Inspect
CCR Performance Tasks

Math Grade 5: Fractions, Decimals, and Money

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Observational Tasks for English/Language Arts and Math Grades K - 1	▪ Developmentally appropriate for individual students and small groups

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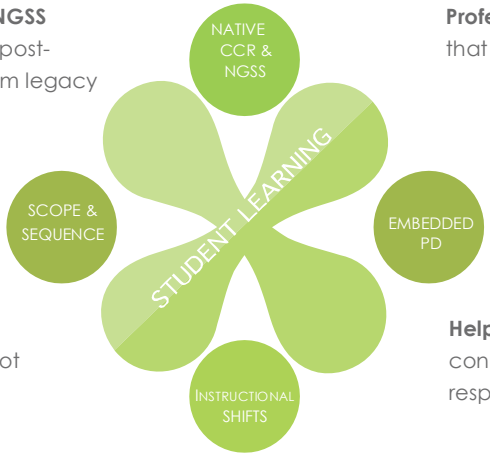
Inspect assessment content offers these benefits:

Native college- and career-ready and NGSS content prepares students to meet their post-secondary goals. Content re-aligned from legacy standards cannot do this.



Professional development embedded within content that

- shows the relationship between specific skills and higher-order thinking
- includes authentic, permissioned texts of appropriate complexity
- and documents student progress using DOK and learning progressions

Content that addresses your scope and sequence so that your assessments do not waste valuable instruction time

Help for teachers addressing the instructional shifts with content that elicits evidence of learning from each response

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CCR Performance Tasks

Math Grade 5: Fractions, Decimals, and Money

Student Test Booklet

Name:

Student Rubric

This problem is meant to test if you can:
• Reason about quantities using both fractions and decimals;
• Perform operations with decimal numbers to the hundredths place.

Your teacher will rate your answer as a level 4, 3, 2, 1, or 0. The descriptions below explain the types of answers expected at each level.

Level 4:
Your answers are correct and complete.
Your answers include:
• Tables that are filled in with the correct answers with work shown;
• Correct comparisons of using fractions and decimals to do similar calculations;
• Correct solutions to the problems, with correct work shown.

Level 3:
Your answers are correct but one or two of your explanations are incomplete or you have made minor calculation mistakes.
Your answers include:
• Tables that are filled in with the correct answers, but some of your work is incomplete or you have made minor mistakes;
• Correct comparisons of using fractions and decimals, but the comparisons may include minor mistakes or your explanation may be incomplete;
• Correct solutions to the problems with explanations or work that may be incomplete.

Level 2:
You have answered parts of the problem correctly but some parts are missing or contain mistakes.
Your answers include:
• Tables that contain several mistakes with work that is incomplete or partially incorrect;
• Incomplete or partially incorrect comparisons of using fractions and decimals;
• Incomplete or partially incorrect solutions to the problems with incomplete or partially incorrect explanations and work.

Level 1:
Your answers are incorrect.
Your answers include:
• Tables that contain several major errors with incorrect explanations;
• Incomplete or incorrect comparisons of using fractions and decimals;
• Incorrect solutions to the problems.

Level 0:
Your answer is not related to the question, the teacher cannot understand your answer, or you do not write anything.

Name:_____

Math Grade 5: Fractions, Decimals, and Money

Complete all the tasks in the test booklet.

