Grade 4 Target D

Domain, Target, Standards, DOK, Vertical Alignments, Achievement Levels, Evidence Required, Vocabulary, Response Types, Materials, Attributes, Question Types, and Question Banks (Examples)

Content Domain: Numbers and Operations in Base Ten
Target D [m]: 4.NBT.A Generalize place value understanding for multi-digit whole numbers.
Standards included in Target D: 4.NBT.A.1, 4.NBT.A.2, 4.NBT.A.3
Vertical Alignment
Achievement Level Descriptors
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Materials
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Claim 1: Concepts and Procedures (DOK 1, 2) Question Banks
Claim 3 Communicating Reasoning Question Banks

Content Domain: Numbers and Operations in Base Ten

Target D [m]: 4.NBT.A Generalize place value understanding for multi-digit whole numbers.

Standards included in Target D: 4.NBT.A.1, 4.NBT.A.2, 4.NBT.A.3

4.NBT.A Generalize place value understanding for multi-digit whole numbers.

4.NBT.A.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. For example, recognize that 700 ÷ 70 = 10 by applying concepts of place value and division.

4.NBT.A.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.

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

Vertical Alignment

Related Grade 3 standards

3.NBT.A Use place value understanding and properties of operations to perform multi-digit arithmetic.

These pages were adapted from open source documents available on the Smarter Balanced Website: http://www.smarterbalanced.org/assessments/development/ August 2016

3.NBT.A.1 Use place value understanding to round whole numbers to the nearest 10 or 100.

Related Grade 5 Standards

3.NBT.A Use place value understanding and properties of operations to perform multi-digit arithmetic.

3.NBT.A.1 Use place value understanding to round whole numbers to the nearest 10 or 100.

Achievement Level Descriptors

Level 1 Students should be able to read and write multi-digit whole numbers less than or equal to 1000 using base-ten numerals, number names, and expanded form; compare multi-digit numbers up to 1000 using <, >, and =; and round multi-digit whole numbers up to 1000 to any place.

Level 2 Students should look for and use repeated reasoning to generalize place value understanding to be able to read and write multi-digit whole numbers less than or equal to 100,000 using base-ten numerals, number names, and expanded form; compare multi-digit numbers up to 100,000 using <, >, and =; and round multi-digit whole numbers up to 100,000 to any place.

Level 3 Students should look for and use repeated reasoning to generalize place value understanding to be able to read and write multi-digit whole numbers less than or equal to 1,000,000 using base-ten numerals, number names, and expanded form; compare multi-digit numbers up to 1,000,000 using <, >, and =; round multi-digit whole numbers up to 1,000,000 to any place; and 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.

Level 4 No Descriptor

Evidence Required

1. The student compares two multi-digit whole numbers in the same form using >, <, and = symbols.

2. The student rounds multi-digit whole numbers to any place.

3. The student identifies multi-digit whole numbers that, when rounded to a given place value, will be closest to a given number.

4. The student compares two multi-digit whole numbers in different forms.

5. The student explains the difference between the values of a numeral in the tens and the ones place, the hundreds place and the tens place, or the thousands place and the hundreds place in

mathematical situations.

Vocabulary

nearest ten, nearest hundred, nearest thousand, nearest ten thousand, nearest hundred thousand, ones, tens, hundreds, thousands, ten thousands, hundred thousands, millions

Response Types

Multiple Choice, single correct response; Multiple choice, multiple correct responses; Matching Table; Equation/Numeric

Materials

- Multi-digit whole numbers less than or equal to 1,000,000 in any of these forms:
    - Numeric form (e.g., 427)
    - Expanded form (e.g., 400 + 20 + 7)
    - "Expanded word" form (e.g., 4 hundreds + 2 tens + 7 ones)
- Comparisons using <, >, or =
- Numbers that include a 0 in one or more place values

Attributes

Items will include multi-digit whole numbers less than or equal to 1,000,000.

Claim 1: Concepts and Procedures (DOK 1, 2) Question Banks

Students can explain and apply mathematical concepts and carry out mathematical procedures with precision and fluency.

Claim 1 4.NBT.A.2 DOK Level 1

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.

Evidence Required

The student solves contextual problems involving multiplicative comparisons, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.

Question Type 1: The student is presented with two pairs of multi-digit whole numbers and directed to compare them using (<, >, or =).

Select the symbol (<, >, or =) that correctly compares each pair of numbers.

	<	>	=
6,285 □ 6,258			
47,385 □ 47,299			

Rubric: (1 point) The student selects the correct symbols (e.g., >, >).
Response Type: Matching Table

Question Type 2: The student is presented with two multi-digit whole numbers in numeric form. One number has a box to represent an unknown digit.

1. A cat has 2 times as many toys as a puppy. The cat has 10 toys. How many toys does the puppy have?

Identify a digit that, when placed in the box (□), makes this comparison true.

524,9□7 < 524,932

Enter the digit in the response box.

