



Core Knowledge[®] MATHEMATICS

Addition and Subtraction on the Number Line



Teacher Guide



Creative Commons Licensing

This work is licensed under a
Creative Commons Attribution-NonCommercial-ShareAlike
4.0 International License.



You are free:

- to Share**—to copy, distribute, and transmit the work
- to Remix**—to adapt the work

Under the following conditions:

Attribution—You must attribute the work in the following manner:
CKMath 6–8 was originally developed by Open Up Resources and authored by Illustrative Mathematics, <https://www.illustrativemathematics.org>, and is copyrighted as 2017–2019 by Open Up Resources. It is licensed under the Creative Commons Attribution 4.0 International License (CC BY 4.0). The Open Up Resources 6–8 Math Curriculum is available at: <https://www.openupresources.org/math-curriculum/>.

Adaptations and updates to the IM 6–8 Math English language learner supports and the additional English assessments marked as "B" are copyright 2019 by Open Up Resources and licensed under the Creative Commons Attribution 4.0 International License (CC BY 4.0).

Adaptations and updates to the IM K–8 Math Spanish translation of assessments marked as "B" are copyright 2019 by Illustrative Mathematics. These adaptations and updates are licensed under the Creative Commons Attribution 4.0 International License (CC BY 4.0).

This particular work is based on additional work of the Core Knowledge® Foundation (www.coreknowledge.org) made available through licensing under a Creative Commons Attribution-Non Commercial-Share Alike 4.0 International License. This does not in any way imply that the Core Knowledge Foundation endorses this work.

Noncommercial—You may not use this work for commercial purposes.

Share Alike—If you alter, transform, or build upon this work, you may distribute the resulting work only under the same or similar license to this one.

With the understanding that:

For any reuse or distribution, you must make clear to others the license terms of this work. The best way to do this is with a link to this web page:

<https://creativecommons.org/licenses/by-nc-sa/4.0/>

Copyright © 2023 Core Knowledge Foundation
www.coreknowledge.org

All Rights Reserved.

Core Knowledge®, Core Knowledge Curriculum Series™, Core Knowledge Math™ and CKMath™ are trademarks of the Core Knowledge Foundation.

Trademarks and trade names are shown in this book strictly for illustrative and educational purposes and are the property of their respective owners. References herein should not be regarded as affecting the validity of said trademarks and trade names.

Addition and Subtraction on the Number Line

Table of Contents

Introduction	i
Unit Overview	1
Section Overview	2
Center Overview	8
Lessons Plans and Student Task Statements:	
Section A: Lessons 1–6 The Structure of the Number Line ...	20
Section B: Lessons 7–15 Add and Subtract on a Number Line ...	71
Teacher Resources	145
Family Support Materials	
Assessments	
Cool Downs	
Instructional Masters	



Addition and Subtraction on the Number Line

Teacher Guide

Core Knowledge Mathematics™

Unit 4: Addition and Subtraction on the Number Line

At a Glance

Unit 4 is estimated to be completed in 14-17 days including 2 days for assessment.

This unit is divided into two sections including 12 lessons and 3 optional lessons.

- Section A—The Structure of the Number Line (Lessons 1-6)
- Section B—Add and Subtract on a Number Line (Lessons 7-15)

On pages 6-7 of this Teacher Guide is a chart that identifies the section each lesson belongs in and the materials needed for each lesson.

This unit uses six student centers.

- Five in a Row: Addition and Subtraction
- How Close?
- Number Line Scoot
- Capture Squares
- Number Puzzles: Addition and Subtraction
- Jump the Line

Unit 4: Addition and Subtraction on the Number Line

Unit Learning Goals

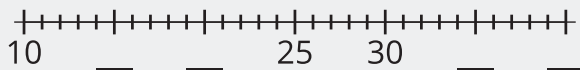
- Students learn about the structure of a number line and use it to represent numbers within 100. They also relate addition and subtraction to length and represent the operations on the number line.

In this unit, students are introduced to the number line, an essential representation that will be used throughout students' K–12 mathematical experience. They learn to use the number line to represent whole numbers, sums, and differences.

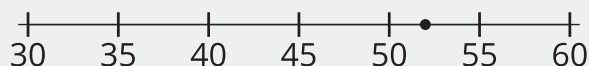
In a previous unit, students learned to measure length with rulers. Here, they see that the tick marks and numbers on the number line are like those on a ruler: both show equally spaced numbers that represent lengths from 0.

Students use this understanding of structure to locate and compare numbers on the number line, as well as to estimate numbers represented by points on the number line.

Locate and label 17 on the number line.



What number could this be? ____



Students then learn conventions for representing addition and subtraction on the number line: using arrows pointing to the right for adding and arrows pointing to the left for subtracting. Students also use the number line to represent addition and subtraction methods discussed in Number Talks, such as counting on, counting back by place, and decomposing a number to get to a ten. The reasoning here deepens students' understanding of the relationship between addition and subtraction.

The number lines in this unit show a tick mark for every whole number in the given range, though not all may be labeled with the numeral. As students become more comfortable with this representation, they may draw number lines that show only the numbers needed to solve the problems, which is acceptable.

Section A: The Structure of the Number Line

Standards Alignments

Addressing 2.MD.B.6, 2.NBT.A.2, 2.NBT.B.5

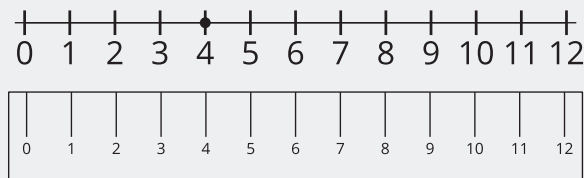
Building Towards 2.MD.B.6

Section Learning Goals

- Represent whole numbers within 100 as lengths from 0 on a number line.
- Understand the structure of the number line.

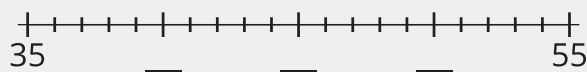
In this section, students begin to use the number line as a tool for understanding numbers and number relationships. They learn that the number line is a visual representation of numbers shown in order from left to right, with equal spacing between each number.

Students see that each number tells the number of length units from 0, just like on the ruler. This means that the numbers to the left are smaller (fewer units away from 0) and those farther to the right are larger (more units away from 0).

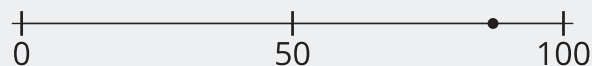


Students learn that whole numbers can be represented with tick marks and points on the number line. They then locate, label, and compare numbers on a number line. They also estimate numbers that could be represented by points on a number line.

Locate and label 43 on the number line.



What number could this be? ____



Suggested Centers

- Five in a Row: Addition and Subtraction (1–2), Stage 6: Add within 100 with Composing (Supporting)
- How Close? (1–5), Stage 3: Add to 100 (Supporting)

Section B: Add and Subtract on a Number Line

Standards Alignments

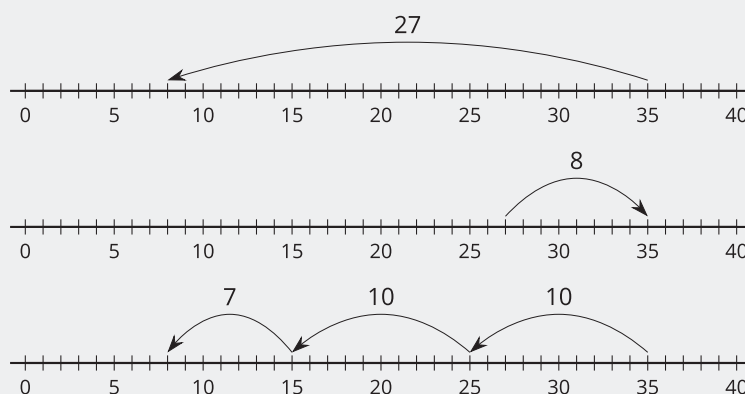
Addressing 2.MD.B.5, 2.MD.B.6, 2.NBT.A.2, 2.NBT.B.5, 2.OA.A.1

Section Learning Goals

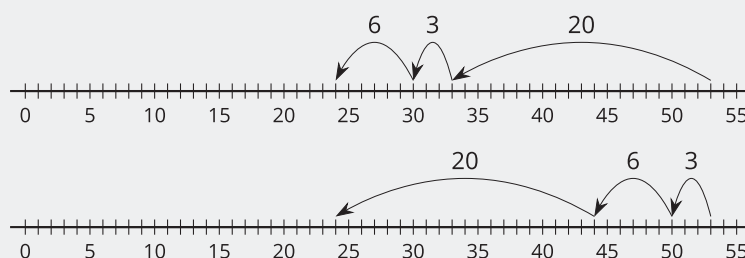
- Represent sums and differences on a number line.

In this section, students reason about sums and differences on the number line. They begin by using directional arrows: an arrow pointing right represents addition, and an arrow pointing left represents subtraction. Students write equations that correspond to given number-line representations, as well as represent given equations on the number line.

Later, students revisit the idea of subtraction as an unknown-addend problem and represent the unknown addend with a jump to the right. For example, here are three ways they may reason about $35 - 27$ on the number line:






As students analyze various representations of a difference on the number line, they consider when certain strategies may be more efficient than others. They also consider reasoning strategies that are based on place value and the properties of operations (for example, adding tens and then ones, or adding ones and then tens). For example, here are two ways to find $53 - 29$:



At the end of the section, students use the number line to make sense of and solve story problems.

They compare this representation with others used in earlier units.

   PLC: Lesson 8, Activity 1, Represent Equations

Suggested Centers

- Number Puzzles: Addition and Subtraction (1–4), Stage 4: Within 100 with Composing (Addressing)
- Number Line Scoot (2–3), Stage 1: Twos, Fives, and Tens (Addressing)
- Jump the Line (2–5), Stage 1: Add and Subtract within 100 (Addressing)
- How Close? (1–5), Stage 3: Add to 100 (Supporting)

Throughout the Unit

Throughout the unit, students engage in warm-up activities that support student fluency in operations within 100. The Number Talks in this section focus on subtraction using place value strategies, including subtracting tens from tens and ones from ones, and decomposing a ten.

Here is a sampling of Number Talk warm-ups in the unit.

lesson 4	lesson 6	lesson 9	lesson 11
$35 - 5$	$65 - 25$	$20 - 2$	$32 - 6$
$35 - 10$	$65 - 27$	$20 - 17$	$43 - 8$
$35 - 15$	$55 - 17$	$49 - 3$	$51 - 5$
$35 - 25$	$46 - 18$	$67 - 64$	$52 - 7$

In addition to Number Talks, the warm-ups include Choral Counts that have students skip-count by 5 and count back by 10 from any number. Students also engage in True or False routines that support students to think about addition and subtraction strategies and as they represent equations on a number line.

Materials Needed

LESSON	GATHER	COPY
A.1	<ul style="list-style-type: none"> • Objects of various lengths 	<ul style="list-style-type: none"> • none
A.2	<ul style="list-style-type: none"> • String 	<ul style="list-style-type: none"> • Class Number Line Cards (0–30) (groups of 30)
A.3	<ul style="list-style-type: none"> • none 	<ul style="list-style-type: none"> • none
A.4	<ul style="list-style-type: none"> • Counters • Dry erase markers • Materials from a previous lesson • Number cubes • Sheet protectors 	<ul style="list-style-type: none"> • Number Line to 100 (groups of 1)
A.5	<ul style="list-style-type: none"> • Chart paper • Markers 	<ul style="list-style-type: none"> • Order Numbers on the Number Line Cards (groups of 12)
A.6	<ul style="list-style-type: none"> • Centimeter cubes • Materials from previous centers • Paper clips 	<ul style="list-style-type: none"> • Number Line Scoot Stage 1 Directions (groups of 2) • Number Line Scoot Stage 1 Gameboard (groups of 2) • Number Line Scoot Stage 1 Spinner (groups of 2)
B.7	<ul style="list-style-type: none"> • Glue • Scissors 	<ul style="list-style-type: none"> • none
B.8	<ul style="list-style-type: none"> • none 	<ul style="list-style-type: none"> • none
B.9	<ul style="list-style-type: none"> • Base-ten blocks 	<ul style="list-style-type: none"> • Number Line to 100 (groups of 1)
B.10	<ul style="list-style-type: none"> • Base-ten blocks 	<ul style="list-style-type: none"> • none
B.11	<ul style="list-style-type: none"> • Base-ten blocks • Tools for creating a visual display 	<ul style="list-style-type: none"> • Number Line to 100 (groups of 1)
B.12	<ul style="list-style-type: none"> • none 	<ul style="list-style-type: none"> • Number Line to 100 (groups of 1)

B.13	<ul style="list-style-type: none">• none	<ul style="list-style-type: none">• Story Problems Card Sort (stories, equations, number lines, diagrams) (groups of 3)• Number Line to 100 (groups of 1)
B.14	<ul style="list-style-type: none">• Dry erase markers• Materials from previous centers• Paper clips• Sheet protectors	<ul style="list-style-type: none">• Jump the Line Stage 1 Gameboard (groups of 2)• Jump the Line Stage 1 Spinners (groups of 2)
B.15	<ul style="list-style-type: none">• none	<ul style="list-style-type: none">• Number Line to 100 (groups of 1)

Center: Five in a Row: Addition and Subtraction (1–2)

Stage 6: Add within 100 with Composing

Lessons

- Grade2.4.A1 (supporting)
- Grade2.4.A2 (supporting)
- Grade2.4.A3 (supporting)
- Grade2.4.A4 (supporting)
- Grade2.4.A5 (supporting)

Stage Narrative

Partner A chooses two numbers and places a paper clip on each number. They add the numbers and place a counter on the sum. Partner B moves one of the paper clips to a different number, adds the numbers, and places a counter on the sum. Students take turns moving one paper clip, finding the sum, and covering it with a counter.

Standards Alignments

Addressing 1.NBT.C.4, 2.NBT.B.5

Materials to Gather

Paper clips, Two-color counters

Materials to Copy

Five in a Row Addition and Subtraction Stage 6
Gameboard (groups of 2)

Additional Information

Each group of 2 needs 25 counters and 2 paper clips.

Stages used in Grade 1

Stage 1

Addressing

- Grade1.1.A
- Grade1.1.B
- Grade1.1.C
- Grade1.3.D

Supporting

- Grade1.4.A
- Grade1.4.B
- Grade1.4.C
- Grade1.5.A
- Grade1.5.B
- Grade1.5.C
- Grade1.6.A
- Grade1.6.B

Stage 2

Addressing

- Grade1.1.A
- Grade1.1.B
- Grade1.1.C
- Grade1.3.D

Supporting

- Grade1.4.A
- Grade1.4.B
- Grade1.4.C
- Grade1.5.A
- Grade1.5.B
- Grade1.5.C
- Grade1.6.A
- Grade1.6.B

Stage 3

Addressing

- Grade1.3.C
- Grade1.3.D

Supporting

- Grade1.4.A
- Grade1.4.B
- Grade1.4.C
- Grade1.5.A
- Grade1.5.B
- Grade1.5.C
- Grade1.6.A
- Grade1.6.B

Stage 4

Addressing

- Grade1.4.A
- Grade1.4.B

Supporting

- Grade1.5.A
- Grade1.5.B
- Grade1.5.C
- Grade1.6.A
- Grade1.6.B

Stage 5

Addressing

- Grade1.5.A
- Grade1.5.B
- Grade1.5.C

Supporting

- Grade1.6.A
- Grade1.6.B

Stage 6

Addressing

- Grade1.5.C

Supporting

- Grade1.6.A
- Grade1.6.B

Center: How Close? (1–5)

Stage 3: Add to 100

Lessons

- Grade2.4.A1 (supporting)
- Grade2.4.A2 (supporting)
- Grade2.4.A3 (supporting)
- Grade2.4.A4 (supporting)
- Grade2.4.A5 (supporting)
- Grade2.4.B15 (supporting)

Activities

- Grade2.4.B14.2 (supporting)

Stage Narrative

Before playing, students remove the cards that show the number 10 and set them aside.

Each student picks 7 cards and chooses 4 of them to create 2 two-digit numbers. Each student adds the numbers and the student whose sum is closest to 100 wins a point for the round. Students pick new cards so that they have 7 cards in their hand and then start the next round.

Standards Alignments

Addressing 1.NBT.C.4, 2.NBT.B.5

Materials to Gather

Number cards 0–10

Materials to Copy

How Close? Stage 3 Recording Sheet (groups of 1)

Stages used in Grade 1

Stage 1

Addressing

- Grade1.3.C
- Grade1.3.D

Supporting

- Grade1.4.A
- Grade1.4.B
- Grade1.6.B
- Grade1.7.A

Stage 2

Addressing

- Grade1.3.D

Supporting

- Grade1.4.A
- Grade1.4.B
- Grade1.6.B
- Grade1.7.A

Stage 3

Addressing

- Grade1.6.A
- Grade1.6.B

Supporting

- Grade1.7.A

Center: Number Line Scoot (2–3)

Stage 1: Twos, Fives, and Tens

Lessons

- Grade2.4.B7 (addressing)
- Grade2.4.B8 (addressing)
- Grade2.4.B9 (addressing)
- Grade2.4.B10 (addressing)
- Grade2.4.B11 (addressing)
- Grade2.4.B12 (addressing)
- Grade2.4.B13 (addressing)
- Grade2.4.B15 (addressing)

Activities

- Grade2.4.A6.1 (addressing)
- Grade2.4.A6.2 (addressing)
- Grade2.4.B14.2 (addressing)

Stage Narrative

Students take turns spinning a spinner and moving their cube that interval on one of the shared number lines. Students may use their whole spin on one number line or split it between multiple number lines. Each time a cube lands exactly on the last tick mark of one of the number lines, the player who moved it keeps the cube and puts a new cube on zero on that number line. The first player to collect five cubes wins.

Standards Alignments

Addressing 2.MD.B.6, 2.NBT.A.2

Materials to Gather

Centimeter cubes, Paper clips

Materials to Copy

Number Line Scoot Stage 1 Directions (groups of 2), Number Line Scoot Stage 1 Gameboard (groups of 2), Number Line Scoot Stage 1 Spinner (groups of 2)

Additional Information

Each group of 2 needs 12 centimeter cubes.

Center: Capture Squares (1–3)

Stage 3: Add within 20

Activities

- Grade2.4.A6.2 (supporting)

Stage Narrative

Students spin to get a number (6–10) and flip a card (0–10) and find the sum. The spinner includes a wild space where students can choose their own number.

Standards Alignments

Addressing 1.OA.C.6, 2.OA.B.2

Materials to Gather

Colored pencils or crayons, Number cards 0–10,
Paper clips

Materials to Copy

Capture Squares Stage 3 Gameboard (groups of 2),
Capture Squares Stage 3 Spinner (groups of 2)

Stage 4: Subtract within 20

Activities

- Grade2.4.A6.2 (supporting)

Stage Narrative

Students spin to get a number (16–20) and flip a card (0–10). They subtract the number on the card from the number on the spinner. The spinner includes a wild space where students can choose their own number.

Standards Alignments

Addressing 1.OA.C.6, 2.OA.B.2

Materials to Gather

Colored pencils or crayons, Number cards 0–10,
Paper clips

Materials to Copy

Capture Squares Stage 4 Gameboard (groups of 2),
Capture Squares Stage 4 Spinner (groups of 2)

Stages used in Grade 1

Stage 1

Addressing

- Grade1.2.B
- Grade1.2.C
- Grade1.2.D

Supporting

- Grade1.7.A
- Grade1.7.B
- Grade1.7.C

Stage 2

Addressing

- Grade1.2.C
- Grade1.2.D

Supporting

- Grade1.7.A
- Grade1.7.B
- Grade1.7.C

Center: Number Puzzles: Addition and Subtraction (1–4)

Stage 4: Within 100 with Composing

Lessons

- Grade2.4.B7 (addressing)
- Grade2.4.B8 (addressing)
- Grade2.4.B9 (addressing)
- Grade2.4.B10 (addressing)
- Grade2.4.B11 (addressing)
- Grade2.4.B12 (addressing)
- Grade2.4.B13 (addressing)

Activities

- Grade2.4.A6.2 (supporting)

Stage Narrative

Students use digit cards to make addition and subtraction equations true. They work with sums and differences within 100 with composing and decomposing. Each digit card may only be used one time on a page.

Standards Alignments

Addressing 1.NBT.C.4, 1.OA.D.8, 2.NBT.B.5

Materials to Copy

Number Puzzles Addition Stage 4 Gameboard (groups of 2), Number Puzzles Digit Cards (groups of 2)

Stages used in Grade 1

Stage 1

Addressing

- Grade1.2.D
- Grade1.3.C

Supporting

- Grade1.3.A
- Grade1.3.B
- Grade1.4.A
- Grade1.4.B
- Grade1.5.A
- Grade1.5.B
- Grade1.5.C

Stage 2

Addressing

- Grade1.3.B
- Grade1.3.C

Supporting

- Grade1.4.A
- Grade1.4.B
- Grade1.5.A
- Grade1.5.B
- Grade1.5.C

Stage 3

Addressing

- Grade1.5.A
- Grade1.5.B
- Grade1.5.C

Stage 4

Addressing

- Grade1.5.C

Center: Jump the Line (2–5)

Stage 1: Add and Subtract within 100

Lessons

- Grade2.4.B15 (addressing)

Activities

- Grade2.4.B14.1 (addressing)
- Grade2.4.B14.2 (addressing)

Stage Narrative

Both players start at 30 on a number line marked by 1. Spinners show adding or subtracting 10, 5, or 1.

Standards Alignments

Addressing 2.MD.B.6

Materials to Gather

Dry erase markers, Paper clips, Sheet protectors

Materials to Copy

Jump the Line Stage 1 Gameboard (groups of 2),
Jump the Line Stage 1 Spinners (groups of 2)

Additional Information

Each group of 2 needs a sheet protector, a dry erase marker, and 2 paper clips.

Section A: The Structure of the Number Line

Lesson 1: Whole Numbers on the Number Line

Standards Alignments

Addressing 2.MD.B.6

Building Towards 2.MD.B.6

Teacher-facing Learning Goals

- Locate whole numbers on a number line.
- Make sense of the structure of a number line.

Student-facing Learning Goals

- Let's represent numbers on a number line.

Lesson Purpose

The purpose of this lesson is for students to understand the structure of the number line and learn how whole numbers can be represented on the number line with tick marks and points.

In a previous unit, students learned about standard length units. They created their own rulers by iterating centimeter cubes and used their understanding of length units to measure the length of objects with rulers, meter sticks, and other tools. Students interpreted the scale of line plots and created their own line plots by relating their structure to the length units on measurement tools.

In this lesson, students learn about the **number line**, a diagram that represents numbers as lengths from 0 using equally spaced tick marks or points, and learn how to locate and represent whole numbers on the number line. Students are introduced to the idea of using a point to represent specific numbers on the number line. Students build on their experiences with measurement to construct a number line to represent numbers within 20. They learn that unlike a linear measurement tool or a line plot, the unit intervals on a number line do not correspond to a specific unit of measure. In the lesson synthesis, students consider how number lines with different unit intervals can be used to represent the same numbers and relationships.

Access for:

Students with Disabilities

- Representation (Activity 1)

English Learners

- MLR8 (Activity 2)

Instructional Routines

Notice and Wonder (Warm-up)

Materials to Gather

- Objects of various lengths: Activity 2

Lesson Timeline

Warm-up	10 min
Activity 1	15 min
Activity 2	20 min
Lesson Synthesis	10 min
Cool-down	5 min

Teacher Reflection Question

In a previous unit, students learned to measure lengths using standard length units. How does this understanding help students understand the structure of the number line?

Cool-down (to be completed at the end of the lesson)

⌚ 5 min

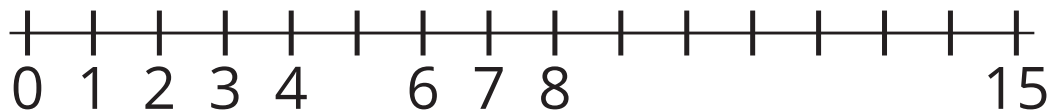
On the Number Line

Standards Alignments

Addressing 2.MD.B.6

Student-facing Task Statement

1.



- Label each tick mark with the number it represents.
- Locate 2 on the number line. Mark it with a point.
- Locate 14 on the number line. Mark it with a point.

Student Responses

- Students label the missing numbers.

- b. Students draw a point to represent 2.
- c. Students draw a point to represent 14.

----- Begin Lesson -----

Warm-up

🕒 10 min

Notice and Wonder: Rulers and Number Lines

Standards Alignments

Building Towards 2.MD.B.6

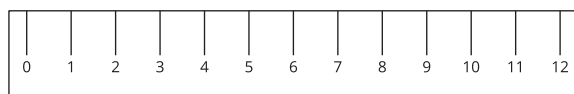
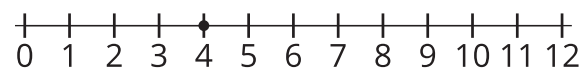
The purpose of this warm-up is for students to make sense of a new representation and how it is similar to and different from a ruler. If possible, display an actual ruler next to the number line. This will be useful when students create their own number lines in a later activity. While students may notice and wonder many things about these images, the connections between the features of a number line and a ruler are the important discussion points.

Instructional Routines

Notice and Wonder

Student-facing Task Statement

What do you notice? What do you wonder?



Student Responses

Students may notice:

- They both show 12.

Launch

- Groups of 2
- Display the image.
- “What do you notice? What do you wonder?”
- 1 minute: quiet think time

Activity

- “Discuss your thinking with your partner.”
- 1 minute: partner discussion
- Share and record responses.

- The bottom one looks like a ruler.
- The top one has a black dot on the line above the number 4.
- The top one doesn't have any sides.

Students may wonder:

- Do these tools represent centimeters or inches?
- Why is there a dot? Should it be an x?
- Should the dot be above the line? Is it a line plot?

Synthesis

- "Today, we are going to think about how the first diagram might be helpful when thinking about numbers."

Activity 1

🕒 15 min

What is a Number Line?

Standards Alignments

Addressing 2.MD.B.6

The purpose of this activity is for students to learn the features of a number line. Students make sense of and use the features of number lines, such as the sequence of numbers moving from left to right and equal spacing between tick marks to locate and represent whole numbers. In the synthesis, students describe how they filled in the missing numbers on a number line and how they located and represented a specific number.

🕒 Access for Students with Disabilities

Representation: Internalize Comprehension. Begin by asking, "Does this number line remind anyone of something we have seen before? What were some important aspects of the ruler/measuring tools that we had to pay close attention to? Do you think they will be similar or different for a number line?"

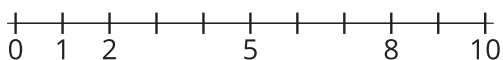
Supports accessibility for: Memory, Conceptual Processing, Organization

Student-facing Task Statement

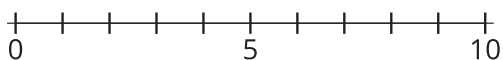
1. Label each tick mark with the number it represents.

Launch

- Groups of 2
- Display the number line image from the



2. Locate 6 on the number line. Mark it with a point.
3. Locate a number on the number line that is greater than 6. Mark it with a point.
4. Label each tick mark with the number it represents.

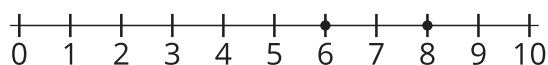


5. Locate 9 on the number line. Mark it with a point.
6. Locate a number on the number line that is less than 9. Mark it with a point.

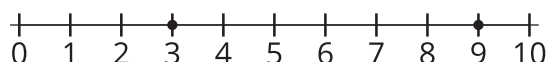
Student Responses

Answers vary.

Sample response for 1–3:



Sample response for 4–6:



warm up.

- “This diagram is called a **number line**. What do you notice about this number line?” (It has tick marks like a ruler. The numbers go in order. There is a point at 4. The numbers are equally spaced.)
- 30 seconds: quiet think time
- 1 minute: partner discussion
- Share and record responses.
- “We noticed some important things about number lines.”
- Summarize the points recorded.
- If it did not come up, make sure the list includes:
 - There is the same amount of space between each tick mark on the number line like a ruler.
 - The numbers on the number line are listed in order from left to right like on a ruler. Each number represents a length from 0.
 - A dot, called a point, on the number line represents a specific number.
- “What number does this point represent? Explain.” (4, because the point is right above the 4. It is 4 length units from 0.)
- 30 seconds: quiet think time
- 30 seconds: partner discussion
- Share responses.

Activity

- “Now you are going to do some work with the number line. You have a number line that is missing labels on the tick marks. Label each tick mark with the number it represents. Locate different points on the number line and mark them with a point.”
- 5 minutes: independent work time
- If students finish early, ask them to extend

the number line and label different points.

Synthesis

- Display the number line with only 0, 5, and 10 labeled.
- “How did you know which numbers to use to label the tick marks?” (It’s like a ruler, I figured out how many length units each tick mark was from 0. I just counted because I know the numbers need to go in order from left to right.)

Advancing Student Thinking

If students draw a point in a location other than a number greater than 6 or less than 9, give students a ruler. Consider asking:

- “Looking at this ruler, what is a measurement that is longer than 6 cm?”
- “How could you show that number on the number line?”

Activity 2

🕒 20 min

Make Your Own Number Line

Standards Alignments

Addressing 2.MD.B.6

The purpose of this activity is for students to learn that numbers are represented on a number line as lengths from 0. Students choose their own length unit to make equally spaced tick marks and label them 0–20. In the synthesis, students compare their number lines and notice that on a given number line the length between successive numbers should be the same. This length represents 1 length unit (the unit interval). Students also notice that, unlike tools that are used to measure standard length units, number lines can use any size of length unit to represent a set of numbers, as long as it's the same between consecutive numbers.

In order to make an accurate number line, students will need to make strategic use of materials in

order to measure the units on their number line. This could be a paper clip or a staple or the equally spaced lines on a lined sheet of paper (MP5).

Students will use the number line they create in an upcoming lesson.

Access for English Learners

MLR8 Discussion Supports. Synthesis. Display sentence frames to support small-group discussion: “The number lines are the same because . . .” and “The number lines are different because . . .”
Advances: Speaking, Conversing

Materials to Gather

Objects of various lengths

Required Preparation

- Each student needs a sentence strip or a 24–30 inch rectangular strip of paper.
- Each group of 2 students needs access to assorted objects that can be used as a length unit to construct number lines (base-ten blocks, inch tiles, paper clips, large erasers, small sticky notes).

Student-facing Task Statement

1. Make a number line that goes from 0 to 20.
2. Locate 13 on your number line. Mark it with a point.
3. Locate 3 on your number line. Mark it with a point.
4. Compare your number line with your partner’s.

Student Responses

Students create a number line 0–20 and mark 3 and 13 with a point.

Launch

- Groups of 2
- Give students a long rectangular strip of paper, like a sentence strip, and access to different objects to create a number line.

Activity

- “Now you’re going to create your own number line. You can use any of the tools provided to create a number line that represents the numbers from 0 to 20.”
- 10 minutes: independent work time
- Monitor for students who choose different objects as their length unit and create accurate number lines.
- 2 minutes: partner discussion

Synthesis

- Display 3 student number lines that have

different sized unit intervals.

- “What is the same and what is different about these representations?” (They all have equally spaced tick marks. They all show 0 to 20 in order. They all show a point on 3 and 13. The length of the space they used between tick marks is different. They used different objects to create their number lines.)

Advancing Student Thinking

If students create a number line with tick marks spaced different lengths apart, consider asking:

- “What object did you use to make your number line? Can you show me how you used it?”
- “How can you use your object to check to see that your tick marks are equally spaced?”

Lesson Synthesis

🕒 10 min

“Today we learned about the **number line**, which is a visual representation of numbers. We learned that, just like with rulers and line plots, numbers can be represented by tick marks to show their length from 0 on the number line. We also learned that you can show specific numbers on a number line by marking them with a point.”

Display the 3 student number lines from the last activity.

“How can the points on each number line represent the same number?” (They used different units, but they all show that 3 is 3 length units from 0 and 13 is 13 length units from 0.)

Suggested Centers

- Five in a Row: Addition and Subtraction (1–2), Stage 6: Add within 100 with Composing (Supporting)
- How Close? (1–5), Stage 3: Add to 100 (Supporting)

----- Complete Cool-Down -----

Response to Student Thinking

Students label each tick mark with a number, but do not locate and mark 2 or 14 with a point.

Next Day Support

- During the warm-up of the next lesson, have students practice locating numbers on the number line with a partner.

Lesson 2: Features of a Number Line

Standards Alignments

Addressing 2.MD.B.6, 2.NBT.A.2

Teacher-facing Learning Goals

- Describe the structure of a number line.

Student-facing Learning Goals

- Let's explore the features of a number line.

Lesson Purpose

The purpose of this lesson is for students to identify and describe the defining features of a number line.

In a previous lesson, students were introduced to number lines and represented the location of numbers with labeled tick marks and points within 20.

