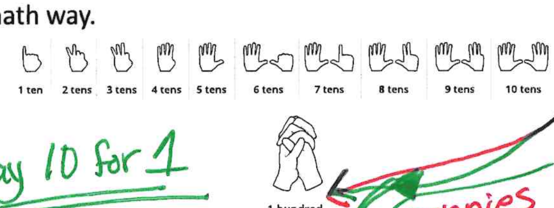
(2) validate what the student did right; and

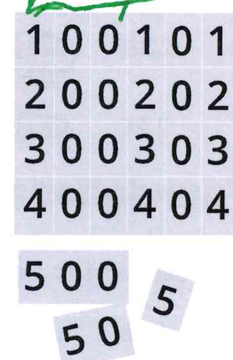
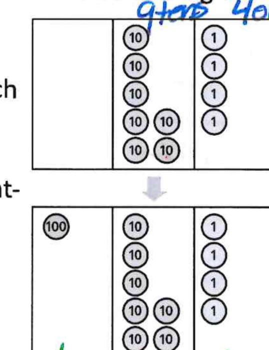
(3) bridge to a better understanding.

The following table presents teachers with guidance on how to collaboratively troubleshoot misconceptions with students. The first three columns of the table outline misconceptions that commonly arise in this module, reasons why students may have the misconceptions, and associated TEKS. Teachers can use this information to help them decide which questions to ask students to surface thinking and to validate what the students understood or did correctly.

The last column of the table provides instructional strategies and sample guided questions that can support students as they build on what they already know and bridge to a better understanding.

Note: Teachers can also refer to the sample teacher–student dialogue in the "Collaboratively Troubleshooting Student Misconceptions" section of the Grade 2 Course Guide for additional guidance on implementing the three-step routine

Topic	TEKS	Student Misconception	How to Bridge to a Better Understanding
Topics A and E	2.2A 10 for 10	Students may think that 10 of a given unit should be exchanged for 10 of the next larger unit, rather than 1 of the next larger unit. (e.g., "10 tens equal 10 hundreds").	Engage students in a kinesthetic activity by having them use their fingers to count by tens the math way.  1 ten · 2 tens · 3 tens · 4 tens · 5 tens · 6 tens · 7 tens · 8 tens · 9 tens · 10 tens · 1 hundred Say 10 for 1 Repeat this process with other units. pennies or bundles

Topic	TEKS	Student Misconception	How to Bridge to a Better Understanding
Topics B and D	2.2A	Students may rely on counting by ones (e.g., "I only count by ones when counting from 128 to 142. 128, 129, 130, 131, 132, … , 142").	Notice how the 5-group model supports students in seeing how many more of a unit are needed to reach a benchmark number. When counting, have students arrange their bundles into 5-groups or draw them. 5 → 10 → 1 hundred 1 ten 2 tens 
Topic C	2.2B	Students may think the digit in a number and the value of that digit is always the same (e.g., "248 is 2, 4, and 8").	digit value Use place value cards to represent a number. Pull the cards apart to show the value of each digit separately. Push them back together to unify the values as one number. Continue using place value cards as needed. 
Topics F and G	2.2D	Students may compare numbers based on a digit in isolation rather than by considering the values of the digits in a number (e.g., "9 is bigger than 3 so 93 must be greater than 314"). 93 > 314	Notice how place value disks are used as a support for students to conceptualize the value of a digit. 9 tens 4 ones When comparing numbers, have students represent each number with place value disks. Emphasize the value of each digit instead of counting the number of digits. Continue using place value disks when comparing as needed.  1 hund 7 tens 4 ones

Focus Grade Level Standards

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 related to place value. The student is expected to:

2.2A use concrete and pictorial models to compose and decompose numbers up to 1,200 in more than one way as a sum of so many thousands, hundreds, tens, and ones;

2.2B use standard, word, and expanded forms to represent numbers up to 1,200;

2.2C generate a number that is greater than or less than a given whole number up to 1,200;

2.2D use place value to compare and order whole numbers up to 1,200 using comparative language, numbers, and symbols (>, <, or =);

2.2E locate the position of a given whole number on an open number line.