1 **The four most commonly used coins in the U.S. are the quarter, dime, nickel, and penny. The quarter is worth $0.25, which is equal to $\frac{25}{100}$ of a U.S. dollar. This fraction simplifies to $\frac{1}{4}$, so a quarter, or $0.25, is equal to $\frac{1}{4}$ of a U.S. dollar. A dime has a value of $0.10, a nickel has a value of $0.05, and a penny has a value of $0.01. A less-common U.S. coin, the half-dollar, has a value of $0.50.**

A. Finish filling out the table below. The second row, for quarters, has been completed for you.

Coin	Value	Fraction	Simplified Fraction
Half-Dollar	$0.50		
Quarter	$0.25	$\frac{25}{100}$	$\frac{1}{4}$
Dime	$0.10		
Nickel	$0.05		
Penny	$0.01		

B. Michael has a jar of change on his desk in his bedroom. The jar contains

- **9 half-dollars**
- **21 quarters**
- **12 dimes**
- **6 nickels**
- **24 pennies.**

For each type of coin, find the value (amount of money) in dollars. Write the value in fraction form and in decimal form. Use your answers to fill in the table on the last page of this test booklet. You can show your work in the table or in the space provided below.

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C. What is the total value of the coins in Michael's jar? When you use fractions to find the total, do you get the same answer as when you use decimals? Explain why or why not.

D. Michael's three younger sisters are going to the grocery store with their mother. Michael wants to give each sister some money so she can buy something for herself at the store. He decides to split his money evenly among his three sisters. How much money does each sister receive? There is more than one way to solve this problem. Be sure to show your work and explain your strategy. What is another way to solve this problem?

Name:_____

Math Grade 5: Fractions, Decimals, and Money

Money in Michael's Jar

(1) Type of Coin	(2) Number of Coins in Jar	(3) Simplified Fraction (from part A)	(4) Value of Coins in Simplified Fraction Form *Show Your Work*	(5) Value of Coins in Decimal Form *Show Your Work*	(6) Are the Two Values Equal? *Show Your Work*
Half-Dollar	9				
Quarter	21				
Dime	12				
Nickel	6				
Penny	24				

CCR Performance Tasks

Math Grade 5: Fractions, Decimals, and Money

Teacher Guide

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About the Teacher Guide

This document contains support materials for “Math Grade 5: Fractions, Decimals, and Money.” This includes:

(a) The task
(b) The standards and depth of knowledge level of the task
(c) The scoring rubric
(d) Discussion questions
(e) Extension activities

These specifications have been included to help you connect the task to the Common Core content standards and the standards for mathematical practice. The rubric is designed to help you look for the development of mathematical practices in student work. It is also here to help you look for consistencies in student content errors that can help guide intervention and re-teach strategies.

Test Definition File

Item #	Correct Answer	Practice Standard	Content Standards
1	See Scoring Rubric	Mathematical Practice 2	Grade 5 introduction; 5.NF.4; 5.NBT.3, 5.NBT.7

SBAC Claims	PARCC Sub-Claims
1 and 3	A and C

Special Instructions

Make sure students understand to use the table on the last page of the test booklet to answer part B.

Performance Task

The four most commonly used coins in the U.S. are the quarter, dime, nickel, and penny. The quarter is worth $0.25, which is equal to $\frac{25}{100}$ of a U.S. dollar. This fraction simplifies to $\frac{1}{4}$, so a quarter, or $0.25, is equal to $\frac{1}{4}$ of a U.S. dollar. A dime has a value of $0.10, a nickel has a value of $0.05, and a penny has a value of $0.01. A less-common U.S. coin, the half-dollar, has a value of $0.50.

A. Finish filling out the table below. The second row, for quarters, has been completed for you.

Coin	Value	Fraction	Simplified Fraction
Half-Dollar	$0.50		
Quarter	$0.25	$\frac{25}{100}$	$\frac{1}{4}$
Dime	$0.10		
Nickel	$0.05		
Penny	$0.01		

B. Michael has a jar of change on his desk in his bedroom. The jar contains

- **9 half-dollars**
- **21 quarters**
- **12 dimes**
- **6 nickels**
- **24 pennies.**

For each type of coin, find the value (amount of money) in dollars. Write the value in fraction form and in decimal form. Use your answers to fill in the table on the last page of this test booklet. You can show your work in the table or in the space provided below.

C. What is the total value of the coins in Michael's jar? When you use fractions to find the total, do you get the same answer as when you use decimals? Explain why or why not.

