Grade 4

Number & Operations in Base Ten

4.NBT.1 - 3

MATH TASKS

Office of Mathematics

Number & Operations in Base Ten 4.NBT 1-3

Generalize place value understanding for multi-digit whole numbers.

Goal:

Read, write and compare multi-digit whole numbers using base-ten numerals, number names, and expanded form. Use place value understanding to round multi-digit whole numbers to any place.

Essential Questions:

- How does making effective comparisons help us in problem solving?
- What is the best way to estimate?
- Is there one "best" way to approach problem solving?

Prerequisites:

- Writing 3-digit numbers in word form, standard form and expanded form.
- Count and compare numbers to 100.

Embedded Mathematical Practices

MP.1 Make sense of problems and persevere in solving them
MP.2 Reason abstractly and quantitatively
MP.3 Construct viable arguments and critique the reasoning of others
MP.4 Model with mathematics
MP.5 Use appropriate tools strategically
MP.6 Attend to precision
MP.7 Look for and make use of structure
MP.8 Look for and express regularity in repeated reasoning.

Lesson 1
4.NBT.1 Using Place Value Concepts

Lesson 2
4.NBT.2 Comparing Numbers Using Inequality Symbols

Lesson 3
4.NBT.3 Rounding Using Place Value

Lesson 4
4.NBT.1-3 Golden Problem

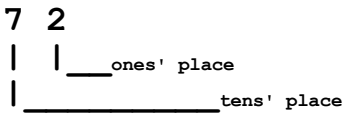
Lesson Structure:
Introductory Task
Prerequisite Skills
Focus Questions
Guided Practice
Homework
Journal Question

Content Overview: Place Value

Numbers, such as 72, have two digits. Each digit is a different place value.

The left digit is the tens' place. It tells you that there are 7 tens.

The last or right digit is the ones' place which is 2 in this example. Therefore, there are 7 sets of 10, plus 2 ones in the number 72.



The number 23 could be represented by this table:

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23							

The tens' place value of 2 in the number 23 is due to the presence of two full sets of 10.
The ones' place value of 3 in the number 23 is due to 3 units that are not included in a full set of 10.

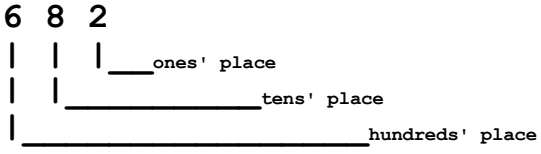
Place Values in Words and Numbers

Numbers, such as 682, have three digits. Each digit is a different place value.

The first digit is called the hundreds' place. It tells you how many sets of one hundred are in the number. The number 682 had six hundreds.

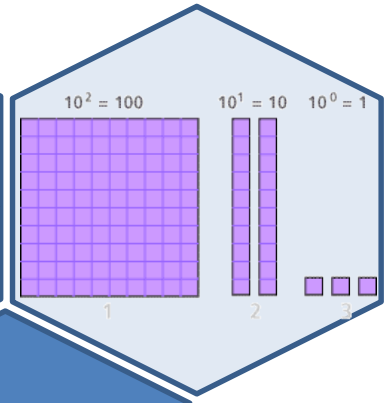
The middle digit is the tens' place. It tells you that there are 8 tens in addition to the six hundreds.

The last or right digit is the ones' place which is 2 in this example. Therefore, there are 6 sets of 100, plus 8 sets of 10, plus 2 ones in the number 682.



Multiple Representations for Place Value

1 Hundred
2 Tens
3 ones



Base Ten Materials

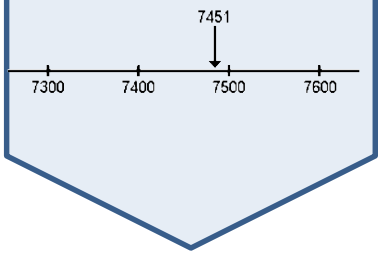
Comparing values

Inequality symbols

Number Line

Round to the nearest…

430 < 460



LESSON 1 4.NBT.1
Recognize that in a multi-digit whole number, a digit in one place represents ten times what it represents in the place to its right.