Foundational Standards

The student is expected to:

acceleration

1.2B use objects, pictures, and expanded and standard forms to represent numbers up to 120 in more than one way as so many hundreds, so many tens, and so many ones;

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 =;

2.7B use an understanding of place value to determine the number that is 10 or 100 more or less than a given number up to 1,200.

M2

TEKS Mathematical Process Standards

The student uses mathematical processes to acquire and demonstrate mathematical understanding. The student is expected to:

2.1B 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

2.1C 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

2.1D communicate mathematical ideas, reasoning, and their implications using multiple representations, including symbols, diagrams, graphs, and language as appropriate.

2.1E create and use representations to organize, record, and communicate mathematical ideas;

2.1F analyze mathematical relationships to connect and communicate mathematical ideas;

2.1G display, explain, and justify mathematical ideas and arguments using precise mathematical language in written or oral communication.

Overview of Module Topics and Lesson Objectives

TEKS	ELPS		Topics and Objectives	Days
2.2A	1.C 1.E 2.C 2.E 2.I 3.D 3.E 4.B 4.D 4.G	A	**Forming Base Ten Units of Ten, a Hundred, and a Thousand** Lesson 1: Bundle and count ones, tens, and hundreds to 1,200. concrete → abstract	1
2.2A	1.C 1.E 2.C 2.E 2.I 3.D 3.E 3.H 4.B 4.D 4.F 4.G 5.B	B	**Understanding Place Value Units of One, Ten, and Hundred** Lesson 2: Count up and down between 100 and 220 using ones and tens. Lesson 3: Count up and down between 90 and 1,200 using ones, tens, and hundreds. Same but 100-220 90 → 1,200 #s go up in rigor	2

TEKS	ELPS		Topics and Objectives	Days
2.2B 2.2A	1.C 1.E 1.F 2.C 2.E 2.I 3.D 3.E 3.H 4.B 4.D 4.F 4.G 5.B	C	**Numbers to 1,200 in Unit, Standard, Expanded, and Word Forms** Lesson 4: Write base ten three-digit numbers in unit form; show the value of each digit. Lesson 5: Write base ten numbers in expanded form. Lesson 6: Write, read, and relate base ten numbers in all forms.	3
2.2A **2.2B** **2.2E**	1.C 1.D 1.E 2.C 2.E 2.I 3.C 3.D 3.E 3.G 4.D 4.G	D	**Modeling Base Ten Numbers Within 1,200 with Money** Lesson 7: Count the total value of $1, $10, and $100 bills up to $1,200. Lesson 8: Count from $10 to $1,200 on the place value chart and the open number line. Lesson 9: Explore $1,000. How many $10 bills can we change for a thousand dollar bill?	3

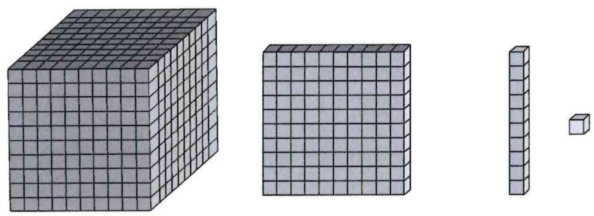
TEKS	ELPS		Topics and Objectives	Days
			Mid-Module Assessment Task: Topics A–D	1
2.2A **2.2B**	1.C 1.E 2.C 2.E 2.I 3.D 3.E 3.H 4.B 4.D 4.G 5.B	E	**Modeling Numbers Up to 1,200 with Place Value Disks** Shift to non-prop. Lesson 10: Count the total value of ones, tens, and hundreds with place value disks. Lesson 11: Change 10 ones for 1 ten, 10 tens for 1 hundred, and 10 hundreds for 1 thousand. Lesson 12: Read and write numbers up to 1,200 after modeling with place value disks. Lesson 13: Model numbers with more than 9 ones or 9 tens; write in expanded, unit, standard, and word forms. Lesson 14: Explore a situation with more than 9 groups of ten.	5
2.2C **2.2D**	1.C 1.E 2.C 2.E 2.I 3.D 3.E 3.F 3.G 3.H 4.C 4.D 4.G	F	**Comparing Numbers to 1,200** Lesson 15: Compare numbers to 1,200 with <, >, and =. Lesson 16: Compare numbers to 1,200 with <, >, and = when there are more than 9 ones, 9 tens, or 9 hundreds. Lesson 17: Order numbers in different forms.	3
2.2A 2.7B	1.C 1.D 1.E 2.C 2.E 2.I 3.D 3.E 3.H 4.D 4.G 5.B	G	**Finding 1, 10, and 100 More or Less than a Number** — Know P.V. Lesson 18: Model and use language to tell about 1 more and 1 less, 10 more and 10 less, and 100 more and 100 less. Lesson 19: Model 1 more and 1 less, 10 more and 10 less, and 100 more and 100 less when changing the hundreds place. Lesson 20: Complete a pattern counting up and down.	3
			End-of-Module Assessment Task: Topics A–G	1
Total Number of Instructional Days				**22**

