

Inspect

CCR Performance Tasks

**Math Grade 2: Solve Challenging Problems
Using Addition and Subtraction**

Inspect offers the following assessment products:

Content Bank for English/Language Arts and Math Grades 2 – High School	<ul style="list-style-type: none"> More than 36,000 items More 1500 complex texts, including authentic permissioned texts Includes Literacy in History, Social Science, Science, and Technical Subjects
Quick Checks for English/Language Arts and Math Grades 2 – High School	<ul style="list-style-type: none"> Fixed-form assessments with five to seven items including constructed response Key instructional concepts embedded in standards (clusters for Math, staircase of text complexity for ELA)
Focused Interim Assessments for English/Language Arts and Math Grades 3 – High School	<ul style="list-style-type: none"> Prebuilt assessments with up to 15 items that focus on groups of related standards within a Claim or domain More focused than summative assessments Flexible and customizable Mirrors SBAC IAB blueprints
NGSS Formative Assessments Grades 5 – High School	<ul style="list-style-type: none"> Prebuilt assessments with items linked to experimental contexts that assess the three dimensions of science learning Flexible and customizable Addresses the California Course Models and NGSS Bundles
Observational Tasks for English/Language Arts and Math Grades K - 1	<ul style="list-style-type: none"> Developmentally appropriate for individual students and small groups

Inspect Assessment Content is available through a variety of assessment administration and data analysis platforms.

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.

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



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

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

We constantly update our content. Ask us about what's new!

Student Rubric

This problem tests if you can:

- Use mathematics to solve everyday problems and explain how you know your answers are correct;
- Add and subtract with numbers up to 1,000.

Your teacher will give your answer a 4, 3, 2, 1, or 0.

This is how you get a 4:

Your answer is correct and complete.

- You correctly solve all the problems;
- You show or explain your work so your teacher understands how you solved the problems.

This is how you get a 3:

Your answer is correct but your explanations are not complete.

- You correctly solve all the problems;
- You show or explain only some of your work so your teacher is not sure how you solved the problems.

This is how you get a 2:

You do not answer one part, or you make some mistakes.

- You correctly solve some of the problems;
- You show or explain your work so your teacher understands how you solved some of the problems.

This is how you get a 1:

You do not answer two parts or you make mistakes in all the parts.

- Your answers show that you do not understand the problems;
- You leave some parts blank and make mistakes.

This is how you get a 0:

You do not answer the question or your teacher cannot understand your answer.

Name: _____

Math Grade 2: Solve Challenging Problems Using Addition and Subtraction

Complete all the tasks in the test booklet

- 1** Kenji and Kiko are working on a craft project after school. Their teacher has put the craft supplies in 5 different bins. Kenji and Kiko are allowed to use a total of 500 supplies for their project. Their teacher gave them a box to carry the 500 supplies they need. The bins and box are shown in the picture below.



- A. Kenji and Kiko can take a total of 500 craft supplies. Are there 4 bins of supplies that Kenji and Kiko can take? Show your work and explain how you know your answer is correct.**

Name: _____

Math Grade 2: Solve Challenging Problems Using Addition and Subtraction

Name: _____

Math Grade 2: Solve Challenging Problems Using Addition and Subtraction

B. Kenji puts two whole bins of craft supplies in the box. The two bins include a total of 240 craft supplies. Which types of supplies did he take? Show your work or explain how you know.

CCR Performance Tasks

Math Grade 2: Solve Challenging Problems Using Addition and Subtraction

Teacher Guide

Math Grade 2: Solve Challenging Problems Using Addition and Subtraction

About the Teacher Guide

This document contains the specific definitions for “Math Grade 2: Solve Challenging Problems Using Addition and Subtraction.”

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 1	2.OA.1, 2.NBT.1, 2.NBT.4, 2.NBT.6, 2.NBT.7

SBAC Claims	PARCC Sub-Claims
1 and 2	A and D

Math Grade 2: Solve Challenging Problems Using Addition and Subtraction

Performance Task

Kenji and Kiko are working on a craft project after school. Their teacher has put the craft supplies in 5 different bins. Kenji and Kiko are allowed to use a total of 500 supplies for their project. Their teacher gave them a box to carry the 500 supplies they need. The bins and box are shown in the picture below.



