Grade 6 Target C

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

Content Domain: The Number System

Target C [s]: 6.NS.B Compute fluently with multi-digit numbers and find common factors and multiples.

Standards included in Target C: 6.NS.B Compute fluently with multi-digit numbers and find common factors and multiples.

6.NS.B.2 Fluently divide multi-digit numbers using the standard algorithm.

6.NS.B.3 Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation.

6.NS.B.4 Find the greatest common factor of two whole numbers less than or equal to 100 and the least common multiple of two whole numbers less than or equal to 12. Use the distributive property to express a sum of two whole numbers 1–100 with a common factor as a multiple of a sum of two whole numbers with no common factor. For example, express 36 + 8 as 4 (9 + 2).

Vertical Alignment

Related Grade 5 standards

5.NBT.B Perform operations with multi-digit whole numbers and with decimals to the

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.NBT.B.7 Add, subtract, multiply, and divide decimals to hundredths, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.

Related Grade 7 Standards

7.NS.A Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers.

7.NS.A.2 Apply and extend previous understandings of multiplication and division of fractions to multiply and divide rational numbers.

> a. Understand that multiplication is extended from fractions to rational numbers by requiring the operations continue to satisfy the properties of operations, particularly the distributive property, leading to products such as $(-1)(-1) = 1$ and the rules for multiplying signed numbers. Interpret products of rational numbers by describing real-world contexts.
> b. Understand that integers can be divided, provided that the divisor is not zero, and every quotient of integers (with nonzero divisor) is a rational number. If p and q are integers, then $-(p/q) = (-p)/q = p/(-q)$. Interpret quotients of rational numbers by describing real-world contexts. c. Apply properties of operations as strategies to multiply and divide rational numbers. d. Convert a rational number to a decimal using long division; know that the decimal form of a rational number terminates in 0s or eventually repeats.

Achievement Level Descriptors

Level 1 Students should be able to add, subtract, and multiply multi-digit whole numbers and decimals to hundredths. They should be able to use the distributive property to express the sum of two whole numbers with a common factor.

Level 2 Students should be able to divide multi-digit whole numbers and add and subtract multi-digit decimal numbers. They should be able to find common factors of two numbers less than or equal to 100 and multiples of two numbers less than or equal to 12.

Level 3 Students should be able to fluently divide multi-digit numbers and add, subtract, multiply, and divide multi-digit decimal numbers. They should be able to find the greatest common factor of two numbers less than or equal to 100 and the least common multiple of two

whole numbers less than or equal to 12.

Level 4 Students should be able to make generalizations regarding multiples and factors of sets of numbers (e.g., state that a particular set of numbers is relatively prime).

Evidence Required

1. The student divides multi-digit numbers.

2. The student adds, subtracts, multiplies, and divides multi-digit decimals.

3. The student determines the greatest common factor of two whole numbers.

4. The student determines the least common multiple of two whole numbers.

5. The student uses the distributive property to express a sum of two whole numbers with a common factor as a multiple of a sum of two whole numbers with no common factor.

Vocabulary

sum, difference, product, quotient, common factor, greatest common factor, common multiple, least common multiple, distributive property

Response Types

Equation/Numeric

Materials

None

Attributes

A multi-digit dividend should have at least 4 digits. A multi-digit divisor should have at least 2 digits. A multi-digit decimal can be to the thousandths. The greatest common factor must be of two whole numbers less than or equal to 100. The least common multiple must be of two whole numbers less than or equal to 12. When using the distributive property to express a sum of two whole numbers, the whole numbers must be 1–100.

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 6.NS.B.2 DOK Level 1

Fluently divide multi-digit numbers using the standard algorithm.

Evidence Required

The student divides multi-digit numbers.

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Question Type 1: Stimulus: The student is presented with a division expression.
1. Divide.

16,536 ÷ 24

Enter the exact quotient.

2. Divide.

35,702 ÷ 25

Enter the exact quotient.

Rubric: (1 point) Student enters the correct quotient (e.g., 689; 1428.08).

Response Type: Equation/Numeric

Claim 1 6.NS.B.3 DOK Level 1

Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation.

Evidence Required

The student adds, subtracts, multiplies, and divides multi-digit decimals.

Question Type 1: The student is presented with an addition expression with two or three terms.

1. Add.

34.381 + 8.2

Enter the exact sum.

Rubric: (1 point) Student enters the correct sum (e.g., 42.581).

Response Type: Equation/Numeric

Question Type 2: The student is presented with a subtraction expression with two terms.

1. Subtract.

48.235 – 29.67

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Enter the exact difference.

Rubric: (1 point) Student enters the correct difference (e.g., 18.565).

Response Type: Equation/Numeric

Question Type 3: The student is presented with a multiplication expression with two decimals.

1. Multiply.

8.296 ● 0.8

Enter the exact product.

