

Just in Time Quick Check

Standard of Learning 4.CE.1

Strand: Computation and Estimation

Standard of Learning 4.CE.1

The student will estimate, represent, solve, and justify solutions to single-step and multistep problems, including those in context, using addition and subtraction with whole numbers.

Students will demonstrate the following Knowledge and Skills:

- a) Determine and justify whether an estimate or an exact answer is appropriate when solving contextual problems involving addition and subtraction with whole numbers. Refine estimates by adjusting the final amount, using terms such as *closer to*, *between*, and *a little more than*.
- b) Apply strategies (e.g., rounding to the nearest 100 or 1,000, using compatible numbers, other number relationships) to estimate a solution for single-step or multistep addition or subtraction problems with whole numbers, where addends or minuends do not exceed 10,000.*
- c) Apply strategies (e.g., place value, properties of addition, other number relationships) and algorithms, including the standard algorithm, to determine the sum or difference of two whole numbers, where addends and minuends do not exceed 10,000.*
- d) Estimate, represent, solve, and justify solutions to single-step and multistep contextual problems involving addition and subtraction with whole numbers where addends and minuends do not exceed 1,000,000.

***On the state assessment, items measuring this objective are assessed without the use of a calculator.**

Just in Time Quick Check

Just in Time Quick Check Teacher Notes

Supporting and Prerequisite SOL: 4.NS.1, 4.PS.1, 4.PFA.1, 3.CE.1

Just in Time Quick Check 4.CE.1

1. The superintendent of a school division is planning a fifth-grade promotion ceremony in the high school football stadium.
 - There are 678 fifth-grade students who will attend.
 - There are 1,488 guests who will attend.
 - The football stadium can seat 2,500 people.

The superintendent wants to know if the football is big enough to fit all the students and guests. Should the superintendent find an exact total number of students and guests or make an estimate of the total number of students and guests? Justify your reasoning.

2. Estimate the sum: $6,981 + 8,322 + 5,512$

3. Estimate the difference: $7,502 - 3,778$

4. Which best describes the difference between 9,983 and 5,051? The difference is—
 - a) closer to 2,000 than 3,000
 - b) closer to 3,000 than 4,000
 - c) closer to 4,000 than 5,000
 - d) closer to 5,000 than 6,000

5. Solve this problem.

$$3,068 + 9,589$$

6. Solve this problem.

$$8,000 - 6,295$$

7. The following table shows four national parks and the number of visitors each national park had in 2024. Use this information to answer the questions below. You may use a calculator to help you.

Park Name	Number of Visitors
Great Basin National Park	152,068
North Cascades National Park	16,485
Dry Tortugas National Park	84,873
National Park of American Samoa	22,567

- a) How many more visitors did Great Basin National Park and North Cascades National Park have combined than Dry Tortugas National Park?
- b) The National Park of American Samoa set a goal to have 30,000 visitors in 2024. How many more visitors did they need to reach their goal?

4.CE.1 Just in Time Quick Check Teacher Notes

Common Errors/Misconceptions and their Possible Indications

1. The superintendent of a school division is planning a fifth-grade promotion ceremony in the high school football stadium.
 - There are 678 fifth-grade students who will attend.
 - There are 1,488 guests who will attend.
 - The football stadium can seat 2,500 people.

The superintendent wants to know if the football is big enough to fit all the students and guests. Should the superintendent find an exact total number of students and guests or make an estimate of the total number of students and guests? Justify your reasoning.

Students may have difficulty determining when an estimate or an exact answer is appropriate when solving contextual problems. In this example, students may believe that they must find the exact number of students and guests to determine whether they will all fit in the football stadium. However, by rounding each number up to the nearest hundred ($700 + 1,500 = 2,200$), the superintendent can easily determine that there will be enough seats to accommodate all students and guests.

When solving contextual problems, it may be beneficial for students to engage in discussions about when contextual problems require an exact solution and when an estimate will suffice. As they become more familiar with contexts where an estimate is needed, they may begin to recognize that certain estimation strategies (e.g., rounding all numbers up) are better suited to estimating when it is important to ensure that there are enough to meet the demands of the context (e.g., enough cookies for everyone in the class, enough money to pay for all of the groceries, enough seats to fit all students and guests).

2. Estimate the sum: $6,981 + 8,322 + 5,512$

A common error students make when estimating the sum of two or more numbers is to find the exact answer, rather than an estimate. Students should be encouraged to estimate all problems prior to solving them because it will help them determine whether their exact answer is reasonable.

When finding the sum of the three given numbers, students will likely use a variety of estimation strategies. For example, some students may round each number to the nearest thousand ($7,000 + 8,000 + 6,000 = 21,000$) or they may round each number to the nearest hundred ($7,000 + 8,300 + 5,500 = 20,800$). Some students may choose to use a combination of estimation strategies (e.g., $7,000 + 8,000 + 5,500 = 20,500$).

It may be beneficial for students to engage in class discussions about their estimation strategies. This will help students hear other students' estimation strategies and can lead to discussions of which estimates will result in a sum that is closer to the exact sum. Additionally, students should be encouraged to explain and justify their estimation strategies (e.g., "I know that the exact answer will

be a little more/less than _____ because ...,” or “I know the exact answer will be in between _____ and _____ because ...”

3. Estimate the difference: $7,502 - 3,778$

A common error students make when estimating the difference of two numbers is to find the exact answer, rather than an estimate. Students should be encouraged to estimate all problems prior to solving them because it will help them determine whether their exact answer is reasonable.

