## Overview

<table>
<thead>
<tr>
<th>Purpose</th>
<th>Formative assessment of students’ understanding of place value and properties of operations used to add or subtract.</th>
</tr>
</thead>
</table>
| Grade Level(s) | 1st Grade  
*This can also be used in 2nd grade, as activities are designed to assess mastery of 1st grade standards as well as progress toward mastery of 2nd grade standards.* |
| Task Format | • Whole group  
• Task will be repeated for up to five consecutive days (five to seven minutes per day) until all students have had the opportunity to participate and be assessed. |
| Materials Needed | • Overhead projector, interactive whiteboard  
• Base-10 blocks (overhead-friendly or virtual) |
| Prerequisite Concepts and Skills | • Counting by 1s to 120  
• Counting by 10s to 100  
• Demonstrating understanding of how to “count on” from a given number  
• See kindergarten “Counting and Cardinality” in the Common Core State Standards (K.CC) for these and related skills. |

## Standards Assessed

<table>
<thead>
<tr>
<th>NBT.C.4</th>
<th>Add within 100, including adding a two-digit number and a one-digit number, and adding a two-digit number and a multiple of 10, 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. Understand that in adding two-digit numbers, one adds 10s and 10s, 1s and 1s; and sometimes it is necessary to compose a 10.</th>
</tr>
</thead>
<tbody>
<tr>
<td>NBT.C.5</td>
<td>Given a two-digit number, mentally find 10 more or 10 less than the number, without having to count; explain the reasoning used.</td>
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<tr>
<td>NBT.C.6</td>
<td>Subtract multiples of 10 in the range of 10–90 (positive or zero differences), 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.</td>
</tr>
</tbody>
</table>

### Extensions

<table>
<thead>
<tr>
<th>NBT.B.5</th>
<th>Fluently add and subtract within 100 using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction.</th>
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<tbody>
<tr>
<td>NBT.B.9</td>
<td>Explain why addition and subtraction strategies work, using place value and the properties of operations.</td>
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</tbody>
</table>

Note: This task does not cover every part of the standards listed above. For example, standard 1.NBT.C.4 covers problems like 37 + 25, but such problems are not covered in this task.
Standards for Mathematical Practice Embedded in This Task

<table>
<thead>
<tr>
<th>MP5</th>
<th>Use appropriate tools strategically.</th>
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</thead>
<tbody>
<tr>
<td></td>
<td><em>The degree of need for MP5 in this task will vary according to the students’ need to use tools to think through the activity. Base-10 blocks are one tool that can be used, but fingers may also be a common tool students might use for this activity. The goal is to see a decrease in the need for tools when figuring out this task, so it is hoped that tool use will decrease over time.</em></td>
</tr>
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<tr>
<th>MP8</th>
<th>Look for and express regularity in repeated reasoning.</th>
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<td></td>
<td><em>MP8 is a foundational practice in this exercise. As students engage in the activity, the repeated opportunities to work with adding or subtracting 1s and 10s, as well as repeatedly adding 10 then subtracting 10, helps students to see patterns in the results. They can work toward generalizing results with the repetition, such as “any time I add 10, I increase the first number (the 10s) by one or if I add and then subtract the same number, I end up at the same number that I started with.”</em></td>
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</table>

Preparing for the Task

1. Set up an overhead projector or interactive whiteboard along with overhead-friendly Base-10 blocks (or virtual Base-10 block manipulatives).
2. Have a copy of the lists of preselected numbers (Days 1–5). Do not share this list with students.

Implementing the Task

Explain to students that the goal of this task is to become good at adding and subtracting 1s and 10s. To build students’ engagement and keep this task playful, you can approach this like a game.

Students will add or subtract 1 or 10 from a number shown with Base-10 blocks and will continue using the result from one operation as the starting point for the next operation.

Throughout the document, when specific language is suggested, it is shown in blue text.

1. Find the appropriate day’s starting number(s) and sequence(s) on pages 5–7. Announce, “Today, we’re starting at ___.” Read the starting number aloud to students. (For example, say, “Today we’re starting at 25.”)
2. Invite a student to model the starting number using Base-10 blocks on the overhead projector or whiteboard (e.g., 25 = two 10s + five 1s).
3. “Now I’ll choose someone and I will say just ‘1 more’ or maybe ‘1 less’ or ‘10 more’ or ‘10 less.’ Your job will be to show the new number and say it out loud.”

*Note:* Keeping the words to a minimum is very important to the task. Students often make mistakes because they have to process several things at once; by minimizing the spoken language that students need to attend to, you are trying to singularly identify difficulties that arise because of mathematical misconceptions or errors, rather than those that might arise from processing.
4. Following the sequence of steps for the day, ask individual students to perform the specified addition or subtraction (of 1 or 10) to the existing number.