Introductory Task	Guided Practice	Collaborative	Homework	Golden Task

Ten Thousands	Thousands	Hundreds	Tens	Ones
4	8	9	2	7

The digit 8 is in the **THOUSANDS** place.
The digit 8 stands for **8 THOUSANDS**.
The digit 8 has a value of **8,000**.

1. There are **2** TENS in 20 and there are ____ ONES in 20.	2. There are **9** HUNDREDS in 900 and there are _____ TENS in 900 and there are _____ ONES in 900.
3. There are **8** THOUSANDS IN 8,000 and there are _____ HUNDREDS in 8,000 and there are _____ TENS in 8,000 and there are _____ ONES in 8,000.	4. There are **4** TEN THOUSANDS in 40,000 and there are _____ THOUSANDS in 40,000 and there are _____ HUNDREDS in 40,000 and there are _____ TENS in 40,000 and there are _____ ONES in 40,0000.

Do you notice any patterns? How many times is the value in every place larger than the place to its right?

Focus Questions
Question 1: Why is Place Value important?

Journal Question
How many TENS are in 500?

LESSON 1 4.NBT.1

Recognize that in a multi-digit whole number, a digit in one place represents ten times what it represents in the place to its right.

Introductory Task	Guided Practice	Collaborative	Homework	Golden Task

For each problem, use place value to solve:

1) There are **3** TENS in 30 and there are ____ ONES in 30.	6) There are _____ HUNDREDS in 500 and there are _____ TENS in 500 and there are _____ ONES in 500.
2) There are **6** TENS in 60 and there are ____ ONES in 60.	7) There are 3 THOUSANDS in 3,000 and there are _____ HUNDREDS in 3,000 and there are _____ TENS in 3,000 and there are _____ ONES in 3,000.
3) There are ____ TENS in 90 and there are ____ ONES in 90.	8) There are 5 THOUSANDS in 5,000 and there are _____ HUNDREDS in 5,000 and there are _____ TENS in 5,000 and there are _____ ONES in 5,000.
4) There are **2** HUNDREDS in 200 and there are _____ TENS in 200 and there are _____ ONES in 200.	9) There are _____ THOUSANDS in 5,600 and there are _____ HUNDREDS in 5,600 and there are _____ TENS in 5,600 and there are _____ ONES in 5,600.
5) There are **4** HUNDREDS in 400 and there are _____ TENS in 400 and there are _____ ONES in 400.	10) There are _____ THOUSANDS in 8,640 and there are _____ HUNDREDS in 8,640 and there are _____ TENS in 8,640 and there are _____ ONES in 8,640.

LESSON 1 4.NBT.1

Recognize that in a multi-digit whole number, a digit in one place represents ten times what it represents in the place to its right.

Introductory Task	Guided Practice	Collaborative	Homework	Golden Task

For each problem, use place value to solve:

1) There are **5** TENS in 50 and there are ____ ONES in 50.	6) There are _____ HUNDREDS in 800 and there are _____ TENS in 800 and there are _____ ONES in 800.
2) There are **7** TENS in 70 and there are ____ ONES in 70.	7) There are 4 THOUSANDS in 4,000 and there are _____ HUNDREDS in 4000 and there are _____ TENS in 4,000 and there are _____ ONES in 4,000.
3) There are ____ TENS in 80 and there are ____ ONES in 80.	8) There are 7 THOUSANDS in7,000 and there are _____ HUNDREDS in 7,000 and there are _____ TENS in 7,000 and there are _____ ONES in 7,000.
4) There are **3** HUNDREDS in 300 and there are _____ TENS in 300 and there are _____ ONES in 300.	9) There are _____ THOUSANDS in 3,700 and there are _____ HUNDREDS in 3,700 and there are _____ TENS in 3,700 and there are _____ ONES in 3,700.
5) There are **7** HUNDREDS in 700 and there are _____ TENS in 700 and there are _____ ONES in 700.	10) There are _____ THOUSANDS in 9,920 and there are _____ HUNDREDS in 9,920and there are _____ TENS in 9,920and there are _____ ONES in 9,920.