D. Michael's three younger sisters are going to the grocery store with their mother. Michael wants to give each sister some money so she can buy something for herself at the store. He decides to split his money evenly among his three sisters. How much money does each sister receive? There is more than one way to solve this problem. Be sure to show your work and explain your strategy. What is another way to solve this problem?

Standards Alignment

Practice Standards

MP2 > DOK 3

Reason abstractly and quantitatively -- Mathematically proficient students make sense of quantities and their relationships in problem situations. They bring two complementary abilities to bear on problems involving quantitative relationships: the ability to *decontextualize*—to abstract a given situation and represent it symbolically and manipulate the representing symbols as if they have a life of their own, without necessarily attending to their referents—and the ability to *contextualize*, to pause as needed during the manipulation process in order to probe into the referents for the symbols involved. Quantitative reasoning entails habits of creating a coherent representation of the problem at hand; considering the units involved; attending to the meaning of quantities, not just how to compute them; and knowing and flexibly using different properties of operations and objects.

Content Standards

From the Introduction to the Grade 5 Content Standards:

2. Students develop understanding of why division procedures work based on the meaning of base-ten numerals and properties of operations. They finalize fluency with multi-digit addition, subtraction, multiplication, and division. They apply their understandings of models for decimals, decimal notation, and properties of operations to add and subtract decimals to hundredths. They develop fluency in these computations, and make reasonable estimates of their results. Students use the relationship between decimals and fractions, as well as the relationship between finite decimals and whole numbers (i.e., a finite decimal multiplied by an appropriate power of 10 is a whole number), to understand and explain why the procedures for multiplying and dividing finite decimals make sense. They compute products and quotients of decimals to hundredths efficiently and accurately.

5.NF.4

Apply and extend previous understandings of multiplication to multiply a fraction or whole number by a fraction.

5.NBT.3

Read, write, and compare decimals to thousandths.

5.NBT.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.

SBAC Claims

Mathematics Claim #1: Concepts and Procedures. Students can explain and apply mathematical concepts and interpret and carry out mathematical procedures with precision and fluency.

Mathematics Claim #3: Communicating Reasoning. Students can clearly and precisely construct viable arguments to support their own reasoning and to critique the reasoning of others.

PARCC Sub-Claims

Sub Claim A: Major Content with Connections to Practices. The student solves problems involving the Major Content for her grade/course with connections to the Standards for Mathematical Practice.

Sub Claim C: Highlighted Practices MP.3, 6 with Connections to Content: expressing mathematical reasoning. The student expresses grade/course-level appropriate mathematical reasoning by constructing viable arguments, critiquing the reasoning of others, and/or attending to precision when making mathematical statements.

Scoring Rubric

4 Point Response:

The response demonstrates a high level of understanding. A level 4 response is characterized by:

- The ability to find equivalent values for various coins in both fractions of dollars and decimal form without error;
- A strong understanding of the meaning of quantities and the relationship between decimals and fractions;
- A strong ability to perform operations on decimals to the hundredths place.

A level 4 response should include:

- The table for part A filled out correctly and completely;
- The table for part B filled out correctly, with work shown;
- A correct answer of $11.49 and an explanation that compares the sum resulting from using decimal values and the sum resulting from using fractional values;
- The correct answer to the problem of how much money each sister receives, with correct and complete work shown;
- A correct description for another way to solve the problem of how much money each sister receives.

A sample level 4 response follows.