Terminology

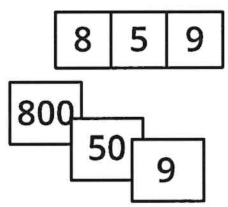
A Spanish cognate is included when the term has a similar meaning and spelling in English. Not every term in this module has a Spanish cognate.

New or Recently Introduced Terms

- **Base ten / dienes blocks:** blocks that represent 1, 10, 100, or 1,000 and help you understand the value of a digit

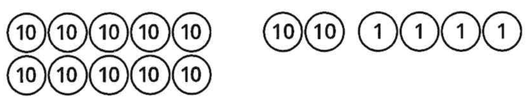


- **Base ten numerals** (*Números de base diez*): numbers that are represented by the following ten digits: 0, 1, 2, 3, 4, 5, 6, 7, 8, and 9



- **Expanded form** (*Forma expandida*): a way of writing a number that shows the value of each digit in that number

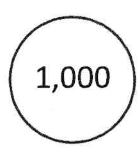
$$100 + 20 + 4 = 124$$



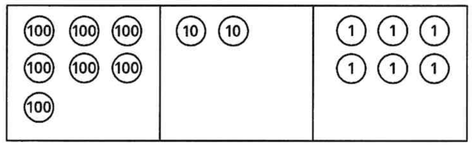
- **Hundreds place:** the location of the digit two places to the left of the ones place; the digit in the hundreds place tells how many hundreds are in a number

Thousands	Hundreds	Tens	Ones
	3	4	2

- **1,000:** a group or unit equal to 1,000 ones



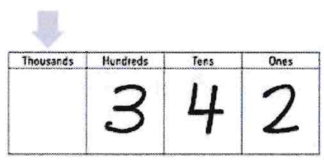
- **Place value or number disk** (*Valor de posición o disco numérico*): a circular disk that represents 1, 10, 100, or 1,000 and helps you understand the value of a digit



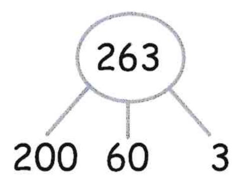
- **Standard form** (*Forma estándar*): a way of writing a number that shows only the digits in that number

120

- **Thousands place:** the location of the digit three places to the left of the ones place; the digit in the thousands place tells how many thousands are in a number



- **Unit form** *(Forma unitaria)*: a way of writing a number that shows how many of a unit



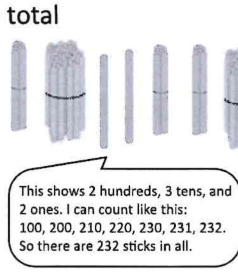
Unit form ——→ 2 hundreds 6 tens 3 ones

- **Word form**: a way of writing a number using only words

1	→ one	11	→ eleven	10	→ ten

Familiar Terms and Symbols[1]

- **Altogether**: counting all to find the total



[1]These are terms and symbols students have seen previously.

