Grade 2:
Resources for Developing Grade-Level Fluencies

"Fluency in each grade involves a mixture of just knowing some answers, knowing some answers from patterns (e.g., "adding 0 yields the same number"), and knowing some answers from the use of strategies. It is important to push sensitively and encouragingly toward fluency of the designated numbers at each grade level, recognizing that fluency will be a mixture of these kinds of thinking which may differ across students" (CC/OA Progression, p. 18).

REQUIRED GRADE-LEVEL FLUENCY STANDARDS:

2.OA.B.2 Fluently add and subtract within 20 using mental strategies. By end of Grade 2, know from memory all sums of two one-digit numbers.
2.NBT.B.5 Fluently add and subtract within 100 using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction.

ADDITIONAL PROCEDURAL FLUENCIES TO DEVELOP:

2.NBT.A.3 Count within 1000; skip-count by 5s, 10s, and 100s.
2.NBT.B.8 Mentally add 10 or 100 to a given number 100-900, and mentally subtract 10 or 100 from a given number 100-900.

HOW TO USE THESE RESOURCES:

This document provides a set of short activities extracted from Engage NY and Illustrative Mathematics, two Open Education Resources, to supplement the fluency practice in *GO Math!*. Although many *GO Math!* lessons include "Fluency Builders," they don't always align to grade-level expectations. Teachers are encouraged to use the activities that do align to the above standards and supplement with the resources in this document.

The activities are designed to support students' progress toward the grade-level fluencies listed above. They are intentionally short, providing educators the flexibility to use them before or after a lesson or anytime during the school day. Since they build on work that students did in Grade 1, they can be used starting very early in the school year. The resources are organized by standard; the number of activities included for a standard indicates the proportional amount of instructional time that should be devoted to developing the fluency throughout the year.

GRADE-SPECIFIC NOTES:

Grade 2 has a number of fluency and procedural standards, so it is critical students consistently practice these skills throughout the year. 2.NBT.B.5 requires students are working within 100, so teachers should ensure that problems give students practice with large two digit numbers by the end of the year.

ACTIVITIES TO DEVELOP FLUENCY WITH ADDITION AND SUBTRACTION WITHIN 20 (2.OA.B.2):

Begin using these activities at the start of the school year and continue throughout the year as required by students to reach the end-of-year benchmark.

1. BUILDING TOWARD FLUENCY

Materials: whiteboard or chart paper and markers, empty number line or cubes lined up to form a number path (alternating colors every 5), list of expressions ready to write up on the board:
4+10 4+12 4+22 8+20 8+29

Directions:

- Write the expression on the board or chart paper. Start with 4+10.
- Ask students to describe their strategy for solving the problem.
- Choose one or more students to explain their strategy to the class. Represent each strategy on the board using the number line or magnetic cubes (see solution).
- Once the student's strategy is understood by the class, continue with the next sum.
  Illustrative Mathematics, Building toward fluency

2. HITTING THE TARGET NUMBER

Materials: number cards labeled 1-10

Directions:

- Begin by playing the game as a whole class to demonstrate the rules and for students to illustrate the range of possible strategies.
- Have a student pick 5 number cards from the cards labeled 1 through 10. Then, have another student pick a "Target Number" between 10 through 20. Students must add and/or subtract 2 or more of the 5 number cards to arrive at the "target" number.
- As students present the different number combinations for the "target" number, write their expressions on the board and have them explain how they were able to mentally come up with the solution.
- As students explain their reasoning, name the strategies they used. For example, look for students making fives (e.g., 6 + 8 = 5 + 1 + 5 +3= 10 + 4 = 14) and tens (9 + 8 = 10 + 7), and using known facts (e.g., 8 + 8 is 16 so 8 + 7 is one less than 16) to encourage flexible thinking about the relationship among the facts.
- When students understand how the game works, they can play in pairs, checking each other's solutions.
  Illustrative Mathematics, Hitting the Target Number

3. TAKE OUT A PART: NUMBERS WITHIN TEN (2 minutes)

Note: Taking out 1 prepares students for adding 9. The students make a ten, adding 9 and 6 by adding 9 and 1 and 5. Taking out 2 prepares students for adding 8. The students make a ten, adding 8 and 6 by adding 8 and 2 and 4.

Directions:

T: Let's take out 1 from each number. I say 5. You say 1 + 4.
T: 5. Get ready.
S: 1 + 4.
T: Now, let's take out 2. If I say 6, you say 2 + 4.
T: 3.
S: 2 + 1.
Continue with the following possible sequence: 5, 10, 4, 7, 9, 8, and 6.
EngageNY, Module 1, Lesson 3

4. **DOUBLES** (1 minute)

Directions:

T: I'll say a doubles fact. You tell me the answer. Wait for my signal. Ready?
T: 5 + 5.
S: 10.
T: 3 + 3.
S: 6.
T: 6 + 6.
S: 12.
T: 1 + 1.
S: 2.
T: 4 + 4.
S: 8.
T: 9 + 9.
S: 18.
T: 2 + 2.
S: 4.
T: 10 + 10.
S: 20.
T: 8 + 8.
S: 16.
T: 7 + 7.
S: 14.

EngageNY, Module 3, Lesson 8

5. **RELATED FACTS WITHIN 20** (2 minutes)

Directions:

T: I say, "10 – 6." You say, "6 + 4 = 10." Wait for my signal. Ready?
T: 8 – 3.
S: 3 + 5 = 8.
T: 13 – 7.
S: 7 + 6 = 13.
T: 11 – 8.
S: 8 + 3 = 11.
T: 15 – 9.
S: 9 + 6 = 15.

Continue in this manner for two minutes.

EngageNY, Module 3, Lesson 8

6. **BREAK TEN IN 2 PARTS** (5 minutes)

Materials: (S) One stick of 10 linking cubes with a color change after the fifth cube

Note: Fluency with the bonds of numbers within 10 is one of the most important foundational skills. By starting at the concrete level, students quickly re-engage with their prior knowledge of these bonds to prepare for the lesson content.