When finding the difference of the two given numbers, students will likely use a variety of estimation strategies. For example, some students may round each number to the nearest thousand ($8,000 - 4,000 = 4,000$) or they may round each number to the nearest hundred ($7,500 - 3,800 = 3,700$). Some students may use a combination of estimation strategies including rounding and/or compatible numbers (e.g., $7,500 - 4,000 = 3,500$ or $7,500 - 3,500 = 4,000$).

It may be beneficial for students to engage in class discussions about their estimation strategies. This will help students hear other students’ estimation strategies and can lead to discussions of which estimates will result in a difference that is closer to the exact difference. Additionally, students should be encouraged to explain and justify their estimation strategies (e.g., “I know that the exact answer will be a little more/less than _____ because ...,” or “I know the exact answer will be in between _____ and _____ because ...”

4. Which best describes the difference between 9,983 and 5,051? The difference is—
- a) closer to 2,000 than 3,000
 - b) closer to 3,000 than 4,000
 - c) closer to 4,000 than 5,000
 - d) closer to 5,000 than 6,000

Estimation is a strategy that students can use to determine an approximate answer and to verify the reasonableness of a solution. Estimation requires students to conceptualize numbers. Students will need to determine whether they should round up or down, round to a specific place value, apply front-end estimation, use compatible numbers, or use a mix of these estimation strategies. To determine the best estimate, students will need to analyze each number. The number 9,983 is close to 10,000 and the number 5,051 is close to 5,000; therefore, the difference is close to 5,000. A common misconception for some students is to look at the thousands place only and subtract 9,000 and 5,000, leading students to state that the difference will be closer to 4,000 than 5,000. If students are unable to determine the best estimate, it may help to explore a variety of estimation strategies with them, selecting problems to highlight the use of appropriate strategies.

5. Solve this problem.

$$3,068 + 9,589$$

Common student misconceptions occur when solving computation problems that require regrouping. Some students struggle with the meaning of regrouping and believe they are just “carrying” the 1 to the next number. For example, some students do not understand that ten 10s are equivalent to 100 and they are really regrouping those ten 10s into one hundred. In this problem, the first regrouping occurs in the ones place. Students must take the group of ten 1s and add this 10 to the 14 tens (60 + 80), resulting in 15 tens. If students struggle with this concept, the use of manipulatives such as base ten blocks may help them build understanding.

Some students will not understand what to do with the sum of the digits in the thousands place and may not realize that they need to regroup into the ten thousands place. One strategy that students may use is to estimate to determine if their answer is reasonable. Rounding to the largest place value or looking for compatible numbers will help struggling students think about their result and identify possible errors. In this problem, if students estimate, they will see that their answer must be greater than ten thousand. It is important to continue to focus on place value and estimation skills when solving operations with larger numbers. Additionally, allowing students to share their strategies when solving problems gives all students an opportunity to connect math and language, as well as deepen their understanding of mathematical concepts.

6. Solve this problem.

$$8,000 - 6,295$$

A common misconception for some students when subtracting two numbers that require regrouping is to subtract the smaller number from the larger number. For example, if students state the difference is 2,295, this may indicate that the students did not regroup correctly and subtracted the smaller digit from the larger digit in each place value. These students would benefit from using base ten blocks to model subtraction.

Some students may not understand how to subtract and regroup with zeroes. If students are unable to regroup with zeroes, using base ten blocks to model subtraction will provide a physical and visual way for students to understand this concept. It may also be helpful to model subtraction with zeros using smaller numbers prior to applying this concept to larger quantities.

When exploring the concept of subtraction, it is also important for students to understand that the distance between two numbers is also the difference of those numbers. Students can explore this concept by using a number line and counting the jumps between the numbers. Adding-on is another strategy to help students explore and discover the difference between two numbers.

7. The following table shows four national parks and the number of visitors each national park had in 2024. Use this information to answer the questions below. You may use a calculator to help you.

Park Name	Number of Visitors
Great Basin National Park	152,068
North Cascades National Park	16,485
Dry Tortugas National Park	84,873
National Park of American Samoa	22,567

- a) How many more visitors did Great Basin National Park and North Cascades National Park have combined than Dry Tortugas National Park?

Students may have difficulty solving multistep contextual problems. For example, students may not understand that this problem requires addition (combining the number of visitors for Great Basin National Park and North Cascades National Park) and subtraction (subtracting the number of visitors at Dry Tortugas National Park from that total). Instead, a common mistake is for students to incorrectly state that there were 253,426 visitors, indicating that students added the number of visitors for all three of the given parks.

Students who struggle with multistep contextual problems may benefit from opportunities to engage with numberless word problems. With a numberless word problem, teachers present a contextual problem to students with all the numbers removed. This allows students to focus on the context of the problem and the actions that occur in the problem. It may be helpful for students to engage in discussions about what operation is associated with the actions in the problem (e.g., if two quantities are combined, the operation is addition; if two quantities are compared, the operation is subtraction). Numbers can then be incorporated into the problem one at a time, and students can use the new information to solve the problem.

- b) The National Park of American Samoa set a goal to have 30,000 visitors in 2024. How many more visitors did they need to reach their goal?

A common error students may make when solving this problem is to notice the word “more” and believe this means they need to use addition to solve the problem, leading to an incorrect answer of 52,567 visitors. Students should be encouraged to focus on the context of the problem to determine what operation is needed, rather than relying on key words. Additionally, students should be encouraged to check whether their answer is reasonable. In doing so, students should understand that 52,567 is not a reasonable answer to how many more visitors were needed to reach the park’s goal, when the goal was only 30,000 visitors.