In the first activity, students each get a number and work together to decide how to place their numbers on a class number line, thinking about the importance of equal spacing and sequencing numbers from left to right. In the second activity, students analyze different student-created number lines and suggest revisions that should be made to make each number line a more accurate representation. Throughout the lesson, students deepen their understanding of the structure of the number line by attending to precision and thinking about the ways they can describe how to correct or improve a number line to others (MP3, MP6).

Access for:

Students with Disabilities

- Action and Expression (Activity 1)

Instructional Routines

Choral Count (Warm-up), MLR8 Discussion Supports (Activity 2)

Materials to Gather

- String: Activity 1

Materials to Copy

- Class Number Line Cards (0–30) (groups of 30); Activity 1

Lesson Timeline

Warm-up	10 min
Activity 1	20 min
Activity 2	15 min
Lesson Synthesis	10 min
Cool-down	5 min

Teacher Reflection Question

Reflect on who participated in class today. What assumptions are you making about those who did not participate? How can you leverage each of your students' ideas to support them in being seen and heard in tomorrow's class?

Cool-down (to be completed at the end of the lesson)

⌚ 5 min

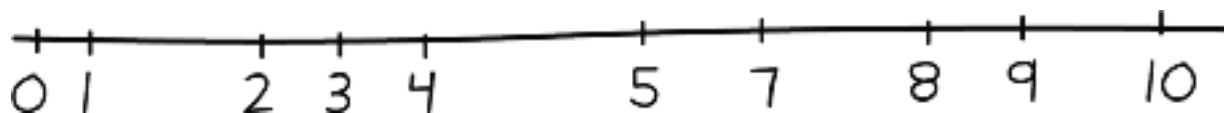
Mai's Number Line

Standards Alignments

Addressing 2.MD.B.6

Student-facing Task Statement

Mai made a number line to show the numbers 0–10.



How should Mai revise her number line?

Student Responses

Sample responses:

- Mai should put the same amount of space between each number.
- Mai needs to label each tick mark with the numbers 0–10, including 6.

----- **Begin Lesson** -----

Warm-up

🕒 10 min

Choral Count: Count by 5

Standards Alignments

Addressing 2.NBT.A.2

The purpose of this Choral Count is for students to practice counting by 5 and notice patterns in the count. These understandings help students develop fluency and will be helpful later in this lesson and future lessons when students show their thinking on the number line. When students notice patterns and explain why they think they occur based on their understanding of operations and the structure of ten, they look for and express regularity in repeated reasoning (MP7, MP8).

Instructional Routines

Choral Count

Student Responses

Record 2 numbers in each row, starting a new row at 0, 10, 20, and so on.

Sample responses:

- The digit in the ones place changes from 0 to 5 over and over.
- All the numbers in the first column have a 0 in the ones place.
- All the numbers in the first column are a number we say when we count by 10.
- All the numbers in the second column have a 5 in the ones place.
- All the numbers in the second column increase by 10 when you go down the column.
- Numbers in a row have the same amount of tens.

Launch

- “Count by 5, starting at 0.”
- Record as students count.
- Stop counting and recording at 100.

Activity

- “What patterns do you see?”
- 1–2 minutes: quiet think time
- Record responses.

Synthesis

- “Who can restate the pattern in different words?”
- “Does anyone want to add an observation about why that pattern is happening here?” ($5 + 5 = 10$, so when you count by 5 two times you make a new ten.)

Activity 1

⌚ 20 min

Class Number Line

 PLC Activity

Standards Alignments

Addressing 2.MD.B.6

The purpose of this activity is for students to reason together about the relative position of numbers on the number line. Students place number cards on the number line, which is represented by yarn strung across the classroom. Students reason about where their number should be placed based on their understanding of the count sequence and by reasoning about the relative distance of numbers from 0 and each other. As more numbers are called, students revise their number locations to be more precise (MP6, MP7). Throughout the activity, encourage students to reflect on the length between numbers and whether it is an accurate representation of the number relationships.

It is recommended that students are called in a random order. This will provide students opportunities to revise their thinking about the position of their number when more information is added to the number line representation.

Access for Students with Disabilities

Action and Expression: Develop Expression and Communication. Some students may benefit from access to a blank number line with equally spaced tick marks on it. Students can then label the tick marks as the numbers are put on the number line to see the appropriate spacing and where the missing numbers lie.

Supports accessibility for: Organization, Visual-Spatial Processing

Materials to Gather

String

Materials to Copy

Class Number Line Cards (0–30) (groups of 30)

Required Preparation

- Hang yarn across the classroom (yarn should be hung taut to resemble a line) for students to hang their number cards on.
- Create a set of number cards from the Instructional master.
- Fold the number cards so they can be hung on the line.

Student Responses

Sample responses:

- I placed 28 near the end, but not at the very end because I know its far from 0, but we need space for 29 and 30.
- 2 and 5 are right next to each other, but they should have more space in between them since some numbers are missing.

Launch

- Give each student a number card.
- It is not necessary to hand out all of the cards.

Activity

- “Today, you are going to create a class number line to represent the numbers from 0 to 30.”
- “When I call you, place your number card on the number line.”
- Place the 0 card to demonstrate how to place a number on the string and to show where the number line begins.
- Invite students to hang their cards in a random order.
- When students place their numbers, ask:
 - “How did you decide where to place your number on the number line?”
 - “What revisions do we need to make to the number line? Why?”
- Pause to check in and revise thinking as needed. If students need prompting for justifying their reasoning for number placement based on length, consider asking:
 - “How close should your number be to ___?”
 - “Should your number be closer to ___ than ___?”

Synthesis

- “Number lines represent the length of numbers from 0 and help us see how close numbers are to each other.”
- “How did you adjust the location of your number as more numbers were added?” (Sometimes we had to make more room or move cards because the new number

needed to fit in between numbers. The more numbers that were already on the number line, the easier it was to be precise.)

- “Looking at our number line, what final revisions could be made to make our number line more precise?”

Activity 2

🕒 15 min

Analyze Number Lines

Standards Alignments

Addressing 2.MD.B.6, 2.NBT.A.2




The purpose of this activity is for students to analyze number lines to determine whether they represent numbers within 10 as lengths from 0. Students analyze number line diagrams that do not have equal unit intervals or have tick marks that are not properly labeled. Students discuss what needs to be added or changed in order to make these number line diagrams accurate (MP3, MP6).

This activity uses *MLR8 Discussion Supports*. *Advances: speaking, conversing*

Instructional Routines

MLR8 Discussion Supports

Student-facing Task Statement

Jada's number line

 line
 Andre's number line

 line
 Elena's number line

 line

Launch

- Groups of 3

Activity

- “Jada, Andre, and Elena were asked to create a number line diagram to represent the numbers from 0 to 10.”

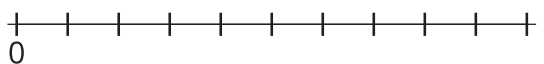
1. How should Jada revise her number line?
2. How should Andre revise his number line?

3. Elena's number line



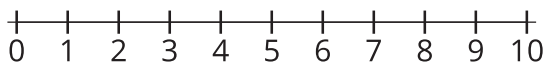
How should Elena revise her number line?

4. Fill in the numbers to create your own number line.



Student Responses

1. Sample response: Jada should revise the labels for 2–10. She skipped some tick marks so the numbers do not show the right lengths from 0.
2. Sample response: Andre should make sure the space between each tick mark is the same length.
3. Sample response: Elena should change 3–10. She forgot 3, so 4–10 show the wrong length.
- 4.



- “Look at each student’s number line on your own. Think of 1 thing you think the student did well when they represented 0–10 and 1 thing you think they should revise. Be prepared to share with your group.”
- 90 seconds: independent work time
- “Discuss each number line with your group.”

MLR8 Discussion Supports

- Display sentence frames to support small-group discussion:
 - “One thing ____ did well was . . .”
 - “One thing ____ should revise is . . .”
- 5 minutes: small-group discussion
- “All of the students need to revise their number lines. For each number line, write what they should do to fix it.”
- 5 minutes: independent work time
- Monitor for students who explain why each diagram needs revising by describing the labels and the space between each number.

Synthesis

- Display Jada’s number line diagram.
- Select previously identified students to share how Jada should revise her number line.

MLR8 Discussion Supports

- Support student use of “length” to describe revisions. For example, revoice the student statement “the numbers are wrong” as “the numbers do not show the correct lengths from 0.”
- Consider asking:
 - “What are some things Jada did well when representing the numbers 0–10 on a number line?” (All of the

numbers were listed and are in order. She started with 0 and used tick marks. The tick marks are equally spaced.)

- If time permits, repeat for each diagram.

Advancing Student Thinking

If students say that a number line does not need revisions, provide students with a ruler. Consider asking:

- “What is the same and what is different between ____’s number line and the ruler?”
- “How could you use the way the tick marks are spaced and labeled on a ruler to describe how ____ could revise their number line?”

Lesson Synthesis

🕒 10 min

“Today we created our own class number line and analyzed number lines. What do we need to think about when creating a number line to represent numbers?” (We should use the same amount of space between each tick mark. We should make sure labels on tick marks show the right length from 0 and are the right length from each other. We can think about a ruler to check if the number line makes sense.)

Suggested Centers

- Five in a Row: Addition and Subtraction (1–2), Stage 6: Add within 100 with Composing (Supporting)
- How Close? (1–5), Stage 3: Add to 100 (Supporting)

----- Complete Cool-Down -----

Response to Student Thinking

Students write that Mai should make sure 6–10 are labeled correctly or that she should use the same amount of space between each number but do not write both.

Next Day Support

- During the warm-up of the next lesson, have a discussion about this cool-down.

Lesson 3: Unlabeled Tick Marks

Standards Alignments

Addressing 2.MD.B.6, 2.NBT.A.2

Teacher-facing Learning Goals

- Represent a whole number on a number line and describe the point in terms of its length from 0.
- Use skip-counting patterns to locate numbers on a number line.

Student-facing Learning Goals

- Let's locate numbers on the number line.

Lesson Purpose

The purpose of this lesson is for students to represent numbers within 100 on number lines that do not label each tick mark.

In a previous lesson, students were introduced to the number line and represented the location of numbers with labeled tick marks and points up to 20.

In this lesson, students use multiples of 5 and 10 to locate numbers up to 100 on the number line. Students leverage their understanding of skip counting by 5 and 10 to locate numbers and build on their understanding of the number line as a representation that includes all numbers. In future lessons, students will estimate numbers on a number line without any tick marks by approximating the location of the number relative to the position of represented numbers.

Access for:

Students with Disabilities

- Action and Expression (Activity 2)

English Learners

- MLR2 (Activity 1)

Instructional Routines

Notice and Wonder (Warm-up)

Lesson Timeline

Warm-up

10 min

Teacher Reflection Question

How effective were your questions in supporting students' thinking about the structure of the

Activity 1	15 min
Activity 2	20 min
Lesson Synthesis	10 min
Cool-down	5 min

number line today? What did students say or do that showed they were effective?

Cool-down (to be completed at the end of the lesson)

🕒 5 min

What's Missing?

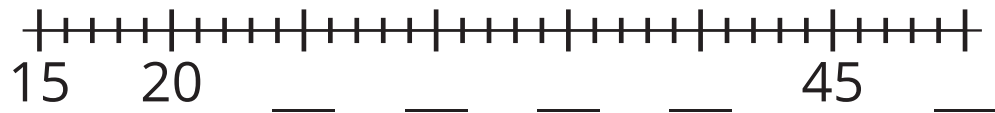
Standards Alignments

Addressing 2.MD.B.6, 2.NBT.A.2

Student-facing Task Statement

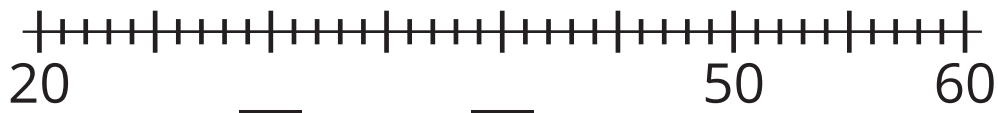
Complete each number line by filling in the missing labels with the number the tick mark represents.

1. a.



b. Locate and label 37 on the number line.

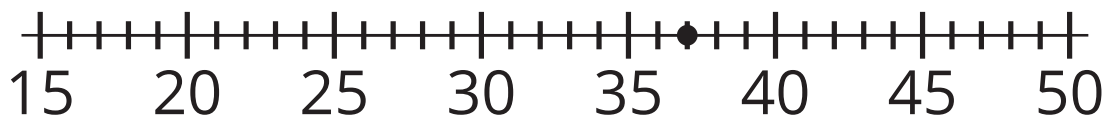
2. a.



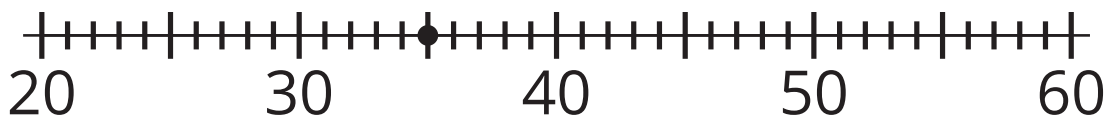
b. Locate and label 35 on the number line.

Student Responses

1.



2,



Begin Lesson

Warm-up

🕒 10 min

Notice and Wonder: From 0 to 30

Standards Alignments

Addressing 2.NBT.A.2

The purpose of this warm-up is to elicit ideas about what a number line can be used to represent. The sequence of diagrams emphasizes the position of multiples of 5 and 10 on the number line, which will be useful when students represent numbers on number lines that only include labeled tick marks at these positions. While students may notice and wonder many things about these number line diagrams, ideas about how the diagrams may represent counting are the important discussion points.

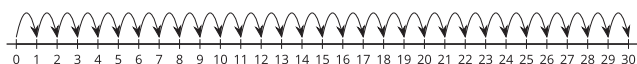
Instructional Routines

Notice and Wonder

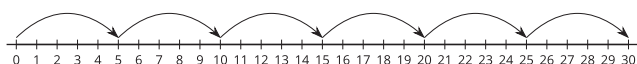
Student-facing Task Statement

What do you notice? What do you wonder?

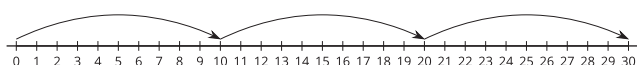
A



B



C



Launch

- Groups of 2
- Display the number lines.
- "What do you notice? What do you wonder?"
- 1 minute: quiet think time

Activity

- "Discuss your thinking with your partner."
- 1 minute: partner discussion
- Share and record responses.

Student Responses

Students may notice:

- Each number line shows numbers 0–30.
- Each number line has the same amount of space between each number (each uses the same length unit).
- Each number line has arrows.
- The arrows in number line B point to numbers you say when you count by 5.
- The arrows in number line C point to numbers you say when you count by 10.

Students may wonder:

- Why are there arrows on the number line?
- What do the arrows mean?
- Does number line B show counting by 5?
- Does number line C show counting by 10?

Synthesis

- “These number lines help us see what it looks like when we count by different numbers.”
- “Count to 30 by 5 starting with 0.”
- “Which number line represents our count? Explain.” (B because the arrows show moving from 0 to 5 to 10 to 15...)
- “Count to 30 by 10 starting with 0.”
- “Which number line represents our count? Explain.” (C because the arrows show moving from 0 to 10 to 20 to 30).

Activity 1

🕒 15 min

Locate the Numbers

Standards Alignments

Addressing 2.MD.B.6

The purpose of this activity is for students to work with number lines that only have multiples of 5 or 10 labeled and do not start with 0. Students reason about how a number line can be accurate without all the numbers labeled. Students use the numbers that are labeled to locate specific numbers on number lines. Students rely on the regular structure of the number line and the counting sequence in order to accurately place numbers (MP7).

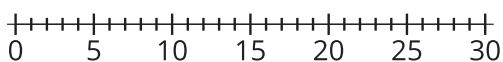
Access for English Learners

MLR2 Collect and Display. Collect the language students use as they work with the number lines and discuss the number patterns. Display words, phrases, and representations such as: number line, distance from zero, in order, interval, spaces, tick mark, point, and pattern. During the synthesis, invite students to suggest ways to update the display: “What are some other words or phrases we should include?” Invite students to borrow language from the display as needed.

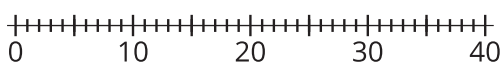
Advances: Conversing, Reading

Student-facing Task Statement

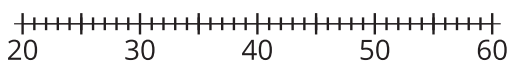
1. Locate 24 on the number line. Mark it with a point.



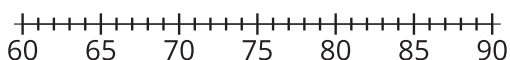
2. Locate 37 on the number line. Mark it with a point.



3. Locate 48 on the number line. Mark it with a point.

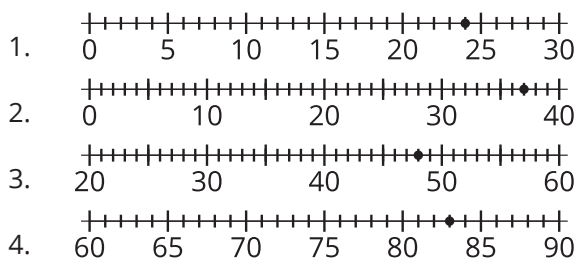


4. Locate 83 on the number line. Mark it with a point.

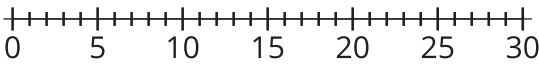


5. Explain how you know the numbers you located are at the right spot on each number line.

Student Responses



Launch

- Groups of 2
 - Display the first number line.
- 
- “What do you notice about this number line?” (Not all the tick marks are labeled. Only the fives are labeled.)
 - 30 seconds: quiet think time
 - Share responses.
 - “Are the labeled tick marks in the right spots on the number line? Explain.” (Yes because 5 is 5 length units from 0. 10 is 10 units from 0. There are 5 length units between each labeled mark.)
 - 30 seconds: quiet think time
 - 1 minute: partner discussion
 - Share responses.
 - “Today we are going to make sense of and use number lines that do not label every tick mark.”

Activity

- “Locate each number on the number line and mark it with a point. Be ready to show your partner how you know you located the numbers and how you know they are in the right spots.”

5. Sample responses:

- I know my point shows 37 because here is 40, and you can count back 3 spaces to find 37.
- I know my point is at 37 because I could count 37 units from 0.

- 4 minutes: independent work time
- 4 minutes: partner work time
- Consider asking:
 - “How did you locate this number?”
 - “How did you use the labeled tick marks?”
 - “How do you know your number is at the right length from 0?”
- Monitor for students who show their number is at the right position by:
 - counting on from 0 or referencing the length from 0
 - counting on or back from a labeled tick mark
 - describing the length between each labeled tick mark

Synthesis

- Display the number line labeled 20, 30, 40, 50, 60.
- Invite 1–2 previously identified students to share how they located 48.
- “How do you know your point is the right distance from 0?” (It’s like when we measured from different spots on a ruler. The tick marks are spaced the same space apart and count by 1 length unit. We could draw the line back and find where 0 is.)
- “A number line representation cannot represent all numbers with tick marks, points, or labels. We can use what we know based on the numbers that are labeled to locate other numbers.”

Advancing Student Thinking

If students count every tick mark to locate numbers, consider asking:

- “How could you use the labeled tick marks to help you find a number?”

Activity 2

🕒 20 min

Are You Missing Something?

Standards Alignments

Addressing 2.MD.B.6, 2.NBT.A.2

The purpose of this activity is for students to locate numbers up to 100 on a number line. They complete number lines that are labeled with multiples of 5 or 10 by using what they know about length on the number line and counting by 5 and 10. They use the labeled tick marks to locate and represent numbers within 100. When students explain to one another how they located different numbers on the number lines they construct viable arguments and may critique each other's reasoning (MP3).

🕒 Access for Students with Disabilities

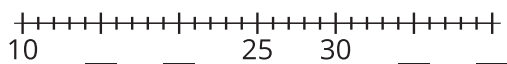
Action and Expression: Develop Expression and Communication. Give students access to two colors of connecting cubes. Build a number line that changes color back and forth at intervals of 5. For example, 5 red cubes, 5 yellow cubes, 5 red cubes, 5 yellow cubes, and so on. The concrete visual of color representing intervals of 5 can be seen clearly.

Supports accessibility for: Conceptual Processing, Organization

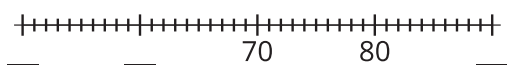
Student-facing Task Statement

Complete each number line by filling in the labels with the number the tick mark represents. Then, locate each number, mark it with a point, and label it with the number it represents.

1. Locate and label 17 on the number line.



2. Locate and label 59 on the number line.



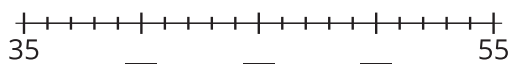
3. Locate and label 43 on the number line.

Launch

- Groups of 2

Activity

- "On your own, complete each number line by filling in the missing labels with the number the tick mark represents. Then, locate each number, mark it with a point, and label the point with the number it represents."
- "When you finish, think of how you can explain to your partner how you know your labels and points are at the right spots on the number lines."
- 5 minutes: independent work time



4. Locate and label 35 on the number line.

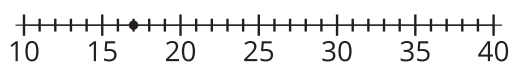


5. Share your number lines with your partner.

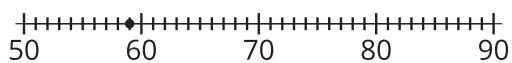


Student Responses

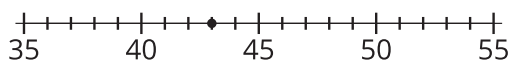
1. Students label the point as 17.



2. Students label the point as 59.



3. Students label the point as 43.



4. Students label the missing numbers (0, 20, 30, 40) and locate and label 35.

5. Sample responses:

- I noticed there were 5 length units between 25 and 30 and between the missing tick marks too. I counted by 5 to fill in the missing labels.
- I know 17 is the right place because it is two units more than 15. I can also tell because it should show a length from 0 that is 7 units longer than 10.

- “Share your work with a partner. Make sure you agree on your answers.”
- 5 minutes: partner discussion
- Monitor for students who:
 - explain their labeled tick marks based on counting by 5 or 10
 - explain their labeled tick marks based on the equal lengths between each labeled tick mark
 - use labeled tick marks to explain how they locate numbers

Synthesis

- Display the image of an incomplete number line labeled with 10 and 50.
- “How could you find 35 without filling in the missing labels?” (We could count back from 50. We could count on from 10.)
- Invite previously identified students to explain how they found the labels and used them to locate 35.
- Complete the number line as students explain.

Advancing Student Thinking

If students' labels are numbers other than the specified numbers, consider asking:

- “I see you labeled this point as _____. How can you use the number line to prove that is the location of that number?”

Lesson Synthesis

🕒 10 min

"Today we made sense of number lines that do not have each number labeled and number lines that do not start with 0."

Display the number line from the second activity synthesis with multiples of 10 labeled.

"Why might someone want to label only the tick marks that show the numbers you say when you skip-count by 10? Why not always label every tick mark?" (It might take too long to label every tick mark when there are a lot of numbers. It might be hard to read if all the numbers are there. You might not have enough space to label every tick mark.)

"What other tick marks could we label on this number line to make it easier to find other numbers?" (The numbers we say when we count by 5.)

Suggested Centers

- Five in a Row: Addition and Subtraction (1–2), Stage 6: Add within 100 with Composing (Supporting)
- How Close? (1–5), Stage 3: Add to 100 (Supporting)

----- Complete Cool-Down -----

Response to Student Thinking

Students show they are thinking about skip-counting, but may not yet be using the structure of the number line to make sure the pattern makes sense. For example, on the second number line, students write 25 in the first blank instead of 30.

Next Day Support

- Before the warm-up, pass back the cool-down and work in small groups to discuss how they can prove their labels and points are accurate using the structure of the number line.

Lesson 4: Compare Numbers on a Number Line

Standards Alignments

Addressing 2.MD.B.6, 2.NBT.B.5

Teacher-facing Learning Goals

- Recognize that on a number line, the numbers increase to the right and decrease to the left.

Student-facing Learning Goals

- Let's use the number line to compare numbers.

Lesson Purpose

The purpose of this lesson is for students to recognize that on a number line the numbers increase to the right and decrease to the left.

In previous lessons, students learned how to locate a number on the number line and represent numbers with labeled tick marks and points. They used multiples of 5 and 10 to help them locate numbers up to 100 on a number line.

In this lesson, students recognize that as you move to the right on the number line, numbers increase in value because they are a greater distance from 0. Students also use the relative position of numbers and generalize that a number that is greater than a given number if it is farther to the right on the number line. To demonstrate this understanding, students compare numbers within 100 (a skill from grade 1) and use the number line to explain their comparison (MP7).

In a later lesson, students connect this understanding to movement on the number line, as they learn to represent addition as moving to the right and subtraction as moving to the left.

Access for:

Students with Disabilities

- Engagement (Activity 1)

Instructional Routines

MLR8 Discussion Supports (Activity 1), Number Talk (Warm-up)

Materials to Gather

- Counters: Activity 1

Materials to Copy

- Number Line to 100 (groups of 1): Activity 2

- Dry erase markers: Activity 2
- Materials from a previous lesson: Activity 1, Activity 2
- Number cubes: Activity 1, Activity 2
- Sheet protectors: Activity 2

Lesson Timeline

Warm-up	10 min
Activity 1	20 min
Activity 2	15 min
Lesson Synthesis	10 min
Cool-down	5 min

Teacher Reflection Question

How did students explain why a number was greater than or less than another number? What can you do to support students who are not yet articulating their reasoning in terms of a number's location on the number line?

Cool-down (to be completed at the end of the lesson)

🕒 5 min

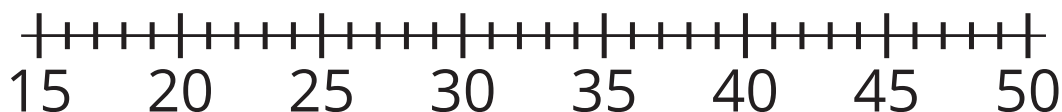
Compare on the Number Line

Standards Alignments

Addressing 2.MD.B.6

Student-facing Task Statement

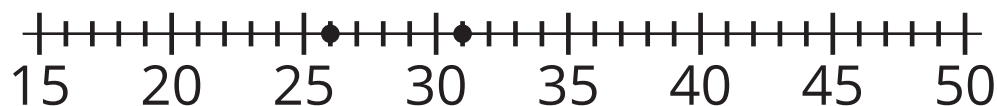
1.



- Locate and label 31 on the number line.
- Locate and label a number that is less than 31 on the number line.
- Use $<$ and $>$ to compare the 2 numbers represented on your number line.
- Explain how you know your comparison is true.

Student Responses

1. a. Students locate and label 31.
- b. Answers vary. Sample response:



- c. Sample response: $26 < 31$
- d. Sample response: My point is on 26. I know it is less than 31 because it is farther to the left.

Begin Lesson

Warm-up

🕒 10 min

Number Talk: Subtract Fives

Standards Alignments

Addressing 2.NBT.B.5

The purpose of this Number Talk is for students to subtract with multiples of 5. As students share strategies based on place value or related to adding on or subtracting multiples of 5, record their thinking using a number line diagram. Students connect their mental strategies to the representation of moving a length of 5, 10, or 20 from one number to another on the number line. The understandings elicited here will be helpful in later lessons when students represent sums and differences on number lines.

Instructional Routines

Number Talk

Student-facing Task Statement

Find the value of each expression mentally.

- $35 - 5$

Launch

- Display one expression.
- "Give me a signal when you have an answer and can explain how you got it."

- $35 - 10$
- $35 - 15$
- $35 - 25$

Student Responses

- 30: I counted back by 5. 35, 30.
- 25: I took away 1 ten from 35.
- 20: I took away 1 ten from 35 then I took away 5 ones. $35 - 10 = 25$, $25 - 5 = 20$.
- 10: I thought of adding 10 to 25. $25 + 10 = 35$, so $35 - 25 = 10$.

- 1 minute: quiet think time

Activity

- Record answers and strategy. Use a number line diagram when possible.
- Keep expressions and work displayed.
- Repeat with each expression.

Synthesis

- “How did the first 2 expressions help you think about the last 2?” (I know that $5 - 5 = 0$ because all of the ones are being taken away. Then I just take the tens from the tens.)

Activity 1

🕒 20 min

Compare the Numbers

Standards Alignments

Addressing 2.MD.B.6

The purpose of this activity is for students to compare two numbers and justify their comparison based on the location of each number on the number line. Using the number lines students created in a previous lesson, students represent numbers by placing counters as points on the number line. Students recognize that given any two numbers, the number farther to the right represents a greater value than the number to the left (MP7).

This activity uses *MLR8 Discussion Supports*. Advances: reading, speaking

🕒 Access for Students with Disabilities

Engagement: Provide Access by Recruiting Interest. Give students a context to relate the number line to. For example, a frog jumping on lily pads, or a rabbit hopping. The counters can represent the animal hopping along the number line.

Supports accessibility for: Conceptual Processing, Attention

Instructional Routines

MLR8 Discussion Supports

Materials to Gather

Counters, Materials from a previous lesson,
Number cubes

Required Preparation

- Each student will need their number line they made in Lesson 1.
- Each group of 2 needs 3 number cubes and 2 counters.

Student-facing Task Statement

- Partner A:
 - Roll 3 number cubes and find the sum.
 - Put a counter on the location of the sum.
- Partner B:
 - Roll 3 number cubes and find the sum.
 - Put a counter on the location of the sum on the same number line.
- Decide which number is greater and explain.
- Use $<$, $>$, or $=$ to compare the 2 numbers represented on your number line.

Partner A	$<$, $>$, or $=$	Partner B

Launch

- Groups of 2
- Give each group 3 number cubes and 2 counters.
- Assign Partner A and B.

Activity

- “You will use the number line you created and work with a partner. Decide with your partner whose number line you will use.”
- As needed, demonstrate the task with a student.
- “I am Partner A. I am going to roll the 3 number cubes and find the sum.”
- “Then, I take a counter and place it on the number line to represent the sum.”
- “Now it’s my partner’s turn. They do the same thing and put their counter on the same number line to represent the sum of their numbers.”
- “Then, we decide which number is greater and explain how we know.”
- “Last, we use the $<$, $>$, or $=$ symbols to record our comparison.”

MLR8 Discussion Supports

Student Responses

Answers vary. Sample responses:

- $3 + 5 + 6 = 14$. Place a counter on 14. My number is greater because it is farther from zero. It is more to the right.
- $1 + 1 + 4 = 6$. Place a counter on 6. Your number is greater because my number is closer to zero.
- $6 < 14$ or $14 > 6$

- If needed, remind students to use comparison vocabulary (less than, greater than, equal to) to read the symbols and their comparisons.
- If needed, invite students to chorally repeat the phrases that each symbol represents.
- 10 minutes: partner work time
- Monitor for students who explain comparisons:
 - based on lengths from 0
 - using the language “to the left” and “to the right”

Synthesis

- Invite 2–3 previously identified groups to share comparisons and their explanations.
- “What do you notice about the numbers that are farther to the right?” (They were greater. They represent a greater length from zero.)

Advancing Student Thinking

If students write comparison statements that are not true, consider asking:

- “How can you use the number line to show that ___ is greater than or less than ___?”

Activity 2

🕒 15 min

Compare Larger Numbers

Standards Alignments

Addressing 2.MD.B.6

The purpose of this activity is for students to use a number line to compare larger numbers. In

the first activity, students compared numbers on a number line with all of the tick marks labeled. In this activity, only the multiples of 5 are labeled. Students locate and label numbers on the number line and compare them. Listen for the language students use to explain how they know a number is greater than or less than another number, including those based on the lengths the numbers represent from 0 (MP6).

Materials to Gather

Dry erase markers, Materials from a previous lesson, Number cubes, Sheet protectors

Materials to Copy

Number Line to 100 (groups of 1)

Required Preparation

- Each group of 2 needs 2 number cubes and a dry erase marker.
- Put number line recording sheets into sheet protectors. The recording sheets will be used in upcoming lessons.

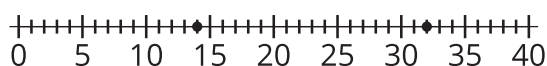
Student-facing Task Statement

- Each partner rolls 2 number cubes and makes a two-digit number.
- Locate and label your numbers on the number line.
- Use $>$, $<$, or $=$ to compare the numbers.
- Explain why your comparison is true.

Partner A	$<$, $>$, or $=$	Partner B

Student Responses

Sample response: Student labels 32 and 14.



My number is 32. I know 32 is greater than 14 because it's farther to the right. $14 < 32$ or $32 > 14$

Launch

- Groups of 2
- Give each group a number line, 2 number cubes, and a dry erase marker.