Directions:

T: Show me your 10 stick.
S: (Show.)
T: Hide it behind your back. I will say the size of one part. Break that part off in one piece. Then without peeking, see if you know how many are in the other part.
T: Ready?
S: Yes!
T: Break off 2. No peeking. At the signal, tell how many are in the other part. (Give signal.)
S: 8.
T: Show your parts and see if you are correct.

S: It's 8.
T: What parts are you holding?
S: 2 and 8.
T: What's the whole?
S: 10.
Continue with the following possible sequences: 3 and 7, 1 and 9, 4 and 6, and 5 and 5. Draw the bond and continue with the remaining bonds at an ever-quickening pace.
T: Tell your partner what pattern or strategy helped you find the missing part when you couldn't peek at how many were left.
EngageNY, Module 1, Lesson 1

7. **MAKE TEN BY IDENTIFYING THE MISSING PART** (4 minutes)
Materials: (S) Personal white boards
Note: Students need this skill as they add 8 and 6 using the ten and subsequently add 18 and 6 or 80 and 60.
T: If I say 9, you say 1, because 9 needs 1 to be 10.
T: Wait for the signal, 5.
S: 5.
Continue with the following possible sequence: 8, 2, 9, and 1.
T: This time I'll say a number and you write the addition sentence to make ten on your personal white board.
T: 0. Get ready. Show me your board.
S: 0 + 10 = 10.
T: 10. Get ready. Show me your board.
S: 10 + 0 = 10.
Continue with the following possible sequence: 3, 7, 6, and 4.
T: Turn and explain to your partner what pattern you noticed that helped you solve the problems.
S: First, you said 0 and the answer was 0 + 10 = 10; next, you said 10 and the answer was 10 + 0 = 10. The numbers switched places!
EngageNY, Module 1, Lesson 2

8. **PAIRS TO MAKE TEN WITH NUMBER SENTENCES** (2 minutes)
Materials: (S) Personal white boards
Note: This is a foundational skill for mastery of sums and differences to 20.
Directions:
T: I'll say a number and you write the addition sentence to make 10 on your personal white board.
T: 5. Get ready. Show me your board.
S: (Show 5 + 5 = 10.)
T: 8. Get ready. Show me your board.
S: (Show 8 + 2 = 10.)
Continue with the following possible sequence: 9, 1, 0, 10, 6, 4, 7, and 3.
T: What pattern did you notice that helped you solve the problems?
S: You can just switch the numbers around! → If you say 8 and the answer is 8 + 2 = 10, then I know that when you say 2 the answer will be 2 + 8 = 10. →The numbers can switch places!
EngageNY, Module 1, Lesson 3

9. **TAKE FROM TEN** (5 minutes)

Materials: (S) Personal white boards
Note: Take from Ten develops the automaticity necessary to subtract fluently from the ten when subtracting from the teens.
Directions:
T: When I say 1, you say 9, because the game is to take the number I say from 10. Ready? 2.
S: 8.
Continue with the following sequence: 3, 6, 5, and 9.

T: This time, after you say how many are left, write the number sentence on your personal white board. 5.
S: 5.
S: (Write the number sentence on their boards.)
T: Show the number sentence.
S: (Show 10 – 5 = 5.)
Continue with the following possible sequence: 7, 8, 6, 9, and 4.
EngageNY, Module 1, Lesson 4

10. **MAKE A TEN TO ADD** (6 minutes)
Note: Reviewing making ten allows students to add within the teens during the lesson and see the distinction.
Directions:
T: Let's make ten to add. I say 9 + 2, and you say 9 + 2 = 10 + 1. Ready? 9 + 2.
S: 9 + 2 = 10 + 1.
T: Answer?
S: 11.
T: 9 + 5.
S: 9 + 5 = 10 + 4
T: Answer?
S: 14.
Continue with the following possible sequence: 9 + 7; 9 + 6; 9 + 8; 8 + 3; 8 + 7; 7 + 4; and 7 + 6.
EngageNY, Module 1, Lesson 4

11. **TAKE FROM TEN** (3 minutes)
Note: This activity builds fluency when subtracting from ten when the subtrahend is greater than the ones digit.
Directions:
T: When I say 1, you say 9. 10 – 1 = 9. Ready? 2.
S: 8.
T: What's the number sentence?
S: 10 – 2 = 8.
Continue with the following sequence: 7, 4, 9, 0, 5, and 8.
EngageNY, Module 1, Lesson 5

12. **TAKE FROM THE ONES** (4 minutes)
Note: As students realize that at times they have enough ones to subtract, they then become aware that sometimes they do not and must take from the ten.
Directions:
T: Let's take from the ones. 5 – 3 = _____.
S: 2.

T: 15 – 3 = _____.
S: 12.
Continue with the following possible sequence: 6 – 2; 16 – 2; 8 – 4; 18 – 4; 4 – 2; 14 – 2; 7 – 5; 17 – 5; 9 – 6; 19 – 6; 7 – 3; 17 – 3; 8 – 5; 18 – 5; 9 – 5; 19 – 5; 9 – 2; and 19 – 2.
EngageNY, Module 1, Lesson 5

13. **TAKE FROM 20** (4 minutes)
Materials: (S) Personal white boards
Note: This exercise will give students practice with making ten and applying it to multiples of 10.
Directions:
T: Take the number I say from 10. I say 1, you say 9. Then write the number sentence and wait for my signal to show it.
T: 7.
S: 3. (Write number sentence.)
T: Show your personal white boards.
S: (Show 10 – 7 = 3.)
Continue with the following possible sequence: 8, 6, and 9.
T: This time instead of taking from 10, let's take from 20. Ready? 1.
S: 19. (Write number sentence.)
T: Show your personal white board.
S: (Show 20 – 1 = 19.)
Continue with the following possible sequence: 3, 2, 5, 0, 6, 8, 7, and 9.
EngageNY, Module 1, Lesson 6

14. **BASIC FACTS ARE TOOLS** (5 minutes)
Materials: (T) Rekenrek
Note: This activity emphasizes the presence of the basic fact. The Rekenrek provides visual support, enabling students to see the structure of ten. For example, 8 + 3 is seen as 8 + 2 + 1.
T: Our basic fact, or tool, is 8 + 2. 8 + 2 is…?
S: 10.
T: 8 + 3 is…? (Show the numbers on the Rekenrek each time.)
S: 10 + 1.
T: 8 + 7 is…?
S: 10 + 5. (Continue with the following possible sequence: 9 + 5, 9 + 4, and 9 + 8.)
T: Our new basic fact, or tool, is 10 – 8. 10 – 8 is…?
S: 2.
T: 12 – 8 is…? (Show the numbers on the Rekenrek each time.)
S: 2 + 2.
T: 15 – 8 is…?
S: 2 + 5. (Continue with the following possible sequence: 12 – 9 and 15 – 9.)
EngageNY, Module 1, Lesson 6

15. **TAKE FROM 20** (5 minutes)
Materials: (S) Personal white boards
Note: Students use personal white boards to see the connection between taking from ten and taking from a multiple of ten.
T: I say 2, you say 8, to take the number I say from 10. Then, write the number sentence and wait for my signal to show it.

