# Mathematics:

## 'A Story of Units'

## Parent Handbook

# GRADE 2
# MODULE 3

# Grade 2 • Module 3

# Place Value, Counting, and

# Comparison of Numbers to 1,000

OVERVIEW

In Module 2, students added and subtracted measurement units within 100, a meaningful application of their work from Module 1 and a powerful bridge into the base ten units of Grade 2.

In this 25-day Grade 2 module, students expand their skill 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 just like a banana—1 hundred, 2 hundred, 3 hundred, etc. A number in Grade 1 generally consisted of two different units, tens and ones. Now, in Grade 2, a number generally consists of three units: hundreds, tens, and ones. 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 of straws to place value disks and to numerals on the place value chart moving from concrete thinking to abstract thinking.
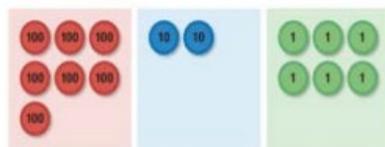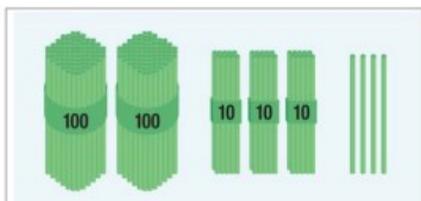


Place Value Chart with Number Disks

**Place Value Chart with Headings**
(Used with unlabeled materials such as base-ten blocks or bundles)

| Hundreds | Tens | Ones |
|---|---|---|
|  |  |  |

Furthermore, in this module instruction includes a great deal of counting: by ones, tens, and hundreds. Counting up using the centimeter tape 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 either to rename units and compare numbers. In this module, the place value story has advanced. Instead of changing 10 ones to 1 ten, students now are also changing 10 tens for 1 hundred. This changing leads to using 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.

The module includes a sequence of engaging problems in which students are asked to change 1 hundred for 10 units of ten and to change 10 units of ten for 1 hundred. Here is an example:

Mrs. has 13 boxes of ice pops. Each box contains 10 ice pops. Write the total number of ice pops of the students using hundreds, tens and ones. Explain using words, pictures or numbers.

In order to explain, students must recognize that each box in the problem represents a group of 10 ice pops. They then count by tens, changing units of ten for 1 hundred as appropriate to find the solution.
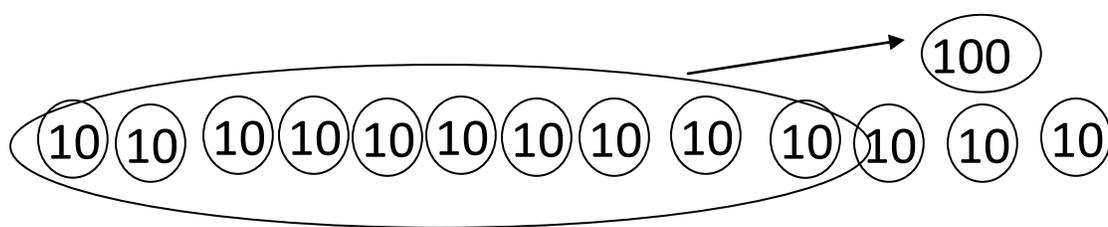


13 tens = 10, 20, 30, 40, 50, 60, 70, 80, 90, 100, 110, 120, 130

# Terminology

## New or Recently Introduced Terms

♦ Base ten numerals (e.g., a thousand is 10 tens, a hundred is 10 ones, starting in Grade 3 a one is 10 tenths, etc.)

