Claim 1: Concepts and Procedures Students can explain and apply mathematical concepts and carry out mathematical procedures with precision and fluency.	
Content Domain: **Operations and Algebraic Thinking**	
Target B [s]: Gain familiarity with factors and multiples. (DOK 1, 2) Tasks for this target will ask students to find factor pairs and determine whether a whole number (1–100) is a multiple of a given one-digit number and whether a whole number (1–100) is prime or composite.	

Standards: 4.OA.B, 4.OA.B.4	**4.OA.B Gain familiarity with factors and multiples.** **4.OA.B.4** Find all factor pairs for a whole number in the range 1–100. Recognize that a whole number is a multiple of each of its factors. Determine whether a given whole number in the range 1–100 is a multiple of a given one-digit number. Determine whether a given whole number in the range 1–100 is prime or composite.
Related Below-Grade and Above-Grade Standards for Purposes of Planning for Vertical Scaling: 3.OA.A, 3.OA.A.4, 3.OA.B, 3.OA.B.5, 3.OA.B.6, 3.OA.C, 3.OA.C.7, 3.NBT.A, 3.NBT.A.3 5.NBT.B, 5.NBT.B.6, 5.NF.A, 5.NF.A.1	**Related Grade 3 Standards** **3.OA.A Represent and solve problems involving multiplication and division.** **3.OA.A.4** Determine the unknown whole number in a multiplication or division equation relating three whole numbers. **3.OA.B Understand properties of multiplication and the relationship between multiplication and division.** **3.OA.B.5** Apply properties of operations as strategies to multiply and divide. *Examples: If 6 × 4 = 24 is known, then 4 × 6 = 24 is also known. (Commutative property of multiplication.) 3 × 5 × 2 can be found by 3 × 5 = 15, then 15 × 2 = 30, or by 5 × 2 = 10, then 3 × 10 = 30. (Associative property of multiplication.) Knowing that 8 × 5 = 40 and 8 × 2 = 16, one can find 8 × 7 as 8 × (5 + 2) = (8 × 5) + (8 × 2) = 40 + 16 = 56. (Distributive property.)* **3.OA.B.6:** Understand division as an unknown-factor problem. *For example, find 32 ÷ 8 by finding the number that makes 32 when multiplied by 8.* **3.OA.C Multiply and divide within 100.** **3.OA.C.7** Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g., knowing that 8 × 5 = 40, one knows 40 ÷ 5 = 8) or properties of operations. By the end of Grade 3, know from memory all products of two one-digit numbers. **3.NBT.A Use place value understanding and properties of operations to perform multi-digit arithmetic.**

	3.NBT.A.3 Multiply one-digit whole numbers by multiples of 10 in the range 10–90 (e.g., 9 × 80, 5 × 60) using strategies based on place value and properties of operations. **Related Grade 5 Standards** **5.NBT.B Perform operations with multi-digit whole numbers and with decimals to hundredths.** **5.NBT.B.6** Find whole-number quotients of whole numbers with up to four-digit dividends and two-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. **5.NF.A Use equivalent fractions as a strategy to add and subtract fractions.** **5.NF.A.1** Add and subtract fractions with unlike denominators (including mixed numbers) by replacing given fractions with equivalent fractions in such a way as to produce an equivalent sum or difference of fractions with like denominators. *For example, 2/3 + 5/4 = 8/12 + 15/12 = 23/12.* (In general, *a/b + c/d = (ad + bc)/bd.*) Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies, including rounding.
DOK Levels:	1, 2
Achievement Level Descriptors:	
RANGE Achievement Level Descriptor (Range ALD) Target B: Gain familiarity with factors and multiples.	**Level 1** Students should be able to recognize that a whole number is a multiple of each of its factors.
	Level 2 Students should be able to find factor pairs for whole numbers in the range of 1–100 that are multiples of 2 or 5 and determine whether a given whole number in the range of 1–100 is a multiple of a given one-digit number.
	Level 3 Students should be able to find all factor pairs for whole numbers in the range of 1–100 and determine whether a given whole number in the range of 1–100 is prime or composite.
	Level 4 No Descriptor
Evidence Required:	1. The student determines one or more factors or factor pairs for a given whole number (from 1 to 100). 2. The student recognizes that a whole number (from 1 to 100) is a multiple of each of its factors. 3. The student determines if a whole number (from 1 to 100) is a multiple of a given one-digit number. 4. The student determines if a whole number (from 1 to 100) is prime or composite.