T: 6.
S: 4. (Write number sentence.)
T: Show your board.
S: (Show 10 – 6 = 4.)
Continue with the following possible sequence: 7, 9, and 5.
T: This time instead of taking from 10, let's take from 20. Ready?
T: 1.
S: 19. (Write number sentence.)
T: Show your board.
S: (Show 20 – 1 = 19.)
Continue with the following possible sequence: 5, 6, 8, and 3.
EngageNY, Module 1, Lesson 7

16. **TWO MORE** (2 minutes)

Note: Students are eased into crossing multiples of ten by asking for just 2 more.

Directions:

T: For every number I say, you will say what number is 2 more. If I say 2, you say 4. Ready? 3.
S: 5.
Continue with the following possible sequence: 6, 9, 8, 18, 38, 58, 78, 9, 19, 39, 59, and 79.
EngageNY, Module 1, Lesson 7

17. **TAKE FROM 20** (3 minutes)

Materials: (S) Personal white boards

Note: Students use personal white boards to see the connection between taking from ten and taking from a multiple of ten. As students show comprehension of the skill, practice orally without the personal boards.

Directions:

T: I say 3, you say 7, to take the number I say from 10. Write the number sentence and wait for my signal to show it.
T: 8.
S: 2. (Write number sentence.)
T: Show your personal boards.
S: (Show 10 – 8 = 2.)
Continue with the following possible sequence: 4, 5, and 9.
T: This time instead of taking from 10, let's take from 20. Ready? 1.
S: 19. (Write number sentence.)
T: Show your personal board.
S: (Show 20 – 1 = 19.)
Continue with the following possible sequence: 3, 2, 5, 0, 6, 8, 7, and 9.
EngageNY, Module 1, Lesson 8

18. **MAKING THE NEXT TEN TO ADD** (6 minutes)

Materials: (S) Personal white board

Note: Students make a unit of 10 to add, which is an important foundational fluency.

Directions:

T: Let's make 10 to add. If I say 9 + 2, you say 9 + 2 = 10 + 1. Ready? 9 + 3.
S: 9 + 3 = 10 + 2.
T: Answer?

S: 12.
T: 9 + 5.
S: 9 + 5 = 10 + 4.
T: Answer?
S: 14.
Continue with the following possible sequence: 9 + 7, 9 + 6, 9 + 8, 8 + 3, 8 + 5, 7 + 4, and 7 + 6.
T: On your personal white board, write at least three other similar examples.
EngageNY, Module 2, Lesson 2

19. **MAKE TEN BY IDENTIFYING THE MISSING PART** (3 minutes)
Materials: (S) Personal white board
Note: Students identify the missing part to make the next ten.
Directions:
T: If I say 9, you say 1 because 9 and 1 make 10.
T: Wait for the signal, 5. (Signal with a snap.)
S: 5.
Continue with the following possible sequence: 15, 25, 16, 24, 19, and 21.
T: This time I'll say a number and you write the addition sentence to make ten on your personal white board.
T: 19. Get ready. Show me your board.
S: (Write 19 + 1 = 20.)
T: Get ready. Show me your board.
Continue with the following possible sequence: 18, 12, 29, 31, 47, and 53.
T: Turn and tell your partner what pattern you noticed that helped you solve the problems.
T: Turn and tell your partner your strategy for finding the missing part.
EngageNY, Module 2, Lesson 3

20. **SPRINT: ADD TENS AND SOME ONES** (12 minutes)
Note: This sprint brings automaticity back with the ten plus sums, which are foundational for the make a ten strategy and expanded form. For directions on how to use sprints, see Appendix.
EngageNY, Module 1, Lesson 1

21. **SPRINT: ONE MORE, TEN MORE** (9 minutes)
Note: In order to be flexible with adding and subtracting one unit, students first work with 1 more and 10 more. For directions on how to use sprints, see Appendix.
EngageNY, Module 1, Lesson 3

22. **SPRINT: ADDING ONES TO ONES** (9 minutes)
Note: The Sprint applies prior knowledge of adding basic facts to larger numbers. For directions on how to use sprints, see Appendix.
EngageNY, Module 1, Lesson 6

23. **SPRINT: MAKE A TEN** (9 minutes)
Note: Students should develop automaticity to fluently make a ten when adding. For directions on how to use sprints, see Appendix.
EngageNY, Module 1, Lesson 8

24. **SPRINT: MAKING TEN** (9 minutes).

Note: Students fluently identify the missing part to make the next ten when adding and subtracting tens and ones. For directions on how to use sprints, see Appendix

EngageNY, Module 2, Lesson 3

25. **SPRINT: DIFFERENCES 2.OA.2** (12 minutes)

Note: This Sprint is a review of the take from ten facts. This is in preparation for student work towards mastery of the sums and differences to 20. Run a few extra copies to give to students to take home; quite a few will want to. For students struggling for fluency with these basic facts, find time if possible in your instructional day to time their improvement, or allow them to time themselves. For directions on how to use sprints, see Appendix.

EngageNY. Module 3, Lesson 21

26. **SPRINT: SUBTRACTION FROM TEENS** (9 minutes)

Note: Students practice subtraction from teens in order to gain mastery of the sums and differences within 20. For directions on how to use sprints, see Appendix.