Part A:

Coin	Value	Fraction	Simplified Fraction
Half-Dollar	$0.50	$\frac{50}{100}$	$\frac{1}{2}$
Quarter	$0.25	$\frac{25}{100}$	$\frac{1}{4}$
Dime	$0.10	$\frac{10}{100}$	$\frac{1}{10}$
Nickel	$0.05	$\frac{5}{100}$	$\frac{1}{20}$
Penny	$0.01	$\frac{1}{100}$	$\frac{1}{100}$

Part B:

Money in Michael's Jar

(1) Type of Coin	(2) Number of Coins in Jar	(3) Simplified Fraction (from part A)	(4) Value of Coins in Simplified Fraction Form *Show your work*	(5) Value of Coins in Decimal Form *Show your work*	(6) Are the Two Values Equal? *Show your work*
Half-Dollar	9	$\frac{1}{2}$	$9 \times \frac{1}{2} = \frac{9}{2} = 4\frac{1}{2}$	$9 \times 0.50 = 4.50$ (w/work)	Yes. $4\frac{1}{2} = 4 + 0.5 = 4.50$
Quarter	21	$\frac{1}{4}$	$21 \times \frac{1}{4} = \frac{21}{4} = 5\frac{1}{4}$	$21 \times 0.25 = 5.25$ (w/work)	Yes. $5\frac{1}{4} = 5 + 0.25 = 5.25$
Dime	12	$\frac{1}{10}$	$12 \times \frac{1}{10} = \frac{12}{10} = 1\frac{2}{10}$	$12 \times 0.10 = 1.20$ (w/work)	Yes. $1\frac{2}{10} = 1 + 0.2 = 1.20$
Nickel	6	$\frac{1}{20}$	$6 \times \frac{1}{20} = \frac{6}{20} = \frac{3}{10}$	$6 \times 0.05 = 0.30$ (w/work)	Yes. $\frac{3}{10} = 0.30$
Penny	24	$\frac{1}{100}$	$24 \times \frac{1}{100} = \frac{24}{100} = \frac{6}{25}$	$24 \times 0.01 = 0.24$ (w/work)	Yes. $\frac{24}{100} = 0.24$

Part C:

"The total amount of money in the jar is $11.49, which I found by adding together the decimal values of how much money Michael had from each coin. If I had added together the fractional values instead, I should have gotten the same answer. I know this because I showed in column 6 that for each coin, the fractional value is equal to the decimal value. It shouldn't matter whether you use fractions or decimals, as long as you are using equal values. $\frac{1}{2} + \frac{1}{2} = 1$ and 0.5 + 0.5 = 1 because $\frac{1}{2} = 0.5$. You are adding the same quantities, just with different ways of writing them."

Part D:

"Each sister should get $3.83, because $11.49 divided by 3 is $3.83. Another way to divide up the money is to divide up the number of each type of coin equally and then add up their values. This works because the number of each type of coin divided by 3 is a whole number. $\frac{11.49}{3} = 3.83$." (The response also shows division work.)

3 Point Response:
The response demonstrates a strong understanding, but the work contains minor errors. A level 3 response is characterized by:

- The ability to find equivalent values for various coins in both fractions of dollars and decimal form, with at most one minor error;
- An understanding of the meaning of quantities and the relationship between decimals and fractions, although explanations and comparisons may be incomplete or include minor errors;
- An ability to perform operations on decimals to the hundredths place, with only one or two minor errors in calculations and shown work.

2 Point Response:
The response demonstrates a basic but incomplete understanding. A level 2 response is characterized by:

- The basic ability to find equivalent values for various coins in both fractions of dollars and decimal form, with at most one or two minor errors;
- A basic understanding of the meaning of quantities and the relationship between decimals and fractions, with explanations and comparisons that are partially incorrect or incomplete;
- The basic ability to perform operations on decimals to the hundredths place, with several minor errors in calculations.

1 Point Response:
The response demonstrates minimal understanding. A level 1 response is characterized by:

- A weak ability to find equivalent values for various coins in both fractions of dollars and decimal form, with multiple errors;
- A weak understanding of the meaning of quantities and the relationship between decimals and fractions, with explanations and comparisons that are incorrect or incomplete;
- A weak ability to perform operations on decimals to the hundredths place, with several major errors in calculations.