Allowable Response Types:	Multiple Choice, single correct response; Drag and Drop; Matching Tables; Hot Spot; Fill-in Table
Allowable Stimulus Materials:	whole numbers from 1 to 100, tables, lists, sets, 100s chart
Construct-Relevant Vocabulary:	whole number, prime, composite, factor, factor pair, multiple
Allowable Tools:	None
Target-Specific Attributes:	Numbers used in this target must be in the range 1 to 100.
Non-Targeted Constructs:	None
Accessibility Guidance:	Item writers should consider the following Language and Visual Element/Design guidelines[1] when developing items. Language Key Considerations: • Use simple, clear, and easy-to-understand language needed to assess the construct or aid in the understanding of the context • Avoid sentences with multiple clauses • Use vocabulary that is at or below grade level • Avoid ambiguous or obscure words, idioms, jargon, unusual names and references Visual Elements/Design Key Considerations: • Include visual elements only if the graphic is needed to assess the construct or it aids in the understanding of the context • Use the simplest graphic possible with the greatest degree of contrast, and include clear, concise labels where necessary • Avoid crowding of details and graphics Items are selected for a student's test according to the blueprint, which selects items based on Claims and targets, not task models. As such, careful consideration is given to making sure fully accessible items are available to cover the content of every Claim and target, even if some item formats are not fully accessible using current technology.[2]
Development Notes:	None

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[1] For more information, refer to the General Accessibility Guidelines at:
http://www.smarterbalanced.org/wordpress/wp-content/uploads/2012/05/TaskItemSpecifications/Guidelines/AccessibilityandAccommodations/GeneralAccessibilityGuidelines.pdf
[2] For more information about student accessibility resources and policies, refer to
http://www.smarterbalanced.org/wordpress/wp-content/uploads/2014/08/SmarterBalanced_Guidelines.pdf

Task Model 1a-b	**Prompt Features:** The student is prompted to identify factors of a whole number.
Response Type: Multiple Choice, single correct response	**Stimulus Guidelines:**
DOK Level 1	• All of the number's factors (or factor pairs) should be included in the key; distractors will include the same number of entries and will include numbers that are not factors (or factor pairs).

4.OA.B.4 Find all factor pairs for a whole number in the range 1–100. Recognize that a whole number is a multiple of each of its factors. Determine whether a given whole number in the range 1–100 is a multiple of a given one-digit number. Determine whether a given whole number in the range 1–100 is prime or composite.	• Numbers used are whole numbers within the range of 1–100.
	 • Item difficulty can be adjusted via these example methods:
	     o Changing the range of numbers used
	     o Using prime numbers
	     o Using numbers outside the 10 × 10 table

	TM1a **Stimulus:** The student is presented with a whole number and lists of whole number factors.
	Example Stem: Which list has **all** of the factors of 36?
Evidence Required: 1. The student determines one or more factors or factor pairs for a given whole number (from 1 to 100).	A. 1, 2, 3, 4, 6, 9, 12, 18, 36 B. 1, 2, 3, 6, 8, 9, 12, 16, 36 C. 1, 2, 4, 6, 8, 9, 16, 18, 36 D. 1, 2, 3, 5, 6, 9, 12, 18, 36
Tools: None	**TM1b** **Stimulus:** The student is presented with a whole number and lists of pairs of whole number factors.
	Example Stem: Which list has **all** of the factor pairs of 36?
	A. 1 × 36, 2 × 18, 3 × 12, 4 × 9, 6 × 6 B. 1 × 36, 2 × 16, 3 × 12, 4 × 9, 6 × 8 C. 1 × 36, 2 × 18, 3 × 6, 4 × 8, 6 × 12 D. 1 × 36, 2 × 12, 3 × 9, 4 × 8, 6 × 6
	Rubric: (1 point) The student identifies the correct list (e.g., A; A).
	Response Type: Multiple Choice, single correct response

Task Model 1c	**Prompt Features:** The student is prompted to identify factor pairs of a whole number.
Response Type: **Drag and Drop**	
DOK Level 1	**Stimulus Guidelines:**
4.OA.B.4 Find all factor pairs for a whole number in the range 1–100. Recognize that a whole number is a multiple of each of its factors. Determine whether a given whole number in the range 1–100 is a multiple of a given one-digit number. Determine whether a given whole number in the range 1–100 is prime or composite.	- Numbers used in the presets are whole numbers within the range of 2–20. - The whole number presented in the stem is **not** 4, 9 or 16. **TM1c** **Stimulus:** The student is presented with a whole number in the range of 2–20 (excluding 4, 9, and 16) and a set of multiplication equations with boxes for all possible factor pairs, each having the given whole number as the product.
	Example Stem: Drag numbers into the boxes to make factor pairs of 12.