EngageNY, Module 7, Lesson 11

ACTIVITIES TO DEVELOP FLUENCY WITH ADDITION AND SUBTRACTION WITHIN 100 (2.NBT.B.5)

Begin using these activities with Chapter 4 (unless otherwise indicated), and continue throughout the year.

1. **TEN PLUS NUMBER SENTENCES** (3 minutes)

Materials: (T) Large ten-frame cards from Lesson 1, Hide Zero cards (Template 1)

Note: Students should be able to claim proficiency with their ten plus facts. "My ten plus facts are easy! I just know them. 10 + 9 is 19. See I didn't have to count." Clearly this then extends into knowing 20 + 9 and later understanding expanded form without difficulty.

Directions:

T: I will flash two ten-frame cards, ten and another card. Wait for the signal. Then tell me the addition sentence that combines the numbers. Let's say numbers the regular way.

T: (Flash 10 and 5.)

S: 10 + 5 = 15.

Continue with the following possible sequence: 10 and 9, 10 and 1, 10 and 3.

T: Let's use Hide Zero cards for larger numbers. (Flash 30 and 5.)

Continue with the following possible sequence: 30 and 8, 70 and 8, and 70 and 7.

T: Talk to your partner about 10 + 8 = 18, 30 + 8 = 38, and 70 + 8 = 78. (Write these facts on the board.) What is the same about these facts? What is different?

T: Partner A, explain how one problem helps you solve the other.

T: Partner B, explain how Say Ten counting is like ten plus number sentences.

EngageNY, Module 1, Lesson 2

2. **BREAK APART AND PUT TOGETHER BY PLACE VALUE** (2 minutes)

Note: Students remember the relevance of their ten plus facts to larger numbers.

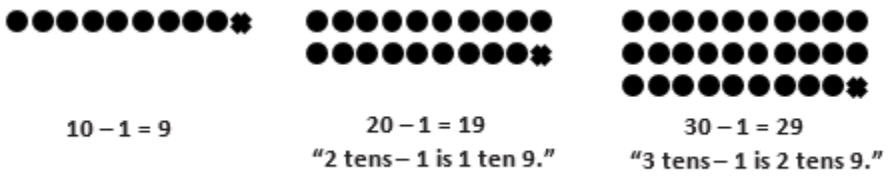
Directions:

T: When I say 10 + 5, you say 15. Ready?

T: 10 + 5.

S: 15.
T: 10 + 2.
S: 12.
Continue with the following possible sequence: 10 + 9, 10 + 4, 20 + 4, 50 + 4, 30 + 8, and 70 + 8.
T: How are 10 + 4 and 50 + 4 the same? How are they different?
T: How is knowing that helpful?
S: (Share.)
T: Now, when I say 13, you say 10 + 3.
T: 13.
S: 10 + 3.
Continue with the following possible sequence: 17, 11, 16, 18, 28, 78, 14, 34, and 94.
EngageNY, Module 1, Lesson 3

3. **SUBTRACT 1 FROM MULTIPLES OF 10** (3 minutes)
Materials: (T) Drawings on the board should be sufficient. Cover rows and reveal them as the numbers grow.
Note: This fluency sequence assures that students can change from 30 to 29, 40 to 39. In Say Ten counting, the count goes from "3 tens" to "2 tens 9," or "4 tens" to "3 tens 9." Continue through 100 – 1. Consider doing the problems in order at first and then jumble the sequence.



EngageNY, Module 1, Lesson, 8

4. **TWO MORE** (1 minute)
Note: Students practice adding two more to make a ten, which builds fluency when crossing a ten.
Directions:
T: For every number I say, you will say the number that is 2 more. If I say 2, you would say 4.
Ready? 3.
S: 5.
Continue with the following possible sequences: 6, 8, 9, 18, 38, 58, 78, 79, 19, 29, and 39.
EngageNY, Module 2, Lesson 1

5. **UP TO THE NEXT TEN WITH NUMBER SENTENCES** (5 minutes)
Note: Students remember the importance of their make ten facts with larger numbers. By saying up it indicates an addition sentence.
T: If I say, "18 up," you say "2."
T: If I say, "Give me the number sentence," you say, "18 + 2 = 20." Ready?
T: 7 up.
S: 3.
T: Give me the number sentence.
S: 7 + 3 = 10.
T: 17 up.
S: 3.
T: Give me the number sentence.
S: 17 + 3 = 20.

Continue with the following possible sequence: 57 up, 97 up, 6 up, 4 up, 26 up, 24 up, 54 up, 74 up, 1 up, 9 up, 31 up, 61 up, and 81 up.
EngageNY, Module 1, Lesson 7

6. **MORE/LESS** (4 minutes)
Note: Practice with giving 1 or 10 more (or less) prepares students to add and subtract 1 and 10 fluently.
Directions:
T: For every number I say, you say a number that is 1 more. When I say 5, you say 6. Ready?
T: 5.
S: 6.
T: 8.
S: 9.
Continue with the following possible sequence: 9, 16, 19, 28, 38, 39, 44, 49, 54, and 60.
T: Now for every number I say, you say a number that is 10 more. When I say 50, you say 60. Ready?
T: 50.
S: 60.
T: 10.
S: 20.
Continue with the following possible sequence: 80, 40, 20, 21, 28, 30, 35, 45, and 56.
T: Let's try saying 1 less for every number I say. When I say 6, you say 5. Ready?
T: 6.
S: 5.
T: 9.
S: 8.
Continue with the following possible sequence: 11, 14, 19, 20, 30, 31, 51, and 50.
T: Now for every number I say, you say a number that is 10 less. When I say 50, you say 40. Ready?
T: 50.
S: 40.
T: 30.
S: 20.
Continue with the following possible sequence: 80, 70, 60, 61, 41, 46, 48, 28, and 18.
EngageNY, Module 4, Lesson 1

7. **HOW MANY MORE TENS?** (3 minutes)
Materials: (S) Personal white board
Directions:
T: If I say 34 – 24, you say 10. To say it in a sentence, you say 34 is 10 more than 24. Ready?
T: 64 – 44.
S: 20.
T: Say it in a sentence.
S: 64 is 20 more than 44.
Continue with the following possible sequence: 85 – 45, 68 – 38, 59 – 49, 47 – 17, and 99 – 19.
EngageNY, Module 4, Lesson 2