Rubric: (1 point) Student enters the correct product (e.g., 6.6368).

Response Type: Equation/Numeric

Question Type 4: The student is presented with a division expression with two decimals.

- The divisor place value should be to the tenths or hundredths and the dividend place value should be at the thousandths or the ten-thousandths.
- Answers should be a positive answer that terminates no greater than the thousandths place.

1. Divide.

0.912 ÷ 0.24

Enter the exact quotient.

Rubric: (1 point) Student enters the correct quotient (e.g., 3.8).

Response Type: Equation/Numeric

Claim 1 6.NS.B.3 DOK Level 2

Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation.

Evidence Required

The student adds, subtracts, multiplies, and divides multi-digit decimals.

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Question Type 1: The student is presented with an addition/subtraction/multiplication/division equation.

1. Use the fact that 12 ● 218 = 2616.

Enter the exact product of 1.2 ● 2.18.

Rubric: (1 point) Student enters the correct product (e.g., 2.616).

Note: Students should be able to determine the product without calculating it, but instead by using the given computation and reasoning skills.

Response Type: Equation/Numeric

Claim 1 6.NS.B.4 DOK Level 1

Find the greatest common factor of two whole numbers less than or equal to 100 and the least common multiple of two whole numbers less than or equal to 12. Use the distributive property to express a sum of two whole numbers 1–100 with a common factor as a multiple of a sum of two whole numbers with no common factor. For example, express 36 + 8 as 4(9 + 2).

Evidence Required

The student determines the greatest common factor of two whole numbers.

Question Type 1: The student is presented with two whole numbers less than 100.

1. Enter the greatest common factor of 24 and 36.

Rubric: (1 point) Student enters the correct greatest common factor (e.g., 12).

Response Type: Equation/Numeric

Claim 1 6.NS.B.4 DOK Level 1

Find the greatest common factor of two whole numbers less than or equal to 100 and the least common multiple of two whole numbers less than or equal to 12. Use the distributive property to express a sum of two whole numbers 1–100 with a common factor as a multiple of a sum of two whole numbers with no common factor. For example, express 36 + 8 as 4(9 + 2).

Evidence Required

The student determines the least common multiple of two whole numbers.

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Question Type 1: The student is presented with two whole numbers less than 12.

1. Enter the least common multiple of 6 and 8.

Rubric: (1 point) Student enters the correct least common multiple (e.g., 24).

Response Type: Equation/Numeric

Claim 1 6.NS.B.4 DOK Level 2

Find the greatest common factor of two whole numbers less than or equal to 100 and the least common multiple of two whole numbers less than or equal to 12. Use the distributive property to express a sum of two whole numbers 1–100 with a common factor as a multiple of a sum of two whole numbers with no common factor. For example, express 36 + 8 as 4(9 + 2).

Evidence Required

The student uses the distributive property to express a sum of two whole numbers with a common factor as a multiple of a sum of two whole numbers with no common factor.

Question Type 1: The student is presented with an equation showing the distributive property with a missing number.

1, Consider the equation.

$24 + 30 = 6(4 + \square)$

Enter the unknown number that makes the equation true.

Rubric: (1 point) Student enters the correct value (e.g., 5).

Response Type: Equation/Numeric

Claim 2 Problem Solving Question Banks

Claim Descriptors and Targets

Students can solve a range of complex well-posed problems in pure and applied mathematics, making productive use of knowledge and problem-solving strategies.

Example 1

Perform the following calculations. You may use a calculator, but in some cases mental calculations might be faster and more reliable.

Part A:
(1 − 1) + (2 − 2) + (3 − 3) + (4 − 4) + (5 − 5) + (6 − 6) + (7 − 7) + (8 − 8) + (9 − 9) + 10 = ?
Enter your answer in the first response box.

Part B: 987 × 654 = ?
Enter your answer in the second response box.

Rubric: (1 point) The student correctly enters the correct values for both parts in the response boxes (e.g., 10; 645,498).

Response Type: Equation/Numeric (2 response boxes)

Commentary: It is more strategic to do the first problem without a calculator. Other examples of calculations that would be better done without a calculator include (100 + 200 + 300 + 400 + 500) ÷ (500 + 400 + 300 + 200 + 100) and (941,704,813 − 237,498) × (1,234 − 1,000 − 200 − 30 − 4).

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

Gina said, “For every possible value of n, we know that |−n| = n.”
Marco said, “Sometimes |−n| = −n.”
Who is correct?
A. Gina
B. Marco
Select all the values for n shown below that support the correct claim.
B. n = 12
C. n = 4.5
D. n = 12
E. n = − 4.5
F. n = − 100
Rubric: (1 point) The student selects the correct student (B, Marco) and all of the correct values that support Marco’s claim (E and F).
Response Type: Multiple Choice, multiple select response

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