LESSON 2 4.NBT.2
Read and write multi-digit whole numbers using base-ten numerals, number names, and expanded form. Compare two multi-digit numbers based on meanings of the digits in each place, using >, =, and < symbols to record the results of comparisons.

Introductory Task	Guided Practice	Collaborative	Homework	Golden Task

Choose four different numbers from the list on the right → **2, 3, 5, 6, 7**
to make the sentence below true:

1	7,		7		<	1	,	3		8

Write both numbers in word form:

First number: _____

_____

Second number: _____

_____

Write the larger of two numbers above in Expanded Form:

_____ + _____ + _____ + _____ + _____

Focus Questions
Question 1: What do the symbols <, >, and = mean?
Question 2: When comparing numbers, which digit do you start with?

Journal Question
Was there another solution to the problem above?

LESSON 2 4.NBT.2

Read and write multi-digit whole numbers using base-ten numerals, number names, and expanded form. Compare two multi-digit numbers based on meanings of the digits in each place, using >, =, and < symbols to record the results of comparisons.

Introductory Task	Guided Practice	Collaborative	Homework	Golden Task

For problems 1 -4, compare the numbers then choose from <, >, or = to make the sentence true.

1) 23,802 ____ 23,789	3) 653,920 ____ 653,899
2) 107,344 ____ 107,351	4) 706,278 ____ 706,281

5) Write the smaller number from problem 1 above in words:

_____

_____

6) Write the larger number from problem 4 above in words:

_____

_____

7) Write the smaller number from problem 2 in Expanded Form:

_____ + _____ + _____ + _____ + _____ + _____

8) Write the larger number from problem 3 in Expanded Form:

_____ + _____ + _____ + _____ + _____ + _____

9) Choose any four of the six digits from below to make a number that makes the sentence below false:

4, 1, 2, 2, 8, 9, 1

_____ > 9,785

How many solutions can you find?

LESSON 2 4.NBT.2
Read and write multi-digit whole numbers using base-ten numerals, number names, and expanded form. Compare two multi-digit numbers based on meanings of the digits in each place, using >, =, and < symbols to record the results of comparisons.

Introductory Task	Guided Practice	Collaborative	Homework	Golden Task

For problems 1 -4, compare the numbers then choose from <, >, or = to make the sentence true.

1) 17,189 ____ 17,221	3) 568,732 ____ 568,740
2) 303,845 ____ 303,852	4) 611,109 ____ 611,118

5) Write the smaller number from problem 1 above in words:

_____

_____

6) Write the larger number from problem 4 above in words:

_____

_____

7) Write the smaller number from problem 2 in Expanded Form:

_____ + _____ + _____ + _____ + _____ + _____

8) Write the larger number from problem 3 in Expanded Form:

_____ + _____ + _____ + _____ + _____ + _____

9) Choose any four of the six digits from below to make a number that makes the sentence below true:

6, 7, 3, 2, 3, 8, 1

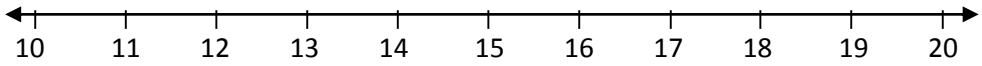
_____ > 8,698

How many solutions can you find?

LESSON 3 4.NBT.3
Use place value understanding to round multi-digit whole numbers to any place.

Introductory Task	Guided Practice	Collaborative	Homework	Golden Task

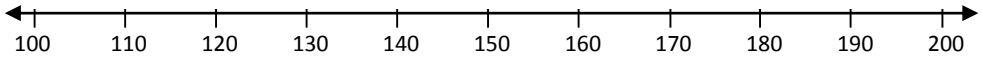
Use the number lines to answer the following problems:



1. What are the two multiples of 10 you see on the number line? _____ and _____.
2. Of the numbers 10 to 20, which are closer to 10? _____
3. Of the numbers 10 to 20, which are closer to 20? _____
4. What number is exactly halfway between 10 and 20? _____
5. Of the numbers 10 to 20, which will round to 10? _____
6. Of the numbers 10 to 20, which will round to 20? _____
7. On a number line that shows numbers 20 to 30, predict which numbers will round to 20:

   _____
8. On a number line that shows numbers 40 to 50, predict which numbers will round to 50:

   _____



9. What is the midpoint between 100 and 200? _____
10. Compare the number 146 to the midpoint. Based on that, round the number 146 to the nearest hundred: _____
11. Compare the number 162 to the midpoint. Based on that, round the number 162 to the nearest hundred: _____
12. Find the smallest number that rounds to 100: _____
13. Find the largest number that rounds to 200: _____

Focus Questions

Question 1: When is rounding useful to use?
Question 2: What is the role of the midpoint?