8. **SPRINT: SUBTRACTION** (9 minutes)
Note: Students practice their simple subtraction skills with numbers greater than 20. For directions on how to use sprints, see Appendix.
EngageNY, Module 2, Lesson 7

9. **SPRINT: ADDITION AND SUBTRACTION BY 5** (9 minutes)
   Note: For directions on how to use sprints, see Appendix.
   EngageNY, Module 7, Lesson 3

10. **SPRINT: SUBTRACTION PATTERNS** (8 minutes)
    Note: Students practice subtraction to gain mastery of the sums and differences within 20 and identify relationships with higher numbers. For directions on how to use sprints, see Appendix.
    EngageNY, Module 7, Lesson 20

11. **SPRINT: SUBTRACTION PATTERNS** (9 minutes)
    Note: Students practice subtraction to gain mastery of the sums and differences within 20 and see relationships with higher numbers. For directions on how to use sprints, see Appendix.
    EngageNY, Module 7, Lesson 19

12. **SPRINT: ADDING ACROSS A TEN** (9 minutes)
    Note: This Sprint gives practice with the grade level fluency of adding within 20 and applies it to larger numbers. For directions on how to use sprints, see Appendix.
    EngageNY, Module 8, Lesson 1

13. **SPRINT: MAKE A HUNDRED TO ADD** (9 minutes)
    Note: Students review compensation, making a hundred, when adding in order to gain automaticity. For directions on how to use sprints, see Appendix.
    EngageNY, Module 8, Lesson 2

14. **METER STRIP ADDITION: ADDING MULTIPLES OF 10 TO NUMBERS** (6 minutes)
    ***Use with/after Chapter 9*
    Materials: (S) Meter Strip Template
    Note: Students apply knowledge of using the ruler as a number line to fluently add multiples of 10. The meter strip solidifies the process for visual and tactile learners, and creates the groundwork for students to make tape diagrams in the lesson.
    Directions:
    T: (Each student has a meter strip.) Put your finger on 0 to start. I'll say the whole measurement. Slide up to that number. Add 10 centimeters and tell me how many centimeters your finger is from 0.
    T: Let's try one. Fingers at 0 centimeters! (Pause.) 30 centimeters.
    S: (Slide their fingers to 30.)
    T: Remember to add 10. (Pause.) How far is your finger from 0?
    S: 40 centimeters.
    Continue with the following possible sequence: 45 cm, 51 cm, 63 cm, 76 cm, 87 cm, and 98 cm. As students show mastery, advance to adding 20 centimeters.
    EngageNY, Module 2, Lesson 9
    Template: EngageNY, Module 2, Lesson 6

15. METER STRIP SUBTRACTION: TAKING MULTIPLES OF 10 FROM NUMBERS WITHIN 10 TO 100 (5 minutes)

***Use with/after Chapter 9*

Materials: (S) Meter Strip Template

T: Put your finger on 0 to start. I'll say the whole measurement. Slide up to that number. Then take away 10 centimeters and tell me how many centimeters your finger is from 0.

T: Let's try one. Fingers at 0 centimeters! (Pause.) 50 centimeters.

S: (Slide their fingers to 50.)

T: Remember to take 10. (Pause.) How far is your finger from 0?

S: 40!

T: 40 what?

S: 40 centimeters!

T: Slide your finger back to 0. (Pause.) 85 centimeters.

T: (Pause.) How far is your finger from 0?

S: 75 centimeters!

T: Good. Slide back to 0. (Pause.) 49 centimeters.

Continue with examples as necessary.

T: Nice work. This time I'll say the whole measurement, and you take 20 centimeters. Ready?

T: Slide back to 0. (Pause.) 65 centimeters.

S: 45 centimeters!

Continue with the following possible sequence: Slide from 0 to 32, then take 20; to 36, then take 30; to 78, then take 50; to 93, then take 40; to 67, then take 60, etc.

EngageNY, Module 3, Lesson 1

Keep students challenged and engaged by adding a new layer of complexity to the game in this second round. The following are suggestions for how you might adapt the sequence demonstrated previously to match students' ability levels. Suggestions are given in order from least to most complex.

- Subtract 9 and then 8 from multiples of 10 up to 100.
- Subtract any two-digit number from a multiple of 10 up to 100 (e.g., 30 – 13, 40 – 24, 60 – 45).
- Tell or write a number sentence describing sliding down from the whole amount (e.g., 50 – 10 = 40 cm).
- Create a sequence of *change unknown* slides. For example:
  - T: Start with your finger on 0. Slide up to 52 cm.
  - T: Now, slide down to 49. How many centimeters did you slide down?
  - S: 3 cm!
- Tell or write a problem to describe the *change unknown* slide (e.g., 52 – ____ = 49 cm).
- State that change in a sentence, including the unit. "I slid down ____ centimeters."

EngageNY, Module 3, Lesson 2

16. METER STRIP ADDITION: USING TWO-DIGIT NUMBERS WITH TOTALS IN THE ONES PLACE THAT ARE LESS THAN OR EQUAL TO 12 (7 minutes)

***Use with/after Chapter 9*

Materials: (S) Meter Strip Template

Directions:

T: (Each student has a meter strip.) We're going to practice addition using our meter strips.

T: Put your finger on 0. Slide up to 20. (Wait.) Slide up 9 more.

T: How many centimeters did you slide up altogether?

S: 29 centimeters.

T: Tell your partner a number sentence describing sliding from 20 to 29.

S: 20 + 9 = 29.

T: Put your finger on 0. Slide up to 34. (Wait.) Slide up 25 more.