Prompt Features: The student is prompted to identify factor pairs of a whole number.

Stimulus Guidelines:
- Numbers used in the presets are whole numbers within the range of 2–20.
- The whole number presented in the stem is **not** 4, 9 or 16.

TM1c
Stimulus: The student is presented with a whole number in the range of 2–20 (excluding 4, 9, and 16) and a set of multiplication equations with boxes for all possible factor pairs, each having the given whole number as the product.

Example Stem: Drag numbers into the boxes to make factor pairs of 12.

$$\square \times \square = 12$$

$$\square \times \square = 12$$

$$\square \times \square = 12$$

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 10 | 11 | 12 | | | | | | |

Evidence Required:
1. The student determines one or more factors or factor pairs for a given whole number (from 1 to 100).

Tools: None

Accessibility Note: Drag and Drop items are not currently able to be Brailled. Minimize the number of items developed to this TM.

Rubric: (1 point) The student identifies all of the correct factor pairs (e.g., 1 × 12, 2 × 6, 3 × 4).

Response Type: Drag and Drop

Task Model 1d	**Prompt Features:** The student is prompted to identify a common factor of two numbers.
Response Type: Multiple Choice, single correct response	
	Stimulus Guidelines:
	• Numbers used are whole numbers within the range of 1–100.
DOK Level 1	
	TM1d
4.OA.B.4 Find all factor pairs for a whole number in the range 1–100. Recognize that a whole number is a multiple of each of its factors. Determine whether a given whole number in the range 1–100 is a multiple of a given one-digit number. Determine whether a given whole number in the range 1–100 is prime or composite.	**Stimulus:** The student is presented with two whole numbers within the range of 1–100.
	Example Stem: Which number is a factor of **both** 16 and 20?
	A. 3
	B. 4
	C. 5
	D. 8
	Rubric: (1 point) The student identifies a common factor (e.g., B).
Evidence Required: 1. The student determines one or more factors or factor pairs for a given whole number (from 1 to 100).	**Response Type:** Multiple Choice, single correct response
Tools: None	

Task Model 1e	Prompt Features: The student is prompted to identify common factors of two numbers.

Response Type:
Multiple Choice, single correct response
 	
DOK Level 1
 	
4.OA.B.4
Find all factor pairs for a whole number in the range 1–100. Recognize that a whole number is a multiple of each of its factors. Determine whether a given whole number in the range 1–100 is a multiple of a given one-digit number. Determine whether a given whole number in the range 1–100 is prime or composite.
 	
Evidence Required:
1. The student determines one or more factors or factor pairs for a given whole number (from 1 to 100).
 	
Tools: None
	Stimulus Guidelines:
	• Numbers used are whole numbers within the range of 1–100.
	• Answer choices should be in the form of lists of three to four whole numbers.
	• Item difficulty can be adjusted via these example methods:
	    ○ Changing the range of numbers used
	    ○ Using numbers outside the 10 × 10 table
	
	TM1e
	Stimulus: The student is presented with two whole numbers.
	
	Example Stem: Which numbers are factors of **both** 18 and 45?
	  A. 1, 2, 8
	  B. 1, 3, 9
	  C. 1, 4, 8
	  D. 1, 5, 9
	
	Rubric: (1 point) The student identifies common factors of two whole numbers (e.g., B).
	
	Response Type: Multiple Choice, single correct response

Task Model 1f

Response Type: Fill-in Table

DOK Level 1

4.OA.B.4
Find all factor pairs for a whole number in the range 1–100. Recognize that a whole number is a multiple of each of its factors. Determine whether a given whole number in the range 1–100 is a multiple of a given one-digit number. Determine whether a given whole number in the range 1–100 is prime or composite.

Evidence Required:
1. The student determines one or more factors or factor pairs for a given whole number (from 1 to 100).

Tools: None

Prompt Features: The student is prompted to identify factor pairs of a whole number.