Activity

- "You are going to do some more work comparing numbers on a number line with a new partner."
- "This time you will use a number line that goes from 0–100."
- "Each of you will roll 2 number cubes and create a two-digit number."
- "Locate and label both numbers on the number line."
- "Then compare the numbers using $<$, $>$, or $=$. Explain how you know your comparison is true."
- 10 minutes: partner work time
- Monitor for student comparisons where both numbers are close on the number line (within 10) and where numbers are farther

apart (greater than 30).

Synthesis

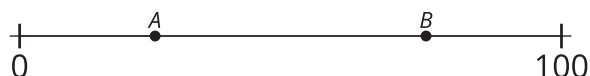
- Invite a previously identified group to share a comparison where the numbers are close.
- Display the number line from the activity to record student comparison or have students display their work so all students can see.
- "Is ____'s comparison true? Explain." (Yes, it is true because ____ [larger number] is farther to right. It represents a longer length from 0 than the smaller number.)
- Repeat with a previously identified group with a comparison where numbers are farther apart.
- "Which comparison has a bigger difference between the two numbers? Explain." (____ has a bigger difference. You can tell because the length between them is much larger than the length between the other two numbers.)

Lesson Synthesis

🕒 10 min

"Today, we used number lines to compare numbers and thought about how close or far away they are from zero and each other. We used what we know about comparing lengths to compare the numbers. We also used position words like to the left or right to talk about which number was less or more."

Display or draw:



"If A and B are points that represent numbers on this number line, which number is less? How do you know?" (A, because it is farther to the left than B. A, because it is closer to zero. A, because B represents a longer length from 0.)

Suggested Centers

- Five in a Row: Addition and Subtraction (1–2), Stage 6: Add within 100 with Composing (Supporting)
- How Close? (1–5), Stage 3: Add to 100 (Supporting)

Complete Cool-Down

Response to Student Thinking

Students locate and compare numbers on the number line accurately, but do not complete their written explanation to show what they understand. Students locate a number other than 31 or a number that is not less than 31 on the number line.

The work of this lesson builds on the work of a prior unit on comparing numbers to 99 using the $>$, $<$, or $=$ symbols.

Next Day Support

- Launch Activity 1 with a discussion about this cool-down.

Prior Unit Support

Grade 1, Unit 4, Section C: Compare Numbers to 99

Lesson 5: Estimate on a Number Line

Standards Alignments

Addressing 2.MD.B.6

Teacher-facing Learning Goals

- Use estimation to reason about the location of whole numbers on a number line.

Student-facing Learning Goals

- Let's estimate numbers on a number line.

Lesson Purpose

The purpose of this lesson is for students to use their understanding of length and the structure of a number line to estimate the location of a number on a number line.

In previous lessons, students estimated the length of objects using what they know about the size of standard length units and the tools used to measure them. Students have located numbers on number lines using what they know about the structure of a number line and the labeled tick marks.

The purpose of this lesson is for students to extend this understanding by estimating numbers on number lines that do not have tick marks to represent each consecutive whole number. Students use their understanding of length and unit intervals on the number line to estimate. Students should be encouraged throughout the lesson to explain why their estimates are reasonable using what they know about number, length, and the structure of the number line.

This lesson has a Student Section Summary.

Access for:



Students with Disabilities

- Action and Expression (Activity 2)



English Learners

- MLR2 (Activity 1)

Instructional Routines

Estimation Exploration (Warm-up), MLR7 Compare and Connect (Activity 2)

Materials to Gather

- Chart paper: Activity 2
- Markers: Activity 2

Materials to Copy

- Order Numbers on the Number Line Cards (groups of 12); Activity 2

Lesson Timeline

Warm-up	10 min
Activity 1	15 min
Activity 2	20 min
Lesson Synthesis	10 min
Cool-down	5 min

Teacher Reflection Question

What strategy did most students use when locating a number on a number line without the support of the tick marks? How can you support students to assess the reasonableness of their estimates in future lessons?

Cool-down (to be completed at the end of the lesson)

⌚ 5 min

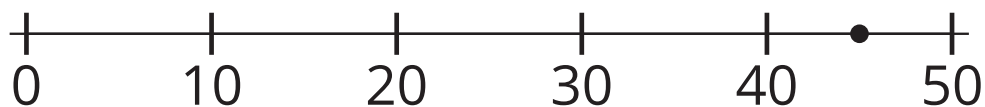
What Number Could This Be?

Standards Alignments

Addressing 2.MD.B.6

Student-facing Task Statement

1. a. What number could be represented by the point?



- b. Explain why your estimate is reasonable.

Student Responses

- Sample response: 44–46
- The number must be between 40 and 50 and it looks like it is right in the middle. I know 45 would be in the middle between 40 and 50.

----- Begin Lesson -----

Warm-up

⌚ 10 min

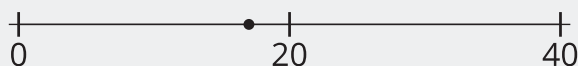
Estimation Exploration: What Number?

Standards Alignments

Addressing 2.MD.B.6

The purpose of this Estimation Exploration is for students to practice the skill of making a reasonable estimate for the number represented by a point on a number line. They give a range of reasonable answers when given incomplete information and have the opportunity to revise their thinking as additional information is provided.

After students have made estimates based on the first image, draw a tick mark at the halfway point and label with 20. Students can revise their thinking based on this additional information. Revealing the actual number represented by the point is not necessary because leaving it open-ended encourages students to focus on reasonableness and not just one right answer.

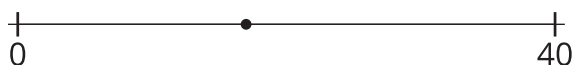


Instructional Routines

Estimation Exploration

Student-facing Task Statement

What number could this be?



1. Record an estimate that is:

too low	about right	too high

2. Record an estimate that is:

too low	about right	too high

Student Responses

- Sample responses:
 - too low: 1–10
 - about right: 11–20

Launch

- Group of 2
- Display image.



- "The point represents a number on the number line. What number could this be?"
- "What is an estimate that's too high? Too low? About right?"
- 1 minute: quiet think time

Activity

- "Discuss your thinking with your partner."
- 1 minute: partner discussion
- Record responses.
- Draw a tick mark at the halfway mark and label with 20.
- "Based on this new information, do you want to revise, or change, your estimates?"

- too high: 21 or more
2. Sample responses:
- too low: 5–14
 - about right: 15–18
 - too high: 19 or more

- 1 minute: quiet think time
- 1 minute: partner discussion
- Record responses.

Synthesis

- “How did the second image help you revise your estimate?” (When I saw it was less than 20, but close to 20, I changed my about right estimate from 14 to 18.)

Activity 1

🕒 15 min

Estimate the Numbers

Standards Alignments

Addressing 2.MD.B.6

The purpose of this activity is for students to estimate the number represented by a point on the number line and justify their reasoning. Encourage students to explain why their estimates are reasonable. Monitor for students who are using the location of other numbers to determine reasonable estimates. Students may choose to estimate and label other numbers (for example, multiples of 5 or 10). For each successive number line, the given tick marks are farther apart so students need to rely more on their understanding of properties of the number line and the accuracy with which they can locate the given numbers depends on how much extra work they do thinking about other numbers which they *can* locate accurately (MP1).

🌐 Access for English Learners

MLR2 Collect and Display. Direct attention to the number line related words collected and displayed from prior lessons. Invite students to borrow language from the display as needed, and update it throughout the lesson.

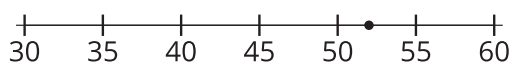
Advances: Conversing, Reading

Student-facing Task Statement

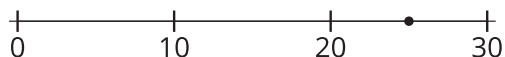
1. What number could this be? _____

Launch

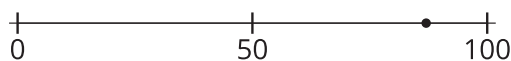
- Groups of 2



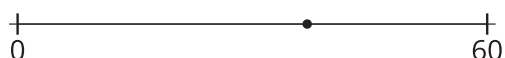
2. What number could this be? _____



3. What number could this be? _____



4. What number could this be? _____



5. Which estimate are you most confident in?
Why?

6. Which estimate are you least confident in?
Why?

Student Responses

Answers vary. Sample responses:

1. 51–53
2. 23–27
3. 80–90
4. 35–45
5. Sample response: The first one because it showed more numbers. It was easier to estimate how big one unit would be.
6. Sample response: The last number line because I tried to label the tens, but I wasn't sure how long ten would be. I'm not sure if all my tens are the same size.

Activity

- "Look at each number line and record an estimate of the number that the point represents."
- 5 minutes: independent work time
- "Compare each estimate with your partner and explain why you believe your answer is reasonable."
- 7 minutes: partner work time
- Monitor for students who add tick marks or labels, including multiples of 10 or 5, to help identify the number.

Synthesis

- "Which estimate are you most confident in? Why?"
- Invite previously identified students to share their strategies for an estimate they are confident in.
- "Which estimates are you least confident in? Why?"
- "What would help you to be more precise with your estimates?" (If I knew more numbers that were closer to the point. If the 10s and 5s were labeled.)

Advancing Student Thinking

If a student's estimates are outside the range of reasonable estimates, consider asking:

- "How did you decide what number this point represents?"
- "How did you use the numbers that are labeled to help you think about the number represented by the point?"
- "If you know this tick mark represents ___ and this tick mark represents __, how could you locate and label other numbers?"

Activity 2

🕒 20 min

Order the Numbers

Standards Alignments

Addressing 2.MD.B.6

The purpose of this activity is for students to locate numbers on a number line without tick marks to represent each number. Students use what they know about multiples of 10, the relative position of numbers on the number line, and comparing length to locate and label a set of numbers on the number line. They start by organizing number cards on a number line and make adjustments to their positions after each card is placed. After they place all of their cards, they locate and label the numbers on the number line. In the synthesis, students compare the number lines that are created and discuss, using the structure of the number line, why some numbers were placed more precisely than others (MP7). This also gives them a chance to construct viable arguments for how they placed the numbers and to critique the reasoning of others (MP3).

This activity uses *MLR7 Compare and Connect*. Advances: representing, conversing.

🕒 Access for Students with Disabilities

Action and Expression: Develop Expression and Communication. Give students access to two colors of connecting cubes. Build a number line with alternating colors in intervals of 5, so that students can see each individual cube as a measurement on the number line (the number actually falls on the line, “tick mark”, between the connecting cubes).

Supports accessibility for: Conceptual Processing, Organization

Instructional Routines

MLR7 Compare and Connect

Materials to Gather

Chart paper, Markers

Materials to Copy

Order Numbers on the Number Line Cards
(groups of 12)

Required Preparation

- Create a number line on chart paper for each group of students.
- On each number line, draw tick marks at the beginning (label 0) and the end (label 40)
- On each number line, draw tick marks and label: 10, 20, 30.

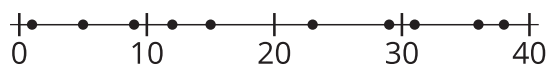
- Create a set of number line cards from the Instructional master for each group of 3 (each set should include 10 cards).

Student-facing Task Statement

- Pick a card and place it on the number line.
- Explain your thinking.
- As a group, revise the position of any cards.
- Repeat until all cards are placed.
- Draw and label points to represent each number on the number line.

Student Responses

Sample response: Students label 1, 5, 9, 12, 15, 23, 29, 31, 36, and 38.



Launch

- Groups of 3
- Give each group chart paper, markers, and a set of number cards.

Activity

- "You will be working with your group to arrange the number cards on the number line."
- "Take turns picking a card and placing it near its spot on the number line."
- "Explain how you decided where to place your card."
- "If you think you need to rearrange other cards, explain why."
- "When you agree that you have placed all the numbers in the right spots, mark each of the numbers on your cards with a point on the number line. Label each point with the number it represents."
- 10 minutes: small-group work time
- Consider asking:
 - "Why did you place your card there?"
 - "Where would you draw a point to represent this number?"
 - "Which cards did you choose to place first? Why?"

Synthesis

MLR7 Compare and Connect

- "Check to make sure all of your numbers are represented in the spots you want them on the number line."
- 1–2 minutes: group work time
- 5–7 minutes: gallery walk

- “What is the same and what is different between the different number lines?”
- Consider asking:
 - “Which numbers did most groups have in the same spot on their number lines?”
 - “Which numbers look like they are in different spots?”

Lesson Synthesis

🕒 10 min

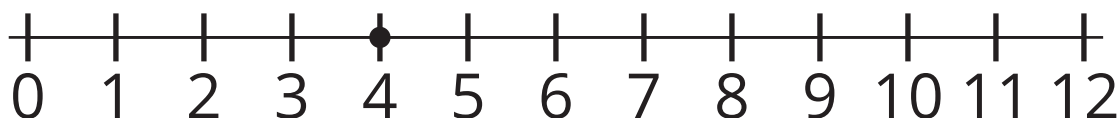
“How did you use what you know about a number line to estimate today?” (I know numbers show a length on the number line. It helped me to think about estimating lengths like when we estimated centimeters and inches. I knew numbers need to be the same amount of space apart. It helped me think about how much space should be between numbers. I know you can use numbers that you are confident in to help you find where other numbers go.)

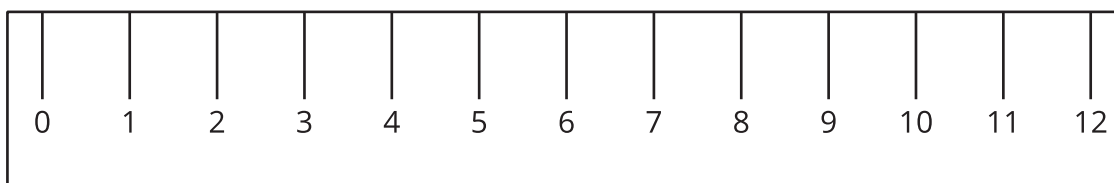
Suggested Centers

- Five in a Row: Addition and Subtraction (1–2), Stage 6: Add within 100 with Composing (Supporting)
- How Close? (1–5), Stage 3: Add to 100 (Supporting)

✍ Student Section Summary

In this section, we learned about the number line. It is like a ruler because it shows numbers as different length units from 0. A number line can be used to represent numbers and show how close or how far they are from 0 and each other. Numbers can be represented by tick marks and points on the number line and increase in value when moving to the right. We used tick marks and counted by 5 and 10 to help us locate and label numbers. We also estimated numbers by thinking about how close they were to zero and other numbers.





Complete Cool-Down

Response to Student Thinking

Students make an estimate that is less than 43 or greater than 46.

Next Day Support

- During the launch of the next day's activity, have students compare their responses to the cool-down and discuss their reasoning.

Lesson 6: Center Day 1 (Optional)

Standards Alignments

Addressing 2.MD.B.6, 2.NBT.A.2, 2.NBT.B.5

Teacher-facing Learning Goals

- Represent numbers on a number line.

Student-facing Learning Goals

- Let's put numbers on a number line.

Lesson Purpose

The purpose of this lesson is for students to represent numbers on a number line and practice addition and subtraction within 100.

This lesson is optional because it is an opportunity for extra practice that not all classes may need. In Activity 1, students learn stage 1 of a new center called Number Line Scoot, where they generate numbers and move that interval on shared number lines. The goal is to land exactly on the end of each number line. In Activity 2, students choose an activity to work on addition and subtraction.

Instructional Routines

Number Talk (Warm-up)

Materials to Gather

- Centimeter cubes: Activity 1
- Materials from previous centers: Activity 2
- Paper clips: Activity 1

Materials to Copy

- Number Line Scoot Stage 1 Directions (groups of 2): Activity 1
- Number Line Scoot Stage 1 Gameboard (groups of 2): Activity 1
- Number Line Scoot Stage 1 Spinner (groups of 2): Activity 1

Lesson Timeline

Warm-up	10 min
Activity 1	15 min
Activity 2	25 min
Lesson Synthesis	10 min

Teacher Reflection Question

Check-in with your norms and routines. Are they promoting engagement from all of your students? Are there any adjustments you might make so that all students do math tomorrow?

----- Begin Lesson -----

Warm-up

🕒 10 min

Number Talk: Decompose and Subtract

Standards Alignments

Addressing 2.NBT.B.5

The purpose of this Number Talk is to elicit strategies and understandings students have for decomposing the subtrahend to create a difference that is known or easier to find. These understandings help students develop fluency and will be helpful later in this lesson when students play center games to practice fluency.

Instructional Routines

Number Talk

Student-facing Task Statement

Find the value of each expression mentally.

- $65 - 25$
- $65 - 27$
- $55 - 17$
- $46 - 18$

Student Responses

Sample responses:

- 40: I subtracted $65 - 5$ to get 60. Then I subtracted $60 - 20$ and got 40.
- 38: I knew $65 - 25 = 40$, so I did that first. Then I took away 2 more because I need to take away 27.
- 38: I took away 10 first ($55 - 10 = 45$). Then I

Launch

- Display one expression.
- "Give me a signal when you have an answer and can explain how you got it."
- 1 minute: quiet think time

Activity

- Record answers and strategy.
- Keep expressions and work displayed.
- Repeat with each expression.

Synthesis

- "What strategies did you hear people use that showed thinking about decomposing what you were subtracting to make the difference easier to find?" (I broke the second number into tens and ones. I broke the number into

took away 5 to get 40 ($45 - 5 = 40$). I had to take away 2 more and got 38.

- 28: I thought of the last expression and took away 10 first to get 36 ($46 - 10 = 36$). Then I took away all the ones ($36 - 6 = 30$). I had two left and counted back to get to 28.

tens and as many ones as I could to take away all the ones. Then I counted back what was left.)

Activity 1

🕒 15 min

Introduce Number Line Scoot, Twos, Fives, and Tens

Standards Alignments

Addressing 2.MD.B.6, 2.NBT.A.2

The purpose of this activity is for students to learn stage 1 of the Number Line Scoot center. In this stage, Twos, Fives, and Tens, Students take turns spinning a spinner and moving their cube that interval on one of the shared number lines. Students may use the number they spin to move that number of length units on one number line or decompose the number and move on multiple number lines. Each time a cube lands exactly on the last tick mark of one of the number lines, the player who moved it keeps the cube and puts a new cube on zero on that number line. The first player to collect 5 cubes wins.

The work of this activity builds a foundation for addition on the number line in upcoming lessons.

Materials to Gather

Centimeter cubes, Paper clips

Materials to Copy

Number Line Scoot Stage 1 Directions (groups of 2), Number Line Scoot Stage 1 Gameboard (groups of 2), Number Line Scoot Stage 1 Spinner (groups of 2)

Launch

- Groups of 2
- Give each group a spinner, paper clip, centimeter cubes, a gameboard, and the directions.
- Display spinner and gameboard.

- "In this game, you spin the spinner and move cubes along the number lines. If you are the one to move a cube directly on the end of a number line you get to keep that cube. You can split your spin between more than one number line."
- "Read the directions with your partner."
- Answer any questions or demonstrate the game for the class if needed.

Activity

- 8 minutes: partner work time

Synthesis

- Display a gameboard with several cubes close to the end of some number lines. Then spin the spinner.
- "This is my gameboard and my next spin. Since I have to land exactly on the end of the number line to collect a cube, what move would you make on the gameboard?"

Activity 2

🕒 25 min

Centers: Choice Time

Standards Alignments

Addressing 2.MD.B.6, 2.NBT.B.5

The purpose of this activity is for students to choose from activities that focus on addition or subtraction.

Students choose from any stage of previously introduced centers.

- Capture Squares
- Number Line Scoot

- Number Puzzles

Materials to Gather

Materials from previous centers

Required Preparation

Gather materials from:

- Capture Squares, Stages 3 and 4
- Number Line Scoot, Stage 1
- Number Puzzles, Stage 4

Student-facing Task Statement

Choose a center.

Capture Squares



Number Line Scoot



Number Puzzles

$$14 = 8 + \square$$

Launch

- “Now you will choose from centers we have already learned. One of the choices is to continue with Number Line Scoot.”
- Display the center choices in the student book.
- “Think about what you would like to do first.”
- 30 seconds: quiet think time

Activity

- Invite students to work at the center of their choice.
- 10 minutes: center work time
- “Choose what you would like to do next.”
- 10 minutes: center work time

Synthesis

- “What did you like about the activities you worked on today?”

Lesson Synthesis

🕒 10 min

"Today our center activities required us to add and subtract. What strategy did you use to help you add and subtract?"

Section B: Add and Subtract on a Number Line

Lesson 7: Addition and Subtraction on the Number Line

Standards Alignments

Addressing 2.MD.B.6

Teacher-facing Learning Goals

- Recognize that on a number line, jumps to the right represent addition and jumps to the left represent subtraction.

Student-facing Learning Goals

- Let's match equations to number line representations.

Lesson Purpose

The purpose of this lesson is for students to attend to the direction of the arrow on the number line to match addition and subtraction expressions.

In previous lessons, students learned that whole numbers can be represented by tick marks and points on the number line. They learned that numbers farther to the right on a number line are greater than those to the left.

In this lesson, students build on that understanding to connect representations that use an arrow to show moving from one number to another on the number line ("jumps") to the operations of addition and subtraction. Students match equations and number line representations and explain how they know they match (MP2, MP7).

Access for:



Students with Disabilities

- Engagement (Activity 1)



English Learners

- MLR7 (Activity 2)

Instructional Routines

Notice and Wonder (Warm-up)

Materials to Gather

- Glue: Activity 2

- Scissors: Activity 2

Lesson Timeline

Warm-up	10 min
Activity 1	15 min
Activity 2	20 min
Lesson Synthesis	10 min
Cool-down	5 min

Teacher Reflection Question

How did students work with locating and labeling numbers on the number line prepare them to connect the direction of arrows to addition and subtraction on the number line? What can you do in the next lesson to build on this understanding?

Cool-down (to be completed at the end of the lesson)

🕒 5 min

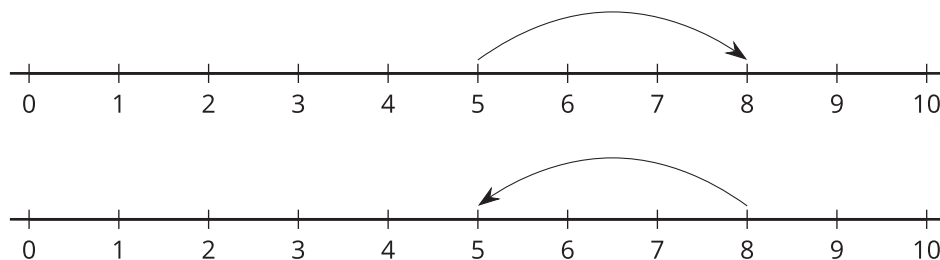
Addition and Subtraction Expressions on a Number Line

Standards Alignments

Addressing 2.MD.B.6

Student-facing Task Statement

1. a. Circle the number line that represents $5 + 3$.



- b. Explain why you chose it.

Student Responses

1. a. The first number line diagram.
b. Sample response: This represents $5 + 3$ because it starts on 5 and jumps 3 more. I know that $5 + 3 = 8$.

Begin Lesson

Warm-up

🕒 10 min

Notice and Wonder: Jumps on the Number Line

Standards Alignments

Addressing 2.MD.B.6

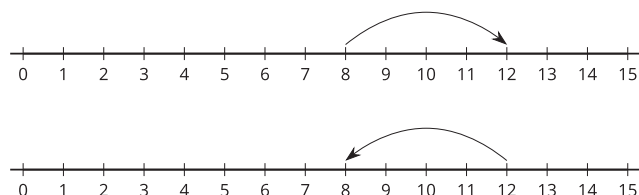
The purpose of this warm-up is to elicit the idea that addition and subtraction can be represented on the number line. Students have learned that numbers farther to the right are larger and numbers to the left are smaller. In this warm-up, students see two number lines with arrows that connect the same numbers. However, one arrow starts at the lesser number and points at the greater number and the other starts with the greater number and points at the lesser number. Noticing the difference in these “jumps” will be useful when students match equations to representations on number lines in a later activity. While students may notice and wonder many things about these images, it is important to discuss how the arrows represent increases and decreases in value on the number line.

Instructional Routines

Notice and Wonder

Student-facing Task Statement

What do you notice? What do you wonder?

**Student Responses**

Students may notice:

- I noticed there are 2 arrows going in different directions.
- I noticed they both touch 8 and 12.
- I noticed the number line is from 0–15.

Students may wonder:

- What is this showing?

Launch

- Groups of 2
- Display the image.
- “What do you notice? What do you wonder?”
- 1 minute: quiet think time

Activity

- “Discuss your thinking with your partner.”
- 1 minute: partner discussion
- Share and record responses.

Synthesis

- “How would you describe what’s happening on the number line?” (Start at 8, add/jump 4, and land on 12. Start at 12, subtract/jump back 4, and land on 8.)

- Why is there an arrow?
- Is the answer 4?
- If needed, “How many spaces did we move on the number line?”
- “Sometimes, we label the jump with a number to show how far we jumped.”
- Record 4 above the jump.
- “Today, we are going to think about how we can show addition and subtraction on the number line.”

Activity 1

🕒 15 min

Add and Subtract

Standards Alignments

Addressing 2.MD.B.6

In previous lessons, students interpreted and represented numbers on the number line. They understand that numbers are represented as lengths from 0, consecutive numbers on the number line must be spaced equally, numbers can be represented with tick marks, and specific numbers can be identified on the number line using a point.

The purpose of this activity is for students to make sense of representations that show addition and subtraction on the number lines. They reason that an arrow pointing to the right represents addition because numbers to the right represent greater numbers, while an arrow pointing to the left represents subtraction because numbers to the left represent lesser numbers. Students connect the starting location, ending location, and direction of an arrow to equations (MP2). They interpret the length between the numbers (or distance traveled by the jump) as the number that was added or subtracted.

🕒 Access for Students with Disabilities

Engagement: Provide Access by Recruiting Interest. Invite students to generate examples of when they may earn money or spend money that connect to their personal backgrounds and interests.
Supports accessibility for: Conceptual Processing, Attention

Student-facing Task Statement

Circle the equation represented on the number

Launch

- Groups of 2

line.

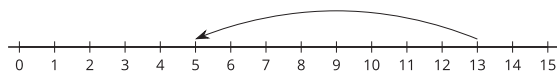
1.



$$10 + 5 = 15$$

$$15 - 5 = 10$$

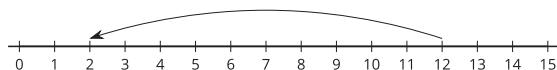
2.



$$8 + 5 = 13$$

$$13 - 8 = 5$$

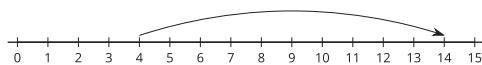
3.



$$12 - 2 = 10$$

$$12 - 10 = 2$$

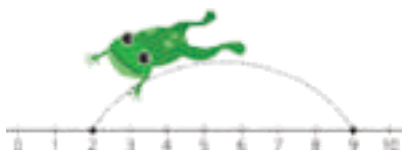
4. a.



$$4 + 10 = 14$$

$$10 + 4 = 14$$

b. Explain why the other equation doesn't match this number line.



Student Responses

1. Student circles $10 + 5 = 15$.
2. Student circles $13 - 8 = 5$.
3. Student circles $12 - 10 = 2$.
4. a. Student circles $4 + 10 = 14$.
b. Sample explanation: $10 + 4 = 14$ doesn't match because the starting point is 4 with a jump of 10. This would be represented with a point on 10 with a jump of 4.

- Display image from warm-up and the equations $4 + 8 = 12$, $8 + 4 = 12$, $12 - 4 = 8$, and $12 - 8 = 4$.
- "Which equations are represented by these number lines? How do you know?" ($8 + 4 = 12$ because there is a point on the 8, a jump of 4, and the arrow is pointing to 12. $12 - 4 = 8$ because there is a point on 12, a jump back of 4, and the arrow is pointing to 8.)
- 30 seconds: quiet think time
- 1 minute: partner discussion
- Share responses.

Activity

- "Now you are going to look at some more number lines that represent addition and subtraction equations."
- "Circle the equation that each number line represents."
- "For the last problem, explain why the other equation doesn't match the number line."
- 6 minutes: independent work time
- "Discuss your choices and your explanation with your partner."
- 2 minutes: partner work time
- Monitor for a student who clearly explains that the jump shows 10 for $4 + 10 = 14$.

Synthesis

- Display the number line for $4 + 10 = 14$.
- "We have learned that $4 + 10$ and $10 + 4$ have the same value. Why doesn't $10 + 4$ match this number line?" (The arrow shows addition, but the first point is on 4 and the arrow shows moving 10 units to the right.)

Advancing Student Thinking

If a student circles the equation that is not represented by the number line, consider asking:

- “Can you explain what you see happening on this number line?”
- “How do you know if the arrow shows addition or subtraction?”

Activity 2

🕒 20 min

Number Lines and Equations

Standards Alignments

Addressing 2.MD.B.6

The purpose of this activity is for students to match addition and subtraction equations to number line representations. Some equations use the same numbers, requiring students to look for the direction of the arrow to see if the number line is representing addition or subtraction (MP7). There is one equation that does not have a matching number line representation. Students represent this equation on the number line. This problem can be used as a formative assessment of student understanding of the connection between equations and their representations on the number line. Teachers can use this information to plan for any additional support that may be needed in the following lesson where students represent different equations on number lines. In the synthesis, students consider how addition and subtraction can look alike on the number line, and how they are different.

🌐 Access for English Learners

MLR7 Compare and Connect. Synthesis: As students compare and contrast number lines, amplify student language and illustrate the connection between the equations and the direction of the arrows by following along and pointing to the relevant parts of the images.

Advances: Representing, Conversing

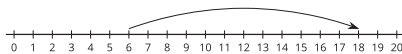
Materials to Gather

Glue, Scissors

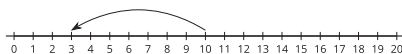
Student-facing Task Statement

1. Cut out the equations.
2. Paste each equation next to the number line that represents it.
3. Paste the equation that didn't have a match and represent it on a number line.

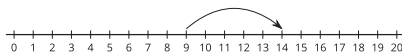
a.



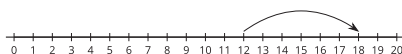
b.



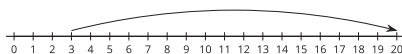
c.



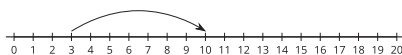
d.



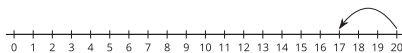
e.



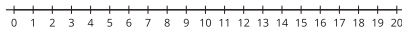
f.



g.



h.



$3 + 7 = 10$	$10 - 7 = 3$	$12 + 6 = 18$	$6 + 12 = 18$
$14 - 5 = 9$	$9 + 5 = 14$	$20 - 3 = 17$	$3 + 17 = 20$

Student Responses

1. $6 + 12 = 18$
2. $10 - 7 = 3$

Launch

- Groups of 2
- Give students glue and scissors.

Activity

- "Now you will work with your partner to match equations to representations on the number line."
- "Cut out the equations and glue them next to the number line that represents it."
- "Before gluing your answers, be sure to compare with your partner."
- "There is one equation that doesn't have a number line to match. Glue it in the extra box and represent that equation on the blank number line."
- 12 minutes: partner work time

Synthesis

- Display the image of the number lines for $20 - 3 = 17$ and $3 + 17 = 20$.
- "What is the same about these number lines? What is different?" (They both have 3, 17, and 20. One has a long jump of 17, but the other has a small jump of 3. The difference between 17 and 20 is 3 and 20 is 17 away from 3.)

3. $9 + 5 = 14$
4. $12 + 6 = 18$
5. $3 + 17 = 20$
6. $3 + 7 = 10$
7. $20 - 3 = 17$
8. $14 - 5 = 9$

This equation doesn't have a match.
Students represent it on the number line.

Advancing Student Thinking

If students match an equation to a number line that does not represent the equation, invite them to read the equation. Consider asking:

- “How could you act out this equation on the number line?”
- “Where should you start? What direction should you go?”
- “How far should you go? Where should you stop?”

Lesson Synthesis

🕒 10 min

“Today we made sense of number lines that show addition and subtraction. What can you tell from a representation by looking at the arrow?” (The arrow can show whether we are adding or subtracting. Pointing to the right is addition and pointing to the left is subtraction. You can look for where the arrows starts and where it ends to help match it to an equation. The arrow can show how much you are adding or subtracting. The arrow can show how far it is from one number to another.)

Suggested Centers

- Number Puzzles: Addition and Subtraction (1–4), Stage 4: Within 100 with Composing (Addressing)
- Number Line Scoot (2–3), Stage 1: Twos, Fives, and Tens (Addressing)

----- Complete Cool-Down -----

Response to Student Thinking

Students circle the number line that represents $8 - 3$.

Next Day Support

- Launch Activity 1 with a discussion about this cool-down.

Lesson 8: Equations on a Number Line

Standards Alignments

Addressing 2.MD.B.6, 2.NBT.A.2

Teacher-facing Learning Goals

- Use number line diagrams to represent and write addition and subtraction equations.

