

Grade 5 Target D

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[Content Domain: Number and Operations in Base Ten](#)

[Target D \[m\]: 5.NBT.B Perform operations with multi-digit whole numbers and with decimals to hundredths.](#)

[Standards included in Target 5.NBT.B, 5.NBT.B.5, 5.NBT.B.6, 5.NBT.B.7](#)

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Content Domain: Number and Operations in Base Ten

Target D [m]: 5.NBT.B Perform operations with multi-digit whole numbers and with decimals to hundredths.

Standards included in Target 5.NBT.B, 5.NBT.B.5, 5.NBT.B.6, 5.NBT.B.7

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

5.NBT.B.5 Fluently multiply multi-digit whole numbers using the standard algorithm.

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.

Vertical Alignment

Related Grade 4 standards

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

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

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.

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.

Related Grade 6 Standards

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.

Achievement Level Descriptors

Level 1 Students should be able to multiply one- and two-digit whole numbers and find whole-number quotients of whole numbers with up to three-digit dividends and one-digit divisors, using arrays or area models. They should be able to perform the four operations on decimals to the tenths and a whole number, e.g., 1.3×7 .

Level 2 Students should be able to multiply three- and four-digit whole numbers; find whole-number quotients of whole numbers with up to three-digit dividends and two-digit divisors; and perform the four operations on decimals to the tenths or on decimals to the hundredths and a whole number, e.g., 3.42×12 .

Level 3 Students should be able to fluently multiply multi-digit whole numbers using the standard algorithm, find whole-number quotients of whole numbers with up to four-digit dividends and two-digit divisors, and perform the four operations on decimals to the hundredths. They should be able to relate the strategy to a written method and explain the reasoning used.

Level 4 No Descriptor

Evidence Required

1. The student multiplies multi-digit whole numbers.

2. The student determines 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.
3. The student adds, subtracts, multiplies, and divides decimals to the hundredths using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction.

Vocabulary

array, area model, equation, quotient, product, factor, divisor, dividend, remainder

Response Types

Multiple Choice, single correct response; Equation/Numeric

Materials

base-10 array model, equations

Attributes

For division problems with whole numbers, up to and including four-digit dividends and two-digit divisors. Add, subtract, multiply, and divide decimals to the hundredths.

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 5.NBT.B.5 DOK Level 1

Fluently multiply multi-digit whole numbers using the standard algorithm.

Evidence Required

The student multiplies multi-digit whole numbers.

Question Type 1: The student is presented with a horizontal multiplication problem.

Enter the product. 4×39

Question Type 2: The student is presented with a vertical multiplication problem.

Enter the product.

4238
 $\times 32$

Rubric: (1 point) The student correctly solves the multiplication problem (e.g., 156; 135,616).

Response Type: Equation/Numeric

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5.NBT.B.6 DOK Level 2

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.

Evidence Required:

The student determines 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.

Question Type 1: The student is presented with a horizontal division problem using the \div symbol.

Enter the quotient. $335 \div 5$

Question Type 2: The student is presented with a division problem using the $\overline{)###}$ symbol.

Enter the quotient. $25 \overline{)3375}$

Rubric: (1 point) The student correctly solves the division problem (e.g., 67; 135).

Response Type: Equation/Numeric

Question Type 3: The student is presented with a division equation with an unknown quotient.

Which equation has the same unknown value as $228 \div 12 = \square$?

- A. $228 \times \square = 12$
- B. $12 \times \square = 228$
- C. $\square \div 12 = 228$
- D. $\square \div 228 = 12$

Rubric: (1 point) The student selects the correct option (e.g., B).

Response Type: Multiple Choice, single correct response

5.NBT.B DOK Level 2

Perform operations with multi-digit whole numbers and with decimals to hundredths.

Evidence Required:

The student determines 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

Question Type 1: The student is presented with a division equation with an unknown divisor or dividend.

Enter the unknown value in the equation. $345 \div \square = 69$

Rubric: (1 point) The student enters the correct number (e.g., 5).

Response Type: Equation/Numeric

5.NBT.B.7 DOK Level 1

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.