♦ Expanded form (e.g., 500 + 70 + 6)

♦ Hundreds place (e.g., the 5 in 576; tells how many hundreds are in a number)

♦ One thousand (1,000)

♦ Place value or number disk

♦ Standard form (e.g., 576)

♦ Word form (e.g., five hundred seventy-six)

## Familiar Terms and Symbols

♦ =, <, > (equal, less than, greater than)

♦ Altogether (e.g., 59 centimeters and 17 centimeters; altogether there are 76 centimeters)

♦ Bundling, grouping (putting smaller units together to make a larger one, e.g., putting 10 ones together to make a ten or 10 tens together to make a hundred)

♦ How many more/less (the difference between quantities)

♦ How much more/less (the difference between quantities)

♦ More than/less than (e.g., 576 is more than 76; 76 is less than 576)

♦ Number sentence

♦ Ones place (e.g., the 6 in 576; tells how many ones are in a number)

♦ Place value (the unitary values of the digits in numbers)

♦ Renaming, changing (instead of "carrying" or "borrowing," e.g., a group of 10 ones is "renamed" a ten when the ones are bundled and moved from the ones to the tens place; if using $1 bills, they may be "changed" for a $10 bill when there are enough)

♦ Tens place (e.g., the 7 in 576; tells how many tens are in a number)

♦ Unit form counting (unit form counting states the amount of hundreds, tens, and ones in each number, e.g., 11 is stated as 1 ten 1 one, 20 as 2 tens, 27 as 2 tens 7 ones, 100 as 1 hundred, and 146 as 1 hundred 4 tens 6 ones.)

♦ Units of ones, tens, hundreds, one thousand (a single one and groups of 10s, 100s, and 1,000)

## Lesson 1

Objective: Bundle and count ones, tens, and hundreds to 1,000.



Examples:

1.      8 tens + 2 tens = 10 tens

     80     +     20     = 100
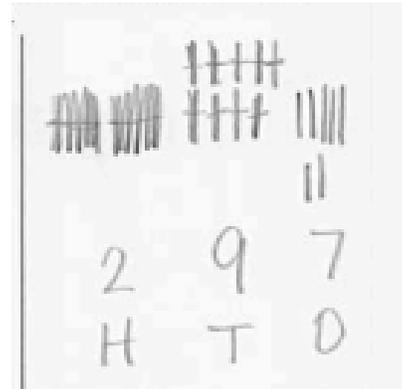
## Lesson 2

Count up and down between 100 and 220 using ones and tens.

Benchmark numbers allow us to skip-count, which is faster than counting by ones. If we started counting at 124 and wanted to stop at 200 my benchmark number would be 130.  That is where we begin skip counting by tens.
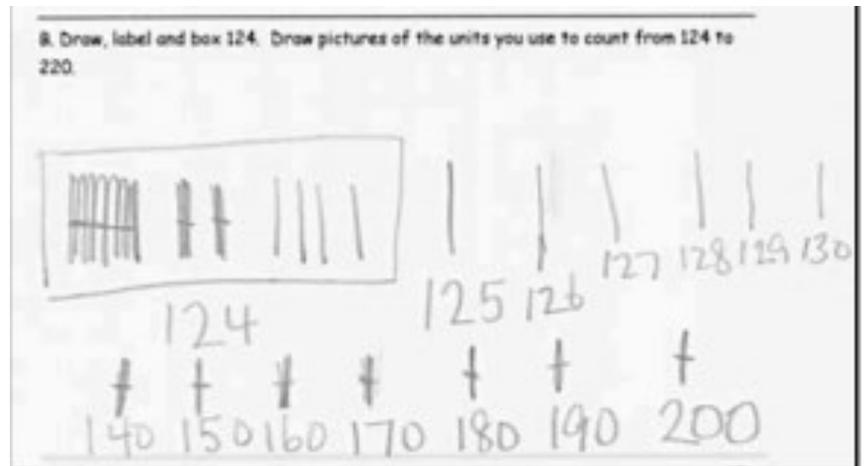


When drawing straws we box the number where we begin counting.  This allows us to see where we began our work and where we ended our work.

## Lesson 3

Objective: Count up and down between 90 and 1,000 using ones, tens, and hundreds.