Student-facing Learning Goals

- Let's write equations and represent them on a number line.

Lesson Purpose

The purpose of this lesson is for students to write equations based on number lines and represent equations on the number line.

In the previous lesson, students interpreted representations of addition and subtraction equations on the number line. They used the direction of the arrow to determine what operation was represented and matched equations to number lines.

In this lesson, students write equations based on number line representations and represent given equations on number lines.

Access for:

Students with Disabilities

- Representation (Activity 2)

English Learners

- MLR8 (Activity 1)

Instructional Routines

Choral Count (Warm-up)

Lesson Timeline

Warm-up	10 min
Activity 1	15 min
Activity 2	20 min
Lesson Synthesis	10 min
Cool-down	5 min

Teacher Reflection Question

What evidence have students given that they understand the connection between the number line and written equations? What questions did you ask to make the connection more visible?

Cool-down (to be completed at the end of the lesson)

⌚ 5 min

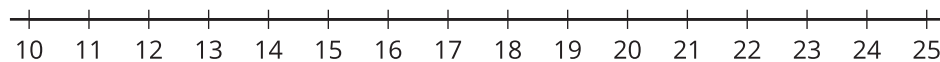
Represent Addition and Subtraction on the Number Line

Standards Alignments

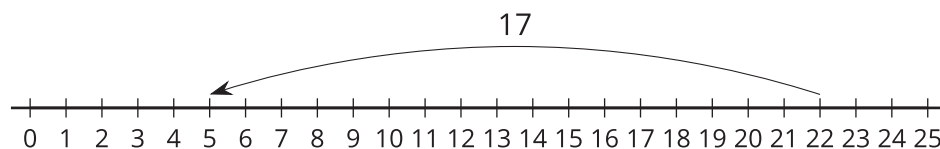
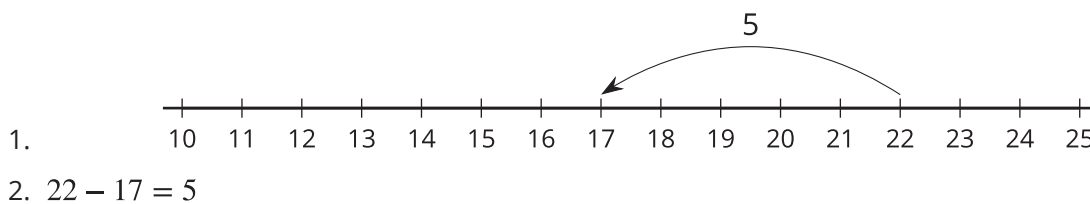
Addressing 2.MD.B.6

Student-facing Task Statement

1. Represent $22 - 5 = 17$ on the number line.



2. Write an equation to show what's represented on the number line.

**Student Responses**

----- Begin Lesson -----

Warm-up

⌚ 10 min

Choral Count: Back by 10

Standards Alignments

Addressing 2.NBT.A.2

The purpose of this Choral Count is to invite students to practice counting back by 10 from any number

and notice patterns in the count. When students recognize that the digit in the ones place remains the same, while the digit in the tens place decreases by 1 each time, they look for and make use of the base ten-structure and express regularity in repeated reasoning (MP7, MP8). These understandings help students develop fluency and will be helpful later in this lesson when students show their thinking on the number line.

Instructional Routines

Choral Count

Student Responses

Record count:

99 89 79 69 59 49

98 88 78 68 58 48

95 85 75 65 55 45

Sample responses:

- Each time we counted back by 10, the digit in the ones place stays the same, but the tens digit goes down by one.
- Looking down each column, the tens place stays the same, but the ones place is different.

Launch

- “Count back by 10, starting at 99.”
- Record as students count.
- Stop counting and recording at 49.
- “Count back by 10, starting at 98.”
- Record as students count directly below the first count.
- Stop counting and recording at 48.
- “Count back by 10, starting at 95.”
- Record as students count directly below the second count.
- Stop counting and recording at 45.

Activity

- “What patterns do you see?” (The ones digit stays the same, but the tens digit goes down by one.)
- 1–2 minutes: quiet think time
- Record responses.

Synthesis

- “Who can restate the pattern in different words?”
- “Does anyone want to add an observation on why that pattern is happening here?”

Activity 1

🕒 15 min

Represent Equations

👤 ↔ 👤 PLC Activity

Standards Alignments

Addressing 2.MD.B.6

The purpose of this activity is for students to represent addition and subtraction equations on a number line. Students consider where to begin and in which direction to draw their arrows in order to accurately represent the operation in the given equation. Throughout the activity, encourage students to explain how they know their representation matches the equation. Listen for the way they explain how they know where to start and end their arrow, which direction they draw their arrow, and how they connect the length the jump represents to the equation (MP3).

🌐 Access for English Learners

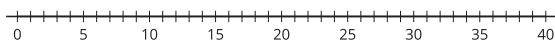
MLR8 Discussion Supports. Display sentence frames to support partner discussion: “Our number lines are the same because...”. “Our number lines are different because...”.

Advances: Speaking, Conversing

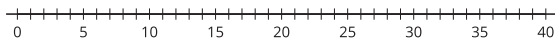
Student-facing Task Statement

Represent each equation on the number line.

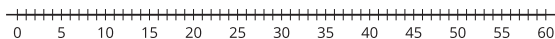
1. $15 + 7 = 22$



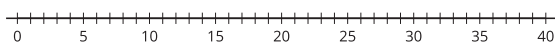
2. $18 - 6 = 12$



3. $46 + 7 = 53$



4. $33 - 9 = 24$



Launch

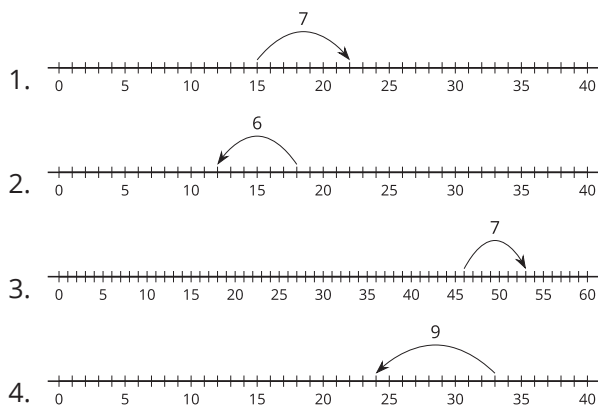
- Groups of 2
- “We have seen addition and subtraction equations represented on a number line. How can you tell whether a number line is representing addition or subtraction?” (Look at the direction of the arrow.)
- 30 seconds: quiet think time
- Share responses.

Activity

- “Now you are going to represent some equations on number lines. Be sure others will be able to tell from looking at your number line whether you are representing addition or subtraction.”



Student Responses



- 8 minutes: independent work time
- Monitor for students who:
 - Mark the first number and last number in each equation with a point first. Then draw their arrow to match the operation.
 - Locate the first number in the equation, count a number of spaces forward or backward to match the operation, and draw an arrow to connect the two numbers.
- “Compare your number lines with your partner. Explain how you know your representation matches the equation.”
- 3 minutes: partner discussion

Synthesis

- Display the equation and blank number line for $15 + 7 = 22$.
- Invite previously selected students to share how they represented the equation on the number line.
- Consider asking:
 - “How do you see each number in the equation in ___’s representation?”
 - “How do you know ___’s representation matches the operation (addition or subtraction)?”
- As time permits, continue with the other equations.

Advancing Student Thinking

If a student's number line representation doesn't match the equation, consider asking:

- “Will you please explain your representation?”
- “How did you decide where to start or end on the number line?”
- “How did you decide which direction to draw your arrow?”

Activity 2

🕒 20 min

Write Equations

Standards Alignments

Addressing 2.MD.B.6

The purpose of this activity is for students to write addition and subtraction equations to match number line representations. Students determine the operation represented by looking at the direction of the arrows. They identify the starting number, the length of the jump, and the ending number in order to write the equation. Each representation shows a relationship between the same three numbers. When students explain to each other why they think two representations are most alike, they look for and make sense of the structure of the number line and deepen their understanding of the relationship between addition and subtraction (MP3, MP7).

🕒 Access for Students with Disabilities

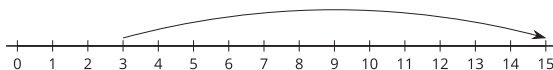
Representation: Access for Perception. Use a cut out of an animal that hops (bird, frog, rabbit, or another example) to demonstrate the jumps on the number line.

Supports accessibility for: Conceptual Processing, Attention

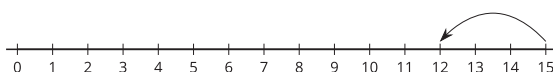
Student-facing Task Statement

For each number line, write an equation that matches the diagram.

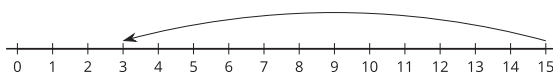
1. Equation: _____



2. Equation: _____



3. Equation: _____



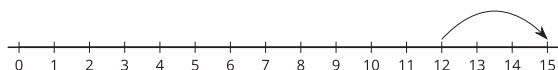
4. Equation: _____

Launch

- Groups of 2

Activity

- “Now you are going to look at number lines and write equations that match the diagram.”
- 5 minutes: independent work time
- “Compare your equations with your partner. Take turns explaining how your equation matches the number line diagram.”
- “Then work together to choose two number lines that you think are the most alike. Be prepared to explain your choice.”



5. Compare your equations with your partner.
6. Pick the 2 number lines you think are most alike. Explain your choice to your partner.

Student Responses

These responses should be the first part of each student response.

1. $3 + ? = 15$
2. $15 - ? = 12$
3. $15 - ? = 3$
4. $12 + ? = 15$
5. Sample response: I wrote $3 + 12 = 15$ because the number line has a point at 3 and has an arrow showing moving 12 length units to the right. The arrow is pointing to 15.
6. Sample response: I think B and D are the most alike because they both show a jump of 3 length units. They both show 12, 15, and 3.

- 5 minutes: partner discussion
- Monitor for students who:
 - explain how their equation matches the point, direction of the arrow, final position of the arrow, and the length of the movement on the number line
 - discuss how number lines are the same because they show the same operation
 - discuss how number lines are the same because the length of the jump is the same

Synthesis

- Invite previously identified students to share their equations for each number line.
- Consider asking:
 - "Do you agree or disagree? Explain."
 - "Can anyone explain why ___'s equation matches the number line in another way?"
- Invite previously identified students to share the number lines they feel are most alike.
- If time, ask "In what other ways are the number lines alike? How are they different?"

Advancing Student Thinking

If students use language that is not precise mathematical language when they explain how they know their equations match the diagrams, consider asking:

- "How do you see each number in the diagram?"
- "How does your equation match the arrow in the diagram?"
- "Why does your equation start with ___? Where is that number in the diagram?"
- "Which number in your equation represents the length between ___ and ___?"

Lesson Synthesis

🕒 10 min

"Today we worked with equations and number line representations."

"How could you explain to a friend how they could use the number line to show addition and subtraction?" (You can use an arrow to show moving from one spot to another on the number line. Moving right is like adding. Moving to the left is like subtracting. You can use a point to show where you start and the arrow shows where you end.)

Suggested Centers

- Number Puzzles: Addition and Subtraction (1–4), Stage 4: Within 100 with Composing (Addressing)
- Number Line Scoot (2–3), Stage 1: Twos, Fives, and Tens (Addressing)

----- Complete Cool-Down -----

Response to Student Thinking

Students write an equation other than $22 - 17 = 5$.

Next Day Support

- Use the next day's warm-up to have students discuss representing equations on a number line.

Lesson 9: The Difference Between Numbers

Standards Alignments

Addressing 2.MD.B.5, 2.MD.B.6, 2.NBT.B.5

Teacher-facing Learning Goals

- On a number line, represent counting on and counting back strategies for solving subtraction equations.

Student-facing Learning Goals

- Let's represent ways to subtract on the number line.

Lesson Purpose

The purpose of this lesson is for students to represent and compare different subtraction methods on the number line.

In previous lessons, students represented addition and subtraction equations on the number line and wrote equations to match representations on a number line.

In this lesson, students deepen their understanding of subtraction as taking from and as an unknown addend problem. Students represent subtraction methods on the number line and compare how each representation shows the difference. The number line is also used to help students visualize when counting on and counting back strategies may be useful when subtracting 2 two-digit numbers. For example, $17 - 14$ can be solved by starting at 17 and counting back 14. It can also be solved by starting at 14 and counting on 3. In this case, counting on would likely be helpful because the numbers are close together and the structure of the number line helps show why this strategy is effective (MP7).

Access for:

Students with Disabilities

- Action and Expression (Activity 2)

Instructional Routines

MLR6 Three Reads (Activity 2), Number Talk (Warm-up)

Materials to Gather

- Base-ten blocks: Activity 1

Materials to Copy

- Number Line to 100 (groups of 1): Activity 1
- Number Line to 100 (groups of 1): Activity 2

Lesson Timeline

Warm-up	10 min
Activity 1	15 min
Activity 2	20 min
Lesson Synthesis	10 min
Cool-down	5 min

Teacher Reflection Question

Which students had opportunities to share their diagrams and thinking during whole-class discussion? How did you select these students?

Cool-down (to be completed at the end of the lesson)

⌚ 5 min

What's the Difference?

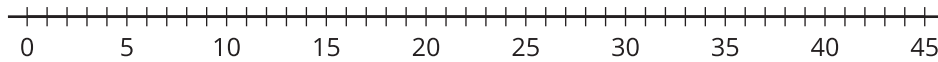
Standards Alignments

Addressing 2.MD.B.6, 2.NBT.B.5

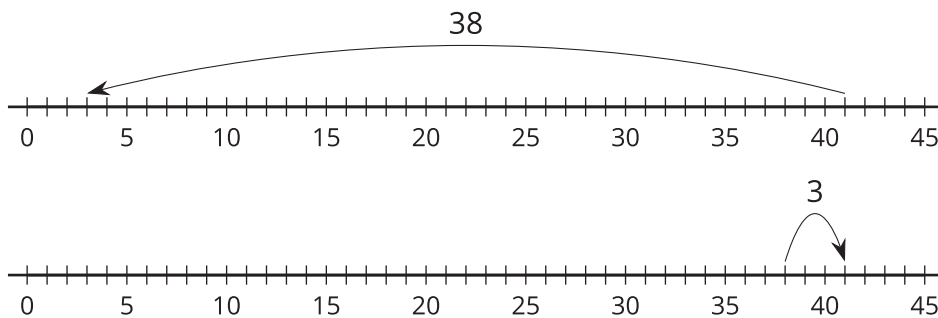
Student-facing Task Statement

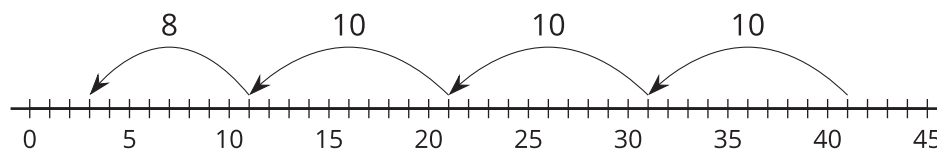
- Use the number line to show a way to find the number that makes the equation true.

$$41 - 38 = ?$$

**Student Responses**

3. Sample responses:





----- Begin Lesson -----

Warm-up

🕒 10 min

Number Talk: Add To

Standards Alignments

Addressing 2.NBT.B.5

The purpose of this Number Talk is to elicit strategies and understandings students have for different ways to find the value of a difference. Students often think of subtraction only as taking away. These equations were chosen to encourage students to show their understanding of subtraction as an unknown addend problem and express strategies based on counting on from the smaller number. These understandings help students develop fluency and will be helpful later in this lesson when students will need to be able to interpret and represent subtraction strategies as counting on or counting back on the number line.

Instructional Routines

Number Talk

Student-facing Task Statement

Find the value of each expression mentally.

- $20 - 2$
- $20 - 17$
- $49 - 3$
- $67 - 64$

Launch

- Display one problem.
- “Give me a signal when you have an answer and can explain how you got it.”
- 1 minute: quiet think time

Activity

- Record answers and strategies using a number line.

Student Responses

- 18: I counted back from 20. 19, 18.
- 3: I counted up from 17. 18, 19, 20.
- 46: I took away 3. 48, 47, 46
- 3: I counted on 65, 66, 67.

- Keep expressions and work displayed.
- Repeat with each expression.

Synthesis

- "I noticed that some students counted on for $20 - 17$ instead of subtracting or counting back."
- "How do you decide when to count back or subtract and when to count on?" (If the numbers are close together, I count on. 17 is only 3 away from 20.)
- "We are going to continue to think about when it is helpful to add to find the difference."

Activity 1

🕒 15 min

Add or Subtract

Standards Alignments

Addressing 2.MD.B.6, 2.NBT.B.5

The purpose of this activity is for students to describe how representations of subtraction on the number line show the difference between two numbers in different ways. The number choices in the activity encourage students to use methods based on taking away or counting back that may be represented as a jump to the left from the larger number. Other number choices encourage students to consider methods that show their understanding of subtraction as an unknown addend problem. Students may start at the smaller addend and find the length of the jump to the right to reach the total. Students may also place both known numbers on the number line and find the length of the space between them by counting from the smaller to larger number or larger number to smaller number. Monitor for each strategy and the ways students represent them on the number line. All of these strategies show an important understanding of numbers and operations and how they can be represented on the number line (MP7).

The synthesis focuses on describing and comparing how the difference is represented on the number line. If a student uses a method that would be difficult to represent on the number line, pair the student with another student who uses a conceptually similar method. For example, if a student finds the value of $57 - 24$ as $7 - 4 = 3$, $50 - 20 = 30$, $30 + 3 = 33$, acknowledge the method would be hard to show on a single number line, and partner them with someone who

shows jumps to the left based on place on the number line to compare methods.

Materials to Gather

Base-ten blocks

Materials to Copy

Number Line to 100 (groups of 1)

Required Preparation

- Place the number line recording sheets in sheet protectors. They will be used in the next activity and future lessons.

Student-facing Task Statement

- What number makes this equation true? _____

$$38 - 4 = ?$$

Represent your thinking on the number line.

- What number makes this equation true? _____

$$75 - 68 = ?$$

Represent your thinking on the number line.

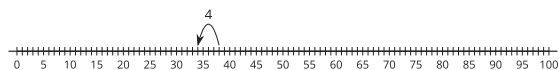
- What number makes this equation true? _____

$$57 - 24 = ?$$

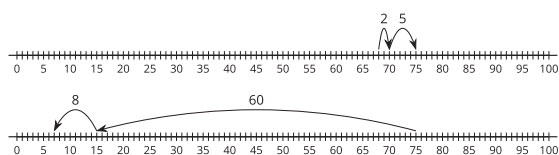
Represent your thinking on the number line.

Student Responses

34. Sample response:



7. Sample responses:



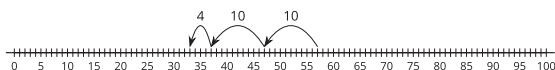
Launch

- Groups of 2
- Give each student a copy of the number lines.
- Give students access to base-ten blocks.

Activity

- "You are going to find the number that makes each equation true in a way that makes sense to you."
- "Then, use the number line to show your thinking."
- 6 minutes: independent work time
- "Compare your methods, solutions, and number line representations with a partner."
- 4 minutes: partner discussion
- For $75 - 68 = ?$, monitor for students who:
 - represent taking away or counting back with arrow(s) moving to the left from 75
 - represent an unknown addend problem with arrow(s) pointing to the right from 68
 - locate 75 and 68 on the number line and count the length of the space between by counting from the

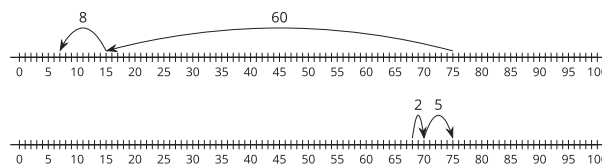
3. 33. Sample response:



smaller to larger number or larger
to smaller number

Synthesis

- Invite previously identified students to share their response and reasoning for $75 - 68 = ?$ or draw the number lines and select the identified students to share their reasoning.



- “Both of these number lines show strategies for finding $75 - 68 = ?$ ”
- If it does not come up when students share, ask:
 - “Which representation shows subtraction as taking away?”
 - “Which representation shows subtraction as finding an unknown addend?”
- “How do both representations show the difference?” (In the first number line, the arrow is pointing to the difference. In the second one, the length of the jump shows the difference.)
- As needed, gesture and restate student responses to emphasize how the difference is represented as a length in each representation.
- “When we show subtraction as taking away on the number line, the difference is the number the last arrow points to. It’s represented as a length from 0 to where the arrow is pointing.”
- “When we show subtraction as an unknown addend problem on the number line, the difference is shown as the length of the space between the two numbers.”

Activity 2

🕒 20 min

Different Ways to Find the Difference

Standards Alignments

Addressing 2.MD.B.5, 2.MD.B.6, 2.NBT.B.5

The purpose of this activity is for students to compare methods for solving subtraction problems. Students compare representations of methods that show subtraction as taking away and subtraction as an unknown addend problem. Students discuss how some representations may better show the actions in a problem and others may show a different way to find the unknown value (MP2). In the synthesis, students consider how to select a strategy based on the numbers in the problem.

This activity uses *MLR6 Three Reads*. Advances: reading, listening, representing

♿ Access for Students with Disabilities

Action and Expression: Develop Expression and Communication. Provide access to poster paper and different colored markers, or whiteboards and different colored markers. Invite students to represent jumping forward on the top of their number line in one color, and jumping backward on the bottom of the number line in another color. Write the equation that matches the work shown.

Supports accessibility for: Organization

Instructional Routines

MLR6 Three Reads

Materials to Copy

Number Line to 100 (groups of 1)

Student-facing Task Statement

1. Elena had a length of string that was much too long for her project. The string was 65 inches long. Elena cut off 33 inches. How long is the string now?

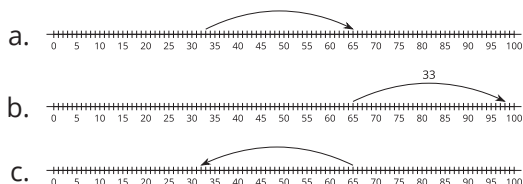
Choose 2 number lines that show a way to

Launch

- Groups of 2
- Give each student a copy of the number lines.

MLR6 Three Reads

find the length of Elena's string.



2. Han had 87 inches of string. He cut off 85 inches of it. How much string does he have left?
 - a. Write an equation to represent the problem with a ? for the unknown.
 - b. Find the number that makes the equation true.
 - c. Represent your thinking on the number line.
3. Find someone who used a different method.

Show their method on the number line.

Student Responses

1. Students circle number lines a and c.
2.
 - a. $87 - 85 = ?$ or $85 + ? = 87$
 - b. Han has 2 inches of string.
 - c. Students show $87 - 85 = 2$ or $85 + 2 = 87$.

- Display only the problem stem for Elena's string problem without revealing the question.
- "We are going to read this problem 3 times."
- 1st Read: "Elena had a length of string that was much too long for her project. The string was 65 inches long. Elena cut off 33 inches."
- "What is this story about?"
- 1 minute: partner discussion.
- Listen for and clarify any questions about the context.
- 2nd Read: "Elena had a length of string that was much too long for her project. The string was 65 inches long. Elena cut off 33 inches."
- "What can we count or measure in this situation?" (Elena's string. The piece she cut off. The piece she has left.)
- 30 seconds: quiet think time
- 2 minutes: partner discussion
- Share and record all quantities.
- Reveal the question.
- 3rd Read: Read the entire problem, including the question aloud.
- "Elena had a length of string that was much too long for her project. The string was 65 inches long. Elena cut off 33 inches. How long is the string now?"
- "Based on this story, what are some methods we can use to solve the problem?"
- 30 seconds: quiet think time
- 1-2 minutes: partner discussion

Activity

- "Work with your partner to choose two number lines that show a method that could be used to find the length of Elena's

string.”

- “Then solve Han’s problem on your own. When you finish, think of how you could explain your method to others.”
- 3 minutes: partner work time
- 3 minutes: independent work time
- “Now, find someone who used a different method than you to solve Han’s problem. Take turns sharing and then try their method on your own.”
- 5 minutes: group work time
- Monitor for students who:
 - represent taking away or counting back with arrow(s) moving to the left from 87 to 2.
 - represent an unknown addend problem with arrow(s) pointing to the right from 85 to 87.
 - locate 85 and 87 on the number line and count the length of the space between by counting from the smaller to larger number or larger to smaller number

Synthesis

- Invite students to share responses and reasoning for Elena’s string.
- Invite previously identified students to share their thinking and number lines for Han’s string.
- If it doesn’t come up, show how you could locate the 85 and 87 on the number line and find the difference.
- “Which method would you prefer to use to solve Elena’s string problem? Why?” (Taking away 33 because it matches the story. Adding on from 33 because I know I could add tens and ones and not have to regroup.)
- “Which method would you prefer to use for

Han's string problem? Why?" (Finding the unknown addend because I know it was small because the numbers are so close together.)

Lesson Synthesis

🕒 10 min

"Today we saw different ways to solve subtraction problems represented on the number line. You can think about subtraction as taking away or as finding an unknown addend."

"Describe to your partner the different ways you can represent and think about $35 - 3 = ?$ and discuss how you would find the number that makes the equation true."

Suggested Centers

- Number Puzzles: Addition and Subtraction (1–4), Stage 4: Within 100 with Composing (Addressing)
- Number Line Scoot (2–3), Stage 1: Twos, Fives, and Tens (Addressing)

Complete Cool-Down

Response to Student Thinking

Students find a difference other than 3.

Next Day Support

- Before the warm-up, discuss the number line representations showing difference and removal.

Lesson 10: Place Value and the Number Line

Standards Alignments

Addressing 2.MD.B.6, 2.NBT.B.5

Teacher-facing Learning Goals

- On a number line, represent place value methods for solving addition and subtraction equations that do not require decomposing a ten.

Student-facing Learning Goals

- Let's compare methods using the number line.

Lesson Purpose

The purpose of this lesson is for students to compare representations of addition and subtraction methods represented on the number line.

In previous lessons, students matched addition and subtraction equations and their representations on a number line. They found the value of differences within 100 and represented their thinking on a number line.

In this lesson, students add and subtract within 100 and represent computation methods on a number line. They compare representations of methods based on place value and make connections across representations (MP2). The expressions in each activity include numbers that elicit methods based on counting on or counting back by place.

Access for:



Students with Disabilities

- Representation (Activity 1)



English Learners

- MLR8 (Activity 2)

Instructional Routines

Notice and Wonder (Warm-up)

Materials to Gather

- Base-ten blocks: Activity 1, Activity 2

Lesson Timeline

Warm-up	10 min
Activity 1	20 min
Activity 2	15 min
Lesson Synthesis	10 min
Cool-down	5 min

Teacher Reflection Question

Why is it important for students to be able to represent their thinking and strategies using varied representations? How can you support students to feel comfortable using other representations?

Cool-down (to be completed at the end of the lesson)

⌚ 5 min

Subtract on the Number Line

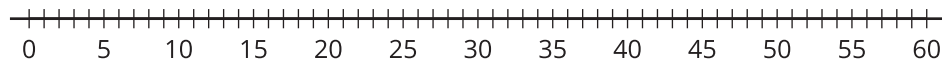
Standards Alignments

Addressing 2.MD.B.6, 2.NBT.B.5

Student-facing Task Statement

$$48 - 22 = ?$$

Find the number that makes the equation true. Represent your thinking on the number line.

**Student Responses**

Sample responses:

- Students show a point on 48 with 2 jumps of 10 and a jump of 2 or one jump of 20 and a jump of 2 to reach 26.
- Students show a point on 22 and 2 jumps of 20 and a jump of 6 to reach 48.

----- **Begin Lesson** -----

Warm-up

🕒 10 min

Notice and Wonder: Base-ten and the Number Line

Standards Alignments

Addressing 2.MD.B.6

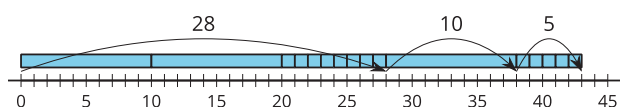
The purpose of this warm-up is for students to connect a base-ten diagram to addition on the number line. This will support their work later in the lesson when they connect place value methods to representations of addition and subtraction on the number line.

Instructional Routines

Notice and Wonder

Student-facing Task Statement

What do you notice? What do you wonder?



Student Responses

Students may notice:

- It looks like a base-ten diagram on top of a number line.
- The arrows match the lengths of the blocks under them.
- It looks like it is showing $28 + 10 + 5$.
- There are 3 tens and 13 ones. Its the same as 43.

Students may wonder:

- Does the base-ten diagram and number line show the same thing?
- Does this show adding centimeters or something else?
- Why are the blocks in that order? Why not put the tens together first, then the ones?
- Can you change the order of the blocks?

Launch

- Groups of 2
- Display the image.
- "What do you notice? What do you wonder?"
- 1 minute: quiet think time

Activity

- "Discuss your thinking with your partner."
- 1 minute: partner discussion
- Share and record responses.

Synthesis

- "What addition equation could be represented here?" ($28 + 10 + 5 = 43$ or $28 + 15 = 43$)
- "We are going to keep thinking about what is the same and what is different between base-ten diagrams and number lines."

Activity 1

🕒 20 min

Compare Representations

Standards Alignments

Addressing 2.MD.B.6, 2.NBT.B.5

The purpose of this activity is for students to connect a subtraction method based on place value to representations on the number line. Students compare representations of a subtraction method using base-ten diagrams, equations, and number lines (MP2). They notice that, just like with base-ten blocks, they can think about subtracting or counting by tens first or by ones first on the number line.

🕒 Access for Students with Disabilities

Representation: Develop Language and Symbols. Support understanding of the problem, by inviting students to act it out. For example, create a number line on the ground or across a large white board in the front of the classroom. Allow students to physically move on the number line.

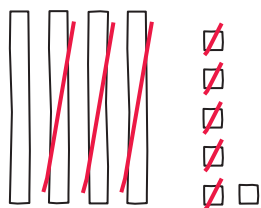
Supports accessibility for: Conceptual Processing

Materials to Gather

Base-ten blocks

Student-facing Task Statement

Clare subtracted and represented her work with a base-ten diagram.



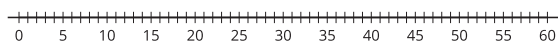
1. Write an equation to represent Clare's work.
2. Represent Clare's method on the number line.

Launch

- Groups of 2
- Give students access to base-ten blocks.
- Display image of Clare's base-ten diagram.

Activity

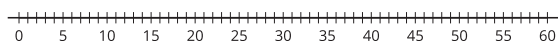
- "Clare subtracted and represented her thinking with a base-ten diagram."
- "What does this diagram tell us?" (She started with 46. She took away 35. She has 1 ten and 1 one left.)
- 30 seconds: quiet think time
- 1 minute: partner discussion



3. Find the value of $58 - 24$.

Show your thinking using a base-ten diagram.

4. Represent how you found the value of $58 - 24$ on the number line.



Student Responses

1. Sample responses:

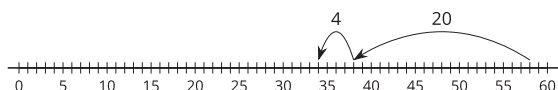
- $46 - 35 = 11$
- $46 - 30 = 16, 16 - 5 = 11$
- $40 - 30 = 10, 6 - 5 = 1, 10 + 1 = 11$

2. Sample responses:

- Students start at 46, draw a jump of 30 to the left, and a jump of 5 to the left.
- Students start at 46, draw a jump of 5 to the left, and draw 3 jumps of 10 to the left.
- Students start at 46, draw 5 jumps of 1 to the left, and draw 3 jumps of 10 to the left.

3. $58 - 24 = 34$. Sample response: students draw a base-ten diagram that shows 5 tens and 8 ones. They cross out 2 tens and 4 ones.

4. Sample response:



- Share responses
- "You are going to write an equation to represent Clare's work. Then you will represent Clare's method on a number line."
- "Work with your partner to decide how to best represent what you think Clare did. You may discuss where to start, how many jumps you should draw, how long each jump should be, and where to land."
- 5 minutes: partner work time
- "Now try one on your own."
- 8 minutes: independent work time
- Monitor for students who:
 - start at 58 and jump 20 and then 4
 - start at 58 and jump 4 and then 20
 - start at 58 and jump 10, 10, and then 4
 - start at 58 and show a jump for each ten and each one (6 total jumps)

Synthesis

- Invite previously identified students to share.
- Display or record their methods.
- Consider asking each student:
 - "How did you decide where to start, how many jumps to make, and the length of each jump?"
- "How are these methods the same? How are they different?" (They started at 54. Some show subtracting tens first, some show ones first. Some show subtracting the value of all the tens or all the ones. Some show subtracting each ten or each one.)
- "How does the number line help you see how these methods are the same?" (It helps you see that it doesn't matter if you subtract tens first or ones first. They both

show subtracting 24.)