- **Bundling, grouping** (*Agrupar*): putting smaller units together to make a larger unit

- **Equal sign**: =
- **Less than sign**: <
- **Greater than sign**: >

Comparisons

$55 > 5$ tens

27 tens 3 ones $> 200 + 3$

Four hundred six $< 400 + 30 + 6$

$920 >$ 88 tens

$920 =$ 88 tens + 4 tens

- **How many more/less**: the difference between quantities

1 more than 314 is 315   1 less than 199 is 198.

- **How much more/less**: the difference between quantities

1 more than 314 is 315   1 less than 199 is 198.

- **More than/less than**: when comparing two numbers, the bigger number is more, and the smaller number is less

1 more than 314 is 315   1 less than 199 is 198.

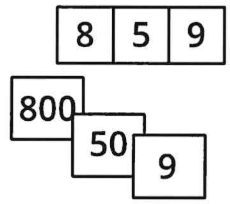
- **Number sentence**: a mathematical statement that is made up of numbers and symbols and tells how numbers are related

$$29 + 1 = 30$$
$$30 + 5 = 35$$

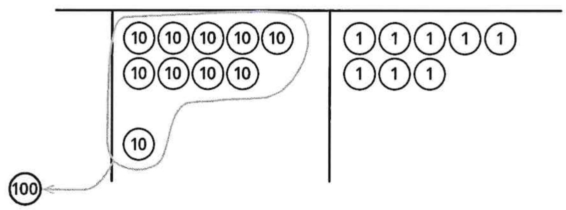
- **Ones place**: the location of the first digit on the right in a number; the digit in the ones place tells how many ones are in a number

Thousands	Hundreds	Tens	Ones
	3	4	2

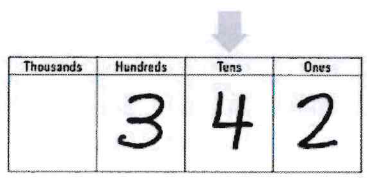
- **Place value**: the value of a digit based on where it is located in a number



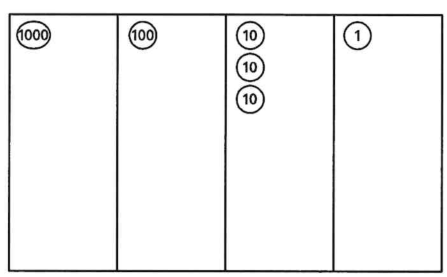
- **Renaming, changing**: composing or decomposing 10 of a unit to make a new unit



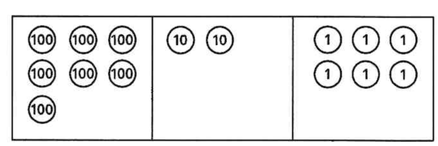
- **Tens place**: the location of the digit to the left of the ones place; the digit in the tens place tells how many tens are in a number



- **Units of ones, tens, hundreds, thousands** (*Unidades*): single ones, groups of 10, groups of 100, and groups of 1,000



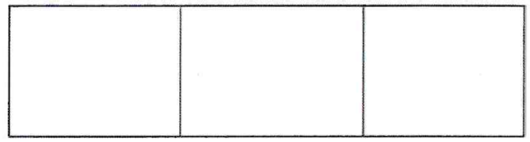
Suggested Tools and Representations



Place Value Disks

- 2 boxes of 1,000 straws per class of 25
- Clock number line (details in Lesson 1 Fluency Practice)
- Dice, 1 per pair
- Dienes blocks, Base Ten blocks
- Place value cards (also known as place value cards) showing numbers 1–5, 10–50, and 100—500 (1 small set per student) (Lesson 4 Template 1))

- Hundreds Chart
- Meter strip (Lesson 1 Template)
- Number spelling activity sheet 3 (Lesson 6 Activity Sheet)
- Open number line
- Personal white boards
- Place value box (details in Lesson 4 Concept Development)
- Place value cards to 1,000, 1 large teacher set
- Place value disks: suggested minimum of one set per pair (18 ones, 18 tens, 18 hundreds, and 1 one thousand)
- Play money: $1, $5, $10, and $100 bills (10 ones, 1 five, 12 tens, and 10 hundreds per pair), and a single set of 16 pennies, 13 dimes
- Rubber bands, 16 per pair
- Small plastic bags (small resealable bags)