T: How many centimeters did you slide up altogether?
S: 59 centimeters!
T: Whisper a number sentence describing sliding from 34 to 59.
S: 34 + 25 = 59
Continue with the following possible sequence: 46 + 32, 65 + 35, 57 + 23, 45 + 36, and 38 + 24.
EngageNY, Module 3, Lesson 5

17. **METER STRIP ADDITION: WITH TWO-DIGIT NUMBERS AND TOTALS IN THE ONES THAT ARE GREATER THAN 12** (7 minutes)
**Use with/after Chapter 9*
Materials: (S) Meter Strip Template, personal white board
Directions:
T: (Each student has a meter strip.) We're going to practice addition using our meter strips.
T: Put your finger on 0. Slide up to 27 centimeters. (Wait) Slide up 35 more centimeters. You might first skip-count by ten three times, then go up 5 ones.
T: How many centimeters did you slide up altogether?
S: 62 centimeters.
T: Tell your partner a number sentence describing sliding from 27 to 62.
S: 27 + 35 = 62.
T: Put your finger on 0 centimeters. Slide up to 38 centimeters. (Wait) Slide up 36 more centimeters.
T: How many centimeters did you slide up altogether?
S: 74 centimeters!
T: At the signal say a number sentence describing sliding from 38 to 74.
S: 38 + 36 = 74.
Continue with the following possible sequence: 37 + 37, 45 + 28, 49 + 26, 68 + 28, and 57 + 29.
T: In each of these problems we had more than 9 ones so we had to make a new ten. I will write an expression. Wait for the signal. Say "make ten" if you have more than 9 ones. Say, "you can't make ten," if there are not enough ones.
T: 35 + 22.
S: You can't make ten.
T: 63 + 16.
S: You can't make ten.
T: 48 + 29.
S: Make ten.
T: 36 + 54.
S: Make ten.
T: 27 + 16.
S: Make ten.
T: Now, turn to your partner and on your personal white board, write as many addition expressions as you can solve on your meter strip that need to make ten. You have one minute. Take your mark, get set, go!
EngageNY, Module 3, Lesson 6

ACTIVITIES TO DEVELOP COUNTING AND SKIP COUNTING WITHIN 1,000 (2.NBT.A.3) AND MENTALLY ADDING OR SUBTRACTING 10 OR 100 (2.NBT.B.8)

Begin using these activities with Chapter 2 (unless otherwise indicated), and continue throughout the year.

1. **CHORAL COUNTING**
Materials: chart paper, marker, base-ten blocks

Note: Teachers may want to devote an entire lesson to introducing this activity. After that, modify the activity to a short amount of practice each time, removing supports as students' counting skills improve.

Directions:

- The teacher will begin by asking a student volunteer to show 3 using base-ten blocks. The teacher will then record 3 on the chart.
- The teacher will then ask how students can show the number that is 10 more and invite another student volunteer to build 10 more with cubes. Student may add 10 individual units or a ten stick. The goal is for students to move from counting ten units to counting one unit of 10, and to connect the concrete representations of the numbers with abstract oral counting. The teacher will then record 13 on the chart.
- The teacher should continue this process, asking students "What's 10 more than __?" and have student volunteers show 10 more with the base-ten blocks. At some point, a student will likely use a ten stick instead of ten ones; when this happens, the teacher can help the students see this is a more efficient strategy. If no students add a ten stick, the teacher can help them make this transition.
- The goal of writing the numbers on the chart paper as shown below is to record the numbers in a way that makes the "add ten" pattern visible for students. By recording 10 numbers in a row, students may see patterns in tens as they look across, and also hundreds as they look vertically.

3	13	23	33	43	53	63	73	83	93
103	113	123	133	143	153	163	173	183	193
203									

As this activity is introduced, the teacher should pose questions to elicit student thinking and understanding of the concept of 10, 100, and patterns within the structure of our base ten number system. Questions may include:

- *What do you notice? Why do you think that is?*
- *What number will be next? How do you know?*
- *What's happening to the digit in the tens place? Why?*
- *What's happening to the digit in the ones place? Why?*
- *Why do the numbers build like that?*
- *What's the relationship between _ and _?*
- *What patterns do you notice looking horizontally? vertically?*
- *What number will be below __ ? How do you know?*
- *What number will be at the end of the fourth row? How do you know?*

As students become more comfortable with choral counting, have them: count up by 100s; count back by 100s; alternate between counting up and back; alternate between counting by 10 and counting by 100.
Illustrative Mathematics, Choral Counting

2. COUNTING WITH ONES, TENS, AND HUNDREDS: 0 TO 1,000 (4 minutes)

Materials: (T) Bundle of 1 hundred, 1 ten, and a single straw

Directions:

T: Let's count by ones, tens, and hundreds. I'll hold bundles to show you what to count by. A bundle of 100 means count by hundreds, a bundle of 10 means count by tens, and a single straw means count by ones. (Create visual support by writing the numbers on the board as students count.)
T: Let's start at 0. Ready? (Hold up a bundle of 10 until students count to 130.)
S: 10, 20, 30, 40, 50, 60, 70, 80, 90, 100, 110, 120, 130.
T: (Hold up a bundle of 100 until students count to 630.)
S: 230, 330, 430, 530, 630.
T: (Hold up a bundle of 10 until students count to 690.)
S: 640, 650, 660, 670, 680, 690.
T: (Hold up a single one until students count to 702.)
S: 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702.
T: (Isolate the numbers 698–702 by drawing a box around them.) Partner A, count these numbers up and down as fast as you can to Partner B, and then switch. If you both finish before one minute is up, try it again and see if you get faster!
EngageNY, Module 3, Lesson 2

3. **UNIT FORM COUNTING FROM 398 TO 405** (3 minutes)
Materials: (T) Hide Zero cards
Directions:
T: Today we're going to practice unit form counting. This time we'll include hundreds! The unit form way to say 324 is 3 hundreds 2 tens 4 ones. (Pull the cards apart to show the 300, 20, and 4.)
T: Try this number. (Show 398. Signal.)
S: 3 hundreds 9 tens 8 ones.
T: (Pull cards apart.) That's right!
T: Let's count on from 398 the unit form way. (Display 399–405 with Hide Zero cards as students count.)
S: 3 hundreds 9 tens 9 ones, 4 hundreds, 4 hundreds 1 one, 4 hundreds 2 ones, 4 hundreds 3 ones, 4 hundreds 4 ones, 4 hundreds 5 ones.
EngageNY, Module 3, Lesson 6
Hide Zero cards: EngageNY, Module 3, Lesson 4