Counting using benchmark numbers is similar to how a cashier will count back change.
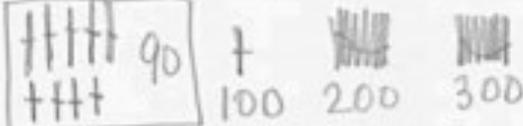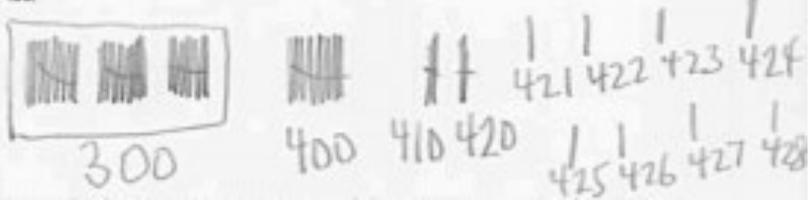


## Lesson 4

Objective: Count up to 1,000 on the place value chart.

We no longer need to draw straws to count. Numerals replace the straws we used before. We can imagine our place value chart. Now we might have two benchmark numbers because we are skip counting by tens and hundreds.

## Lesson 5

Objective: Write base ten three-digit numbers in unit form; show the value of each digit.

Unit form helps identify the value of each digit. We can use number bonds to create a visual.

375= 3 hundreds 7 tens 5 ones= 300+70+5
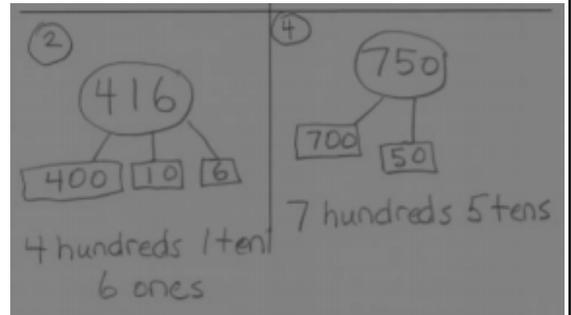


## Lesson 6

Objective: Write base ten numbers in expanded form.

When we write our numbers as addition sentences with parts representing the total value of each unit that is called expanded form. It helps us to see the value of each place. We know the commutative property tells us that order does not matter when adding. This holds true in expanded form as well.



Examples:

200 + 40 + 9 = 249          9 + 40 + 200 = 249

900 + 10 + 3 = 913          913 = 3 + 900 + 10

**Lesson 7**

Objective: Write, read, and relate base ten numbers in all forms.

Numbers can be represented in several ways
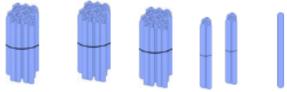
A. Numeral: <u>321</u>

B. Expanded Form: <u>300+20+1</u>

C. Number Name (word form): <u>three hundred twenty-one</u>

D. Unit Form: <u>3 hundreds 2 tens 1 one</u>

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**Lesson 8**

Objective: Count the total value of $1, $10, and $100 bills up to $1,000.

We can use money to explore place value.

431= 400+30+1

| 100 | 100 | 10 | 10 |

| 100 | 100 | 10 | 1 |

## Lesson 9

Objective: Count from $10 to $1,000 on the place value chart and the empty number line.

Count from 776 to 900



1. Label each end of your empty number line with your starting and ending number.

2. Mark and label your first bench mark number (780).

3. Label the first jump (4 ones).

4. Mark and label your next benchmark number (800).

5. Label the second jump (2tens).

6. Mark and label your final jump (1 hundred).
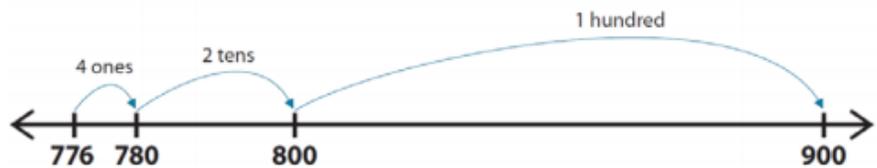
## Lesson 10

Objective: Explore $1,000. How many $10 bills can we change for a thousand dollar bill?