Advancing Student Thinking

If students represent their thinking using a base-ten diagram, but the number line doesn't match their thinking, consider asking:

- “Can you tell me more about your number line? How did you decide where to start?”
- “How does the number line connect to your base-ten diagram?”

Activity 2

🕒 15 min

On the Number Line

Standards Alignments

Addressing 2.MD.B.6, 2.NBT.B.5

The purpose of this activity is for students to represent addition and subtraction within 100 on a number line. Students make connections to strategies based on counting on or back by place. The numbers in each subtraction equation are designed to elicit methods that do not require students to explicitly decompose a ten. For example, when finding the value of $50 - 32$, students may first add on to make a ten ($32 + 8 = 40$), then add on more tens to reach the total ($40 + 10 = 50$). Others may see they can count back 2, then subtract the tens. In the synthesis, students share their thinking and discuss how the number line helps see how they can use what they know about the structure of counting sequence and what they know about tens and ones to add and subtract (MP7).

🌐 Access for English Learners

MLR8 Discussion Supports. Synthesis: For each comparison that is shared, invite students to turn to a partner and restate what they heard using precise mathematical language. Ask, “Who can restate what ____ shared using the place value language?”

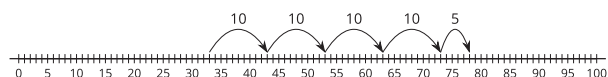
Advances: Listening, Speaking

Materials to Gather

Base-ten blocks

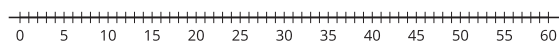
Student-facing Task Statement

Diego is finding the value of $33 + 45$. He says he can count on by tens, then by ones. He used a number line to show what he means.



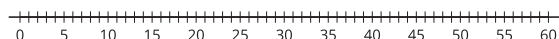
1. Write an equation to show the sum for Diego's work.
2. Find the value of $23 + 24$.

Represent your thinking on the number line.



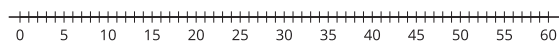
3. Find the value of $50 - 32$.

Represent your thinking on the number line.



4. Find the value of $40 - 26$.

Represent your thinking on the number line.



Student Responses

1. $33 + 45 = 78$
2. 47. Sample responses:
 - Students start at 23. They show a jump of 20 and a jump of 4 to the right.
 - Students start at 23. They show 4 jumps of one and 2 jumps of 10 to the right.
3. 18. Sample responses:
 - Students start at 50. They show a jump of 30 and a jump of 2 to the left.
 - Students start at 32. They show a jump of 8 and a jump of 10 to the right.

Launch

- Groups of 2
- Give students access to base-ten blocks.
- Display images of Diego's number line.
- "Diego found the value of $33 + 45$. He used a number line to represent his thinking."
- "Where do you see 33 and 45 on his number line?" (On the number line there is a point on 33 and 4 jumps of 10 and 1 jump of 5.)
- 30 seconds: quiet think time
- Share responses

Activity

- "You will be finding the value of expressions and representing your thinking on the number line."
- "Draw base-ten diagrams if it helps."
- 8–10 minutes: independent work time

Synthesis

- Invite 2–3 previously selected students to share.
- Consider asking each student:
 - "How did you decide where to start?"
 - "How did you decide how much to add/subtract first?"
 - "How does your number line show the value of the difference?"
- "What other questions do you have about ____'s number line?"
- "How does the number line help you make sense of ____'s method?"

4. 14. Sample responses:

- Students start at 40. They show a jump of 6 and a jump of 20 to the left.
- Students start at 26. They show a jump of 4 and a jump of 10 to the right.

Advancing Student Thinking

If students use base-ten diagrams or blocks to show decomposing a ten to subtract, validate their reasoning and consider asking:

- “After you decomposed a ten, did you subtract tens or ones first?”
- “Locate 50 (or 40) on the number line. If you used the number line to show counting back, would you count back by tens first or ones first? Why?”
- “What should you do next?”
- “How is this method like what you did with the block (or base-ten diagram)? How is it different?”

Lesson Synthesis

🕒 10 min

“Today we learned that some of the methods we use to add or subtract can be represented on the number line. We saw you can add or subtract the tens first and then the ones or the ones first and then the tens. We saw methods for subtraction that counted back by tens and ones from the larger number and those that showed counting on by tens or ones from the smaller number.”

“Did you prefer showing your thinking with base-ten diagrams, the number line, or another way? Was it the same for addition and subtraction? Explain.”

Suggested Centers

- Number Puzzles: Addition and Subtraction (1–4), Stage 4: Within 100 with Composing (Addressing)
- Number Line Scoot (2–3), Stage 1: Twos, Fives, and Tens (Addressing)

----- Complete Cool-Down -----

Response to Student Thinking

Students find a value other than 26.

Next Day Support

- After the warm-up, pair students up to discuss their cool-down from this lesson and make revisions.

Lesson 11: Different Ways to Add and Subtract

Standards Alignments

Addressing 2.MD.B.6, 2.NBT.B.5

Teacher-facing Learning Goals

- On a number line, represent place value methods for solving addition and subtraction equations that may involve composing or decomposing a ten.

Student-facing Learning Goals

- Let's add and subtract by using a ten.

Lesson Purpose

The purpose of this lesson is for students to represent sums and differences on the number line with an emphasis on the strategy of using a ten to count up or count back.

In previous lessons, students learned to look for ways to decompose a number in an expression to get to a ten when adding or subtracting numbers mentally in Number Talks. They have learned to use this method when adding or subtracting larger numbers which require composing or decomposing a ten.

In this lesson, students use the number line to represent these methods. These methods do not require students to explicitly compose or decompose a ten. The number line helps students see how others use what they know about the structure of whole numbers, properties of operations, and place value (MP7) to add and subtract within 100. The number choices in the expressions used in this lesson are designed to elicit methods based on looking for ways to make a ten or get to a ten. However, many students may prefer to use other strategies or representations, such as base-ten blocks or diagrams, to find the values. Look for ways to connect these students with peers who use different methods and can explain why they chose their method based on what they noticed about the numbers in the expressions.

Access for:

Students with Disabilities

- Action and Expression (Activity 1)

Instructional Routines

MLR7 Compare and Connect (Activity 2), Number Talk (Warm-up)

Materials to Gather

- Base-ten blocks: Activity 2
- Tools for creating a visual display: Activity 2

Materials to Copy

- Number Line to 100 (groups of 1): Activity 1
- Number Line to 100 (groups of 1): Activity 2

Lesson Timeline

Warm-up	10 min
Activity 1	15 min
Activity 2	20 min
Lesson Synthesis	10 min
Cool-down	5 min

Teacher Reflection Question

What evidence are you seeing that students are looking at the relationship between the numbers in an expression to select their method? What progress have you seen students make toward using methods based on the properties of operations and place value?

Cool-down (to be completed at the end of the lesson)

🕒 5 min

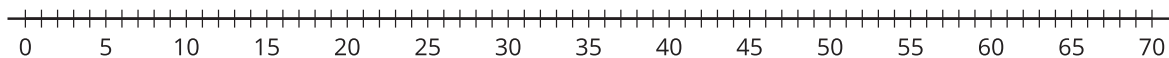
Sums and Differences

Standards Alignments

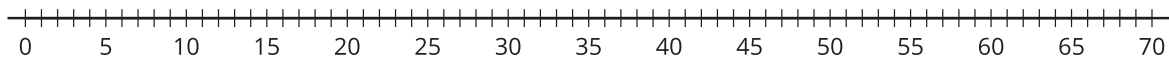
Addressing 2.MD.B.6, 2.NBT.B.5

Student-facing Task Statement

1. Find the value of $38 + 28$.
Represent your thinking on the number line.

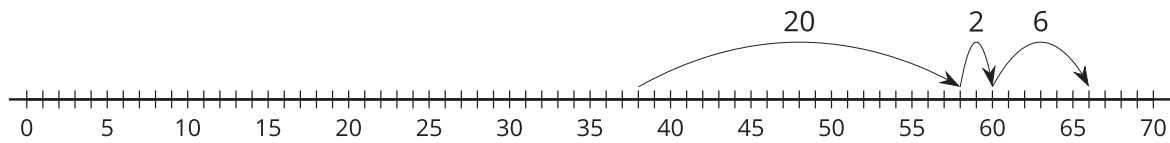


2. Find the value of $57 - 19$.
Represent your thinking on the number line.

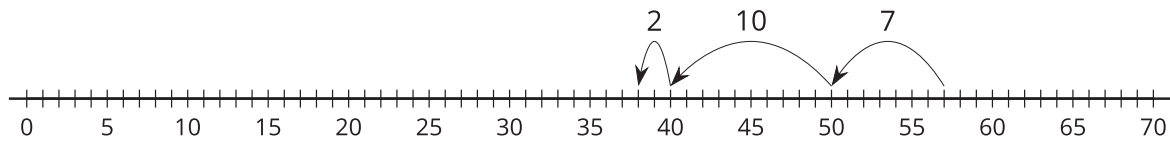


Student Responses

1. 66. Sample response:



2. 38. Sample response:



Begin Lesson

Warm-up

🕒 10 min

Number Talk: Use Tens

Standards Alignments

Addressing 2.NBT.B.5

This Number Talk encourages students to think about decomposing the subtrahend to get to a ten when subtracting. For example, in the first problem it is helpful to think about 6 as $2 + 4$. This way you can subtract 2 to get to 30, and then subtract 4 from 30. The understandings elicited here will be helpful later in the lesson when students represent sums and differences on a number line by jumping to the nearest ten.

In reasoning together about the number line representation, and connecting the strategy of making a ten to jumping to the nearest ten, students need to be precise in their word choice and use of language (MP6).

Instructional Routines

Number Talk

Student-facing Task Statement

Find the value of each expression mentally.

Launch

- Display one expression.

- $32 - 6$
- $43 - 8$
- $51 - 5$
- $52 - 7$

Student Responses

26: I counted back 2 to get to 30 and then 4 more to get to 26.

35: I counted back 3 to get to 40 and then 5 more to get to 35.

46: I counted back 1 to get to 50 and then 4 more to get to 46.

45: I counted back 2 to get to 50 and then 5 more to get to 45.

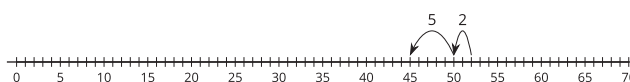
- "Give me a signal when you have an answer and can explain how you got it."
- 1 minute: quiet think time

Activity

- Record answers and strategy on a number line.
- Keep expressions and work displayed.
- Repeat with each expression.

Synthesis

- "For $52 - 7$ some students decomposed the 7 to make it easier to get to a ten. How does this number line representation connect to that strategy?"



- Draw a number line showing 52 represented with a point, a jump of 2, and then a jump of 5.

Activity 1

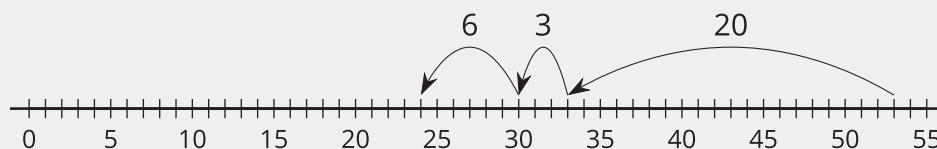
🕒 15 min

Compare Methods

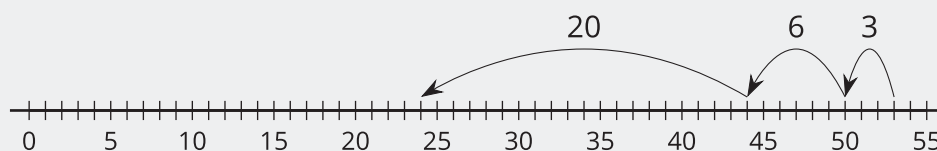
Standards Alignments

Addressing 2.MD.B.6, 2.NBT.B.5

The purpose of this activity is for students to use a number line to compare different methods for getting to a ten when subtracting a two-digit number from a two-digit number. Students analyze and try a method where they add or subtract the tens first and then decompose the ones to reach a multiple of 10. Diego's method is an example of this for $53 - 29$.



They analyze a method that begins by decomposing the ones being added or subtracted to get to a multiple of ten. In the synthesis, students discuss each method and which one they prefer. Tyler's method is an example of this for $53 - 29$.



Access for Students with Disabilities

Action and Expression: Internalize Executive Functions. Check for understanding by inviting students to explain where the parts of the problem can be found in their work with the number line. For example, "Where is the 29 in Diego/Tyler's work? Where is the 53? Did you find the difference? Where is it?" Use different colored markers or pencils to represent the numbers and keep this visible throughout the activity.

Supports accessibility for: Memory, Organization, Conceptual Processing

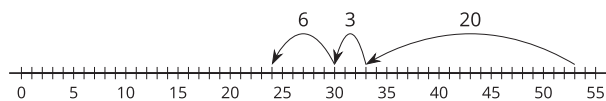
Materials to Copy

Number Line to 100 (groups of 1)

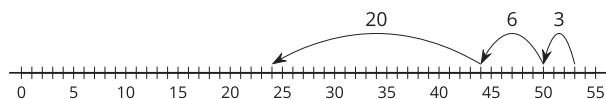
Student-facing Task Statement

Diego and Tyler found the value of $53 - 29$. Their work is shown.

Diego's Method:



Tyler's Method:



1. Use Diego's method to find the value of $82 - 35$.

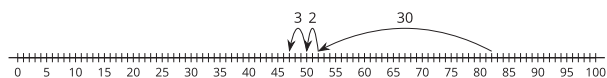
Launch

- Groups of 2
- Give each student a copy of the Instructional master.
- "Diego and Tyler found the value of $53 - 29$ on the number line. Each student represented how they found the difference. Explain each student's method."
- 1 minute: quiet think time
- 2 minutes: partner discussion
- Share responses.
- "What is the same and what is different about how Diego and Tyler found the difference?" (Diego started by subtracting

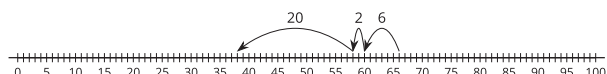
2. Use Tyler's method to find the value of $66 - 28$.

Student Responses

1.



2.



the tens and Tyler started by subtracting the ones. They both decomposed the ones to make subtracting the ones easier. They both thought of a way they could decompose to get to a ten.)

Activity

- “Now, you will have the opportunity to try out Diego and Tyler’s methods. Find the value of each expression. Represent the methods on the number line.”
- 8 minutes: independent work time
- 2 minutes: partner discussion

Synthesis

- Invite students to share how they used each Tyler and Diego’s methods.
- “Did you find Tyler’s method or Diego’s method more helpful? Explain.”
- “Is there another way we could use the number line to show a way to make it easier to find the value of $53 - 29$ by getting to a ten?”
- If not suggested by students, ask: “How could we start with 29 and use a method like Diego or Tyler’s?” (Start with 29, jump over 1 to get to 30, then it’s easy to see all you need to do is jump 23 to get to 53.)
- Record the method and display throughout the lesson for students to reference.
- “How is this method the same as Diego or Tyler’s? How is different?”

Activity 2

🕒 20 min

More Methods

Standards Alignments

Addressing 2.MD.B.6, 2.NBT.B.5

The purpose of this activity is for students to continue to develop fluency with addition and subtraction within 100. The numbers in each expression encourage the use of the methods students analyzed in the previous activity. However, students should be encouraged to use whatever method makes the most sense to them. Partners work together to create a visual display to share their representations of 1 sum and 1 difference including number lines and do a gallery walk to compare their representations to others (MP2).

This activity uses *MLR7 Compare and Connect*. *Advances: representing, conversing*

Instructional Routines

MLR7 Compare and Connect

Materials to Gather

Base-ten blocks, Tools for creating a visual display

Materials to Copy

Number Line to 100 (groups of 1)

Student-facing Task Statement

Partner A

1. Find the value of $59 + 27$.
2. Find the value of $65 - 18$.

Partner B

1. Find the value of $68 - 39$.
2. Find the value of $22 + 49$.



Student Responses

Partner A

Launch

- Groups of 2
- Give each student a copy of the Instructional master and access to base-ten blocks.
- Assign Partner A and Partner B.

Activity

- "Find the value of the sum and difference. You may continue to try Diego or Tyler's method or use any other way that makes sense to you. Use the number line if it helps to show your thinking."
- 5 minutes: independent work time
- 3 minutes: partner discussion

Synthesis

MLR7 Compare and Connect

1. 86. Sample responses:

- Students use base-ten blocks to show both addends as tens and ones. They circle and label to show composing a ten. They label to show a total of 8 tens and 6 ones.
- Students use a number line to show starting at 59. They show a jump of 1 and a jump of 26 to the right.

2. 47. Sample responses:

- Students use base-ten blocks to show 65 as 6 tens and 5 ones. They show decomposing 1 ten and crossing out 1 ten and 8 ones. The label to show the difference as 4 tens and 7 ones.
- Students use a number line to show starting at 65. They show a jump of 10, a jump of 5, and a jump of 3 to the left.

Partner B

1. 29. Sample response:

- Students use a number line to show starting at 39. They show a jump of 1 and a jump of 28 to the right.

2. 71. Sample response:

- Students use a number line to show starting at 49. They show a jump of 1 and a jump of 21 to the right.

- "Create a visual display that shows your thinking for 1 sum and 1 difference with a partner."
- "You should include a number line for at least one expression in your display. You may want to include base-ten diagrams or other details to help others understand your thinking."
- 5 minutes: partner work time
- 6 minutes: gallery walk
- "What is the same and what is different between the representations?"

Advancing Student Thinking

Students can use base-ten blocks or diagrams to find the value of each expression. Consider pairing these students with partners who use methods like those students analyze Activity 1. Consider asking:

- "How did you decompose or compose a ten with the blocks? How can you tell by looking at the expression that you would need to decompose or compose a ten?"
- "How is this like how your partner used the number line? How is it different?"

Lesson Synthesis

🕒 10 min

Display students' work from the second activity showing the same sum or difference represented with a base-ten diagram and a number line.

"When we are adding and subtracting within 100, we may use different methods based on the numbers in the problem we're working on. The number line can be helpful to show our thinking."

"___ used base ten diagrams and ___ used a number line to show their thinking. What connections can we make between these representations and how they found sums and differences?"

Suggested Centers

- Number Puzzles: Addition and Subtraction (1–4), Stage 4: Within 100 with Composing (Addressing)
- Number Line Scoot (2–3), Stage 1: Twos, Fives, and Tens (Addressing)

----- Complete Cool-Down -----

Response to Student Thinking

Students find the value of the sum or difference. However, the number line doesn't match their work.

Next Day Support

- Before the warm-up, have students practice representing simple equations on a number line with a partner.

Lesson 12: Equations with Unknowns

Standards Alignments

Addressing 2.MD.B.6, 2.NBT.B.5, 2.OA.A.1

Teacher-facing Learning Goals

- Write equations and represent sums and differences on a number line.

Student-facing Learning Goals

- Let's represent equations with a ? for the unknown.

Lesson Purpose

The purpose of this lesson is for students to represent equations with an unknown in all positions on the number line and find the unknown values.

In previous lessons, students found the value of sums and differences within 100, represented their thinking on the number line, and compared different methods.

In this lesson, students find the number that makes addition and subtraction equations true within 100 in equations with unknowns in all positions. They continue to think about the relationships between the numbers in each equation and reason about how they can use the structure of the number line, the relationship between addition and subtraction, and their understanding of place value to find the number that makes each equation true (MP7). The context of the first activity encourages all students to reason with the number line. In the second activity, students may use the methods and representations that make the most sense to them. The work of this lesson helps students make sense of the way the number line can be used to represent and solve story problems which will be useful in upcoming lessons.

Access for:

Students with Disabilities

- Representation (Activity 1)

English Learners

- MLR8 (Activity 2)

Instructional Routines

True or False (Warm-up)

Materials to Copy

- Number Line to 100 (groups of 1): Activity 1

- Number Line to 100 (groups of 1): Activity 2

Lesson Timeline

Warm-up	10 min
Activity 1	20 min
Activity 2	15 min
Lesson Synthesis	10 min
Cool-down	5 min

Teacher Reflection Question

Reflect on how students work together during partner work. How are students supporting one another when reasoning together and sharing mathematical ideas?

Cool-down (to be completed at the end of the lesson)

⌚ 5 min

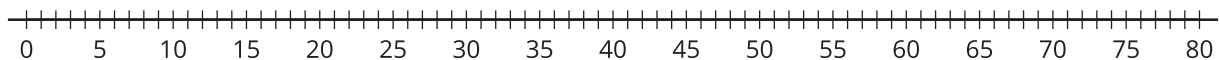
Jumps on the Number Line

Standards Alignments

Addressing 2.MD.B.6, 2.NBT.B.5

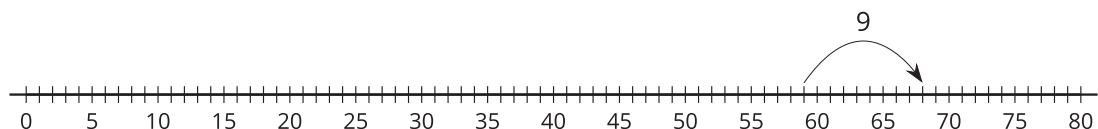
Student-facing Task Statement

- I started on 59 and jumped to 68. How far did I jump?
 - Write an equation to represent the problem with a ? for the unknown.
 - Find the number that makes the equation true.
 - Represent your thinking on the number line.



Student Responses

- $59 + ? = 68$
 - 9
 -



Begin Lesson

Warm-up

⌚ 10 min

True or False: Making Tens

Standards Alignments

Addressing 2.NBT.B.5

The purpose of this True or False is to elicit strategies and understandings students have for making it easier to find the value of expressions by making a ten. These understandings help students deepen their understanding of the properties of operations and will be helpful later when students will need to fluently add within 100.

Instructional Routines

True or False

Student-facing Task Statement

Decide if each statement is true or false. Be prepared to explain your reasoning.

- $40 = 10 + 27 + 3$
- $47 = 20 + 7 + 3 + 10$
- $60 = 3 + 47 + 10$

Student Responses

True: I knew $3 + 27 = 30$ and 10 more is 40.

False: $7 + 3 = 10$, so there isn't an extra 7.
 $20 + 10 + 10 = 40$

True: $47 + 3 = 50$ and 10 more is 60.

Launch

- Display one statement.
- "Give me a signal when you know whether the statement is true and can explain how you know."
- 1 minute: quiet think time

Activity

- Share and record answers and strategy.
- Repeat with each statement.

Synthesis

- "How could we change the second equation to make it true?" (We could change the 10 to 17 or the 20 to 27 because we need 7 more.)

Activity 1

⌚ 20 min

Number Line Riddles

Standards Alignments

Addressing 2.MD.B.6, 2.NBT.B.5, 2.OA.A.1

The purpose of this activity is for students to solve addition and subtraction problems within 100 with the unknown in all positions. Students write equations with a ? for the unknown and find the number that makes the equations true. The mathematical context of each problem encourages students to use the number line to reason about what is unknown and how they may represent the problem with an equation (MP2).

Access for Students with Disabilities

Representation: Access for Perception. Use a small toy animal or cut out animal (bird, frog, rabbit, or another animal) to demonstrate the jumping on the number line.

Supports accessibility for: Attention, Organization

Materials to Copy

Number Line to 100 (groups of 1)

Student-facing Task Statement

Solve riddles to find the mystery number.

For each riddle:

- Write an equation that represents the riddle and write a ? for the unknown.
- Write the mystery number. Represent the equation on the number line.

1. I started at 15 and jumped 17 to the right. Where did I end?

Equation: _____

Mystery number: _____

Launch

- Groups of 2
- Give each student a copy of the Instructional master.
- Display an image of a blank number line or draw a number line.
- “Today you will be solving riddles to find a mystery number.”
- “For each riddle, you will write an equation that represents the riddle, and write a ? for the unknown.”
- “Then you will represent the equation on the number line.”
- “Let’s try one together.”

2. I started at a number and jumped 20 to the left. I ended at 33. Where did I start?

Equation: _____

Mystery number: _____

3. I started on 42 and ended at 80. How far did I jump?

Equation: _____

Mystery number: _____

4. I started at 76 and jumped 27 to the left. Where did I end?

Equation: _____

Mystery number: _____

5. I started at a number and jumped 19 to the right. I ended at 67. Where did I start?

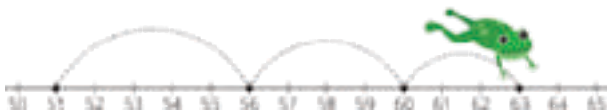
Equation: _____

Mystery number: _____

6. I started at 92 and ended at 33. How far did I jump?

Equation: _____

Mystery number: _____



Student Responses

Students complete the number lines to represent the following equations.

- Equation: $15 + 17 = ?$ Mystery number: 32
- Equation: $? - 20 = 33$ Mystery number: 53
- Equation: $42 + ? = 80$ Mystery number: 38
- Equation: $76 - 27 = ?$ Mystery number: 49

- Demonstrate on a number line with input from the students.
- "I started on a number, jumped 10 to the left. My jump ended at 42. What equation could I write with a ? for the unknown?" ($? - 10 = 42$)
- "How could I find the value of the mystery number?" (Do the opposite. Start at 42 and move 10 to the right.)
- 1 minute: quiet think time
- 1 minute: partner discussion
- Share responses and record on the number line.

Activity

- "Now you will have a chance to solve riddles to find a missing number, and then represent your thinking on a number line. You and your partner can take turns reading the riddle, while the other person follows along on the number line."
- 12 minutes: partner work time

Synthesis

- Invite students to share the answer to each riddle and display their number line.
- "Which riddles did you and your partner find to be most challenging? Explain."

5. Equation: $? + 19 = 67$ Mystery number: 48
6. Equation: $92 - ? = 33$ Mystery number: 59

Advancing Student Thinking

If students write equations other than those represented by the riddle or number line representation, consider asking:

- “How do you decide where to put your starting or ending points?”
- “What part of the riddle could help you choose the direction for your arrows and jumps?”

Activity 2

🕒 15 min

Make the Equations True

Standards Alignments

Addressing 2.MD.B.6, 2.NBT.B.5

The purpose of this activity is for students to find the value of an unknown in addition and subtraction equations. Students can choose to find the unknown number using either operation and represent their thinking on a number line. Listen for the ways students use the number line to make sense of the relationship between the numbers in each equation and use methods that show they are thinking about ways to use the structure of the number line and their understanding of place value (MP7).

🌐 Access for English Learners

MLR8 Discussion Supports. Synthesis: Provide students with the opportunity to rehearse what they will say with a partner before they share with the whole class.

Advances: Speaking

Materials to Copy

Number Line to 100 (groups of 1)

Student-facing Task Statement

Find the number that makes each equation true.

Show your thinking on the number line.

1. $? - 48 = 19$

2. $86 - ? = 39$

3. $? + 57 = 72$

4. $73 + ? = 91$

Student Responses

1. $67 - 48 = 19$

2. $86 - 47 = 39$

3. $15 + 57 = 72$

4. $73 + 18 = 91$

Launch

- Groups of 2
- Give each student a copy of the Instructional master.

Activity

- "Find the number that makes each equation true in a way that makes sense to you."
- "Represent your thinking on the number line."
- Monitor for a student who finds the value for $? + 57 = 72$ by:
 - starting at 57, drawing a jump to 72, and counting each length unit in between
 - starting at 57, drawing a jump of 3 and a jump of 12 to 72
 - starting at 72 and jumping back 57 in one jump or multiple jumps

Synthesis

- Invite previously selected students to share how they found the number that makes $? + 57 = 72$ true.
- Consider asking:
 - "How does ____'s number line show the numbers that we knew? How does it show the unknown number?"
 - "How are these methods the same? How are they different?"
- As time permits, continue with other equations.

Lesson Synthesis

🕒 10 min

"Today you solved all different types of problems on the number line with the unknown in all different positions by using addition and subtraction. You used equations with a symbol for the unknown and found the number that made them true."

Display $? + 14 = 24$ and $? - 14 = 24$

"How could I find the number that makes each of these equations true?" (For the addition equation, you could start at 24 and go to the left 14 on the number line, but for the subtraction equation you could start at 24 and go to the right 14.)

"How did the number line help with these types of equations?" (I could start with the result and jump in the opposite direction and land on the answer.)

Suggested Centers

- Number Puzzles: Addition and Subtraction (1–4), Stage 4: Within 100 with Composing (Addressing)
- Number Line Scoot (2–3), Stage 1: Twos, Fives, and Tens (Addressing)

Complete Cool-Down

Response to Student Thinking

Students write something other than $59 + ? = 68$.

Next Day Support

- Launch Activity 1 by highlighting important notation from previous lessons.

Lesson 13: Represent Story Problems

Standards Alignments

Addressing 2.MD.B.5, 2.MD.B.6, 2.NBT.B.5, 2.OA.A.1

Teacher-facing Learning Goals

- Represent addition and subtraction story problems using equations, tape diagrams, and number lines.

Student-facing Learning Goals

- Let's compare representations and solve problems.

Lesson Purpose

The purpose of this lesson is for students to make connections between different representations of situations for sums and differences.

In previous lessons, students were introduced to the number line. They learned that numbers are located at points on the line, depending on their distance from zero. They represented addition and subtraction equations with unknowns in all positions on number lines. Students have also used tape diagrams to represent story problems in previous lessons.

In this lesson, students interpret multiple representations and match them to story problems. In the first activity students are not asked to solve the problems. This allows them to focus on how each problem can be represented in different ways, rather than finding the solution. In the second activity, students are given diagrams to complete, but they can find the solution in any way that makes sense to them. They are also given the option to use a number line if it helps.

This lesson has a Student Section Summary.

Access for:

Students with Disabilities

- Action and Expression (Activity 2)

English Learners

- MLR8 (Activity 1)

Instructional Routines

Notice and Wonder (Warm-up)

Materials to Copy

- Story Problems Card Sort (stories, equations,

number lines, diagrams) (groups of 3): Activity 1

- Number Line to 100 (groups of 1): Activity 2

Lesson Timeline

Warm-up	10 min
Activity 1	20 min
Activity 2	15 min
Lesson Synthesis	10 min
Cool-down	5 min

Teacher Reflection Question

Which students came up with an unexpected strategy or connection in today's lesson? What are some ways you can be more open to the ideas of each and every student?

Cool-down (to be completed at the end of the lesson)

🕒 5 min

Clare's Train

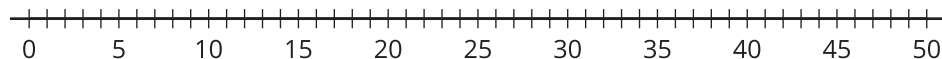
Standards Alignments

Addressing 2.MD.B.5, 2.OA.A.1

Student-facing Task Statement

Clare made a train that was 15 cubes long. Then she added some more cubes. Now her train is 28 cubes long. How many cubes did she add to her train?

Show your thinking. Use a number line or diagram if it helps.



Student Responses

1. 13 cubes. Sample response: $15 + ? = 28$ or $15 + 13 = 28$

----- Begin Lesson -----

Warm-up

🕒 10 min

Notice and Wonder: Compare Representations

Standards Alignments

Addressing 2.MD.B.6

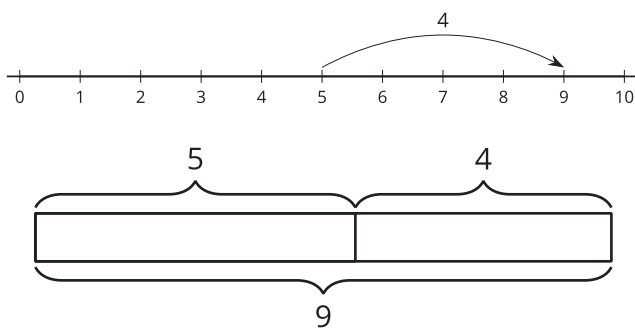
The purpose of this warm-up is to elicit the idea that number lines and tape diagrams can be used to represent the same relationships between numbers, which will be useful when students use tape diagrams and number lines in a later activity to interpret and solve story problems. While students may notice and wonder many things about these representations, the important discussion points are the way both representations show quantities and how they could be used to represent addition.

Instructional Routines

Notice and Wonder

Student-facing Task Statement

What do you notice? What do you wonder?



Student Responses

Students may notice:

- You can see all the numbers on the number line but not on the diagram.
- They both show $5 + 4 = 9$.
- The top shows one jump and the bottom shows 2 rectangles.

Students may wonder:

- Do they both show the same thing?
- Why does one diagram label the length of

Launch

- Groups of 2
- Display the image.
- "What do you notice? What do you wonder?"
- 1 minute: quiet think time

Activity

- "Discuss your thinking with your partner."
- 1 minute: partner discussion
- Share and record responses.