For example, say, “[Student name], 10 more.” The student will then add a rod to 25 and then say “35.”

The task continues from that new number, adding or subtracting another 1 or 10 until the sequence for that day is used up.

5. After a few rounds of students demonstrating the change and the resulting number on the overhead (or board), ask the students to respond in chorus to the next step in the sequence. You might say, “Now we are going to do this as a whole class, so after I say the change, you say the new number all together.”

6. Addressing Student Misconceptions/Errors. When errors occur with modeling or reporting the answer, you might ask the student to “show why you think that’s true” to uncover student thinking and gain further insight into what caused the error: misconception or just a slip. This is not a time for breaking into a lecture.

The following situation illustrates this point:

(The previous number is 37.)

TEACHER: Michayla, add 10.

MICHAYLA: 46.

TEACHER: Show me why you think that is true.

MICHAYLA: Okay ... (counts on fingers) 37, 38, 39, 40, 41, 42, 43, 44, 45, 46. (The student’s misconception arises from the fact that he or she includes the starting number when counting and does not count on.)

TEACHER: What do the rest of you think?

STUDENT B: I think it should be 47 ‘cause when you add 10, the 30 changes to 40, but the 7 stays.

TEACHER: Great, let’s keep going from 47. Jerome, add 1. (This ought to help Michayla rethink the counting method. This is something to note about Michayla but to address at a later time.)

While in this early mode of a single student responding, if a different student happens to call out the correct answer, you might ask the student in front, “What do you think?” You might also say nothing and allow the student in front to make a decision about what to do. It’s important at this point, however, not to allow this interaction to disrupt the flow of the activity.

Once the activity is in choral-response mode, you may (on occasion) hear both correct and incorrect answers; it is not actually necessary in these cases to correct the response (but make note of it). When this occurs, you might say, “One of those is correct.” Then choose a new starting number and complete the sequence (or restart if you deem appropriate, but stay in choral mode). Often, in hearing the other students’ responses a student will self-correct in one or two steps. Note any significant student misconceptions on the rubric provided.
Assessing Student Understanding

As this activity unfolds, fill out the task rubric. The rubric serves two purposes: (1) to help determine each student’s understanding and what the student is able to do independently; and (2) to inform next steps in each student’s learning trajectory and plan next steps for instruction.

Illustrating the Task

TEACHER: Our starting number is 25. [Student name] please show us 25 using Base-10 blocks. (Student A places two 10s and five 1s on the overhead projector.)

TEACHER TO STUDENT A: How do you know that this is 25? (Student A explains the reasoning used.)

TEACHER: (Selects a new student) [Student name], add 10. (Student B comes up to the overhead projector, places a ten rod and says, “35.” Student may also write this number in numeral form.)

After the first three or four moves are represented with the Base-10 blocks, indicate to students that you are now going to challenge them by not modeling with the blocks for the whole class, although they are still allowed to use tools at their desk to help figure out the answers. Ask students to wait two beats before calling out their response. This game continues for four to five minutes until you have had the chance to assess several students on one or more series of numbers.

TASK: List of Numbers

This list of numbers and sequence has been carefully developed to help students use repeated reasoning over time to make generalizations. On Day 1, the task becomes increasingly complex, making sure students work effectively with 1s and then 10s and then interchanging them. For Day 2 and beyond, they continue the mixing of 1s and 10s but begin having students cross decades (20s, 30s, 40s, etc). When it seems reasonable for your class, ask students to begin to combine the adding and subtracting of 1s and 10s to assess whether they understand situations such as that adding 1 and 10 is 11 and whether adding 10 followed by subtracting 10 (or 1) leaves the number unchanged.

We hold off on working with units and teens until the last section of the task, since in spoken English, units and teens do not follow the same pattern as the higher decades. Consequently, working with these numbers requires more cognitive effort for students. So, despite the seemingly inherent simplicity of smaller numbers, it is important to delay the work with units and teens until Day 5. If evidence from your students’ responses on previous sequences suggests that students are ready to move to this prior to Day 5, begin when you believe it is appropriate.
Day 1

Part 1: Adding/Subtracting 1s
Starting number: 23
Sequence:
  1 more, 1 more, 1 more, 1 more,
  1 more, 1 less, 1 more, 1 less,
  1 less, 1 less, 1 less, 1 more,
  1 less, 1 more, 1 less, 1 more

Part 2: Adding/Subtracting 10s
Starting number: 34
Sequence:
  10 more, 10 more, 10 more, 10 more,
  10 more, 10 less, 10 more, 10 less,
  10 less, 10 less, 10 less, 10 less,
  10 less, 10 more, 10 less, 10 more, 10 less

Part 3: Adding/Subtracting 1s and 10s
Starting number: 36
Sequence:
  1 more, 1 less, 10 more, 10 more,
  1 less, 10 less, 10 more, 10 more,
  10 less, 10 more, 1 more, 1 less,
  1 less, 1 more, 10 less
Days 2–4

**Part 1: Crossing Decades**

Starting number for Day 2: 47

*Note:* For Days 3 and 4, choose starting numbers that cause crossing over decades, such as 58, 37 or 77, avoiding units and teens.