4. **SKIP-COUNT BY TENS: UP AND DOWN CROSSING 100** (2 minutes)
Directions:
T: Let's skip-count by tens starting at 60.
T: Ready? (Rhythmically point up until a change is desired. Show a closed hand and then point down. Continue, mixing it up.)
S: 60, 70, 80, 90, 100, 110, 120, 130, 140. (Switch direction.) 130, 120, 110, 100, 90. (Switch direction.) 100, 110, 120, 130, 140, 150, 160, 170, 180, 190, 200, 210, 220. (Switch direction.) 210, 200, 190, 180.
EngageNY, Module 3, Lesson 1

5. **MIXED COUNTING WITH ONES, TENS, AND HUNDREDS FROM 1,000 TO 0** (5 minutes)
Materials: (T) Bundle of one hundred, one ten, and a single stick
Directions:
T: Let's play Mixed Counting using what we know about counting by ones, tens, and hundreds. I'll hold bundles to show you what to count by. A bundle of 100 means count by hundreds, a bundle of 10 means count by tens, and a single stick means count by ones.
T: Let's start at 1,000 and count down. Ready? (Hold up a bundle of 10 until students count to 940. If necessary, create visual support with the difficult language of these numbers by writing them on the board as students count.)
S: 990, 980, 970, 960, 950, 940.
T: (Hold up a bundle of 100 until students count to 540.)
S: 840, 740, 640, 540.
T: (Hold up a bundle of 10 until students count to 500.)
S: 530, 520, 510, 500.
T: (Hold up a single one until students count to 495.)
S: 499, 498, 497, 496, 495.
T: (Hold up a ten until students count to 465.)
S: 485, 475, 465.
Continue, varying practice counting with ones, tens, and hundreds down to zero.
EngageNY, Module 3, Lesson 8

6. **SKIP-COUNT BY TWOS BEGINNING AT 394** (7 minutes)
Materials: (S) Blank piece of paper
Directions:
Using a blank piece of paper and a pencil, students count by twos beginning at 394. They write numbers, counting as fast and as high as they can for one minute. "Skip-count by" follows the same energizing routine for administration as Sprints.
Like Sprints, after animated correction, an extra minute for independent practice, sharing with a partner, and a brief kinesthetic exercise, students repeat the counting task. The vast majority of students immediately see improvement on the second effort. Celebrate improvement in the same way as with a Sprint.
EngageNY, Module 3, Lesson 9

7. SPRINT: SKIP-COUNTING BY 5

Note: For directions on how to use sprints, see Appendix.
EngageNY, Module 3, Lesson 4

8. SKIP-COUNT UP AND DOWN BY FIVES ON THE CLOCK (11 minutes)

***Use with/after Chapter 7*

Materials: (T) A "clock" made from a 24-inch ribbon marked off at every 2 inches

Directions:

T: (Display the ribbon as a horizontal number line—example pictured above.) Count by fives as I touch each mark on the ribbon.
S: (Starting with 0, count by fives to 60.)
T: (Make the ribbon into a circle resembling a clock.) Now I've shaped my ribbon to look like a …
S: Circle! Clock!
T: Let's call it a clock. Again, count by fives as I touch each mark on the clock.
S: (Starting with 0, skip-count by fives to 60.)
T: This time, the direction my finger moves on the clock will show you whether to count up or down. (While explaining, demonstrate sliding a finger forward and backward around the clock.)
T: As I slide to the marks, you count them by fives.
Starting at 12, slide forward to 4 as students count on. On a clock, 12 represents both 0 and 60. We are not stating 0 so that students count on effectively.
S: 5, 10, 15, 20.
T: How many minutes is that?
S: 20 minutes!
T: (Starting from 4, slide a finger forward to 9. Do not restate 20. Count on.)
S: 25, 30, 35, 40, 45.
T: How many minutes is that?
S: 45 minutes!
T: (Keep a finger at 9.) What if I slide back one mark, then how many minutes?
S: 40 minutes!
T: Good. What if I slide forward one mark, then how many minutes?
S: 45 minutes!
T: Nice job. Let's count back from 50. (Start from 50 and slide back 5 times.)
S: 45, 40, 35, 30, 25.
T: How many minutes now?
S: 25 minutes!
Continue. Notice which switches or numbers students find most difficult, and use their cues to guide the practice provided.
T: Let's pause for a couple of minutes to think about the tools we've used so far today.
T: With your partner, compare the meter strip to the clock. How are they the same? How are they different?
For about one or two minutes, circulate and listen for responses. Use questioning strategies to support student communication and the level of their insights.
S: They're both curly. Remember our paper meter strips were curly, too. They can both be a straight line. The clock has 12 marks and the other one has a lot more. You can count with both of them. The clock goes to 60 and the meter strip goes to 100. On one you skip-count by fives and on the other you can skip-count by twos or tens. All the marks on the clock are the same space apart, and the marks on the meter strip are the same space apart. You can use them both to measure. One measures time and one measures length.
T: I hear some of you saying that we use both tools to measure. It's true that clocks and meter strips both measure.

T: What makes them useful for measuring? Talk with your partner for 30 seconds.
S: They both have marks that are the same space apart. The numbers go from smallest to biggest. They're both like rulers, but they have different units. Clocks measure time. We can't see that! It's like they both keep track of our counts. And they both give us a place to count.
T: I used a ribbon to make our clock. What would happen if I moved it back into a horizontal line so that it looked more like a meter strip? Partner A, could I still use it to measure the length of time? Tell Partner B why or why not.
S: I think so. You're not changing the numbers on it. You can still count how many minutes. When you've counted the whole thing, you know an hour went by.
T: (Move the ribbon back into a horizontal line and present it to students near the meter strip for a visual comparison.) Partner B, tell Partner A why you agree or disagree.
S: I disagree. There are no little hands to tell you where to count and tell you how many minutes have gone by.
T: Keep thinking and talking about these two measurement tools. Ask your parents what they think!
EngageNY, Module 3, Lesson 1
In this second round, add a new layer of complexity to the work to keep students challenged and engaged. The following is a suggestion for how to adapt the routine explained above.
T: Skip-count by 5 until my finger stops. (Slide a finger to 4.)
S: 5, 10, 15, 20.
T: (From 4, slide a finger forward to 9.) Keep counting as I move my finger.
S: 25, 30, 35, 40, 45.
T: How many minutes have passed in all?
S: 45 minutes!
T: (Keep a finger at 9.) How many is 10 minutes less?
S: 35 minutes!
T: Good. (Put a finger back at 9.) How many is 10 minutes more?
S: 55 minutes!
EngageNY, Module 3, Lesson 2