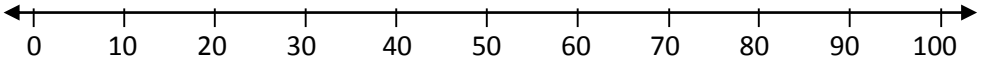
Journal Question

Predict what the number 2,498 will round to if we round it to the nearest thousand.

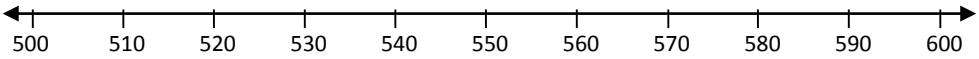
LESSON 3 4.NBT.3
Use place value understanding to round multi-digit whole numbers to any place.

Introductory Task	Guided Practice	Collaborative	Homework	Golden Task

Use the number lines to answer the following problems.



1. What are the multiples of 20 on the number line above? _____
2. What number is exactly halfway between 10 and 100? _____
3. Of the numbers 10 to 100, which will round to 100? _____
4. Of the numbers 10 to 100, which will round to 10? _____



5. What is the midpoint between 500 and 600? _____
6. Compare the number 556 to the midpoint. Based on that, round the number 556 to the nearest hundred: _____
7. Compare the number 548 to the midpoint. Based on that, round the number 548 to the nearest hundred: _____
8. Find the smallest number that rounds to 500: _____
9. Find the largest number that rounds to 600: _____

10. On a number line that shows numbers 200 to 300, predict which numbers will round to 200:

    _____

11. On a number line that shows numbers 800 to 900, predict which numbers will round to 900:

    _____

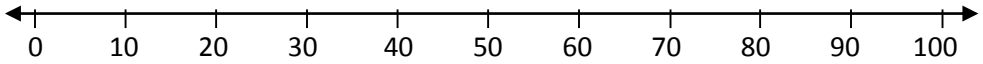
12. On a number line that shows numbers 900 to 1,100, predict which numbers will round to 1,000:

    _____

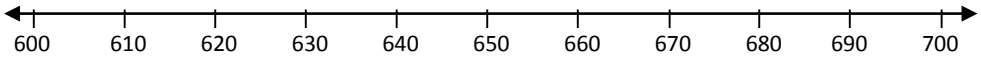
LESSON 3 4.NBT.3
Use place value understanding to round multi-digit whole numbers to any place.

Introductory Task	Guided Practice	Collaborative	Homework	Golden Task

Use the number lines to answer the following problems:



1. What are the multiples of 30 on the number line above? _____
2. What number is exactly halfway between 10 and 100? _____
3. Of the numbers 10 to 100, which will not round to 100? _____
4. Of the numbers 10 to 100, which will not round to 10?



5. What is the midpoint between 600 and 700? _____
6. Compare the number 650 to the midpoint. Based on that, round the number 650 to the nearest hundred: _____
7. Compare the number 658 to the midpoint. Based on that, round the number 658 to the nearest hundred: _____
8. Find the smallest number that rounds to 600: _____
9. Find the largest number that rounds to 700: _____