Jerry is a second grader. He was playing in the attic and found an old, dusty trunk. When he opened it, he found things that belonged to his grandfather. There was a cool collection of old coins and bills in an album. One bill was worth $1,000. Wow! Jerry lay down and started daydreaming. He thought about how good it would feel to give as many people as he could a ten dollar bill. He thought about how he had felt on his birthday. last year when he got a card from his uncle with a ten dollar bill inside. But even more, he thought about how lucky he felt one snowy, cold day walking to school when he found a ten dollar bill in the snow. Maybe he could quietly hide the ten dollar bills so that lots of people could feel as lucky as he did on that cold day! He thought to himself, "I wonder how many ten dollar bills are equal to a thousand dollar bill? I wonder how many people I could bring a lucky day to?"

Suggested Strategies:

♦ Use $1,$10, $100

♦ Number bond or number line

♦ Draw straws, place value discs

## Lesson 11

Objective: Write base ten three-digit numbers in unit form; show the value of each digit.
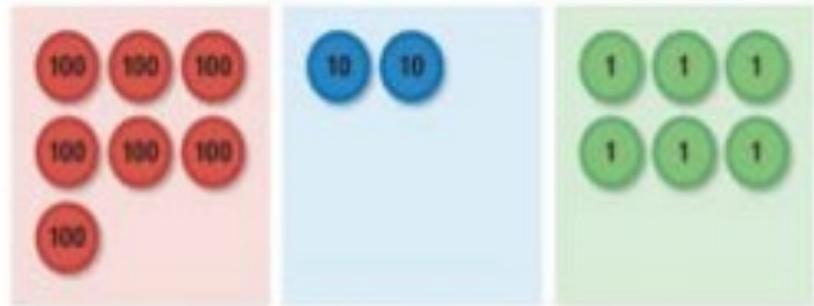


Place Value Chart with Number Disks

## Lesson 12

Objective: Change 10 ones for 1 ten, 10 tens for 1 hundred, and 10 hundreds for 1 thousand.

Count from **582 to 700** using place value disks. Change for a larger unit when necessary.

When you counted from **582 to 700**:

| Did you make a larger unit at... | Yes, I changed to make: | | No, I need _____ |
|---|---|---|---|
| 590 ? | (1 ten) | 1 hundred | ____ ones. <br> ____ tens. |
| 600 ? | 1 ten | (1 hundred) | ____ ones. <br> ____ tens. |
| 618 ? | 1 ten | 1 hundred | _2_ ones. <br> ____ tens. |

## Lesson 13

Objective: Read and write numbers within 1,000 after modeling with place value disks.

