| Task Model 1

Response Type:
Equation/Numeric

DOK Level 1

4.NBT.B.4
Fluently add and subtract multi-digit whole numbers using the standard algorithm.

Evidence Required:
1. The student adds or subtracts whole numbers in non-contextual mathematics problems.

Tools: None

Version 3 Update:
Added example stem 2 to TM1a. | **Prompt Features:** The student is prompted to add two or more multi-digit whole numbers, or to subtract two multi-digit whole numbers.

Stimulus Guidelines:
Follow any stated guidelines on allowable number ranges.
At least one number in each item should be at least four digits.
Present numbers horizontally (4325+654=?), vertically, or with words (what is the difference between 4003 and 1486?).
Item difficulty can be adjusted via these example methods:
The number of times composing or decomposing is required while solving the problem
The absence/presence of zeros
More than 2 addends
Selecting numbers that are easier or harder to add/subtract (e.g., doubles + 1 are typically easier), numbers closer to 10 or 100
TM1a
Stimulus: The student is presented with a non-contextual addition problem with two or more whole numbers.

Example Stem 1: Enter the sum.

    4325
  + 654
  ‾‾‾‾‾‾

Example Stem 2: Add together 33, 149, and 67. Enter the sum in the response box.

Rubric: (1 point) The student enters the correct number (e.g., 4,979; 249).

Response Type: Equation/Numeric |

Task Model 1	**TM1b**
Response Type: Equation/Numeric	**Stimulus:** The student is presented with a non-contextual subtraction problem.
DOK Level 1	**Example Stem 1:** Enter the difference.
4.NBT.B.4 Fluently add and subtract multi-digit whole numbers using the standard algorithm.	7529 - 382
Evidence Required: 1. The student adds or subtracts whole numbers in non-contextual mathematics problems.	**Example Stem 2:** Enter the difference. 4003 - 1486 **Rubric:** (1 point) The student enters the correct number (e.g., 7,147; 2,517).
Tools: None	**Response Type:** Equation/Numeric

Task Model 2a **Response Type: Equation/Numeric** **DOK Level 1** **4.NBT.B.5** Multiply a whole number of up to four digits by a one-digit whole number, and multiply two two-digit numbers, using strategies based on place value and the properties of operations. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models. **Evidence Required:** 2. The student multiplies whole numbers (up to four digits by one digit or two digits by two digits) using strategies based on place value and the properties of operations. **Tools:** None **Version 3 Update:** Added example stem 2 to TM2a.	**Prompt Features:** The student is prompted to multiply two whole numbers. **Stimulus Guidelines:** • Follow any stated guidelines on allowable number ranges. • Item difficulty can be adjusted via these example methods: ○ One factor is a multiple of 10, 100, or 1000 ○ One or more partial products result from multiplying 5 by an even digit (e.g., multiplying 5 by 4 gives 20, but 5 by 40 gives 200 – the extra 0 seems to violate the pattern of "when you multiply ones by tens, just add a zero on the end") ○ Factors contain digits that are easier to multiply (e.g., multiplying by 2 or 5 is typically easier than multiplying by 6, 7, or 8). ○ Solving the problem requires composing/ decomposing ○ Presenting numbers horizontally vs. vertically; larger number first vs. smaller number first **TM2a** **Stimulus:** The student is presented with a non-contextual multiplication problem. **Example Stem 1:** Enter the product. $$\begin{array}{r} 5327 \\ \times \quad\ \ 4 \\ \hline \end{array}$$ **Example Stem 2:** Multiply 48 and 20. Enter the product in the response box. **Rubric:** (1 point) The student multiplies two whole numbers and enters the correct product (e.g., 21,308; 960). **Response Type:** Equation/Numeric

Task Model 2b **Response Type: Equation/Numeric** **DOK Level 2** **4.NBT.B.5** Multiply a whole number of up to four digits by a one-digit whole number, and multiply two two-digit numbers, using strategies based on place value and the properties of operations. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models. **Evidence Required:** 2. The student multiplies whole numbers (up to four digits by one digit or two digits by two digits) using strategies based on place value and the properties of operations. **Tools:** None **Version 3 Update:** Revised Example Stem 2 in TM2b to include an area model.	**Prompt Features:** The student is prompted to complete a multiplication strategy. **Stimulus Guidelines:** Same as for TM2a. **TM2b** **Stimulus:** The student is presented with a multiplication expression in which properties of operations have been used as strategies for multiplication, with one unknown number. **Example Stem 1:** Enter the unknown number that makes the equation true. $26 \times 74 = (20 + 6) \times (\square + 4)$ **Rubric:** (1 point) The student enters the unknown number that makes the equation true (e.g., 70). **Response Type:** Equation/Numeric **Example Stem 2:** In the area model shown, A = 2700 and D = 7. What are the values of B and C? **Rubric:** (1 point) The student enters correct numbers for B and C (e.g., B = 210, C = 450). **Response Type:** Equation/Numeric (2 response boxes, labeled B = and C =, respectively).

Task Model 2c-d	**Prompt Features:** The student is prompted to select a multiplication strategy.
Response Type: Multiple Choice, single correct response	**Stimulus Guidelines:** Same as for TM2a.
DOK Level 2	**TM2c**
4.NBT.B.5 Multiply a whole number of up to four digits by a one-digit whole number, and multiply two two-digit numbers, using strategies based on place value and the properties of operations. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.	**Stimulus:** The student is presented with a multiplication expression in the stem and expressions reflecting use of the distributive property or decomposition of factors in the answer choices.

Example Stem: Which expression is equal to 36×94?