9. HAPPY COUNTING (2 minutes)
***Use with/after Chapter 9*
Materials: (T) 2 meter sticks
Note: Students fluently count by tens crossing the hundred and relate it to metric units.
Directions:
T: Let's do some Happy Counting in centimeters. Watch me as I pinch the meter stick where the centimeters are while we count. When I get to 100 centimeters (1 meter), I will call a volunteer to hold another meter stick.
T: Let's count by tens, starting at 70 centimeters. When we get to 100 centimeters, we say 1 meter, and then we will go back to counting by centimeters. Ready? (Pinch the meter stick to stop on a number, moving pinched fingers up and down to lead students in Happy Counting by tens on the meter stick.)
S: 70 cm, 80 cm, 90 cm, 1 m, 110 cm, 120 cm. (Switch direction.) 110 cm, 1 m, 90 cm, 80 cm. (Switch direction.) 90 cm, 1 m, 110 cm, 120 cm.
T: Now, let's say it with meters and centimeters. Let's start at 80 centimeters. Ready?
S: 80 cm, 90 cm, 1 m, 1 m 10 cm, 1 m 20 cm, 1 m 30 cm, 1 m 40 cm. (Switch direction.) 1 m 30 cm, 1 m 20 cm. (Switch direction.) 1 m 30 cm, 1 m 40 cm, 1 m 50 cm, 1 m 60 cm, 1 m 70 cm, 1 m 80 cm, 1 m 90 cm, 2 m.
EngageNY, Module 2, Lesson 6

10. HAPPY COUNTING BY CENTIMETERS (4 minutes)
***Use with/after Chapter 9*
Note: Students practice counting by 10 centimeters and exchanging centimeters for meters. This activity relates to Say Ten counting, where ones are exchanged for tens. It can be demonstrated on a Rekenrek, with each bead representing 10 centimeters.
Directions:

T: Let's count by 10 centimeters, starting at 80 centimeters. When we get to 100 centimeters, we say 1 meter, and then we will count by meters and centimeters. Ready? (Rhythmically point up until a change is desired. Show a closed hand, then point down. Continue, mixing it up.)
S: 80 cm, 90 cm, 1m, 1m 10 cm, 1 m 20 cm, 1 m 30 cm, 1 m 40 cm, 1 m 50 cm. (Switch direction.) 1 m 40 cm, 1 m 30 cm, 1 m 20 cm. (Switch direction.) 1 m 30 cm, 1 m 40 cm, 1 m 50 cm, 1 m 60 cm, 1 m 70 cm, 1 m 80 cm, 1 m 90 cm, 2 m. (Switch direction.) 1 m 90 cm. (Switch direction.) 2 m, 2 m 10 cm, 2 m 20 cm. (Switch direction.) 2 m 10 cm, 2 m, 1 m 90 cm.
T: Excellent! Try it for 30 seconds with your partner starting at 80 centimeters. Partner B, you are the teacher today.
EngageNY, Module 2, Lesson 9

APPENDIX

Directions for Administration of Sprints

One Sprint has two parts with closely related problems on each. The problems on each part move from simple to complex, creating a challenge for every learner. Before the lesson, cut the Sprint sheet in half to create Sprint A and Sprint B. Students complete the two parts of the Sprint in quick succession with the goal of improving on the second part, even if only by one more. With practice, the following routine takes about 8 minutes.

SPRINT A

(Put Sprint A face down on desks with instructions to not look at problems until the signal is given.)

T: You will have 60 seconds to do as many problems as you can.
T: I do not expect you to finish all of them. Just do as many as you can, your personal best.
T: Take your mark! Get set! THINK! (When you say THINK, students turn papers over and work furiously to finish as many problems as they can in 60 seconds. Time precisely.)

(After 60 seconds:)

T: Stop! Circle the last problem you did. I will read just the answers. If you got it right, call out "Yes!" If you made a mistake, circle it. Ready?

(Repeat to the end of Sprint A or until no one has any more correct.)

T: Now write your correct number at the top of the page. This is your personal goal for B.
T: How many of you got 1 right? (All hands should go up.)
T: Keep your hand up until I say a number that is 1 more than the number you got right. So, if you got 14 right, when I say 15 your hand goes down. Ready?
T: (Quickly.) How many got 2 right? And 3, 4, 5, etc. (Continue until all hands are down. Optional routine, depending on whether or not the class needs more practice with Sprint A.)
T: Take one minute to do more problems on this half of the Sprint.

(As students work, you might have the person who scored highest on Sprint A pass out Sprint B.)

T: Stop! I will read just answers. If you got it right, call out "Yes!" If you made a mistake, circle it. Ready? (Read the answers to the first half again.)

Note: To keep the energy and fun going, do a stretch or a movement game in between Sprints.

SPRINT B

(Put Sprint B face down on desks with instructions to not look at the problems until the signal is given. Repeat the procedure for Sprint A up through the show of hands for how many right.)

T: Stand up if you got more correct on the second Sprint than on the first.
S: (Stand.)
T: Keep standing until I say the number that tells how many more you got right on Sprint B. If you got 3 more right on Sprint B than on Sprint A, when I say 3 you sit down. Ready?
T: (Call out numbers starting with 1. Students sit as the number by which they improved is called. An alternate method is to choose three students to tell how many they got correct on Sprint A and Sprint B.)

For each set of scores, on your signal, the class chorally says the difference. This provides frequent practice with counting on and other mental strategies, and it reinforces the relationship between addition and subtraction.

T: Miguel, how many did you get correct on Sprint A and Sprint B?
S: On Sprint A, I got 12, and on Sprint B I got 17.
T: How many more did Miguel do on Sprint B than on Sprint A? (Pause.)
S: 5!