10. On a number line that shows numbers 400 to 500, predict which numbers will round to 400:

_____

11. On a number line that shows numbers 700 to 800, predict which numbers will round to 800:

_____

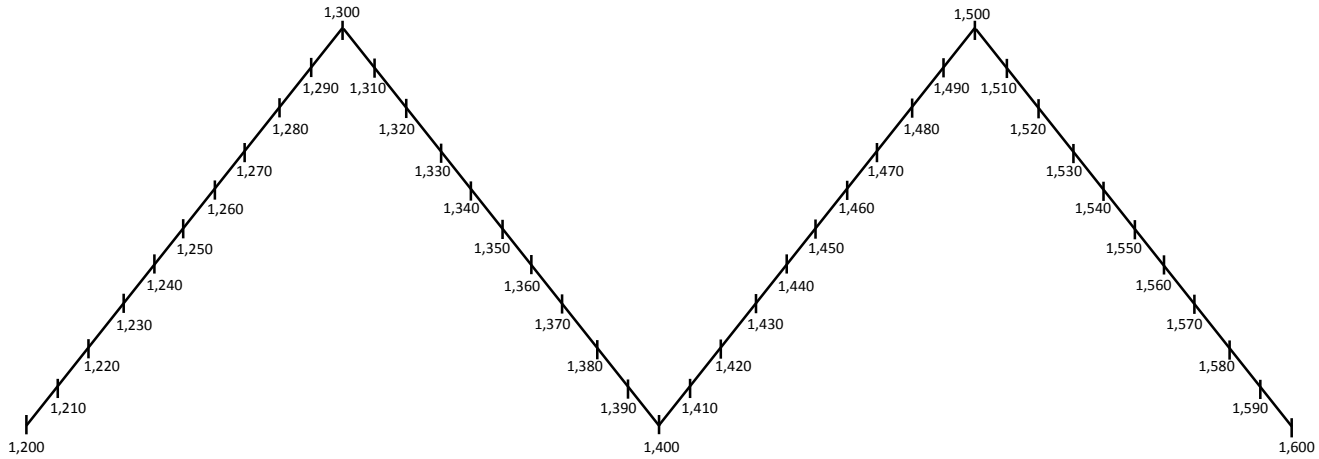
12. On a number line that shows numbers 800 to 1,000, predict which numbers will round to 900:

_____

LESSON 4 4.NBT.1-3: GOLDEN PROBLEM

Generalize place value understanding for multi-digit whole numbers.
Recognize that in a multi-digit whole number, a digit in one place represents ten times what it represents in the place to its right. Read and write multi-digit whole numbers using base-ten numerals, number names, and expanded form. Compare two multi-digit numbers based on meanings of the digits in each place, using >, =, and < symbols to record the results of comparisons. Use place value understanding to round multi-digit whole numbers to any place.

Introductory Task	Guided Practice	Collaborative	Homework	Golden Task



Use the number line above to answer the following questions:

Part A

a) How many TENS are in 1,250? _____ b) How many HUNDREDS are in 1,400 _____

c) Is the number 1,444 less than or greater than the midpoint between 1,440 and 1,450?
_____

Part B

Find all of the numbers that round to 1,300 when rounded to the nearest hundred:

_____

_____

Part C

Given the rounded number, determine what the original value could have been and which one it could not have been.

1,700

Provide a viable argument to support your reasoning.

Golden Problem RUBRIC

Mathematical Problem Solving: Thinking and Applying

SCORE POINT = 3

Part A: The student correctly determines that a) there are 125 TENS in 1,250 **AND** that b) there are 14 HUNDREDS in 1,400 **AND** that c) the number 1,444 is less than the midpoint (1,445) between 1,440 and 1,450,

AND

Part B: Correctly determines that all of the numbers (from the number line provided) that round to 1,300 are: *1,250, 1,260, 1,270, 1,280, 1,290, 1,300, 1,310, 1,320, 1,330, and 1,340,*

AND

Part C: The student correctly determines a valid number that could have been rounded to 1,700 either by rounding to the nearest Ten or nearest Hundred, AND the student correctly determines a valid number that could not have been rounded to 1,700 because rounding to the nearest Ten or Hundred would have arrived at a different number. The student provides a clear explanation to support their reasoning.

SCORE POINT = 2

The student correctly solves two of the three parts. Explanation or steps must be shown on how the student arrives at the answers. The explanation may not be clear.

SCORE POINT = 1

The student correctly solves one of the three parts. However, the student shows incomplete explanation.

SCORE POINT = 0

The response shows insufficient understanding of the problem's essential mathematical concepts. The procedures, if any, contain major errors. There may be no explanation of the solution or the reader may not be able to understand the explanation.