- A. Kenji and Kiko can take a total of 500 craft supplies. Are there 4 bins of supplies that Kenji and Kiko can take? Show your work and explain how you know your answer is correct.**
- B. Kenji puts two whole bins of craft supplies in the box. The two bins include a total of 240 craft supplies. Which types of supplies did he take? Show your work or explain how you know.**
- C. Now there are 240 craft supplies in the box. Which bins of craft supplies can Kiko add to the box without going over a total of 500 supplies? Show your work or explain how you know.**

Math Grade 2: Solve Challenging Problems Using Addition and Subtraction

Standards Alignment

MP1 > DOK 3

Make sense of problems and persevere in solving them. -- Mathematically proficient students start by explaining to themselves the meaning of a problem and looking for entry points to its solution. They analyze givens, constraints, relationships, and goals. They make conjectures about the form and meaning of the solution and plan a solution pathway rather than simply jumping into a solution attempt. They consider analogous problems, and try special cases and simpler forms of the original problem in order to gain insight into its solution. They monitor and evaluate their progress and change course if necessary. Older students might, depending on the context of the problem, transform algebraic expressions or change the viewing window on their graphing calculator to get the information they need. Mathematically proficient students can explain correspondences between equations, verbal descriptions, tables, and graphs or draw diagrams of important features and relationships, graph data, and search for regularity or trends. Younger students might rely on using concrete objects or pictures to help conceptualize and solve a problem. Mathematically proficient students check their answers to problems using a different method, and they continually ask themselves, "Does this make sense?" They can understand the approaches of others to solving complex problems and identify correspondences between different approaches.

Content Standards

2.OA.1

Use addition and subtraction within 100 to solve one- and two-step word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.

2.NBT.1

Understand that the three digits of a three-digit number represent amounts of hundreds, tens, and ones; e.g., 706 equals 7 hundreds, 0 tens, and 6 ones. Understand the following as special cases:

- 100 can be thought of as a bundle of ten tens — called a "hundred."
- The numbers 100, 200, 300, 400, 500, 600, 700, 800, 900 refer to one, two, three, four, five, six, seven, eight, or nine hundreds (and 0 tens and 0 ones).

2.NBT.4

Compare two three-digit numbers based on meanings of the hundreds, tens, and ones digits, using $>$, $=$, and $<$ symbols to record the results of comparisons.

2.NBT.6

Add up to four two-digit numbers using strategies based on place value and properties of operations.

2.NBT.7

Add and subtract within 1000, 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. Understand that in adding or subtracting three-digit numbers, one adds or subtracts hundreds and hundreds, tens and tens, ones and ones; and sometimes it is necessary to compose or decompose tens or hundreds.

Math Grade 2: Solve Challenging Problems Using Addition and Subtraction

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 #2:

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

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 D:

Highlighted Practice MP.4 with Connections to Content: modeling/application. The student solves real-world problems with a degree of difficulty appropriate to the grade/course by applying knowledge and skills articulated in the standards for the current grade/course (or, for more complex problems, knowledge and skills articulated in the standards for previous grades/courses), engaging particularly in the Modeling practice, and where helpful making sense of problems and persevering to solve them (MP.1), reasoning abstractly and quantitatively (MP.2), using appropriate tools strategically (MP.5), looking for and making use of structure (MP.7), and/or looking for and expressing regularity in repeated reasoning (MP.8).

Math Grade 2: Solve Challenging Problems Using Addition and Subtraction

Scoring Rubric

4 Point Response:

The response demonstrates a high level of understanding.

A level 4 response demonstrates:

- An ability to make sense of problem situations and develop a solution strategy;
- An ability to use estimation, addition, subtraction, and place value understanding to solve problems;
- An ability to add and subtract numbers up to 1,000 using various strategies.

A level 4 response should include:

- A correct answer in part A with correct and complete work and explanation;
- The correct answer in part B, namely craft sticks and stones, with correct and complete work shown or a correct and complete explanation;
- The correct answer in part C, namely beads or jars of glitter, with correct and complete work or explanation.

A sample level 4 response follows.

Sample response for part A: "They cannot take 4 bins without going over 500. I know this is true because I added together the three bins with the lowest numbers and got 415. I know from estimation that I would need a bin that is less than 100. But the other bins have 250 and 325, either of which is too many."

$$\begin{array}{r} 77 \\ 163 \\ + 175 \\ \hline 415 \end{array}$$

Sample response for part B: "Kenji can take craft sticks and stones. I know this because $163 + 77 = 240$. None of the other bins add up to 240."

Sample response for part C: "Kiko can take glitter or beads but not buttons. Glitter is okay because $240 + 175 = 415$, which is less than 500. Beads are okay because $240 + 250 = 490$, which is less than 500, but buttons don't work because $240 + 325 = 565$, which is more than 500."

3 Point Response:

The response demonstrates a strong understanding, but the work contains minor errors.