Synthesis

- "What equation do you think best matches these diagrams?" ($5 + 4 = 9$)
- "Where do we see the 5 in both diagrams?" (the 5 on the number line is the distance from 0 to the point at 5)
- "Where do you see the 4 in both diagrams?" (the 4 on the number line is the 4 spaces that were moved to the right)

each part?

- Are we going to be using these diagrams today?

Activity 1

🕒 20 min

Card Sort: Represent Stories

Standards Alignments

Addressing 2.MD.B.6, 2.NBT.B.5, 2.OA.A.1

The purpose of this activity is for students to make connections between different representations of story problems. Students match stories, equations, number lines, and tape diagrams (MP2, MP7). The synthesis focuses on how the representations are the same and different. Students recognize some representations help to make sense of the story, while others help to show their thinking when finding solutions.

🌐 Access for English Learners

MLR8 Discussion Supports. As students match the cards they should explain their reasoning to their partner. Display the following sentence frames for all to see: “I noticed __, so I matched . . .”

Encourage students to challenge each other when they disagree.

Advances: Speaking, Conversing

Materials to Copy

Story Problems Card Sort (stories, equations, number lines, diagrams) (groups of 3)

Required Preparation

- Create a set of cards from the Instructional master for each group of 3.

Student Responses

Students match:

- A, G, J, E
- D, P, O, B

Launch

- Groups of 3
- Give each group a set of cards (A–P).

- F, M, C, K
- L, I, H, N

Activity

- “We have been representing addition and subtraction on the number line.”
- “Today we are going to think about how we can use diagrams to make sense of stories and use number lines to show our thinking.”
- “Lin and her friends were making connecting cube trains. These stories are about all the ways they built their trains.”
- “Match each story to a diagram, a number line, and an equation.”
- 10 minutes: small-group work time

Synthesis

- Display cards A, E, G, O.
- “How are these representations of the same problem the same? How are they different?” (I can see the whole length of the train in the diagram, but I only see a point at 37 on the number line and I don’t see anything but the numbers in the equation. They all show 37 as one part and they all show addition.)

Activity 2

🕒 15 min

All Kinds of Representations

Standards Alignments

Addressing 2.MD.B.6, 2.NBT.B.5, 2.OA.A.1

The purpose of this activity is for students to solve story problems using any strategies and representations that make sense to them. In previous lessons, students have used number lines, tape diagrams, and equations to represent situations and solve problems. They will have the

opportunity to apply their understanding and make choices about how to make sense of problems and show their thinking. In the synthesis, students reflect on which representations are most helpful to them and make connections across representations (MP2). This question will likely elicit a variety of responses from students which can emphasize the point that students should use representations that make sense to them.

Access for Students with Disabilities

Action and Expression: Develop Expression and Communication. Give students access to two different colors of connecting cubes to create/act out the problem they read and match diagrams.

Supports accessibility for: Conceptual Processing, Memory

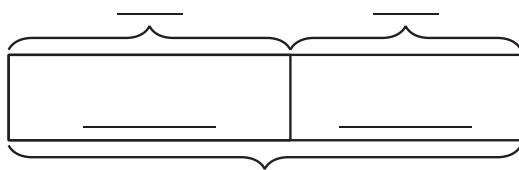
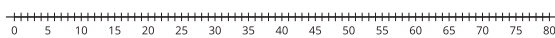
Materials to Copy

Number Line to 100 (groups of 1)

Student-facing Task Statement

Solve each problem. Show your thinking. Use a number line or diagram if it helps.

1. Clare started with 24 cubes and added on some more. Clare made a train with 42 cubes. How many cubes did Clare add on?



2. Andre had 37 cubes. Then he added 39 more to make the train longer. How many cubes did Andre use?

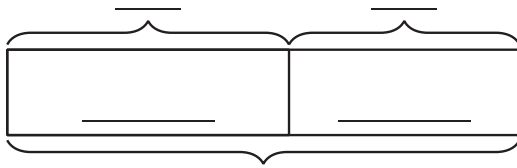


Launch

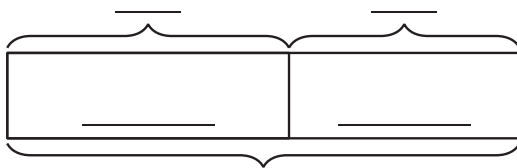
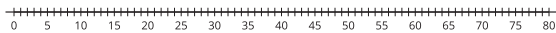
- Groups of 2
- Give students access to the Instructional master.

Activity

- "While doing the card sort, you had a chance to read stories and find matching representations."
- "Now you are going to solve story problems and represent your thinking in a way that makes sense to you."
- "There are blank number lines and diagrams that you can use if it helps."
- "You and your partner will read each problem together and then solve on your own."
- "Be prepared to explain your thinking."
- 8 minutes: partner work time
- As students work, consider asking: "What is the same or different about the way you showed your thinking and the way your partner showed theirs?"



3. Mai wanted her train to be 55 cubes long. So far she has 47. How many more cubes does Mai need?



Student Responses

18. Sample response: $24 + 18 = 42$
76. Sample response: $37 + 39 = 76$
8. Sample responses: $47 + 8 = 55$ or $55 - 47 = 8$

- Monitor for students who use a number line and tape diagram for the same problem.

Synthesis

- Invite previously selected students display their work side by side for all to see.
- “What was the same or different between ____ and ____ representations?”
- Help students make connections across representations by highlighting the places where they see the solution in each.
- “Which representations do you find most helpful?”

Lesson Synthesis

🕒 10 min

“Today you solved problems and compared representations. You have learned how you can use diagrams to make sense of story problems and how number lines can help you show your thinking.”

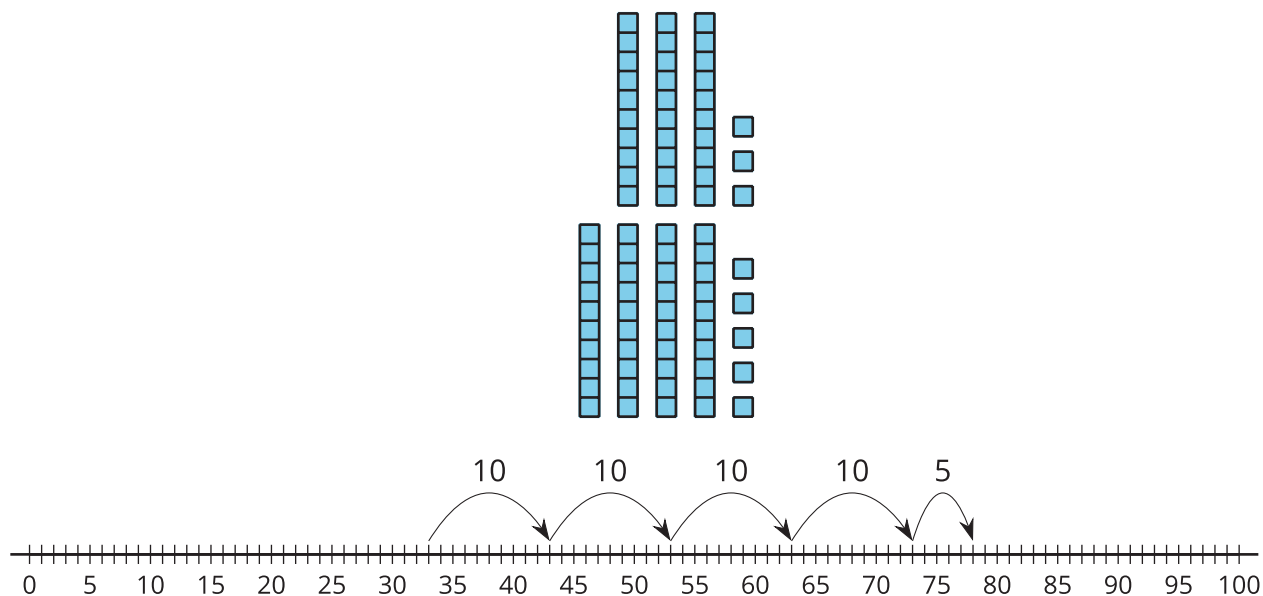
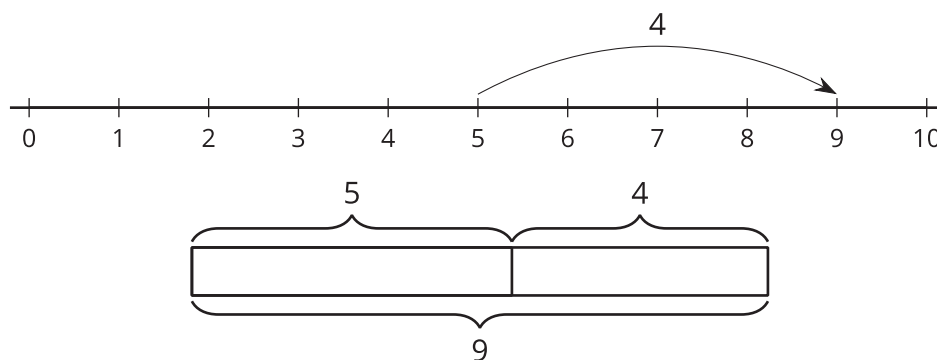
“We’ve spent a lot of time looking at addition and subtraction on the number line during this unit. Tell a partner 1 way the number line helped you understand a strategy or someone else’s thinking.”

Suggested Centers

- Number Puzzles: Addition and Subtraction (1–4), Stage 4: Within 100 with Composing (Addressing)
- Number Line Scoot (2–3), Stage 1: Twos, Fives, and Tens (Addressing)

Student Section Summary

In this unit, we have solved all types of problems and represented them in different ways. We represented addition and subtraction on the number line and made connections to equations and strategies. When adding and subtracting within 100, we can use diagrams, base-ten blocks, number lines, and equations to make sense of stories and situations and to show our thinking. They are all connected.



----- Complete Cool-Down -----

Response to Student Thinking

The student writes a solution other than 13 cubes.

Next Day Support

- Before the launch of the first activity in the next lesson, have students compare their strategies for finding the number of cubes.

Lesson 14: Center Day 2 (Optional)

Standards Alignments

Addressing 2.MD.B.6, 2.NBT.B.5

Teacher-facing Learning Goals

- Practice addition and subtraction within 100.
- Represent addition and subtraction on the number line.

Student-facing Learning Goals

- Let's practice adding and subtracting and using the number line.

Lesson Purpose

The purpose of this lesson is for students to practice adding and subtracting within 100 and representing addition and subtraction on the number line.

This lesson is optional because it is an opportunity for extra practice that not all classes may need. In Activity 1, students learn stage 1 of the Jump the Line center. In this new center, students take turns making strategic choices about numbers to add or subtract to reach target numbers. In Activity 2, students choose to continue working on Jump the Line, or choose between two previously introduced centers focused on addition and subtraction.

Instructional Routines

True or False (Warm-up)

Materials to Gather

- Dry erase markers: Activity 1
- Materials from previous centers: Activity 2
- Paper clips: Activity 1
- Sheet protectors: Activity 1

Materials to Copy

- Jump the Line Stage 1 Gameboard (groups of 2): Activity 1
- Jump the Line Stage 1 Spinners (groups of 2): Activity 1

Lesson Timeline

Warm-up	10 min
Activity 1	20 min
Activity 2	20 min

Teacher Reflection Question

Think about times when students were able to make connections to and build on the ideas of their peers during discussions in this unit. What norms or routines allowed students to engage with other students' ideas respectfully?

Lesson Synthesis

10 min

----- Begin Lesson -----

Warm-up

🕒 10 min

True or False: Is This 50?

Standards Alignments

Addressing 2.NBT.B.5

The purpose of this True or False is to elicit strategies students have for reasoning about place value to determine if an equation is true or false. The reasoning students do here helps to deepen their understanding of using strategies based on place value. It will also be helpful later when students reason about how to reach 100 from a given number using the number line.

Instructional Routines

True or False

Student-facing Task Statement

Decide if each statement is true or false. Be prepared to explain your reasoning.

- $28 + 2 + 20 = 50$
- $16 + 3 + 30 = 50$
- $36 + 4 + 20 = 50$

Student Responses

- True: I know $28 + 2 = 30$. I know $30 + 20 = 50$.
- False: I know $16 + 3 = 19$. I know adding 3 tens to 19 will not make 50.
- False: I know $36 + 20 = 56$. It will be more

Launch

- Display one statement.
- “Give me a signal when you know whether the statement is true and can explain how you know.”
- 1 minute: quiet think time

Activity

- Share and record answers and strategy.
- Repeat with each statement.

Synthesis

- “How can you explain your answer to the last

than 50.

statement without finding the sum of all three addends?" (I could add 36 and 20 and see that it's more than 56. I could add 36 and 4 to get 40. I know I would need 10 more to get to 50 and I see more than 10 left to add.)

Activity 1

🕒 20 min

Introduce Jump the Line, Add and Subtract within 100

Standards Alignments

Addressing 2.MD.B.6

The purpose of this activity is for students to learn stage 1 of the Jump the Line center. In this stage, students take turns making strategic choices about numbers to add or subtract to reach target numbers. Students choose 3 target numbers and mark them on the number line. Both players start at the beginning of the number line. They spin all 3 spinners and decide which of the moves they want to use on their turn. Students take turns spinning and moving, trying to land exactly on the target numbers. The first player to land on 2 target numbers wins.

Materials to Gather

Dry erase markers, Paper clips, Sheet protectors

Materials to Copy

Jump the Line Stage 1 Gameboard (groups of 2), Jump the Line Stage 1 Spinners (groups of 2)

Launch

- Groups of 2
- Give each group a spinner, paper clip, dry erase marker and gameboard.
- Display spinners and gameboard.
- "You and your partner will choose 3 target numbers and mark them on your number line."
- "Then you will take turns spinning all 3 spinners. On your turn you can decide which spin to use. Your goal is to jump to one of

the numbers you and your partner marked.”

- “The first player to land exactly on 2 of the target numbers wins.”
- Play a round with the class, if needed.

Activity

- 15 minutes: partner work time

Synthesis

- Display a gameboard with 3 target numbers. Spin the three spinners.
- “This is my gameboard and my spins. Which spin would you use? Why?”

Activity 2

🕒 20 min

Centers: Choice Time

Standards Alignments

Addressing 2.MD.B.6, 2.NBT.B.5

The purpose of this activity is for students to choose from activities that focus on addition or subtraction. Students choose from any stage of previously introduced centers.

- Jump the Line
- Number Line Scoot
- How Close?

Materials to Gather

Materials from previous centers

Required Preparation

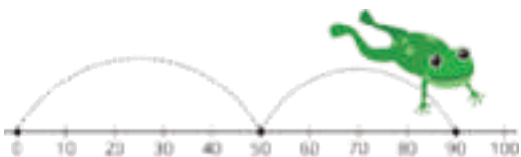
Gather materials from:

- Jump The Line, Stage 1
- Number Line Scoot, Stage 1
- How Close, Stage 3

Student-facing Task Statement

Choose a center.

Jump the Line



Number Line Scoot



How Close?

$$\boxed{} \boxed{} + \boxed{} \boxed{} = \underline{\hspace{2cm}}$$

Launch

- “Now you will choose from centers we have already learned. One of the choices is to continue with Jump the Line.”
- Display the center choices in the student book.
- “Think about what you would like to do first.”
- 30 seconds: quiet think time

Activity

- Invite students to work at the center of their choice.
- 8 minutes: center work time
- “Choose what you would like to do next.”
- 8 minutes: center work time

Synthesis

- “What did you like about the activity you worked on today?”

Lesson Synthesis

🕒 10 min

“How did you and your partner work together during centers? What went well? What can we continue to work on?”

Lesson 15: Riddles (Optional)

Standards Alignments

Addressing 2.MD.B.6, 2.NBT.B.5, 2.OA.A.1

Teacher-facing Learning Goals

- Solve addition and subtraction problems to investigate in context.
- Write addition and subtraction story problems.

Student-facing Learning Goals

- Let's use what we know about adding and subtracting to solve and write riddles about people's ages.

Lesson Purpose

The purpose of this lesson is for students to generate their own addition and subtraction stories, and use the number line as a tool to write and solve story problems.

This lesson is optional because it does not address any new mathematical content standards. This lesson does provide students with an opportunity to apply precursor skills of mathematical modeling.

In previous lessons, students represented addition and subtraction on the number line and considered different methods based on the numbers being added and subtracted.

In this lesson, students apply previous understandings of the methods and representations for addition and subtraction problems within 100 to write and solve their own real-world problems. Students are encouraged to use the number line to represent the ages and solve problems. In the first activity, they become familiar with the context by solving problems about ages using any method that makes sense to them. In the second activity, they write their own problems about the ages of people they know, represent the problems, and solve them.

In this lesson, when students decide what quantities are important in a real-world situation, use these quantities to develop their own story problems, and choose math that matches a simplified situation, they build the precursor skills they need to model with mathematics (MP4).

Access for:



Students with Disabilities

- Representation (Activity 2)



English Learners

- MLR7 (Activity 1)

Instructional Routines

Notice and Wonder (Warm-up)

Materials to Copy

- Number Line to 100 (groups of 1): Activity 1
- Number Line to 100 (groups of 1): Activity 2

Lesson Timeline

Warm-up	10 min
Activity 1	15 min
Activity 2	20 min
Lesson Synthesis	10 min

Teacher Reflection Question

Students shared their thinking multiple times in this lesson. What have you noticed about the language students use? What support can you offer to students who struggle to communicate their ideas orally?

Begin Lesson

Warm-up

🕒 10 min

Notice and Wonder: Birthday Candles

Standards Alignments

Addressing 2.MD.B.6

The purpose of this warm-up is to invite students to share what they know about people's ages and to elicit the idea that ages are numbers that can be put on a number line. While students may notice and wonder many things in this context, it is important to highlight the candles correspond to ages and that the ages can be represented on a number line.

Instructional Routines

Notice and Wonder

Required Preparation

- Create a number line from 0–100, marking intervals of 5, to display during the synthesis.

Student-facing Task Statement

What do you notice? What do you wonder?



Student Responses

Students may notice:

- Both people are blowing out candles.
- The first person is older and the second is younger.
- There are more than 10 candles for the first person.
- There are less than 10 candles for the second person.

Students may wonder:

- How many candles are on each cake?
- How long will it take them to blow out all of the candles?
- How old is each person?
- How much older is the first person?
- How much younger is the second person?

Launch

- Groups of 2
- Display the images.
- “What do you notice? What do you wonder?”
- 1 minute: quiet think time

Activity

- “Discuss your thinking with your partner.”
- 1 minute: partner discussion
- Share and record responses.

Synthesis

- “Without trying to count all the candles, do you have an idea about how old the first and second person might be?”
- “How old are some of the people that you know, including adults?”
- Select a few responses to locate and label on the number line.
- “Today, we are going to think about different people’s ages and make up addition and subtraction problems about ages. We’ll use our number line to represent and help us solve our problems.”

Activity 1

🕒 15 min

Kiran's Age Riddles

Standards Alignments

Addressing 2.MD.B.6, 2.NBT.B.5, 2.OA.A.1

The purpose of this activity is for students to leverage their previous work representing addition and subtraction problems on the number line to solve problems about the differences in family members' ages. For each riddle, the previous answer is needed to solve. Students may use any strategy that helps them make sense of the problems in context.

🌐 Access for English Learners

MLR7 Compare and Connect. Synthesis: After all strategies have been presented, lead a discussion comparing, contrasting, and connecting the different approaches. Ask, "What did the approaches have in common?", "How were they different?"

Advances: Representing, Conversing

Materials to Copy

Number Line to 100 (groups of 1)

Student-facing Task Statement

Solve Kiran's age riddles. Show your thinking. Use a number line if it helps.

1. I'm 7. My sister is 5 years older than I am. How old is she?

_____ years old

2. If you add 27 years to my sister's age, you get my mom's age. How old is my mom?

_____ years old

3. My brother is 24 years younger than my mom. How old is my brother?

_____ years old

Launch

- Groups of 2
- "Kiran wrote some riddles based on the ages of people in his family. Let's solve them."
- Give each student a copy of the Instructional master.

Activity

- "Work with your partner to read each riddle carefully. You may use a number line if it is helpful."
- "As you work, think about whether you are using addition or subtraction."

4. My grandma is 53 years older than my brother. How old is my grandma?
_____ years old
5. My uncle is 21 years younger than my grandma. How old is my uncle?
_____ years old
6. My uncle is 33 years older than my cousin. How old is my cousin?
_____ years old
7. There is a 50 year difference between my grandpa's age and my cousin's age. How old is my grandpa?
_____ years old

Student Responses

1. Kiran's sister: 12 years old
2. Kiran's mom: 39 years old
3. Kiran's brother: 15 years old
4. Kiran's grandma: 68 years old.
5. Kiran's uncle: 47 years old
6. Kiran's cousin: 14 years old
7. Kiran's grandpa: 64 years old

- 10 minutes: partner work time
- Monitor for students who use a number line or write an expression or equation to show their thinking.
- Monitor for students who locate and label each family member's age and name on the number line.

Synthesis

- Invite previously selected students to share.
- "How did you know which strategy to use when you read a riddle?" (I thought about if the person was older or younger than the person before. That helped me decide if I should count on or count backwards.)
- "What other mathematical questions can we ask related to Kiran's family's ages?"
- Share and record responses. Keep them displayed for the next activity.
- Suggest a few of the following if needed:
 - "If Kiran's sister and brother have their birthday party together, how many candles do they need?" (27: $12 + 15$)
 - "How much older is Kiran's grandma than his grandpa?" (4: $68 - 64$)
 - "How many years ago was his mom Kiran's age?" (32: $39 - 7$)

Activity 2

🕒 20 min

Write Riddles

Standards Alignments

Addressing 2.MD.B.6, 2.NBT.B.5

The purpose of this activity is for students to write their own number riddles involving people's ages. Keep the mathematical questions from the synthesis displayed for students if they need ideas for riddles.

Access for Students with Disabilities

Representation: Access for Perception. Use connecting cubes in two colors (increments of 5 - 5 red, 5 white, and continue) to create the number line and find ages on the number line. Discuss difference in age as the distance between the two numbers on the number line.

Supports accessibility for: Conceptual Processing, Organization

Materials to Copy

Number Line to 100 (groups of 1)

Student-facing Task Statement

1. Complete the table by writing down 4 people you know with different ages.

person's first name	age (years)

2. Come up with 3 mathematical questions to ask your partner.

Question 1:

Question 2:

Question 3:

3. Solve your partner's riddles. Show your thinking using a number line or equation.

Student Responses

1. Students complete table.
2. Sample response: My dad is 47 and I'm 7. How many years older is my dad? I'm 8 and my mom is 35. How many years is that

Launch

- Groups of 2
- Give each student a copy of the Instructional master.
- "We're going to make up our own age riddles to share with each other. Can you think of someone between 1–9 years old, someone between 10–19 years old, and someone who is 20–39 years old? Older than 40?"
- 30 seconds: quiet think time
- 1 minute: partner discussion

Activity

- "You will use people you know and their ages to come up with mathematical questions to ask your partner. If you don't know the person's age for sure, make a good estimate to use."
- "You can use Kiran's riddles to help. You can locate the age of each person you plan to use on your number line if it helps you plan your questions."
- 5 minutes: independent work time

altogether? My auntie is 72 and my sister is 13. How many years until my sister is my auntie's age?

3. Students record their responses using equations or a number line.

- 30 seconds: quiet think time
- "Take turns asking questions. When your partner asks you a question, record your thinking using a number line or equation."
- 10 minutes: partner work time.
- Monitor for students who come up with something different than the questions presented in the previous activity.

Synthesis

- Invite previously selected students to share.
- "Did you find any problems that were challenging to solve? What made it challenging?"

Lesson Synthesis

 10 min

"Today we worked to write, represent, and solve real-world problems about ages."

"How could you explain to a friend how they could take some ages and make up their own addition and subtraction problems?"

"How would you suggest they solve them?"

Suggested Centers

- Jump the Line (2–5), Stage 1: Add and Subtract within 100 (Addressing)
- Number Line Scoot (2–3), Stage 1: Twos, Fives, and Tens (Addressing)
- How Close? (1–5), Stage 3: Add to 100 (Supporting)



Family Support Materials

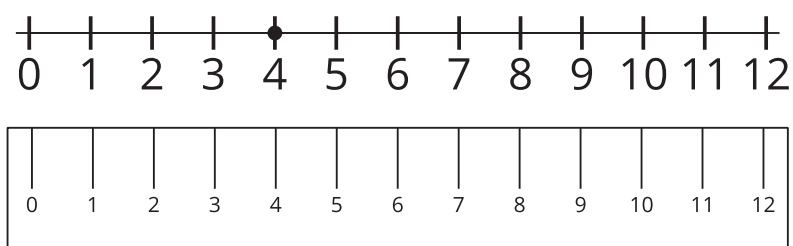
Family Support Materials

Addition and Subtraction on the Number Line

In this unit, students learn about the structure of a number line and use it to represent numbers within 100. They also relate addition and subtraction to length and represent the operations on the number line diagram.

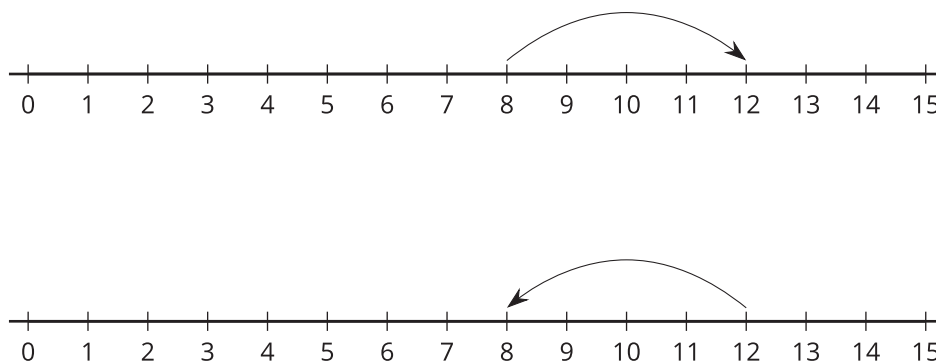
Section A: The Structure of the Number Line

In this section, students make connections between rulers and the number line. Students notice how they are the same and different and finally understand the number line to be a visual representation of numbers. They learn that number lines display numbers in sequence from left to right, with equal spacing between each number. As students begin to use the number line as a tool for understanding numbers and number relationships, they learn that whole numbers can be represented with a point on the number line. They identify, locate, and represent numbers on a number line. Students also use the number line to compare numbers based on their location relative to zero and each other. They understand that numbers to the right are larger and numbers to the left are smaller.



Section B: Add and Subtract on a Number Line

In this section, students learn to represent sums and differences on the number line. They begin by representing addition and subtraction with directional arrows. An arrow pointing right represents addition, and an arrow pointing left represents subtraction. For example, the number lines show how students can represent $8 + 4 = 12$ (top) and $12 - 4 = 8$ (bottom) on the number line.



Students use this understanding to write equations based on number line representations, as well as create the number line representation of a given equation. Students also use the number line to represent computation strategies based on place value and the properties of addition (for example, adding tens then ones vs. adding ones then tens) as they explain their strategies and compare their strategies with those of their classmates.

Try it at home!

Near the end of the unit, ask your student to solve the following problems on a number line:

- $29 + 48$
- $54 - 37$

Questions that may be helpful as they work:

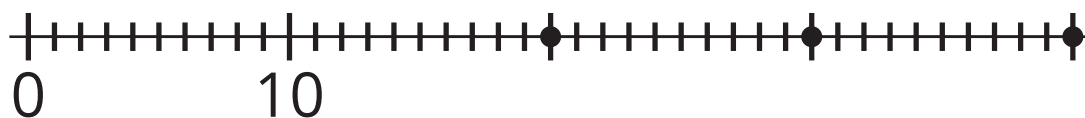
- How are the problems similar?
- How are they different?
- How did you show addition? Subtraction?
- Where is your answer on the number line?
- Could you have solved it a different way?

Unit Assessments

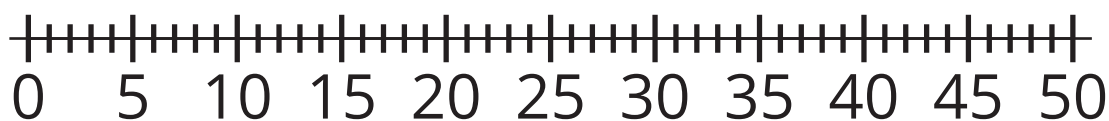
Check Your Readiness A and B
End-of-Unit Assessment

Addition and Subtraction on the Number Line: Section A Checkpoint

1. Label the 3 points on the number line.



2. Locate and label 34 and 43 on the number line.

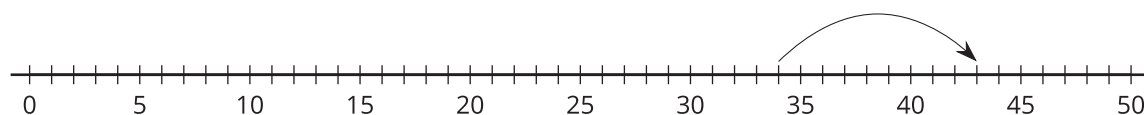


3. What number could the point represent? Explain or show your reasoning.



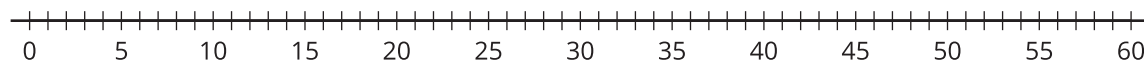
Addition and Subtraction on the Number Line: Section B Checkpoint

1. Which expression matches the number line?



- A. $34 - 9$
- B. $34 + 9$
- C. $34 + 43$
- D. $43 - 9$

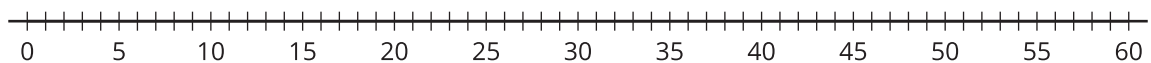
2. Find the value of $55 - 19$. Represent your thinking on the number line.



3. Mai created a bracelet that was 17 cm long. She also made a necklace that was 38 cm longer than the bracelet. How long was the necklace?

a. Write an equation to represent the problem with a ? for the unknown.

b. Solve the problem. Explain or show your thinking. Use the number line if it is helpful.



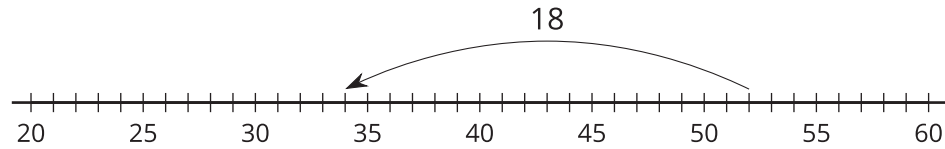
Addition and Subtraction on the Number Line: End-of-Unit Assessment

1. What number could the point represent?



- A. 10
- B. 25
- C. 30
- D. 40
- E. 60

2. Select 2 equations that the number line diagram represents.



A. $? - 18 = 52$

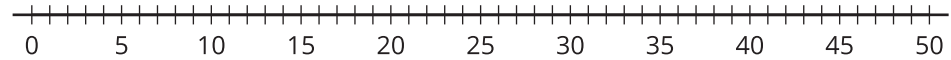
B. $34 + 18 = ?$

C. $52 - 18 = ?$

D. $52 + 18 = ?$

E. $? - 18 = 34$

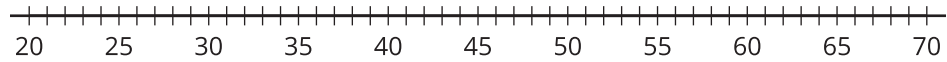
3. a. Locate and label 43 and 38 on the number line.



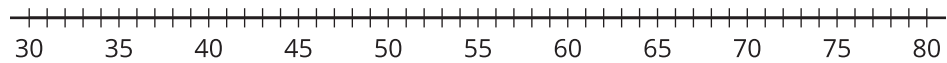
- b. Explain how to use the number line to find the value of $43 - 38$.

4. Represent each equation on the number line.

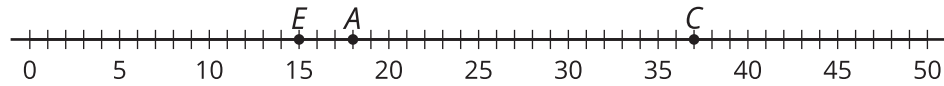
a. $25 + ? = 44$



b. $53 - 17 = ?$

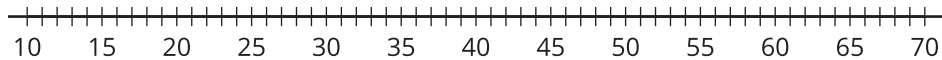


5. Andre, Clare, and Elena collected seashells at the beach. The number line shows how many seashells each student collected.



- a. Who collected the most seashells? Who collected the fewest?
- b. Clare says she collected more seashells than Elena and Andre together. Do you agree with Clare? Explain or show your reasoning.