Unlabeled Hundreds Place Value Chart
(use with number disks)

Module 3 Lesson Overview Materials List

Lesson	Teacher Materials	Student Materials *All counts are per student unless otherwise indicated.*
1	24-inch ribbon 1200 drinking straws or sticks	Meter strip (T)*
2	24-inch ribbon Drinking straws or sticks: 10 bundles of 100 10 bundles of 10 10 single drinking straw or sticks	Meter strip (T) Personal white board Drinking straws or sticks (per pair of students): 10 bundles of 100 10 bundles of 10 10 single drinking straws or sticks
3	Drinking straws or sticks: 1 bundle of 1000 12 bundles of 100 10 bundles of 10 10 single drinking straws or sticks	Drinking straws or sticks (as needed): 10 bundles of 100 10 bundles of 10 10 single drinking straws or sticks
4	4 shoe box lids Bundles of drinking straws or sticks: 1 bundle of 1000 12 bundles of 100 10 bundles of 10 10 single drinking straws or sticks Blank paper	Base ten blocks: 1 hundred 10 tens 12 ones 1 die (per pair of students) Meter strip (T) Place value cards (T) Small resealable bag Place value chart (T) (per pair of students) Personal white board

Lesson	Teacher Materials	Student Materials *All counts are per student unless otherwise indicated.*
5	Place value box (created in Lesson 4) Bundles of drinking straws or sticks: 1 bundle of 1000 12 bundles of 100 10 bundles of 10 10 single drinking straws or sticks	Meter strip (T) Place value cards (T) Blank paper
6	12 Ten-dollar bills 1 Five-dollar bill	Personal whiteboard Activity Sheet (T) Drinking straws or base ten blocks (per pair of students): 21 units of one 21 units of ten
7	1 bundle of 100 straws or sticks	Meter strip (T) Personal white board Unlabeled hundreds place value chart (T) 10 one-dollar bills 10 ten-dollar bills 12 hundred-dollar bills Small resealable bag
8	11 pennies 3 dimes	Meter strip (T) Personal white board Blank paper Unlabeled hundreds place value chart (T) Small resealable bag (per pair of students) containing: 10 one-dollar bills 10 ten-dollar bills 10 hundred-dollar bills
9	16 pennies 13 dimes	Poster board (per pair of students)—optional
10	100-bead Rekenrek Base ten blocks Unlabeled thousands place value chart (T) Place value disks (T)	Base ten blocks Unlabeled thousands place value chart (T) Place value disks (T)
11		Place value disks (per pair of students) Unlabeled thousands place value chart (T) (per pair of students)

Lesson	Teacher Materials	Student Materials *All counts are per student unless otherwise indicated.*
12	Open number line (T) Base ten bundles of straws	Personal white board Open number line (T) Place value disks Unlabeled thousands place value chart (T)
13		Place value disks (per pair of students) Unlabeled thousands place value chart (T)
14	Pre-cut inequality symbol cards (T)	Small resealable bag Digit cards 0-9 (T) Pre-cut inequality symbol cards (T) (per pair of students) Poster board (per pair of students)—optional Base ten blocks (as needed)
15		Unlabeled thousands place value chart (T) Place value disks Number comparison sheet (T)
16		Unlabeled thousands place value chart (T) Place value disks Inequality symbol cards (T)
17	Unlabeled thousands place value chart (T) from Lesson 10 Place value disks Pocket chart Pre-cut inequality symbol cards (T) from Lesson 14	Unlabeled thousands place value chart (T) Place value disks Personal white board
18		Unlabeled thousands place value chart (T) Place value disks
19		Unlabeled thousands place value chart (T) Place value disks Unlabeled hundreds place value chart (T) from Lesson 8 Personal white board
20	Pocket chart	Unlabeled thousands place value chart (T) Place value disks Hundreds chart (T) 4 large index card (per pair of students)

(T) Template provided in TE, Practice, and/or Learn