Sequence:

1 more, 1 less, 1 more, 1 more,
1 less, 1 more, 1 more, 1 more,
10 more, 1 less, 1 less, 10 more,
1 more, 1 less, 1 less, 10 more,
1 less, 10 less, 10 less, 10 less,
10 less, 1 more, 1 more, 1 more

**Part 2: Combining 1s and 10s**

Starting number for first day: 65

*Note:* Depending on your students’ understanding, this can begin as early as Day 2, but it may make sense to hold off until Day 3 or 4 if students need some more work with the single operations. For subsequent days, choose starting numbers that cross decades, but don’t get into units, teens or negative numbers.

Sequence:

10 more, 10 less, 10 more, 1 more,
1 less, 1 more, 1 less, 10 less, 10 more and 1 more,
10 more and 1 more, 1 less and 10 less, 1 more and 1 more,
1 more and 1 more, 1 less and 1 less, 1 more and 1 less, 1 less and 1 more,
10 more and 10 less, 10 less and 10 more, 1 more and 10 less, 10 more and 1 less,
10 less and 1 more, 1 less and 10 more
Day 5

Starting in Units**

Starting number: 3

Note: Repeat the activity starting with 2, and again beginning with 11.

Sequence:

10 more, 10 less, 1 more, 10 more,
1 more, 10 less, 1 less, 1 less,
1 less, 10 more, 10 less, 10 more,
1 more, 10 more, 10 more, 1 less, 1 more

**Note: In spoken English, units and teens do not follow the same pattern as the higher decades. Consequently, working with these numbers requires more cognitive effort for students. So, despite the seemingly inherent simplicity of smaller numbers, it is important to delay the work with units and teens until Day 5. If evidence from your students’ responses on previous sequences suggests that students are ready to move to this prior to Day 5, begin when you believe it is appropriate.

Potential erroneous responses that might signify processing errors rather than mathematical misconceptions:

1. When crossing decades, students might do something like the following:
   - 62 [1 less]  61 [1 less]  60 [1 less]  69/59
     
     This is a typical error that results from students having to keep so many things in working memory at once; they know the 1s digit has to decrease by one, and they are working so hard to make sure that happens, they forget to decrease the 10s digit as well.

     If you hear both 59 and 69, tell students that one of those responses is correct (you don’t have to say which one), and then redo the same sequence starting in another decade.

   - 72 [1 less]  71 [1 less]  70 [1 less]  79/69
     
     On the next round, fewer students will make the error because when they hear the right answer in the previous round, they typically realize their mistake right away because it is generally not a misconception. If need be, you can do this process again.
Adding and Subtracting 1 and 10 Rubric

**Overview:** This rubric breaks down the “smaller understandings” that build toward deep understanding of the standards 1.NBT.6. Recognizing these smaller understandings will allow you to identify where student misconception is happening and plan next steps for instruction accordingly.

**Directions:** This rubric is a checklist. Write in student names (or initials) when evidence is observed.

<table>
<thead>
<tr>
<th>Student(s) Comprehension</th>
<th>Scaffolding Learning</th>
<th>Follow-up</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>APPROACHING THE STANDARD</strong></td>
<td></td>
<td>- Can state any given number?</td>
</tr>
<tr>
<td><strong>Check all that apply</strong></td>
<td></td>
<td>- Can state any addition or subtraction equation?</td>
</tr>
</tbody>
</table>
| Student adds 1 correctly to any number within a decade (less than 100). Student demonstrates recognition that the number value *increases*.  
Student subtracts 1 from any number within a decade (starting less than 100). Student demonstrates recognition that the number value *decreases*.  
*Note: Numbers within a decade include value of numbers 0–9, 10–19, 20–29, 30–39, 40–49, 50–59, 60–69, 70–79, 80–89, 90–99.* | Uses fingers for support.  
Uses manipulatives for support.  
Manipulative(s): __________  
Requires additional teacher support. Explain below:  
__________________________________________________________  
Calculates mentally. | - Does student cross the decade to count on?  
- Can state any addition or subtraction equation?  
*Example:*  
32 – 1 = 31  
(35 – 1 = 34)  
(corresponding Base-10 model) |
| When adding 1 to a number like 29, 39, 49, etc., student reliably crosses the decade correctly (e.g., getting to 30, 40, 50).  
When subtracting 1 from a multiple of 10 (e.g., from 60, 70, 80), student reliably moves to the preceding decade (e.g., getting to 59, 69, 79, etc.). | Uses fingers for support.  
Requires additional teacher support. Explain below:  
__________________________________________________________  
Calculates mentally. | - Does student cross the decade to count on?  
- Can state any addition or subtraction equation?  
*Example:*  
32 + 1 = 33  
(29 + 1 = 30)  
(corresponding Base-10 model) |
**PARCC Draft Grade 1 Formative Task Prototype**