0 Point Response:
There is no response, or the response is off topic.

Discussion Questions

Use the following questions to help students struggling to access the problem:

1. Which is easier to use to add up how much money is in the jar: adding the fractions together (column 4) or adding the decimals together (column 5)? Why?

Possible response: *It is easier to use the decimal values or the fractional values that all have 100 in the denominator, because that way you need to do only addition. If you use the simplified fractions, then you have to find a common denominator to use for the fractions, such as 100. Using decimals basically uses the common denominator of 100, since the place value of the "cents" digit is* $\frac{1}{100}$ *of a dollar.*

2. What are some different ways of solving the problem in part D? Why does each way work to equally divide up the money from the jar?

Possible response: *One way to solve part D is to take the sum obtained by adding the decimal values and divide that sum by three. Another way is to count out the coins, putting equal numbers of each type of coin into 3 different piles. This works if the number of each type of coin is divisible by 3. Then the value of the coins in each pile is* $\frac{1}{3}$ *the total value. It doesn't matter what method is used, since the values of the coins remain the same.*

3. We know that a half-dollar coin is $\frac{1}{2}$ of a dollar and a quarter is $\frac{1}{4}$ of a dollar. Why do you think we do not have a coin that represents $\frac{1}{3}$ of a dollar?

Possible response: *One-half of a dollar is exactly 50 cents, or fifty pennies. One-quarter of a dollar is exactly 25 cents, or 25 pennies. One-third of a dollar is 33.3 repeating cents, or 33.3 repeating pennies. Since this means that we have 33 pennies and part of a penny, and since pennies are the smallest unit of money that we have, it does not make sense to have a coin that divides a penny into smaller pieces. If I go to the store and buy something for 33 cents and I pay with a* $\frac{1}{3}$ *coin, my change is 0.3 repeating pennies. This cannot happen.*

Extension Activities

1. Develop mathematical reasoning skills.

a. Counting coins with different values: Students are given a handful (or more) of change with several different coins. Students can consider how they count the change to figure out the total amount of money. Students can explain their strategies for finding out how much they have in quarters vs. how much they have in nickels. How do they group their coins when counting and why? Do they group quarters, nickels, and pennies in different ways? When students find their totals, are they using multiplication by fractions for one type of coin and multiplication by decimals for the other?

b. Reasoning about division of money into whole number parts: When Michael is dividing up his money, he is able to give each of his three sisters the same amount of money. List a handful of other amounts of money near the amount Michael has in his jar, and determine whether or not Michael's sisters receive equal amounts when it is divided up. Explore the values and come up with a rule that explains your answers.

Sample Response: Suppose Michael has $10.77 in his jar. If he adds one cent, then he has $10.78. Not all of the sisters receive the same amount money. Two receive $3.59 and one receives $3.60. If he adds two cents, then he has $10.79 in his jar. Still, not all of the sisters receive the same amount of money. One sister receives $3.59 and two receive $3.60. If he adds 3 cents to the jar, he has $10.80 and each of the sisters receives $3.60. [Students should continue to explore with more values.] When the amount of money added to the jar is a multiple of three, then the amount in the jar is able to be divided equally among the three sisters. Each time Michael adds 3 cents to the jar, each sister receives one more cent.

2. Explore connections with history and social studies content (this activity could be used as DOK4).

a. Students can explore the history of the use of "dollars" and "bits." Today, we don't cut up our coins, but in the past, cutting coins was a common practice. Originally, dollars were "pieces of eight" and each dollar could be split into 8 pieces, each called a "bit." Research can be done by the instructor with varied amounts of information given to students to vary the DOK level from 3 to 4.

Samples:

- What coins were originally used as dollars? What is the origin of a "bit"? (What fraction of a dollar is one "bit"?)
- How many cents is a "bit"?
- How many "bits" are there in a quarter?
- Research the colloquial expressions "two-bit" and "shave and a haircut, two bits." Why has the meaning of the expression "two-bit" changed over time?