Evidence Required:

The student adds, subtracts, multiplies, and divides decimals to the hundredths using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction.

Question Type 1: The student is presented with a decimal addition problem with up to four addends.

Enter the sum.
 $16 + 5.67 + 8.3$

Rubric: (1 point) The student correctly calculates the solution to a problem involving decimals (e.g., 29.97).

Response Type: Equation/Numeric

Question Type 2: The student is presented with a decimal subtraction problem.

Enter the difference.
 $20.50 - 3.65$

Rubric: (1 point) The student correctly calculates the solution to a problem involving decimals (e.g., 16.85).

Response Type: Equation/Numeric

Question Type 3: The student is presented with a decimal multiplication problem.

Enter the product.

$$7.86 \times 3$$

Rubric: (1 point) The student correctly calculates the solution to a problem involving decimals (e.g., 23.58).

Response Type: Equation/Numeric

Question Type 4: The student is presented with a decimal division problem.

Enter the quotient.

$$8.40 \div 5$$

Enter the quotient.

$$7 \div 0.2$$

Rubric: (1 point) The student correctly calculates the solution to a problem involving decimals (e.g., 1.68; 35).

Response Type: Equation/Numeric

Question Type 5: The student is presented with a decimal addition or subtraction equation involving an unknown value.

Which equation has the same unknown value as $33.74 - 18.9 = \square$?

- A. $18.9 + \square = 33.74$
- B. $33.74 + \square = 18.9$
- C. $\square - 33.74 = 18.9$
- D. $\square - 18.9 = 33.74$

Rubric: (1 point) The student selects the correct option (e.g., A).

Response Type: Multiple Choice, single correct response

5.NBT.B.7 DOK Level 2

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.

Evidence Required:

The student adds, subtracts, multiplies, and divides decimals to the hundredths using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction.

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Question Type 1: The student is presented with a decimal addition or subtraction equation with an unknown value.

1. Enter the unknown value in the equation. $18.9 + \square = 33.74$

2. Enter the unknown value in the equation. $\square - 18.9 = 33.74$

Rubric: (1 point) The student enters the correct number (e.g., 14.84; 52.64).

Response Type: Equation/Numeric

5.NBT.B.7 DOK Level 1

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.

Evidence Required:

The student adds, subtracts, multiplies, and divides decimals to the hundredths using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction.

Question Type 1: The student is presented with a decimal multiplication expression and answer choices that show equivalent fraction multiplication expressions.

Which expression is equal to 0.47×0.08 ?

- A. $\frac{47}{10} \times \frac{8}{10}$
- B. $\frac{47}{10} \times \frac{8}{100}$
- C. $\frac{47}{100} \times \frac{8}{10}$
- D. $\frac{47}{100} \times \frac{8}{100}$

Question Type 2: The student is presented with a decimal multiplication expression and answer choices that show equivalent fraction multiplication equations.

Which equation shows a correct strategy and product for the expression shown? 0.4×0.8

- A. $\frac{4}{10} \times \frac{8}{10} = \frac{32}{10}$
- B. $\frac{4}{10} \times \frac{8}{10} = \frac{32}{100}$
- C. $\frac{4}{100} \times \frac{8}{100} = \frac{32}{100}$
- D. $\frac{4}{100} \times \frac{8}{100} = \frac{32}{10,000}$

Rubric: (1 point) The student selects the correct option (e.g., D; B).

Response Type: Multiple Choice, single correct response

Question Type 3: The student is presented with a decimal division expression.

Which expression is equal to $16.25 \div 2.5$?

- A. $1.625 \div 25$
- B. $16.25 \div 25$
- C. $162.5 \div 25$
- D. $1625 \div 25$

Rubric: (1 point) The student selects the correct option (e.g., C).

Response Type: Multiple Choice, single correct response

Claim 2 Problem Solving Questions 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

Luke buys a bicycle that is on sale for 12 of the original price. The sale price is \$80 less than the original price. What is the original price, in dollars, of the bicycle?

Enter your answer in the response box.

Rubric: (1 point) The student enters the correct original price (160 or \$160).