- c. How many seashells did Andre, Clare, and Elena collect together? Explain or show your reasoning. Use the number line if it is helpful.



Assessment Answer Keys

Check Your Readiness A and B
End-of-Unit Assessment

Assessment Answer Keys

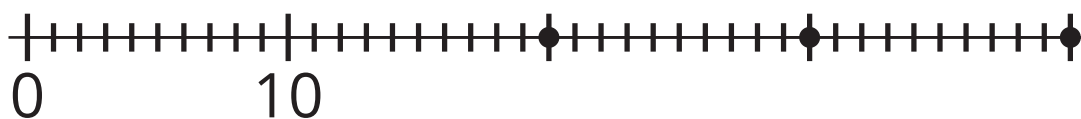
Assessment: Section A Checkpoint

Problem 1

Goals Assessed

- Represent whole numbers within 100 as lengths from 0 on a number line.

Label the 3 points on the number line.



Solution

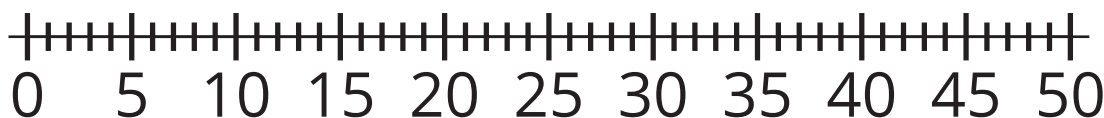


Problem 2

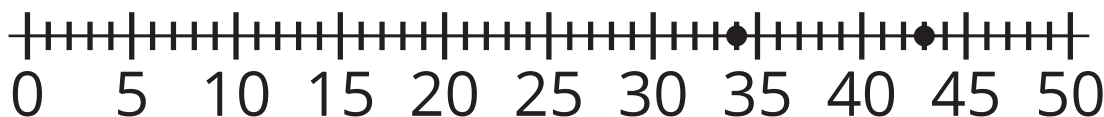
Goals Assessed

- Represent whole numbers within 100 as lengths from 0 on a number line.

Locate and label 34 and 43 on the number line.



Solution



34 is one tick mark left of 35 and 43 is 3 tick marks right of 40.

Problem 3

Goals Assessed

- Understand the structure of the number line.

What number could the point represent? Explain or show your reasoning.

**Solution**

20 to 30. Sample response: In the middle of the number line is 40 and this is definitely less than that.

Assessment: Section B Checkpoint

Problem 1

Goals Assessed

- Represent sums and differences on a number line.

Which expression matches the number line?



- A. $34 - 9$
- B. $34 + 9$
- C. $34 + 43$
- D. $43 - 9$

Solution

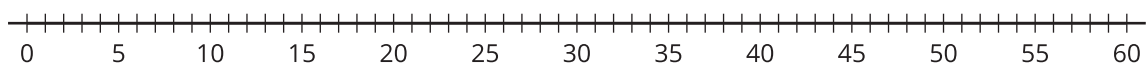
B

Problem 2

Goals Assessed

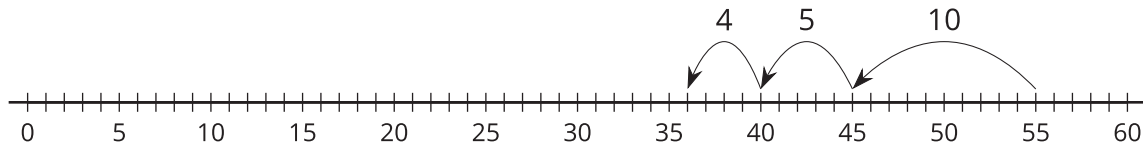
- Represent sums and differences on a number line.

Find the value of $55 - 19$. Represent your thinking on the number line.



Solution

36. Sample response:



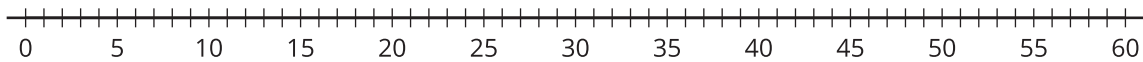
Problem 3

Goals Assessed

- Represent sums and differences on a number line.

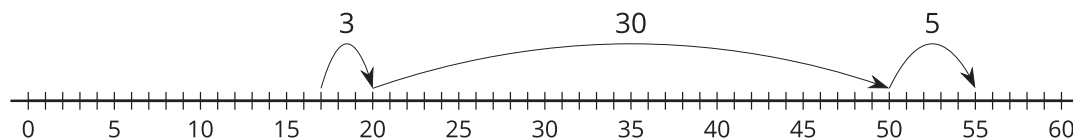
Mai created a bracelet that was 17 cm long. She also made a necklace that was 38 cm longer than the bracelet. How long was the necklace?

- Write an equation to represent the problem with a ? for the unknown.
- Solve the problem. Explain or show your thinking. Use the number line if it is helpful.



Solution

- $17 + 38 = ?$
- 55 cm. Sample response:



Assessment: End-of-Unit Assessment

Problem 1

Standards Alignments

Addressing 2.MD.B.6

Narrative

Students choose the number that could be represented by the point on the number line. Students may choose C if they understand the number represented by the point must be greater than the midpoint of 25, but do not consider the position of the point relative to the midpoint. Students who choose A, B, or E need further practice with the structure of the number line, specifically the requirement of numbers being equally spaced as well as increasing as we move from left to right.

What number could the point represent?



- A. 10
- B. 25
- C. 30
- D. 40
- E. 60

Solution

["D"]

Problem 2

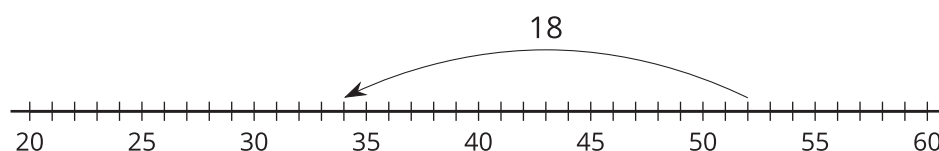
Standards Alignments

Addressing 2.MD.B.6

Narrative

Students match a number line diagram with equations having an unknown. Without an unknown, the diagram represents the equation $52 - 18 = 34$. The jump or difference 18 is labeled so the unknown could be the starting point, 52, and that gives the equation $? - 18 = 34$. Or the unknown could be the landing point and then the equation would be $52 - 18 = ?$. Response A has the right operation and the right numbers but the numbers are in the wrong place. Response B has the correct numbers but the wrong operation, that is, it would be represented by the same diagram with the arrow in the opposite direction. Response D has the wrong operation and the result would not be on this graph.

Select **2** equations that the number line diagram represents.



- A. $? - 18 = 52$
- B. $34 + 18 = ?$
- C. $52 - 18 = ?$
- D. $52 + 18 = ?$
- E. $? - 18 = 34$

Solution

["C", "E"]

Problem 3

Standards Alignments

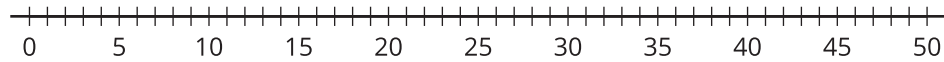
Addressing 2.MD.B.6, 2.NBT.B.5

Narrative

Students locate numbers on a number line and then use the number line to find their difference. Students have seen two ways to calculate differences on the number line. In this situation, they could jump back 38 from 43 and see that they land on 5 or they could notice that if they add on 5

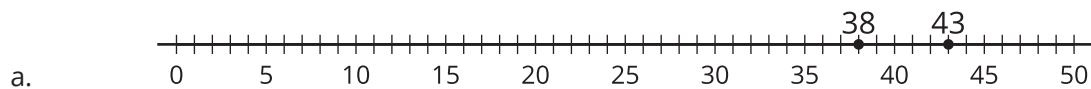
from 38 they land on 43.

- a. Locate and label 43 and 38 on the number line.



- b. Explain how to use the number line to find the value of $43 - 38$.

Solution



- b. The number line shows that 43 is just 5 from 38, $43 - 38 = 5$.

Problem 4

Standards Alignments

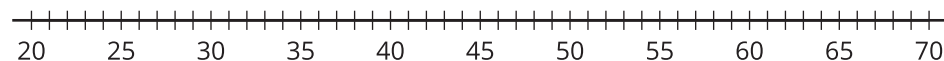
Addressing 2.MD.B.6

Narrative

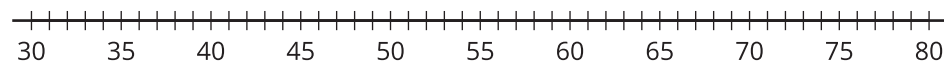
Students represent equations on the number line. They represent one addition equation and one subtraction equation. For the addition equation, the jump or difference is unknown so they will likely label the arrow with a question mark. For the second problem where it is the destination that is unknown, they may label the tick mark 36 with a ? but this is not required. For the second problem, they may make several jumps instead of just one. For example, they may make a jump of 10 and a jump of 7 or they may make a jump of 4, then a jump of 10, then a jump of 3.

Represent each equation on the number line.

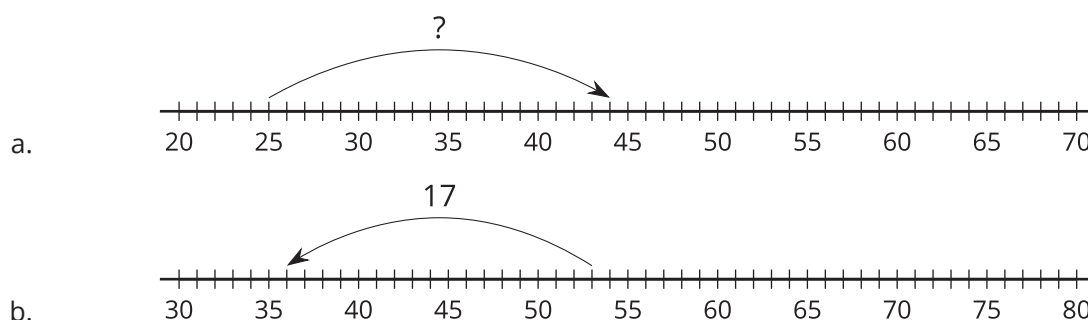
- a. $25 + ? = 44$



- b. $53 - 17 = ?$



Solution



Problem 5

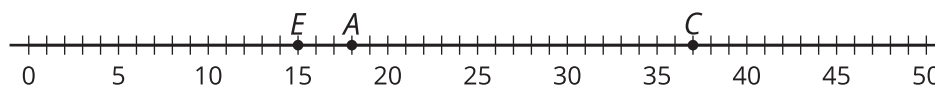
Standards Alignments

Addressing 2.MD.B.6, 2.NBT.B.5, 2.OA.A.1

Narrative

Students solve a two-step story problem and may represent it on the number line. The information is presented on a number line. After identifying the numbers from the number line, students solve one-step and two-step story problems about the information. Some students may use the answer to the comparison between Elena and Andre and Clare to answer the final question about the total number of seashells. If they do so, then their answer to the final question should be evaluated based on their calculation of Elena's and Andre's seashells even if this calculation is not correct.

Andre, Clare, and Elena collected seashells at the beach. The number line shows how many seashells each student collected.

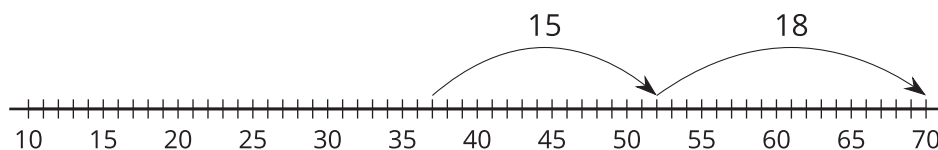


- Who collected the most seashells? Who collected the fewest?
- Clare says she collected more seashells than Elena and Andre together. Do you agree with Clare? Explain or show your reasoning.
- How many seashells did Andre, Clare, and Elena collect together? Explain or show your reasoning. Use the number line if it is helpful.



Solution

- a. Clare collected the most and Elena collected the fewest.
- b. Elena collected 15 seashells and Andre collected 18 seashells and Clare collected 37. I know $37 - 15$ is 22 since I can take away a ten and 5 ones. That's more than 18 so Clare is correct.
- c. Sample response: 70, I used the number line to add the numbers. I started with Clare's 37 shells, added Elena's 15 and then Andre's 18.

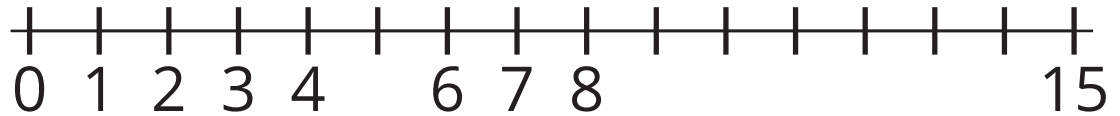


Lesson Cool Downs

Lesson 1: Whole Numbers on the Number Line

Cool Down: On the Number Line

1.

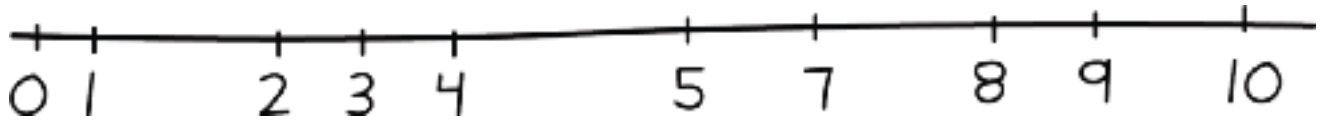


- Label each tick mark with the number it represents.
- Locate 2 on the number line. Mark it with a point.
- Locate 14 on the number line. Mark it with a point.

Lesson 2: Features of a Number Line

Cool Down: Mai's Number Line

Mai made a number line to show the numbers 0–10.



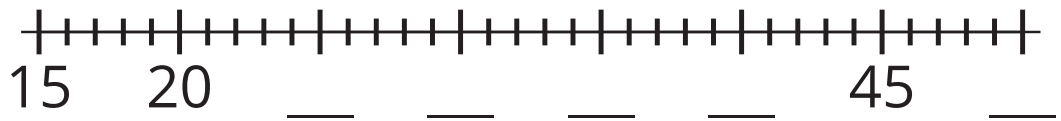
How should Mai revise her number line?

Lesson 3: Unlabeled Tick Marks

Cool Down: What's Missing?

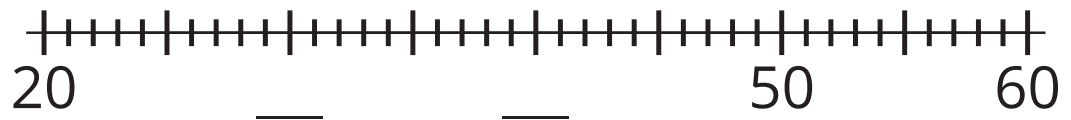
Complete each number line by filling in the missing labels with the number the tick mark represents.

1. a.



b. Locate and label 37 on the number line.

2. a.

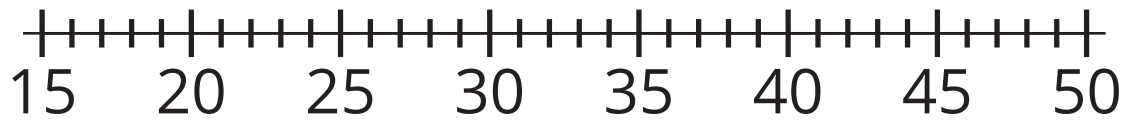


b. Locate and label 35 on the number line.

Lesson 4: Compare Numbers on a Number Line

Cool Down: Compare on the Number Line

1.



- a. Locate and label 31 on the number line.
- b. Locate and label a number that is less than 31 on the number line.
- c. Use $<$ and $>$ to compare the 2 numbers represented on your number line.
- d. Explain how you know your comparison is true.

Lesson 5: Estimate on a Number Line

Cool Down: What Number Could This Be?

1. a. What number could be represented by the point?

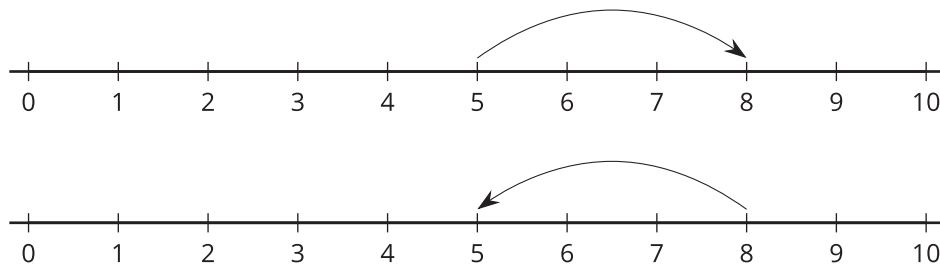


- b. Explain why your estimate is reasonable.

Lesson 7: Addition and Subtraction on the Number Line

Cool Down: Addition and Subtraction Expressions on a Number Line

1. a. Circle the number line that represents $5 + 3$.

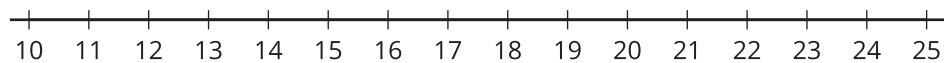


- b. Explain why you chose it.

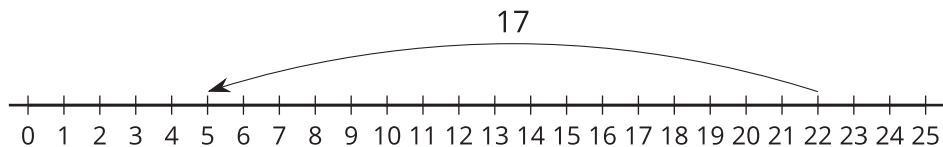
Lesson 8: Equations on a Number Line

Cool Down: Represent Addition and Subtraction on the Number Line

1. Represent $22 - 5 = 17$ on the number line.



2. Write an equation to show what's represented on the number line.

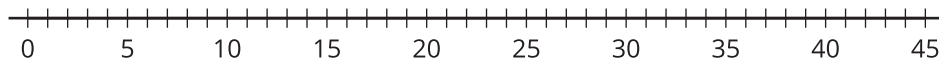


Lesson 9: The Difference Between Numbers

Cool Down: What's the Difference?

1. Use the number line to show a way to find the number that makes the equation true.

$$41 - 38 = ?$$

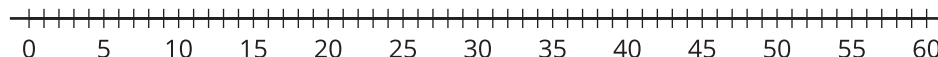


Lesson 10: Place Value and the Number Line

Cool Down: Subtract on the Number Line

$$48 - 22 = ?$$

Find the number that makes the equation true. Represent your thinking on the number line.

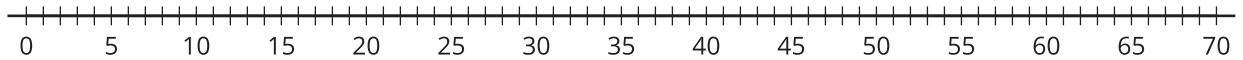


Lesson 11: Different Ways to Add and Subtract

Cool Down: Sums and Differences

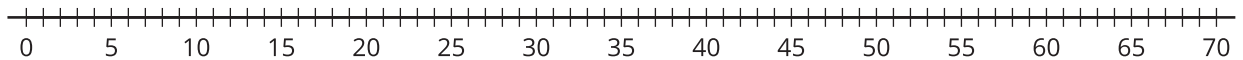
1. Find the value of $38 + 28$.

Represent your thinking on the number line.



2. Find the value of $57 - 19$.

Represent your thinking on the number line.



Lesson 12: Equations with Unknowns

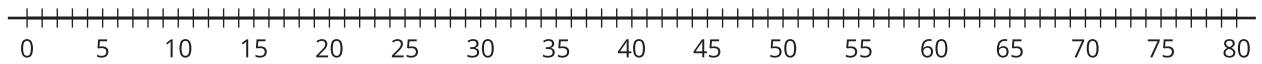
Cool Down: Jumps on the Number Line

1. I started on 59 and jumped to 68. How far did I jump?

a. Write an equation to represent the problem with a ? for the unknown.

b. Find the number that makes the equation true.

c. Represent your thinking on the number line.

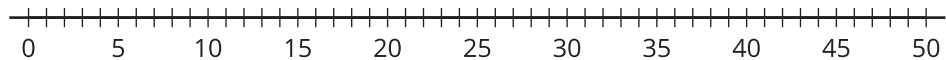


Lesson 13: Represent Story Problems

Cool Down: Clare's Train

Clare made a train that was 15 cubes long. Then she added some more cubes. Now her train is 28 cubes long. How many cubes did she add to her train?

Show your thinking. Use a number line or diagram if it helps.



Instructional Masters

Instructional Masters for Addition and Subtraction on the Number Line

address	title	students written requires per copy	on?	cutting? recommended?	card stock	color paper recommended?
Activity Grade2.4.5.2	Order Numbers on the Number Line Cards	12	no	yes	no	no
Activity Grade2.4.2.1	Class Number Line Cards (0-30)	30	no	yes	yes	no
Activity Grade2.4.4.2	Number Line to 100	1	yes	no	no	no
Activity Grade2.4.9.1	Number Line to 100	1	yes	no	no	no
Activity Grade2.4.9.2	Number Line to 100	1	yes	no	no	no
Activity Grade2.4.11.1	Number Line to 100	1	yes	no	no	no
Activity Grade2.4.11.2	Number Line to 100	1	yes	no	no	no
Activity Grade2.4.12.1	Number Line to 100	1	yes	no	no	no
Activity Grade2.4.12.2	Number Line to 100	1	yes	no	no	no
Activity Grade2.4.13.2	Number Line to 100	1	yes	no	no	no
Activity Grade2.4.15.1	Number Line to 100	1	yes	no	no	no
Activity Grade2.4.15.2	Number Line to 100	1	yes	no	no	no

Activity Grade2.4.6.1	Number Line Scoot Stage 1 Directions	2	no	yes	no	no
Center	Number Line Scoot Stage 1 Directions	2	no	yes	no	no
Activity Grade2.4.6.1	Number Line Scoot Stage 1 Gameboard	2	no	no	no	no
Center	Number Line Scoot Stage 1 Gameboard	2	no	no	no	no
Activity Grade2.4.13.1	Story Problems Card Sort (stories, equations, number lines, diagrams)	3	no	yes	no	no
Activity Grade2.4.6.1	Number Line Scoot Stage 1 Spinner	2	no	no	no	no
Center	Number Line Scoot Stage 1 Spinner	2	no	no	no	no
Activity Grade2.4.14.1	Jump the Line Stage 1 Gameboard	2	no	no	no	no
Center	Jump the Line Stage 1 Gameboard	2	no	no	no	no
Activity Grade2.4.14.1	Jump the Line Stage 1 Spinners	2	no	no	no	no
Center	Jump the Line Stage 1 Spinners	2	no	no	no	no
Center	Five in a Row Addition and Subtraction Stage 6 Gameboard	2	no	no	no	no
Center	How Close? Stage 3 Recording Sheet	1	yes	no	no	no
Center	Capture Squares Stage 3 Gameboard	2	yes	no	no	no
Center	Capture Squares Stage 3 Spinner	2	no	no	no	no
Center	Capture Squares Stage 4 Gameboard	2	yes	no	no	no
Center	Capture Squares Stage 4 Spinner	2	no	no	no	no

Center	Number Puzzles Digit Cards	2	no	yes	no	no
Center	Number Puzzles Addition Stage 4 Gameboard	2	no	no	no	no

Order Numbers on the Number Line Cards

1	5	9	12	15	23	29	31	36	38
1	5	9	12	15	23	29	31	36	38
1	5	9	12	15	23	29	31	36	38

Class Number Line Cards (0 30)

Class Number Line 0	Class Number Line 1	Class Number Line 2	Class Number Line 3

Class Number Line Cards (0 - 30)

Class Number Line	Class Number Line	Class Number Line	Class Number Line
4	5	6	7

Class Number Line Cards (0 - 30)

Class Number Line	Class Number Line	Class Number Line	Class Number Line
8	9	10	11

Class Number Line Cards (0 - 30)

Class Number Line	Class Number Line	Class Number Line	Class Number Line
12	13	14	15

Class Number Line Cards (0 - 30)

Class Number Line	Class Number Line	Class Number Line	Class Number Line
16	17	18	19

Class Number Line Cards (0 - 30)

Class Number Line	Class Number Line	Class Number Line	Class Number Line
20	21	22	23

Class Number Line	Class Number Line	Class Number Line	Class Number Line
24	25	26	27

Class Number Line Cards (0 - 30)

Class Number Line	Class Number Line	Class Number Line	
28	29	30	

0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100

0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100

0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100

0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100

0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100

0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100

0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100

0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100

0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100

0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100

0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100

0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100

0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100

0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100

0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100

0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100

0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100

0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100

0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100

0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100

0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100

0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100

0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100

0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100

0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100

0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100

0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100

0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100

0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100

0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100

0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100

0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100

0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100

0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100

0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100

0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100

0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100

0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100

0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100

0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100

0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100

0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100

0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100

0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100

0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100

0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100

0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100

0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100

0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100

0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100

Number Line Scoot Stage 1 Directions

Directions:

- Place a small cube on zero on each number line.
 - On your turn:
 - Spin the spinner.
 - Count aloud as you move that distance on one or more number lines.
 - You can use your whole spin on one number line or split it between multiple number lines.
 - Take turns spinning and moving.
 - If a cube lands *exactly* on the last tick mark of a number line, that player keeps the cube and puts a new one at 0.
 - The first player to collect 5 cubes wins.
-

Directions:

- Place a small cube on zero on each number line.
- On your turn:
 - Spin the spinner.
 - Count aloud as you move that distance on one or more number lines.
 - You can use your whole spin on one number line or split it between multiple number lines.
- Take turns spinning and moving.
- If a cube lands *exactly* on the last tick mark of a number line, that player keeps the cube and puts a new one at 0.
- The first player to collect 5 cubes wins.

Number Line Scoot Stage 1 Directions

Directions:

- Place a small cube on zero on each number line.
 - On your turn:
 - Spin the spinner.
 - Count aloud as you move that distance on one or more number lines.
 - You can use your whole spin on one number line or split it between multiple number lines.
 - Take turns spinning and moving.
 - If a cube lands *exactly* on the last tick mark of a number line, that player keeps the cube and puts a new one at 0.
 - The first player to collect 5 cubes wins.
-

Directions:

- Place a small cube on zero on each number line.
- On your turn:
 - Spin the spinner.
 - Count aloud as you move that distance on one or more number lines.
 - You can use your whole spin on one number line or split it between multiple number lines.
- Take turns spinning and moving.
- If a cube lands *exactly* on the last tick mark of a number line, that player keeps the cube and puts a new one at 0.
- The first player to collect 5 cubes wins.

Number Line Scoot Stage 1 Gameboard



Number Line Scoot Stage 1 Gameboard



Story Problems Card Sort (stories, equations, number lines, diagrams)

Story Problems Card Sort

A

Lin made a train from some cubes. Then she added 37 more cubes. Now her train is 63 cubes long. How many cubes long was Lin's train at first?

Story Problems Card Sort

E

$$? + 37 = 63$$

Story Problems Card Sort

B

$$37 + ? = 63$$

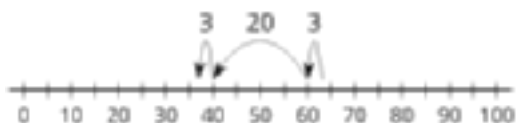
Story Problems Card Sort

F

Tyler's train was 63 cubes long. Then he broke off some cubes. Now his train is 37 cubes long. How many cubes did Tyler break off?

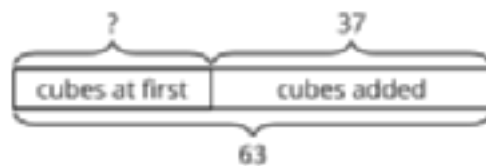
Story Problems Card Sort

C



Story Problems Card Sort

G



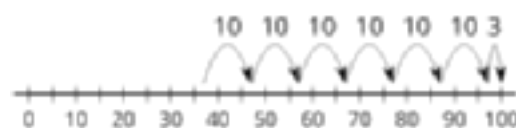
Story Problems Card Sort

D

Jada's train was 37 cubes long. Then she added some more cubes. Now her train is 63 cubes long. How many cubes did she add?