H          T          O

134 can be shown using number disks. It has

1 hundred, 3 tens, and 4 ones.
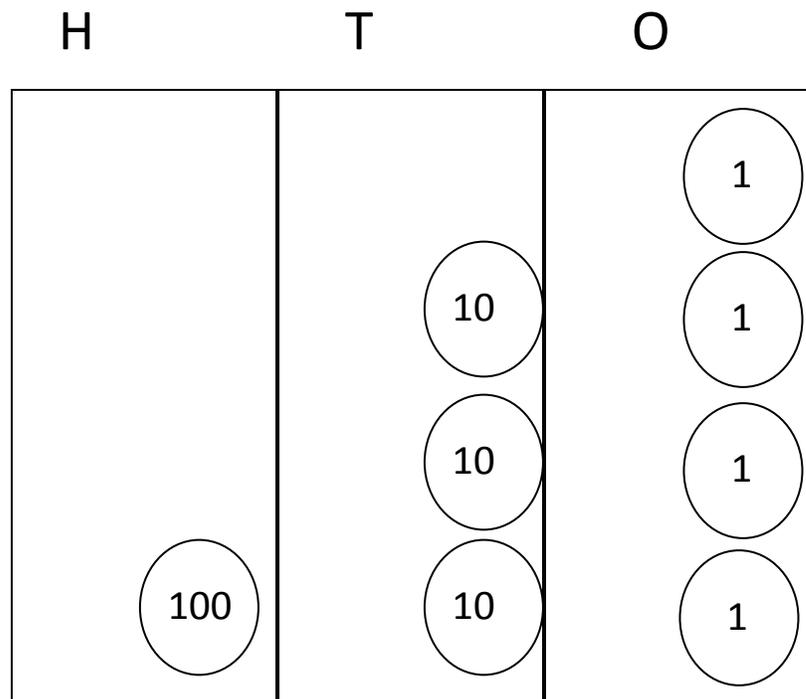


## Lesson 14

Objective: Model numbers with more than 9 ones or 9 tens; write in expanded, unit, standard, and word forms.

Larger units can be unbundled to make a larger group of smaller units. Here are a few examples:

250= 2 hundreds 5 tens

We can unbundled 1 of the hundreds to make:

250= 1 hundred 15 tens

We can unbundle both hundreds to make:

250= 25 tens



200

100          100

10 tens          10 tens

20 tens

23 groups of 10

20 tens   3 tens

10 tens   10 tens

100 + 100 + 30 = 230

23 students have 230 fingers.
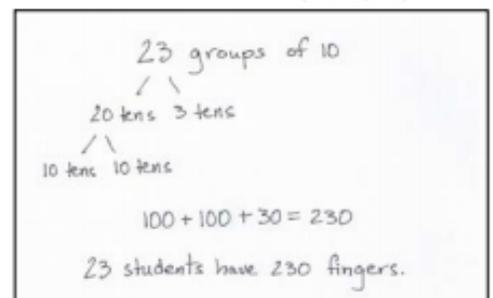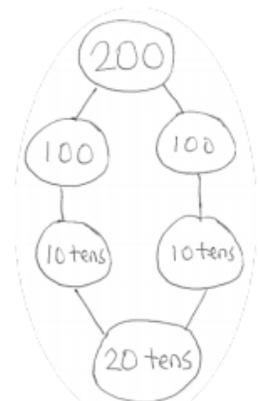
## Lesson 15

Objective: Explore a situation with more than 9 groups of ten.

Throughout the year students have learned many different strategies for solving math problems. In this lesson student can decompose to add or subtract, use models, and words to solve problems.

Think about using:

♦ $1, $10, $100

♦ Number line

♦ Straws

♦ Number disks

4. How many boxes of pencils do you think would be good for your class to have ready for January, February, March and April? How many pencils is that? Explain your thinking.

24 students
1 pencil every week

24 + 24 + 24 + 24
48        48    = 80 + 16 =
40  8    40  8       96

96 + 96 + 96 + 96
 JF    F     M    A

100    100    100    100
(108)  (108)  (108)  (108)
       400 - 8 = 392
       392 - 8 = 384

We think 384 pencils.
       39 boxes would be good.

## Lesson 16

Objective: Compare two three-digit numbers using <, >, and =.

Place value disk often help us compare the value of numbers. We can see 724 is greater than 472 because it has 3 more hundreds.

| 472 | 274 | 724 |
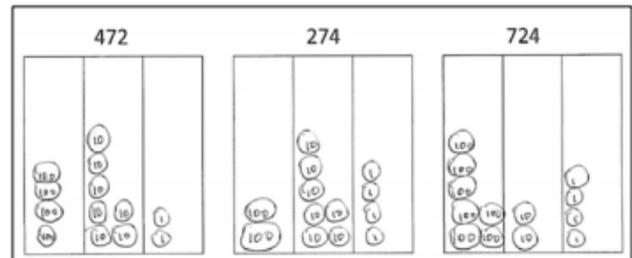
< less than

> greater than                724 > 472

= equal to

## Lesson 17

Objective: Compare two three-digit numbers using <, >, and = when there are more than 9 ones or 9 tens

When comparing numbers it is important to change them into the same form. Place value disc can help students do this as seen below.