Rubric: (1 point) The student enters a digit to create a correct comparison (e.g., 2, 1, or 0).
Response Type: Equation/Numeric

Question Type 3: The student is prompted to generate a multi-digit number from a given set of digits to create a larger number for the given context.

Joe and Kate were playing a number game with the following four cards.

The winner of the game is the person that makes the number with the greatest value.
Joe made the number 6731. Using the same cards, what number could Kate make to win the game?

Rubric: (1 point) The student enters a number greater than 6731 (e.g., 7631, 7613, 7361, 7316, 7163, 7136, etc.).

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Claim 1 4.NBT.A.3 DOK Level 1

Use place value understanding to round multi-digit whole numbers to any place.

Evidence Required:
The student rounds multi-digit whole numbers to any place.

Question Type 1: The student is presented with a multi-digit whole number in numeric form and the name of a place value to which the number should be rounded.

1. Round 4108 to the nearest thousand. Enter your answer in the response box.

2. Round 658,749 to the nearest ten thousand. Enter your answer in the response box.

Rubric: (1 point) The student enters the number correctly rounded to the nearest designated place value (e.g., 4000; 660,000).
Response Type: Equation/Numeric

Claim 1 4.NBT.A.3 DOK Level 2

Use place value understanding to round multi-digit whole numbers to any place.

Evidence Required:
The student identifies multi-digit whole numbers that, when rounded to a given place, will be closest to a given number.

Question Type 1: The student is presented with a multi-digit whole number in numeric form and the name of a place value.

When rounding to the nearest thousand, what is the least whole number that rounds to 16,000? Enter your answer in the response box.

Rubric: (1 point) The student enters the correct number (e.g., 15,500).
Response Type: Equation/Numeric

Question Type 2: The student is presented with a multi-digit whole number in numeric form and the name of a place value.

When rounding to the nearest thousand, select all numbers that round to 16,000.

A. 16,204
B. 15,179
C. 16,523
D. 15,545

Rubric: (1 point) The student correctly identifies the numbers that round to a given number (e.g., A, D).
Response Type: Multiple choice, multiple correct responses

Claim 1 4.NBT.A.2 DOK Level 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.

Evidence Required:
The student compares two multi-digit whole numbers in different forms.

Question Type 1: The student is presented with three comparisons of two multi-digit whole numbers in different forms.

Select True or False for each comparison.

	True	**False**
5 hundreds + 4 tens > 50 + 400		
524 < 50 + 200 + 4		
50 tens + 20 ones = 520		

Rubric: (1 point) The student correctly identifies three comparisons as true or false (e.g., T, F, T).
Response Type: Matching Tables

Claim 1 4.NBT.A.1 DOK Level 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. For example, recognize that 700 ÷ 70 = 10 by applying concepts of place value and division.

Evidence Required:

The student explains the difference between the values of a numeral in the tens and the ones place, the hundreds place and the tens place, or the thousands place and the hundreds place in mathematical situations.

Question Type 1: The student is presented with two multi-digit whole numbers.

Select the statement that explains how the values of the numbers 420 and 4200 are different.

A. 4200 is 1000 times as large as 420.
B. 4200 is 100 times as large as 420.
C. 4200 is 10 times as large as 420.
D. 4200 is 1 time as large as 420.

Rubric: (1 point) The student selects the correct statement (e.g., C).
Response Type: Multiple Choice, single correct response
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Question Type 2: The student is presented with two multi-digit whole numbers in context.

Jim and Tom collected empty soda cans to raise money. Jim collected 70 cans and Tom collected 700 cans.

The number of cans Tom collected is how many times greater than the number of cans Jim collected?

Enter your answer in the response box.

Rubric: (1 point) The student enters the correct value (e.g., 10).
Response Type: Equation/Numeric

Claim 3 Communicating Reasoning Question Banks

Claim Descriptors and Targets

Students can clearly and precisely construct viable arguments to support their own reasoning and to critique the reasoning of others.

Example 1

Mr. Spivak's class was finding the volume of a right rectangular prism with dimensions 20 cm, 45 cm, and 80 cm.
Brigit said, "I tried two ways of multiplying the dimensions and got different answers. I can't figure out what went wrong."
She explained her two ways to Mr. Spivak.

First method:
Step 1: I distributed.
$20 \times (45 \times 80) = (20 \times 45) + (20 \times 80)$
Step 2: I multiplied 20 by 45 and 20 by 80.
$= 900 + 1600$
Step 3: Then I added.
$= 2500$

Second method:
Step 1: I broke apart the numbers.
$20 \times 45 \times 80 = (2 \times 10) \times (5 \times 9) \text{ x } (8 \times 10)$
Step 2: I rearranged the numbers.
Step 3: Then I multiplied everything.
$= 72 \times (10 \times 100) = 72{,}000$

Which method has an error? Which step has the first error in that method?
Brigit's [drop-down options: first, second] method has an error. She made the error in step [drop-down options: 1, 2, 3].

Rubric: (1 point) The student selects the incorrect method (first) and identifies the step in which the error occurred (1).
Response Type: Drop-down Menu7