Response Type: Equation/Numeric

Example 12

Carl feeds his dog $2\frac{1}{2}$ cups of dog food every day. Each bag contains 64 cups of dog food. What is the maximum number of days that Carl can feed his dog exactly $2\frac{1}{2}$ cups of dog food from one full bag?

Enter your answer in the response box.

Rubric: (1 point) The student is able to determine the total number of servings in one bag of food and interpret the remainder as not being enough for another whole serving (25).

Response Type: Equation/Numeric

Claim 4 Modeling and Data Analysis Question Banks

Claim Descriptors and Targets

Students can analyze complex, real-world scenarios and can construct and use mathematical models to interpret and solve problems.

Example 1

How many minutes are in 1 day? [Click here for more information if you need it]

Interaction: If the student clicks for more information, they get the following conversion data5:

- There are 60 seconds in 1 minute
- There are 60 minutes in 1 hour
- There are 24 hours in 1 day
- There are 7 days in 1 week
- There are 52 weeks in 1 year

Rubric: (1 point) The student enters the correct number of minutes (1440).

Response Type: Equation/Numeric (label the response box with minutes)

Example 2

A parking meter accepts nickels, dimes, and quarters. It holds up to 1500 coins. Estimate the value of the coins, in dollars, in the meter when it is full.

Rubric: (1 point) The student enters a reasonable estimate (a multiple of 5 between 75 and 375).

Response Type: Equation/Numeric

Example 3

A school spends \$2.40 on every lunch it serves in the cafeteria and \$0.30 for each carton of milk.

- 250 people at the school get a lunch each day
- 120 people take a carton of milk

Create an expression using this information that shows how much the school spends altogether on lunches and milk each day.

Rubric: (1 point). Student constructs a correct numerical expression ($250 \times 2.40 + 120 \times 0.30$ or its equivalent).

Response Type: Equation/Numeric

Example 4

Molly and Sam need about 2 pounds of apples for a pie. Medium apples cost \$0.45 each. Large apples cost \$0.65 each.

Molly says: "Let's buy the medium apples, they are less expensive."

Sam says: "I think it's less expensive to buy large apples. They are more expensive but we won't have to buy as many of them."

Analyze both approaches. You can use the scale to weigh the apples.

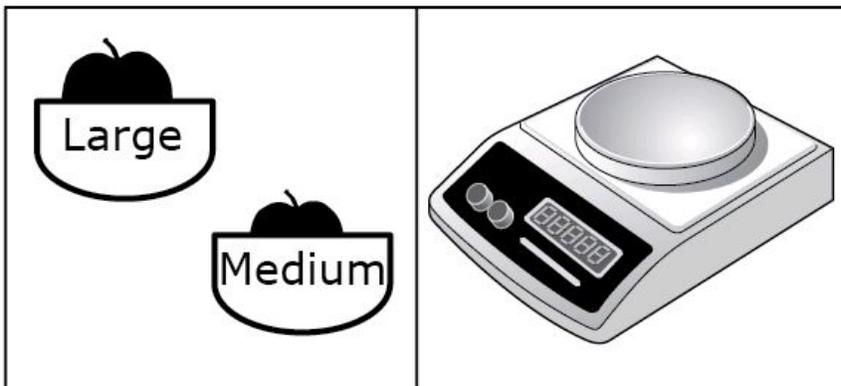
Use the drop down menus to complete each statement.

Statement A:

Molly and Sam would need [1, 2, 3, 4, 5, 6, 7, 8] medium apples or [1, 2, 3, 4, 5, 6, 7, 8] large apples for the pie.

Statement B:

The number of medium apples that would be needed cost [more, less] than the number of large apples that would be needed. So [Molly, Sam] is correct.



Rubric: (2 points) The student selects the correct numbers and words in all of the drop-down menus (6, 4, more, Sam)

(1 point) Student identifies the correct number of each size of apple needed but does not compare their costs correctly or identify the right reasoning, or the numbers of apples are different but their cost is correctly compared and the correct conclusion is made about who is correct in their reasoning based on the numbers the student chose.

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Response Type: Drop-Down Menu