Stimulus Guidelines:
- A maximum of four equations/factor pairs should be required.
- Item difficulty can be adjusted via these example methods:
  - Number of factor pairs required
  - Familiarity with the number
  - Changing the range of numbers used
  - Using numbers outside the 10 × 10 table

TM1f
Stimulus: The student is presented with a whole number in the range of 1–100 and multiplication equations equaling that whole number with unknown factors in a fill-in table.

Example Stem: Enter numbers into the boxes to make four different factor pairs of 54.

	×		= 54
	×		= 54
	×		= 54
	×		= 54

Rubric: (1 point) The student identifies four different factor pairs of the number (e.g., 1 and 54, 2 and 27, 3 and 18, 6 and 9).

Note: Numbers may be in either order (e.g., 1 and 54 **or** 54 and 1).

Response Type: Fill-in Table

Task Model 1g-h	**Prompt Features:** The student is prompted to identify factors of a whole number.

Response Types: Multiple Choice, single correct response and Equation/Numeric
 	
DOK Level 1
 	
4.OA.B.4
Find all factor pairs for a whole number in the range 1–100. Recognize that a whole number is a multiple of each of its factors. Determine whether a given whole number in the range 1–100 is a multiple of a given one-digit number. Determine whether a given whole number in the range 1–100 is prime or composite.
 	
Evidence Required:
1. The student determines one or more factors or factor pairs for a given whole number (from 1 to 100).
 	
Tools: None
 	
Version 3 Update:
Added two new task models TM1g and TM1h.
	Stimulus Guidelines:
	• All of the number's factors (or factor pairs) should be included in the key; distractors will include the same number of entries and will include numbers that are not factors (or factor pairs).
	• Numbers used are whole numbers within the range of 1–100.
	• Item difficulty can be adjusted via these example methods:
	   o Changing the range of numbers used
	   o Using prime numbers
	   o Using numbers outside the 10 × 10 table
	
	TM1g
	Stimulus: The student is presented with a whole number and lists of whole number factors with one factor missing.
	
	Example Stem: Which factor of 12 is missing in this list of numbers?
	
	1, 2, 3, 4, __, 12
	
	   A. 5
	   B. 6
	   C. 8
	   D. 10
	
	Rubric: (1 point) The student identifies the correct missing factor (e.g., B).
	
	Response Type: Multiple Choice, single correct response
	
	TM1h
	Stimulus: The student is presented with a whole number and lists of whole number factors with one factor missing.
	
	Example Stem: Which factor of 24 is missing in this list of numbers?
	
	1, 2, 3, 4, 6, __, 12, 24
	
	Rubric: (1 point) The student identifies the correct missing factor (e.g., 8).
	
	Response Type: Equation/Numeric

Task Model 2

Response Type: Hot Spot/Matching Tables

DOK Level 2

4.OA.B.4
Find all factor pairs for a whole number in the range 1–100. Recognize that a whole number is a multiple of each of its factors. Determine whether a given whole number in the range 1–100 is a multiple of a given one-digit number. Determine whether a given whole number in the range 1–100 is prime or composite.

Evidence Required:
2. The student recognizes that a whole number (from 1 to 100) is a multiple of each of its factors.

Tools: None

Accessibility Note: Hot Spot items are not currently able to be Brailled, but the only current way to assign partial credit. Minimize the number of items developed to this TM using Hot Spot. An accessible alternate to Hot Spot for this TM is to use the Matching Tables format when partial credit scoring becomes available for this format.

Prompt Features: The student is prompted to match factors and multiples.

Stimulus Guidelines:
- All numbers are whole numbers within the range of 1–100.
- Item must include at least one number for each column (e.g., cannot have a column that should be left blank).
- Item difficulty can be adjusted via these example methods:
    - Using factors of 1, 2, or 5
    - Using factors of 3 or 4
    - Using factors of 6, 7, 8, or 9
    - Using prime numbers
    - Using numbers outside the 10 × 10 table

TM2
Stimulus: The student is presented with a one-digit whole number and six additional whole numbers.

Example Stem: Decide whether each number is a multiple of 6, a factor of 6, or neither. Each number may be matched to more than one description. Click in the table to respond.