**Adding and Subtracting 1 and 10**

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<thead>
<tr>
<th><strong>APPROACHING THE STANDARD</strong></th>
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<tbody>
<tr>
<td><strong>Student(s) Comprehension</strong></td>
<td><strong>Scaffolding Learning</strong></td>
</tr>
<tr>
<td><em>Check all that apply</em></td>
<td></td>
</tr>
</tbody>
</table>

| **Student conceptually understands that when you add or subtract 1 or 10 from any number, you are “doing” something to the number to create a new number and further understands that when you perform the opposite action, subtracting or adding the same amount starting at that new number, you are “undoing” what was just done. That is, the sequences “start at 47, add 10, subtract 10” and “start at 47, subtract 10, add 10” both end where they started — at 47.** | **Requires additional teacher support. Explain below:** |
| **Continuous learning and support** | **Calculates mentally.** | |

- Is student understanding the “rule” of adding and subtracting? How is this happening? Is the student able to add 10 to 47 and subtract 10 from the result? Is the student able to subtract 10 from 47 and add 10 to the result? Is the student applying this knowledge to other numbers? |

| **Student understands that when adding or subtracting 10, the “last name” of the number (the “9” in “39”) remains the same, but the “first name” (the “30”) changes. In written notation, student recognizes which place (tens) changes and which place (ones) remains the same.** | **Uses fingers for support.** |
| **Requires additional teacher support. Explain below:** | **Calculates mentally.** |

- Can student accurately add and subtract 10 from any number? Are there any patterns or strategies the student is using? How does the student apply these patterns or strategies to new numbers? How is the student tracking their progress? |

| **Can student accurately add and subtract 10 from any number? Are there any patterns or strategies the student is using? How does the student apply these patterns or strategies to new numbers? How is the student tracking their progress?** | **Needs additional support in understanding the relationship between adding and subtracting 10 from any number. Explain below:** |
| **Calculates mentally.** | **Please see below.** |

- Is student understanding the “rule” of adding and subtracting? How is this happening? Is the student able to add 10 to 47 and subtract 10 from the result? Is the student able to subtract 10 from 47 and add 10 to the result? Is the student applying this knowledge to other numbers?
<table>
<thead>
<tr>
<th>Student(s) Comprehension</th>
<th>Scaffolding Learning</th>
<th>Follow-up&lt;br&gt;Please share any evidence you have of a student(s) <strong>not</strong> meeting the standards.</th>
</tr>
</thead>
</table>
| Student is able to add and subtract 1 from any number within 100 fluently and consistently. | Uses fingers for support.<br>Uses manipulatives for support.<br>Requires additional teacher support. Explain below:  

|  |  |  |
|  |  |  |
| Calculates mentally. | | |
| Student is able to add and subtract 10 from any number within 100 fluently and consistently. | Uses fingers for support.<br>Uses manipulatives support (excluding Base-10 blocks).<br>Manipulative(s):  

|  |  |  |
|  |  |  |
| Calculates mentally. | | |
| Student is able to flexibly integrate adding and subtracting 1 and 10 from any number within 100. | Uses fingers for support.<br>Uses manipulatives support.<br>Requires additional teacher support. Explain below:  

|  |  |  |
|  |  |  |
| Calculates mentally. | | |

- Is student independent and using these strategies within 10 seconds? If not, what do you think is getting in the way? How can we change the way we support student(s)?
- Can the student(s) jump stages? Could we give a problem that requires subtraction to negatively modeled calculation?
### MEETING THE STANDARD

<table>
<thead>
<tr>
<th>Student(s) Comprehension</th>
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<th>Follow-up Questions</th>
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<tbody>
<tr>
<td><strong>Check all that apply</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| Student makes connections between a series of steps and generalizes to explain what is happening. For example, “If I add 10 and then add 1 to any number, it is the same as adding 11.”* | Does student...
| | | Add 10...
| | | Add...
| | | Add 12...
| | Other | Other |

*Note: These activities are not specifically called for in this task, but if deemed appropriate, could be implemented as follow-up questions.*