    A. $(30 \times 90) + (6 \times 4)$
    B. $(30 + 6) \times (90 + 4)$
    C. $(30 + 6) \times 94 + (30 + 6) \times 4$
    D. $(30 \times 90) + (30 \times 6) + (90 \times 6) + (90 \times 4)$

Rubric: (1 point) The student selects a correct expression (e.g., B).

Response Type: Multiple Choice, single correct response

Evidence Required:
2. The student multiplies whole numbers (up to four digits by one digit or two digits by two digits) using strategies based on place value and the properties of operations.

Tools: None

TM2d
Stimulus: The student is presented with a multiplication problem and four vertically recorded partial solutions.

Example Stem: Which strategy for multiplying 94 and 36 should result in the correct product?

A.	94	B.	94	C.	94	D.	94
	× 36		× 36		× 36		× 36
	24		24		2700		2700
	540		54		540		540
	120		120		120		120
	+ 270		+ 2700		+240		+ 24

Rubric: (1 point) The student selects a correct strategy (e.g., D).

Response Type: Multiple Choice, single correct response

Task Model 3a **Response Type: Equation/Numeric** **DOK Level 1** **4.NBT.B.6** Find whole-number quotients and remainders with up to four-digit dividends and one-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models. **Evidence Required:** 3. The student finds whole number quotients and remainders (up to four-digit dividends and one-digit divisors) using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. **Tools:** None **Version 3 Update:** Revised TM3a to focus on the relationship between multiplication and division with, or without, a remainder.	**Prompt Features:** The student is prompted to divide two whole numbers or determine the remainder when given two factors of a quotient plus an unknown number. **Stimulus Guidelines:** • Follow any stated guidelines on allowable number ranges. • Item difficulty can be adjusted via these example methods: ○ Using an easier divisor (e.g., dividing by 2 or 5 is typically easier than dividing by 6, 7, or 8) ○ Dividends that do or do not contain 0s (e.g., dividing 527 by 4 will be easier than dividing 507 by 4) ○ Divisors that are greater than, less than, or equal to the first digit of the dividend (e.g., dividing 839 by 7 will be easier than dividing 639 by 7) ○ Partial remainders of 0 (e.g., dividing 83 by 3 will be easier than dividing 83 by 4) ○ Partial dividends that are greater than the divisor (e.g., dividing 632 by 5 will be easier than dividing 632 by 6) ○ Problems that are "math facts" (e.g., dividing 64 by 8 will be easier than dividing 68 by 8) **TM3a** **Stimulus:** The student is presented with an equation that illustrates the relationship between multiplication and division with, or without, a remainder. (Note: In the case of a remainder as the unknown, be sure the number is less than the single digit factor.) **Example Stem 1:** Enter the unknown number that makes the equation true. $2571 \div 3 = \square$ **Example Stem 2:** Enter the unknown number that makes the equation true. $120 \times 5 + \square = 603$ **Rubric:** (1 point) The student enters the correct unknown number (857; 3). **Response Type:** Equation/Numeric

| Task Model 3b

Response Type: Equation/Numeric

DOK Level 2

4.NBT.B.6
Find whole-number quotients and remainders with up to four-digit dividends and one-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.

Evidence Required:
3. The student finds whole number quotients and remainders (up to four-digit dividends and one-digit divisors) using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division.

Tools: None | **Prompt Features:** The student is prompted to complete the decomposition of a dividend as a strategy to divide.

Stimulus Guidelines: Same as for TM3a.

TM3b
Stimulus: The student is presented with a non-contextual division problem with a box to represent an unknown number.

Example Stem: Enter the unknown number to make the equation true.

$98 \div 5 = (\square \div 5) + (8 \div 5)$

Rubric: (1 point) The student enters the correct number (e.g., 90).

Response Type: Equation/Numeric |

| Task Model 3c

Response Type: Multiple Choice, single correct response

DOK Level 1

4.NBT.B.6
Find whole-number quotients and remainders with up to four-digit dividends and one-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.

Evidence Required:
3. The student finds whole number quotients and remainders (up to four-digit dividends and one-digit divisors) using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division.

Tools: None | **Prompt Features:** The student is prompted to select a multiplication equation that is the inverse of a given division equation.

Stimulus Guidelines: Same as for TM3a.

TM3c
Stimulus: The student is presented with a division equation with a box representing an unknown number.

Example Stem: Select the equation that has the same unknown number as $90 \div 5 = \square$.

  A. $5 \times 90 = \square$
  B. $90 \times \square = 5$
  C. $5 \times \square = 90$
  D. $\square \times 90 = 5$

Rubric: (1 point) The student selects the related multiplication equation (e.g., C).

Response Type: Multiple Choice, single correct response |

Task Model 3d **Response Type: Equation/Numeric** **DOK Level 1** **4.NBT.B.6** Find whole-number quotients and remainders with up to four-digit dividends and one-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models. **Evidence Required:** 3. The student finds whole number quotients and remainders (up to four-digit dividends and one-digit divisors) using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. **Tools:** None **Version 3 Update:** Added new TM3d.	**Prompt Features:** The student is prompted to determine the whole number quotient and remainder when given a contextual problem to solve. **Stimulus Guidelines:** Same as for TM3a. **TM3d** **Stimulus:** The student is presented with a contextual division problem where the student must identify the whole number quotient and remainder. **Example Stem:** A teacher has 1247 craft sticks. She divides them equally among 9 students. How many craft sticks does each student get? Enter your answer in the first response box. How many craft sticks are left over? Enter your answer in the second response box. **Rubric:** (1 point) The student enters the correct numbers in each response box (e.g., 138, 5). **Response Type:** Equation/Numeric, two response boxes