Comparisons

55 > 5 tens

27 tens 3 ones > 200 + 3

four hundred six < 400 + 30 + 6

920 > 88 tens

920 = 88 tens + 4 tens

A

Draw 217 using hundreds, tens, and ones.

B

Draw 21 tens 7 ones.

A

B
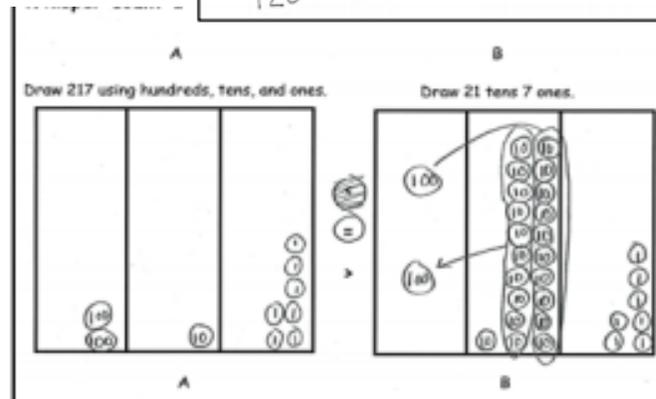
## Lesson 18

Objective: Order numbers in different forms.

We can use all of the strategies learned thus far to compare numbers in different forms. Before comparing them try to change the numbers into numeral form.

Name: Freddy        Date:_____

Draw the following values on the place value charts as you think best.

1 hundred  19 ones          3 ones  12 tens          120

Order the numbers from smallest to greatest: __119__  120  123

Order the following from least to greatest in standard form.

a) 436    297    805                    a) _297_  436  805

b) 317    three hundred seventy    307    b) _307_  317  370

c) 826    2 + 600 + 80    200 + 60 + 8    c) _268_  682  826

d) 5 hundreds 9 ones    51 tens 9 ones    591    d) _509_  519  591

e) 16 ones 7 hundreds    6 + 700 + 10    716    e) _716_  716  716
                                                    All equal

## Lesson 19

Objective: Model and use language to tell about 1 more and 1 less, 10 more and 10 less, and 100 more and 100 less.

We can use any of the models in this module to show 1, 10, or 100 more or less than a number.

Stella's Way

||||  ||||  |||  ♯ ♯ ♯ ♯ ♯ ♯  |  |  ||||  ||||
100  200  300  310 320 330 340 350 360  361  362  462  562

Jesse's Way

362 + 200 = 562

Ben's Way

362  (462)  (562)    200 more

Latrice's Way

300 + 60 + 2         500 + 60 + 2

300 + 200 = 500
so 500 is 200 more than 300

| | than 242 is | 153 | 312 | 465 | 571 | 683 |
|---|---|---|---|---|---|---|
| 100 more | 342 | 253 | 412 | 565 | 671 | 783 |
| 100 less | 142 | 53 | 212 | 365 | 471 | 583 |

## Lesson 20

Objective: Model 1 more and 1 less, 10 more and 10 less, and 100 more and 100 less when changing the hundreds place.

Model each problem with a partner on your place value chart. Then fill in the blanks and circle all that apply. Whisper the complete sentence.

a) 1 more than 39 is ___40___.

We made a ___ten___.

b) 10 more than 190 is ___200___.

We made a ___hundred___.

c) 10 more than 390 is ___400___.

We made a ___hundred___.

d) 1 more than 299 is ___300___.

We made a ___hundred. or a ten___.

e) 10 more than 790 is ___800___.

We made a ___hundred___.

# Lesson 21

Objective: Complete a pattern counting up and down.

When trying to determine a pattern look at each unit and ask:

♦ Which units are changing (hundreds, tens, or ones)?

♦ How much larger or smaller did they become?

a)

| 72 | 73 | 74 | 75 | 76 | |
|----|----|----|----|----|----|
| | | 84 | 85 | | |
| 92 | 93 | 94 | 95 | 96 | 97 |
| | | 104 | 105 | 106 | |
| | | | 115 | 116 | 117 |

b)