	Multiple of 6	**Factor of 6**	**Neither a Multiple Nor a Factor of 6**
1			
2			
3			
6			
8			
12			

Rubric: (3 points) The student correctly fills in all three columns (e.g., Multiple column: 6, 12; Factor column: 1, 2, 3, 6; Neither column: 8), with no incorrect fill-ins.
(2 points) Partial credit is possible for correctly filling in two of the three columns (e.g., Multiple column and Neither column filled in correctly, but Factor column not filled in correctly), with no incorrect fill-ins on the two columns (e.g., Multiple and Neither).
(1 point) Partial credit is possible for correctly filling in one of the three columns (e.g., Multiple column filled in correctly but Factor and Neither column not filled in correctly), with no incorrect fill-ins on the one column (e.g., Multiple).

Response Type: Hot Spot or Matching Tables

| Task Model 3

Response Type:
Multiple Choice, single
correct response

DOK Level 1

4 OA.B.4.
Find all factor pairs for a whole number in the range 1–100. Recognize that a whole number is a multiple of each of its factors. Determine whether a given whole number in the range 1–100 is a multiple of a given one-digit number. Determine whether a given whole number in the range 1–100 is prime or composite.

Evidence Required:
3. The student determines if a whole number (from 1 to 100) is a multiple of a given one-digit number.

Tools: None | **Prompt Features:** The student is prompted to identify multiples of a one-digit whole number.

Stimulus Guidelines:
All numbers are whole numbers within the range of 1–100.
Answer choices should be a list of whole numbers that are multiples of the given number.
Item difficulty can be adjusted via these example methods:
Varying the factors (factors of 1, 2, or 5), (factors of 3 or 4), and (factors of 6, 7, 8, or 9)
Using correct answers that are less than or equal to ten times the given factor
Using correct answers that are greater than ten times the given factor
TM3a
Stimulus: The student is presented with a one-digit whole number.

Example Stem: Select the list of numbers that are **all** multiples of 8.
   A. 8, 18, 24, 44
   B. 8, 26, 44, 62
   C. 16, 32, 48, 64
   D. 40, 48, 54, 76

Rubric: (1 point) The student correctly identifies the multiples of a one-digit number (e.g., C).

Response Type: Multiple Choice, single correct response |

| Task Model 3

Response Type:
Multiple Choice, single
correct response

DOK Level 1

4.OA.B.4
Find all factor pairs for a whole number in the range 1–100. Recognize that a whole number is a multiple of each of its factors. Determine whether a given whole number in the range 1–100 is a multiple of a given one-digit number. Determine whether a given whole number in the range 1–100 is prime or composite.

Evidence Required:
3. The student determines if a whole number (from 1 to 100) is a multiple of a given one-digit number.

Tools: None | **Prompt Features:** The student is prompted to identify common multiples of two one-digit whole numbers.

Stimulus Guidelines:
• All numbers are whole numbers within the range of 1–100.
• Item difficulty can be adjusted via these example methods:
    ○ Varying the factors (factors of 1, 2, or 5), (factors of 3 or 4), and (factors of 6, 7, 8, or 9)
    ○ Using correct answers that are less than or equal to ten times the given factor
    ○ Using correct answers that are greater than ten times the given factor

TM3b
Stimulus: The student is presented with two one-digit whole numbers.

Example Stem: Which number is a multiple of **both** 2 and 5?
  A. 7
  B. 14
  C. 40
  D. 52

Rubric: (1 point) The student correctly identifies the multiple of two one-digit numbers (e.g., C).

Response Type: Multiple Choice, single correct response |

Task Model 4	**Prompt Features:** The student is prompted to identify numbers as prime or composite.

Task Model 4

Response Type: Matching Tables

DOK Level 2

4.OA.B.4
Find all factor pairs for a whole number in the range 1–100. Recognize that a whole number is a multiple of each of its factors. Determine whether a given whole number in the range 1–100 is a multiple of a given one-digit number. Determine whether a given whole number in the range 1–100 is prime or composite.

Evidence Required:
4. The student determines if a whole number (from 1 to 100) is prime or composite.

Tools: None

Prompt Features: The student is prompted to identify numbers as prime or composite.

Stimulus Guidelines:
- All numbers are whole numbers within the range of 1–100.
- Item difficulty can be adjusted via these example methods:
    o Prime numbers less than vs. greater than 50
    o Composite numbers with factors that are less than 10 vs. greater than 10

TM4
Stimulus: The student is presented with three whole numbers.

Example Stem: Decide whether each number is prime or composite. Click in the table to respond.

	Prime	**Composite**
17		
52		
87		

Rubric: (1 point) The student identifies all numbers as prime or composite (e.g., P, C, C).

Response Type: Matching Tables