Story Problems Card Sort

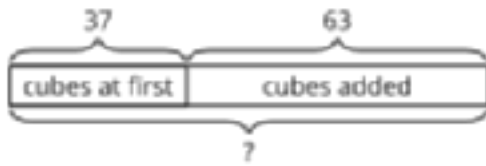
H



Story Problems Card Sort (stories, equations, number lines, diagrams)

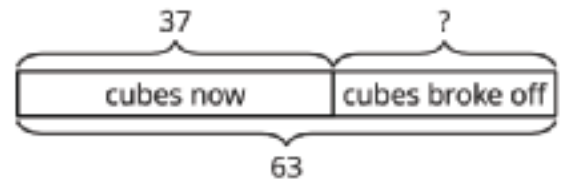
Story Problems Card Sort

I



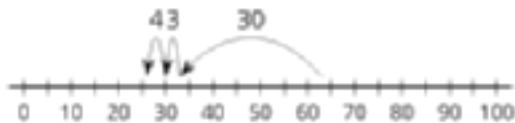
Story Problems Card Sort

M



Story Problems Card Sort

J



Story Problems Card Sort

N

$$37 + 63 = ?$$

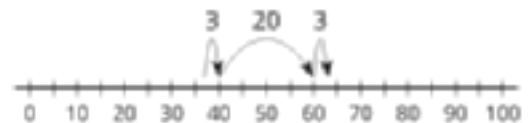
Story Problems Card Sort

K

$$63 - ? = 37$$

Story Problems Card Sort

O



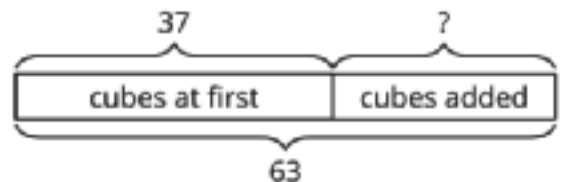
Story Problems Card Sort

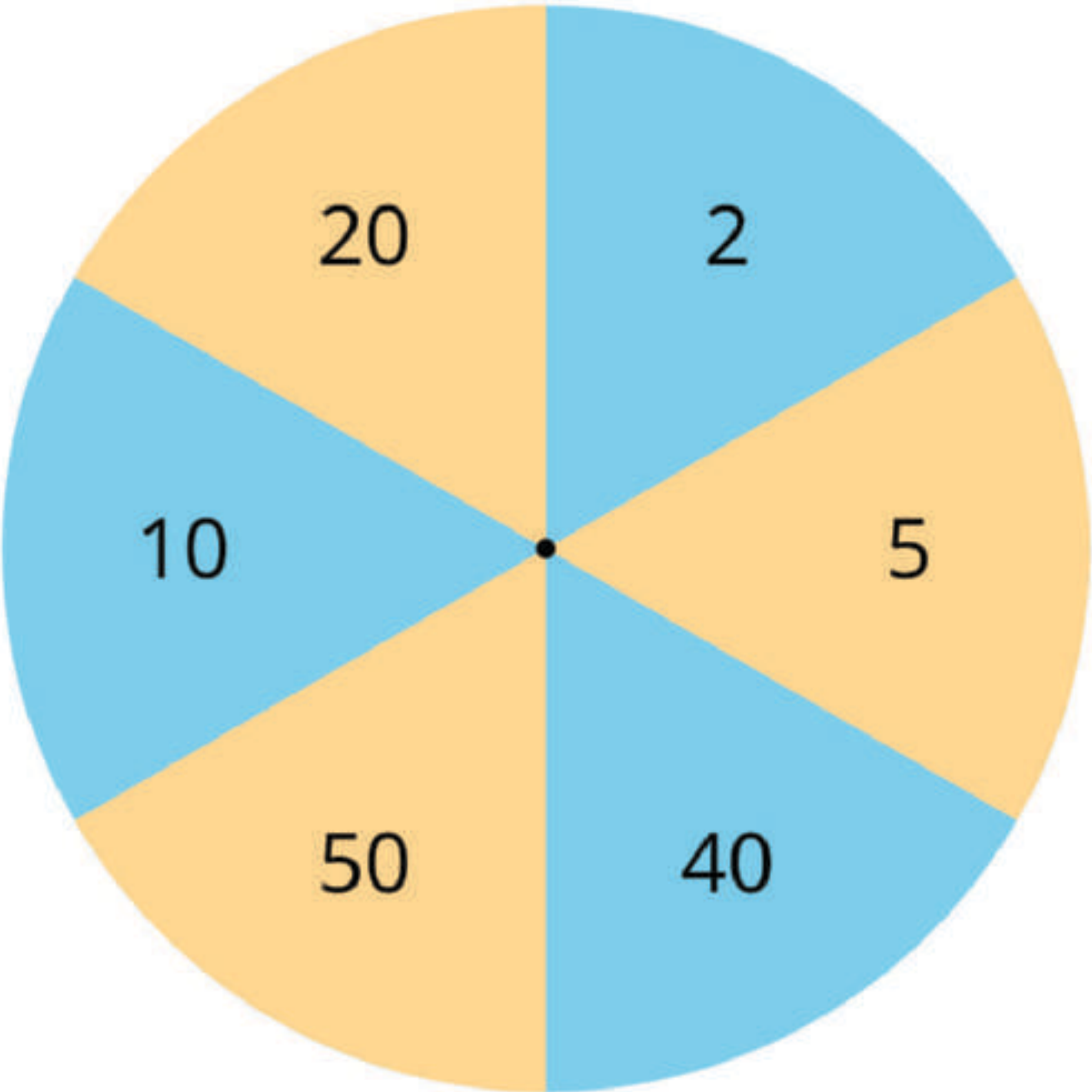
L

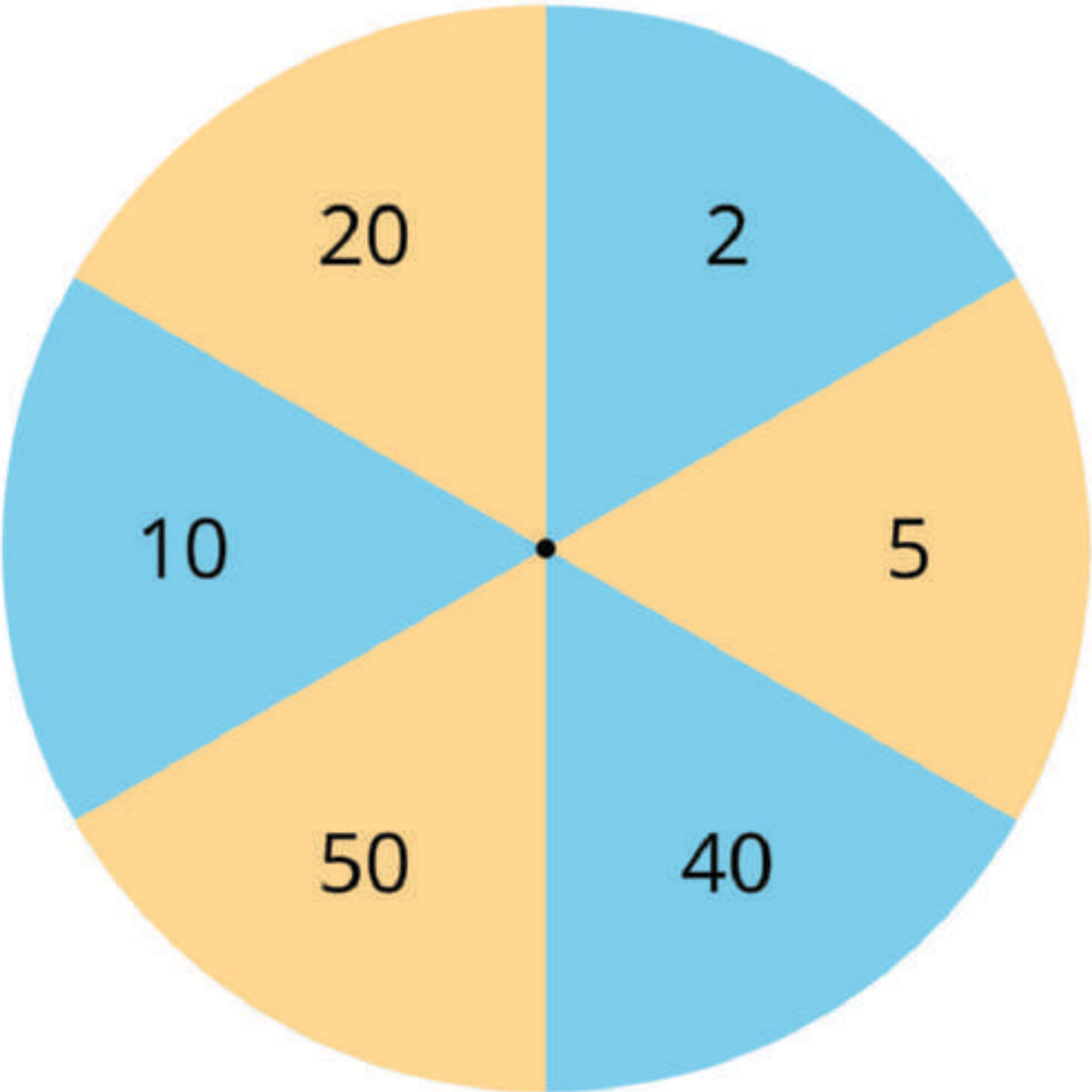
Han's train was 37 cubes long. Then he added 63 more cubes. How many cubes long is Han's train now?

Story Problems Card Sort

P



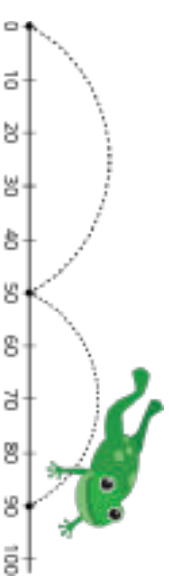




Jump the Line Stage 1 Gameboard

Directions:

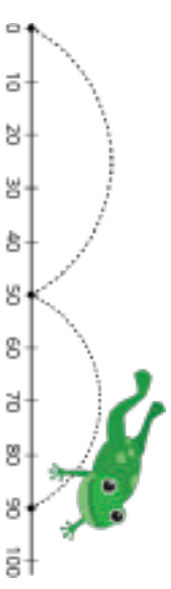
- Together with your partner, decide on 3 target numbers and mark them on your number line.
- On your turn:
 - Spin all 3 spinners. Decide which moves you want to use on your turn.
 - Mark where you ended up on the number line.
- Take turns spinning and moving on the number line. The first partner to land on 2 of the target numbers wins.



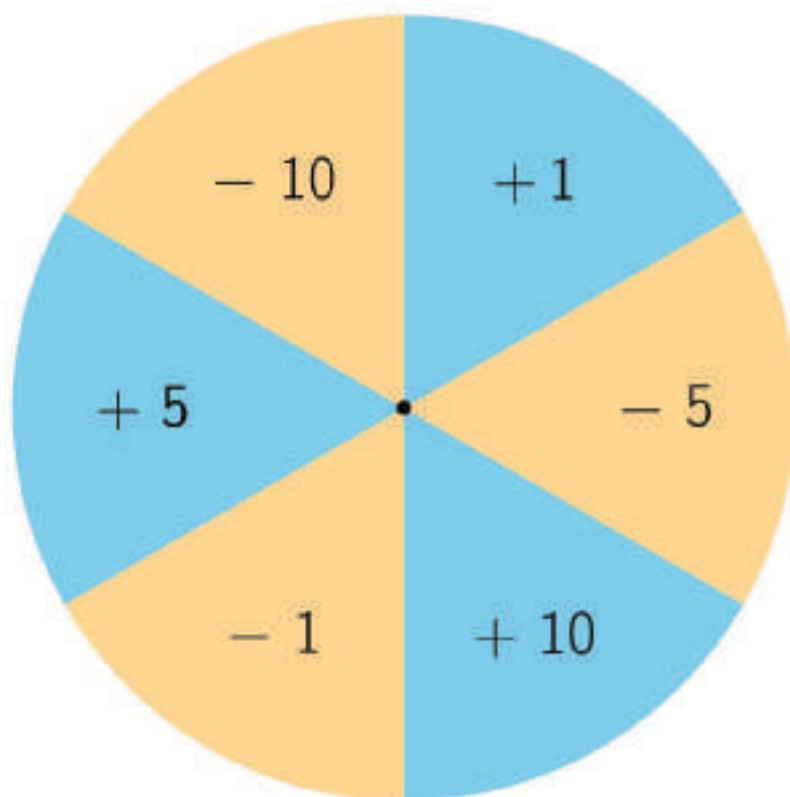
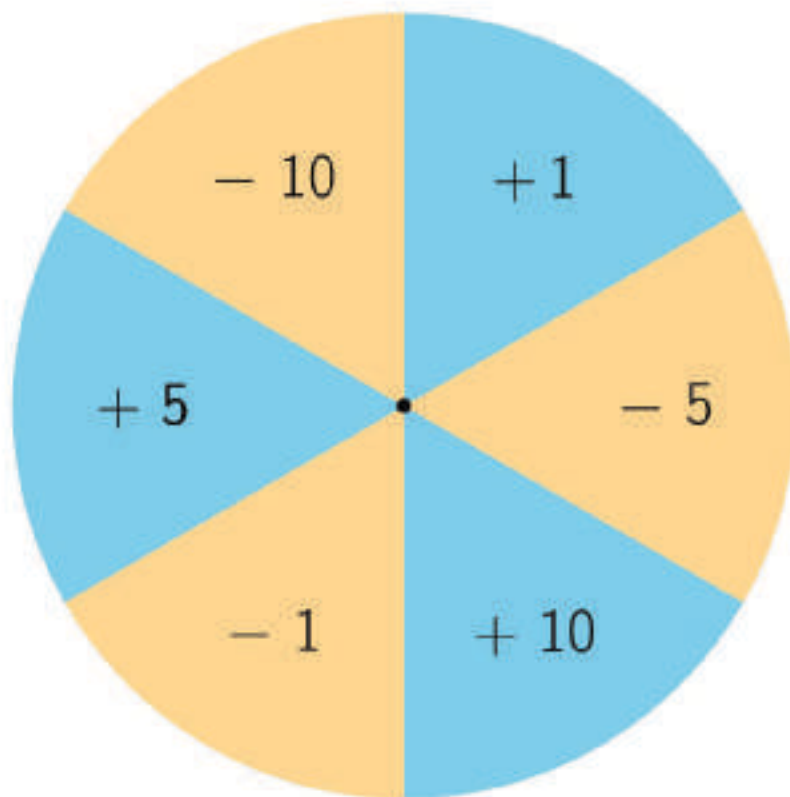
Jump the Line Stage 1 Gameboard

Directions:

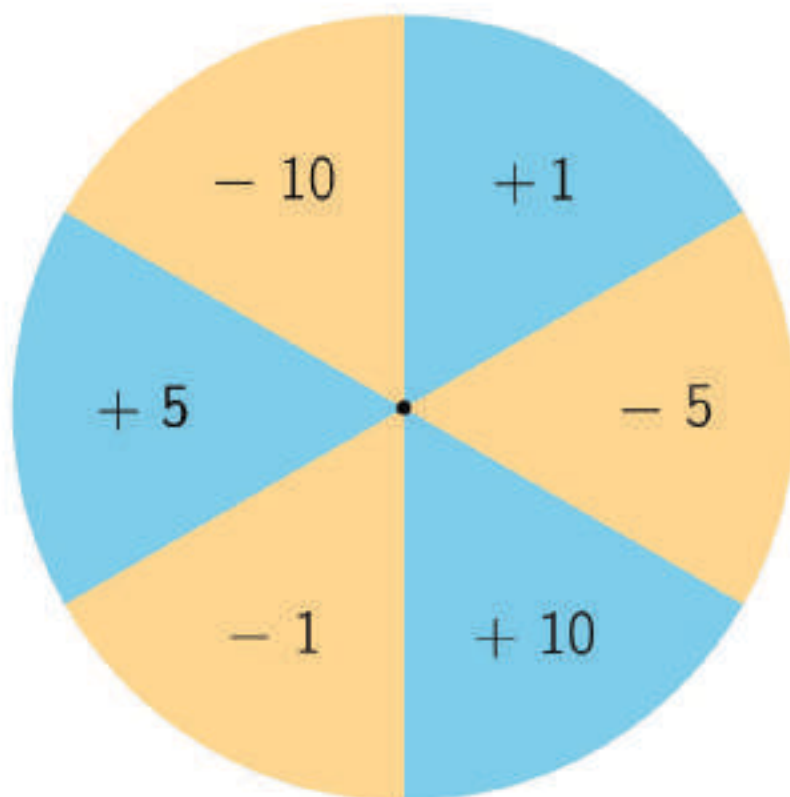
- Together with your partner, decide on 3 target numbers and mark them on your number line.
- On your turn:
 - Spin all 3 spinners. Decide which moves you want to use on your turn.
 - Mark where you ended up on the number line.
- Take turns spinning and moving on the number line. The first partner to land on 2 of the target numbers wins.



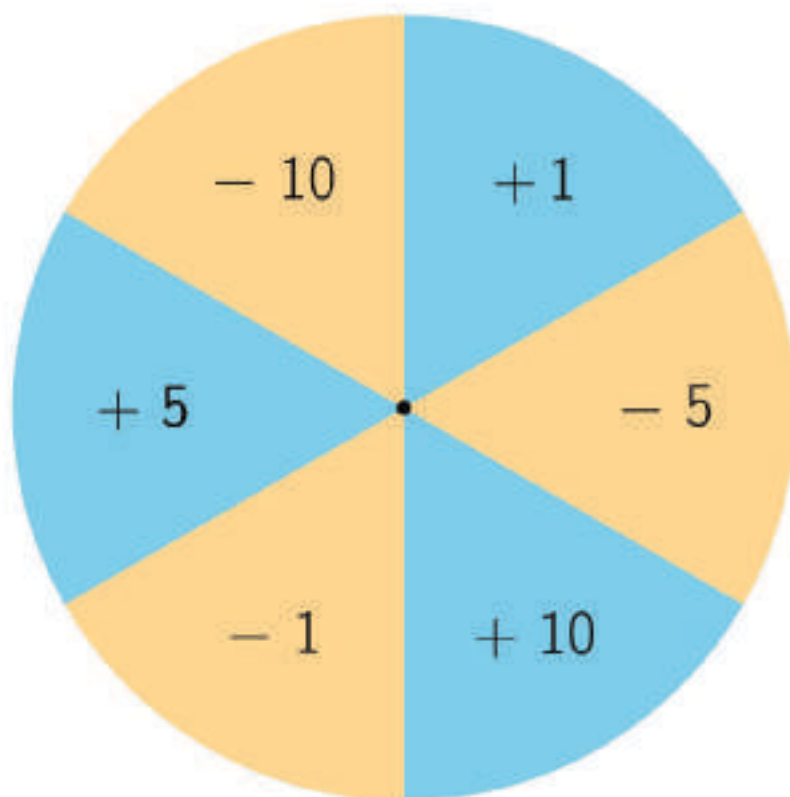
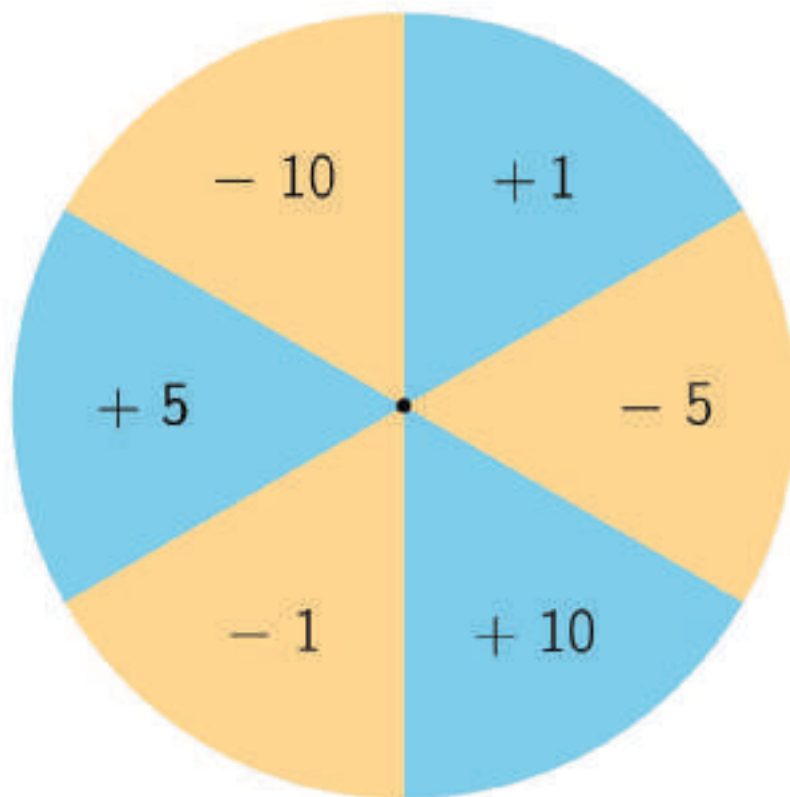
Jump the Line Stage 1 Spinners



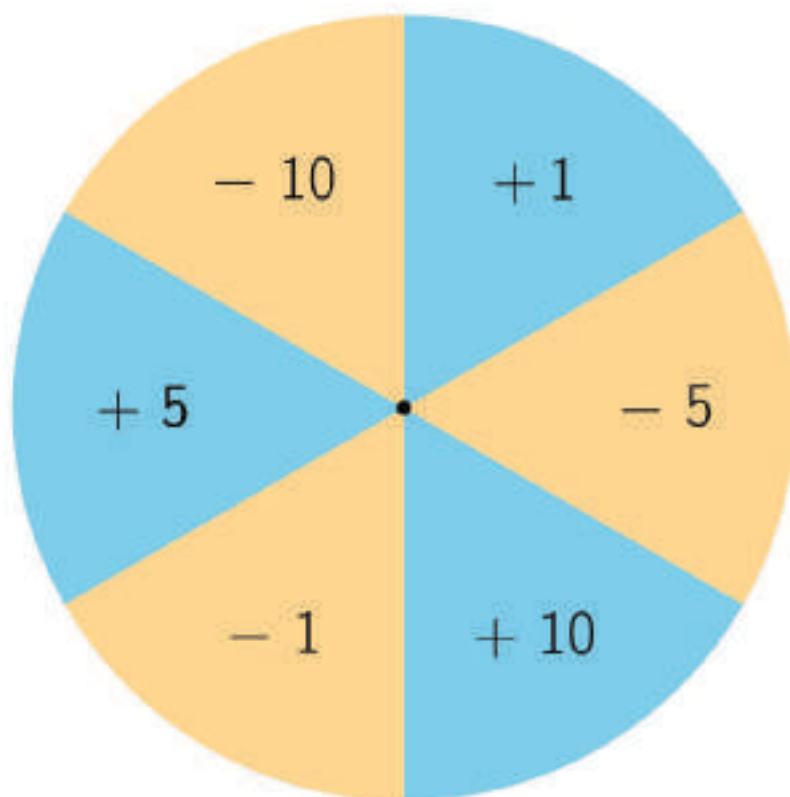
Jump the Line Stage 1 Spinners



Jump the Line Stage 1 Spinners



Jump the Line Stage 1 Spinners



Five in a Row Addition and Subtraction Stage 6 Gameboard

Directions: (two-digit plus two-digit)

- Partner A: Put a paper clip on 2 numbers in the grey rows. Cover the sum of the 2 numbers with a counter.
- Partner B: Move 1 of the paper clips, add the numbers, and cover the sum with a counter.
- Take turns. The first partner to cover 5 squares in a row wins.



81	91	54	46	90
84	83	35	82	53
60	92	99	73	51
73	42	44	53	92
100	75	82	61	64

16	27	25	34	35
----	----	----	----	----

65	19	57	26	48
----	----	----	----	----

Five in a Row Addition and Subtraction Stage 6 Gameboard

Directions: (one-digit plus two-digit)

- Partner A: Put a paper clip on 2 numbers in the grey rows. Cover the sum of the 2 numbers with a counter.
- Partner B: Move 1 of the paper clips, add the numbers, and cover the sum with a counter.
- Take turns. The first partner to cover 5 squares in a row wins.



75	64	24	26	63
65	25	22	31	55
58	30	67	32	66
72	56	54	34	71
74	23	33	73	57

5	6	7	8	9
---	---	---	---	---

17	25	49	58	66
----	----	----	----	----

Directions:

- Each partner:
 - Take 7 cards.
 - Choose 4 cards to make 2 two-digit numbers.
 - Write an equation to show the sum of the numbers you made.
 - Compare sums with your partner, whoever is closer to 100 wins a point.
- Take 4 new cards and start the next round.

$$\begin{array}{|c|c|} \hline \square & \square \\ \hline \end{array} + \begin{array}{|c|c|} \hline \square & \square \\ \hline \end{array} = \underline{\hspace{2cm}}$$

$$\begin{array}{|c|c|} \hline \square & \square \\ \hline \end{array} + \begin{array}{|c|c|} \hline \square & \square \\ \hline \end{array} = \underline{\hspace{2cm}}$$

$$\begin{array}{|c|c|} \hline \square & \square \\ \hline \end{array} + \begin{array}{|c|c|} \hline \square & \square \\ \hline \end{array} = \underline{\hspace{2cm}}$$

$$\begin{array}{|c|c|} \hline \square & \square \\ \hline \end{array} + \begin{array}{|c|c|} \hline \square & \square \\ \hline \end{array} = \underline{\hspace{2cm}}$$

--	--

 +

--	--

 =

--	--

 +

--	--

 =

--	--

 +

--	--

 =

--	--

 +

--	--

 =

--	--

 +

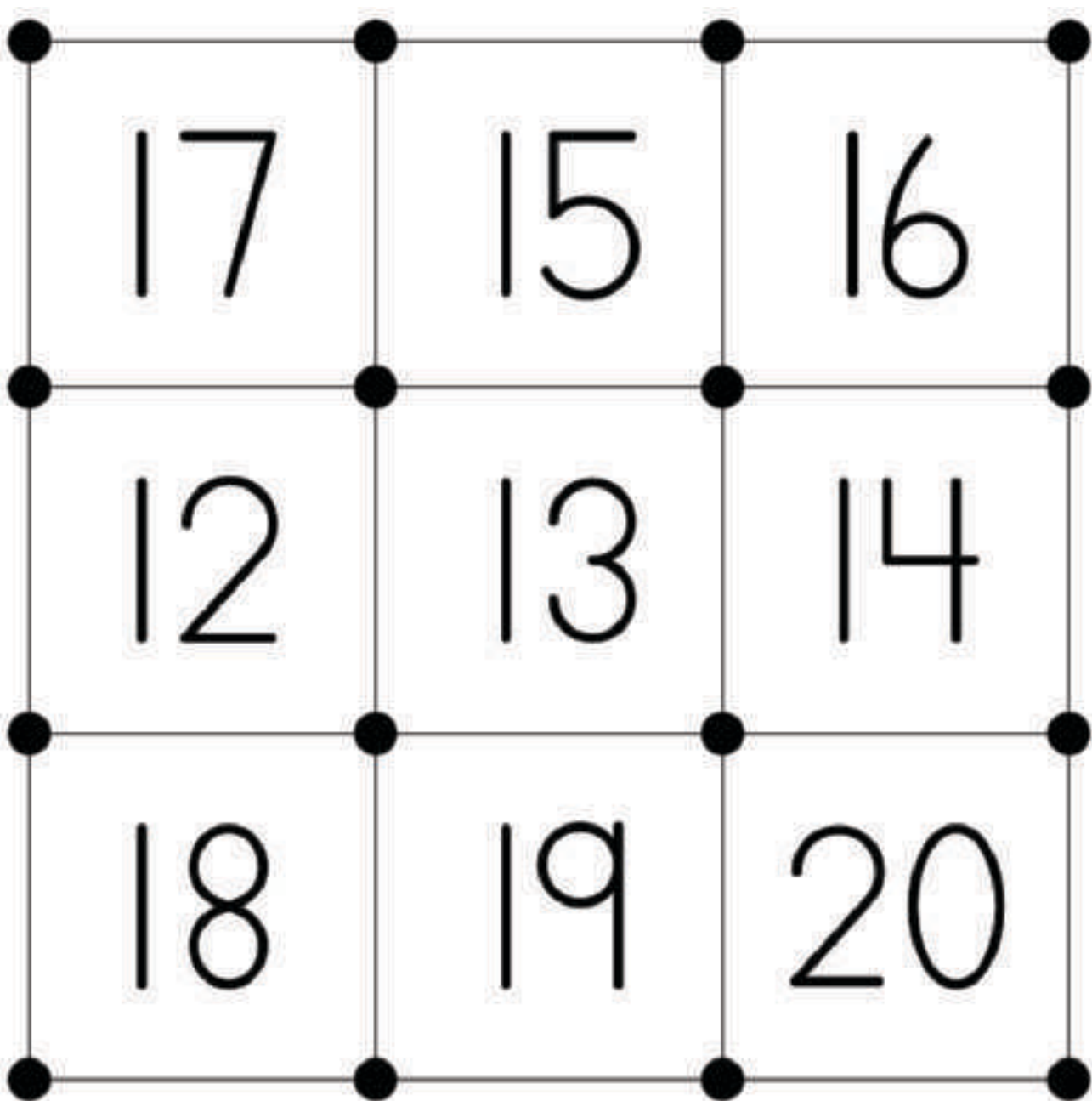
--	--

 =

Capture Squares Stage 3 Gameboard

Directions:

- On your turn:
 - Spin the spinner and take 1 number card. Find the sum.
 - Choose a square on the gameboard that shows that number. Draw one line connecting any 2 dots around the number.
 - If you can't draw a line, spin again and take a new card.
 - If you draw a line that finishes a square around a number, shade in that box with your color.
- Take turns with your partner. The first player to shade in 3 boxes wins.

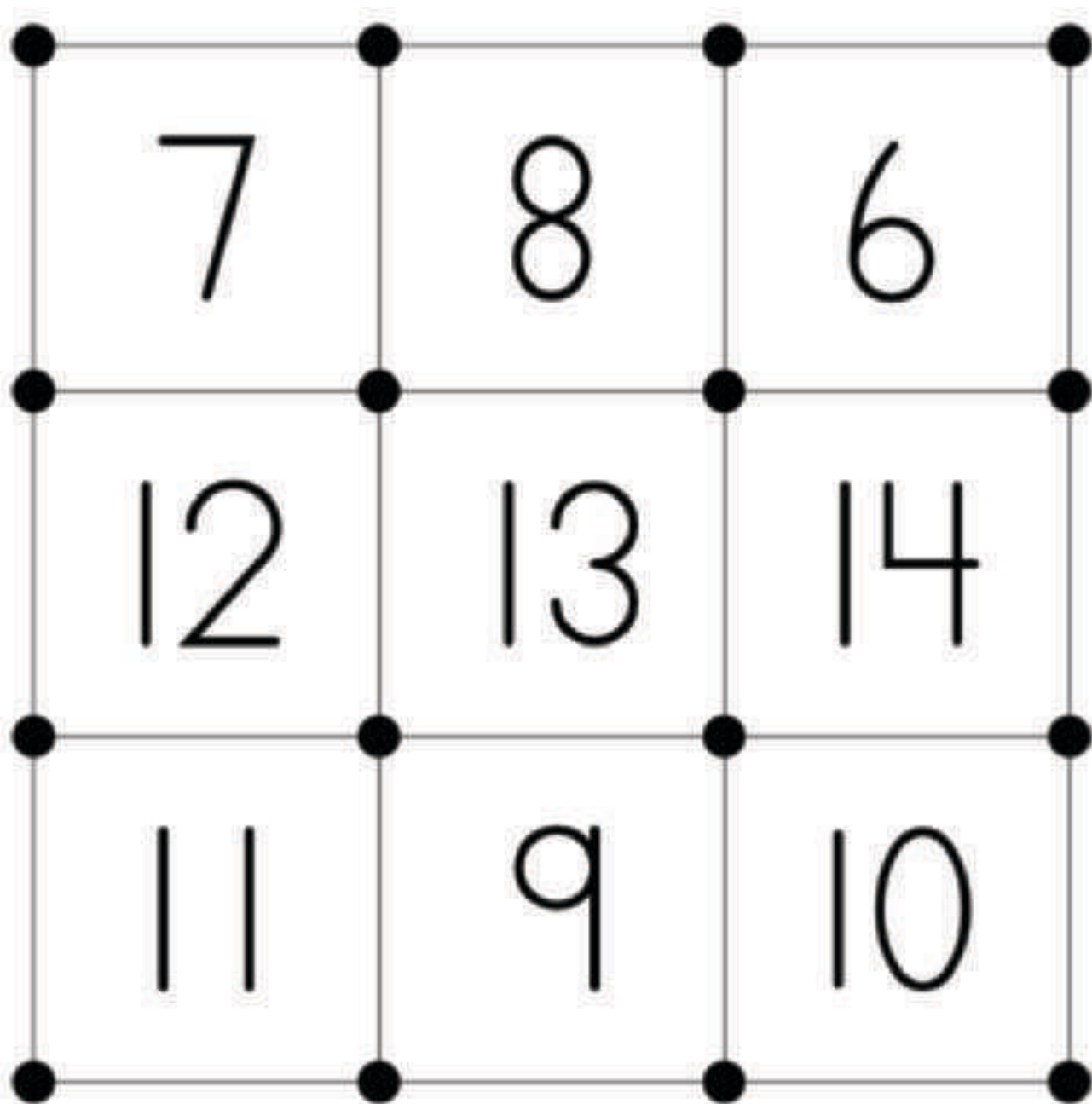




Capture Squares Stage 4 Gameboard

Directions:

- On your turn:
 - Spin the spinner and take 1 number card. Subtract the number on the card from the number on the spinner.
 - Choose a square on the gameboard that shows that number. Draw one line connecting any 2 dots around the number.
 - If you can't draw a line, spin again and take a new card.
 - If you draw a line that finishes a square around a number, shade in that box with your color.
- Take turns with your partner. The first player to shade in 3 boxes wins.





Number Puzzles Digit Cards

[illegible]

Puzzle 1

Make each equation true. Use number cards 0-9.

$63 = 5 \square + 8$	$63 = 5 \square + \square$
$63 = 1 \square + 52$	$63 = 3 \square + \square 9$
$63 = \square + 24$	$63 = 3 \square + 25$

Puzzle 2

Make each equation true. Use number cards 0-9.

$80 = 3 \square + 41$	$80 = \square 3 + 7$
$80 = 27 + \square \square$	$80 = 1 \square + 6 \square$
$80 = \square \square + 16$	$80 = 5 \square + 29$

Puzzle 3

Make each equation true. Use number cards 0-9.

$27 = 1 \square + 14$	$27 = 1 \square + 1 \square$
$27 = 9 + \square \square$	$27 = 2 \square + 3$
$2 \square = 1 \square + 11$	$27 = 1 \square + 8$







Puzzle 4

Make each equation true. Use number cards 0-9.

$92 = \square\square + 6$	$92 = \square + 83$
$92 = 7\square + 1\square$	$92 = 9\square + \square$
$92 = 39 + 5\square$	$92 = 78 + \square\square$

Puzzle 5

Make each equation true. Use number cards 0-9.

$46 =$  $+ 23$	$46 = 1$  $+ 31$
$46 = 4$  $+ 5$	$46 = 3$  $+ 7$
$46 = 3$  $+ 10$	$46 = 3$  $+ 8$

Credits

CKMath K–8 was originally developed by Open Up Resources and authored by Illustrative Mathematics, <https://www.illustrativemathematics.org>, and is copyrighted as 2017–2019 by Open Up Resources. It is licensed under the Creative Commons Attribution 4.0 International License (CC BY 4.0). The Open Up Resources K–8 Math Curriculum is available at: <https://www.openupresources.org/math-curriculum/>.

Adaptations and updates to the IM K–8 Math English language learner supports are copyright 2019 by Open Up Resources and licensed under the Creative Commons Attribution 4.0 International License (CC BY 4.0),

Adaptations and updates to IM K–8 Math are copyright 2019 by Illustrative Mathematics, including the additional English assessments marked as "B", and the Spanish translation of assessments marked as "B". These adaptations and updates are licensed under the Creative Commons Attribution 4.0 International License (CC BY 4.0).

This particular work is based on additional work of the Core Knowledge® Foundation (www.coreknowledge.org) made available through licensing under a Creative Commons Attribution-NonCommercial-ShareAlike 4.0 International License.

Illustration and Photo Credits

Matthew Cole / Alamy Stock Vector: Cover B

Illustrative Math K–8 / Cover Image, all interior illustrations, diagrams, and pictures / Copyright 2019 / Licensed under the Creative Commons Attribution 4.0 International License (CC BY 4.0).

These materials include public domain images or openly licensed images that are copyrighted by their respective owners, unless otherwise noted/credited. Openly licensed images remain under the terms of their respective licenses.



CKMath™
Core Knowledge **MATHEMATICS™**

CKMath™

Core Knowledge MATHEMATICS™

A comprehensive program for mathematical skills and concepts
as specified in the **Core Knowledge Sequence**
(content and skill guidelines for Grades K–8).

Core Knowledge MATHEMATICS™

units at this level include:

Adding, Subtracting, and Working with Data

Adding and Subtracting within 100

Measuring Length

Addition and Subtraction on the Number Line

Numbers to 1,000

Geometry, Time, and Money

Adding and Subtracting within 1,000

Equal Groups

Putting it All Together

www.coreknowledge.org

Core Knowledge Curriculum Series™