A level 3 response is characterized by:

- An ability to make sense of problem situations and develop a solution strategy, although the explanation of the strategy may be incomplete;
- An ability to use estimation, addition, subtraction, and place value to solve problems, although the work may contain some minor errors;
- An ability to add and subtract numbers up to 1,000 using various strategies, although the work may contain minor errors.

2 Point Response:

The response demonstrates a basic but incomplete understanding.

A level 2 response is characterized by:

- A weak ability to make sense of problem situations and develop a solution strategy. Students may struggle with determining how to solve the problems, or they may need support from peers or the teacher to develop a solution strategy;
- A basic ability to use addition, subtraction, and place value to solve problems. Students implement the solution strategy correctly or with only minor errors. They can use place value to compare numbers correctly;
- A basic ability to add and subtract numbers up to 1,000 using various strategies. Students can add and subtract correctly or with only minor errors.

Math Grade 2: Solve Challenging Problems Using Addition and Subtraction

1 Point Response:

The response demonstrates minimal understanding.

A level 1 response is characterized by:

- A lack of ability to make sense of problem situations and develop a solution strategy. Students do not understand the problem situation and do not develop a solution strategy even with support;
- A weak ability to use addition, subtraction, and place value to solve problems. The work is missing or contains major errors;
- A weak ability to add and subtract numbers up to 1,000 using various strategies. The work contains major errors.

0 Point Response:

There is no response, or the response is off topic.

Math Grade 2: Solve Challenging Problems Using Addition and Subtraction

Discussion Questions

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

1. How can you use mental math to add $300 + 400$?

Possible response: *I can use the basic fact $3 + 4 = 7$, but since I'm adding hundreds, $300 + 400 = 700$.*

2. How can you use place-value blocks to add $253 + 120$?

Possible response: *I can show 3 ones units, I can show 7 tens (5 tens and 2 tens), and finally I can show 2 hundreds blocks and add on 1 more to make 3 hundreds. So, I have 3 hundreds, 7 tens, and 3 ones to make 373.*

3. Use your place-value blocks to show how to regroup to find $147 + 115$.

Possible response: *I need to regroup 12 ones into 1 ten and 2 ones. Then I add 1 ten to 4 tens. So, $147 + 115 = 262$.*

4. In what types of situations do you use addition to solve a problem?

Possible response: *I use it when adding to a group, such as when I have 4 cookies and I make 10 more cookies, so I have a total of $4 + 10$. I also use it when combining groups, as in there are 8 girls and 5 boys, so there are $8 + 5$ children.*

5. In what types of situations do you use subtraction to solve a problem?

Possible response: *I use it when I'm taking away from a group, such as when I have 12 cookies and I eat 3 cookies; then I have $12 - 3$ cookies left. I also use it when I'm separating a big group into smaller groups, such as when I have a total of 20 apples and 13 of them are red and the rest are green; this means I have $20 - 13$ apples that are green. Sometimes I use subtraction when comparing things, such as if Jane is 8 and Sam is 5, Jane is $8 - 5$ years older than Sam.*

Math Grade 2: Solve Challenging Problems Using Addition and Subtraction

Extension Activities

1. Demonstrate understanding of the commutative ($a + b = b + a$) property of addition and the associative property of addition ($(a + b) + c = a + (b + c)$) using mental math.

Example: Give each pair of students a set of index cards with the numbers 10, 20, 30, ..., 90 written on cards. Have the students mix the cards and sort them into groups of three cards each. Then tell the students to add the three numbers, starting with the two numbers that are easier to add mentally. For example, if the cards are 70, 30, and 20, the students can first add 70 and 30 to make 100, and then add on 20 to get the final sum of 120.

2. Develop estimation strategies.

Example: Ask students to each draw or write a word problem using 3-digit numbers. Then students can exchange problems with their partners and estimate an answer by using numbers to the nearest hundred. Then have students work together to answer the problems, compare answers with their estimates, and discuss the methods used to solve the problems.

3. Demonstrate understanding of the addition and subtraction algorithms through concrete models.

Example: Provide students with some 3-digit addition and subtraction problems. Have each pair of students use base-10 blocks to model the problems, recording the problems on paper. Have students take turns describing the addition or subtraction process.

4. Demonstrate understanding of place-value by solving and discussing problems.

Example: Write some incomplete problems on the board, and ask students questions about each problem.

Sample:

- a. Problem 1: Suppose you can write 9 in any one box. Where should you put it to make the greatest sum?

$$\square 5 \square + \square \square \square$$

- b. Problem 2: What number can you put in the box to make a sum closest to 1,000 without going over?

$$720 + \square 56$$