



Teachers Guide | Grade 3 September



The MATH LEARNING CENTER

Number Corner® Third Edition
Grade 3 Teachers Guide Volume 1

The Number Corner Grade 3 package consists of:

Number Corner Grade 3 Teachers Guide Volumes 1–3
Number Corner Grade 3 Print Originals
Number Corner Grade 3 Student Book
Number Corner Grade 3 Print Originals Answer Key

Number Corner Grade 3 Student Book Answer Key
Number Corner Grade 3 Components & Manipulatives
Word Resource Cards
Bridges Educator Site

Digital resources noted in italics.

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Bridges in Mathematics is a standards-based K–5 curriculum that provides a unique blend of concept development and skills practice in the context of problem solving. It incorporates Number Corner, a collection of daily skill-building activities for students.

The Math Learning Center is a nonprofit organization serving the education community. Our mission is to inspire and enable individuals to discover and develop their mathematical confidence and ability. We offer innovative and standards-based professional development, curriculum, materials, and resources to support learning and teaching. To find out more, visit us at www.mathlearningcenter.org.

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Number Corner Student Book Pages

Page numbers correspond to those in the consumable books.

Loops & Groups Record Sheet.....	1
Multiplication Models	2

September Daily Planner

Day	Page	Date	Activities	Updates
Day 1	19 20		Calendar Grid Introducing the September Calendar Markers Calendar Collector Introducing the Calendar Collector	
Day 2	25		Calendar Collector What Would You Like to Know About Our Class?	CG
Day 3	27		Computational Fluency Introducing Loops & Groups	CG
Day 4	31		Calendar Grid Charting Observations, Part 1	
Day 5	33		Solving Problems Number String 1	CG
Day 6	37		Number Line Introducing Spud—the Counting Game	CG
Day 7	39		Calendar Collector Student Surveys, Part 1	CG
Day 8	41		Calendar Grid Charting Observations, Part 2	
Day 9	43		Solving Problems Number String 2	CG
Day 10	47		Number Line Spud Revisited	CG
Day 11	49		Calendar Grid Making Predictions & Writing Equations, Part 1	
Day 12	51		Calendar Collector Student Surveys, Part 2	CG
Day 13	53		Number Line From Grid to Number Path	CG
Day 14	55		Computational Fluency Loops & Groups Rematch	CG
Day 15	57		Number Line Number Riddles	CG
Day 16	59 59		Calendar Grid Making Predictions & Writing Equations, Part 2 Solving Problems Number String 3	
Day 17	63		Calendar Collector Which Read-Aloud?	CG
Day 18	67		Computational Fluency Loops & Groups with a Partner	CG
Day 19	69		Calendar Grid Completing the Multiplication Models Page	CG
Day 20	71		Calendar Grid Making Predictions & Writing Equations, Part 3	

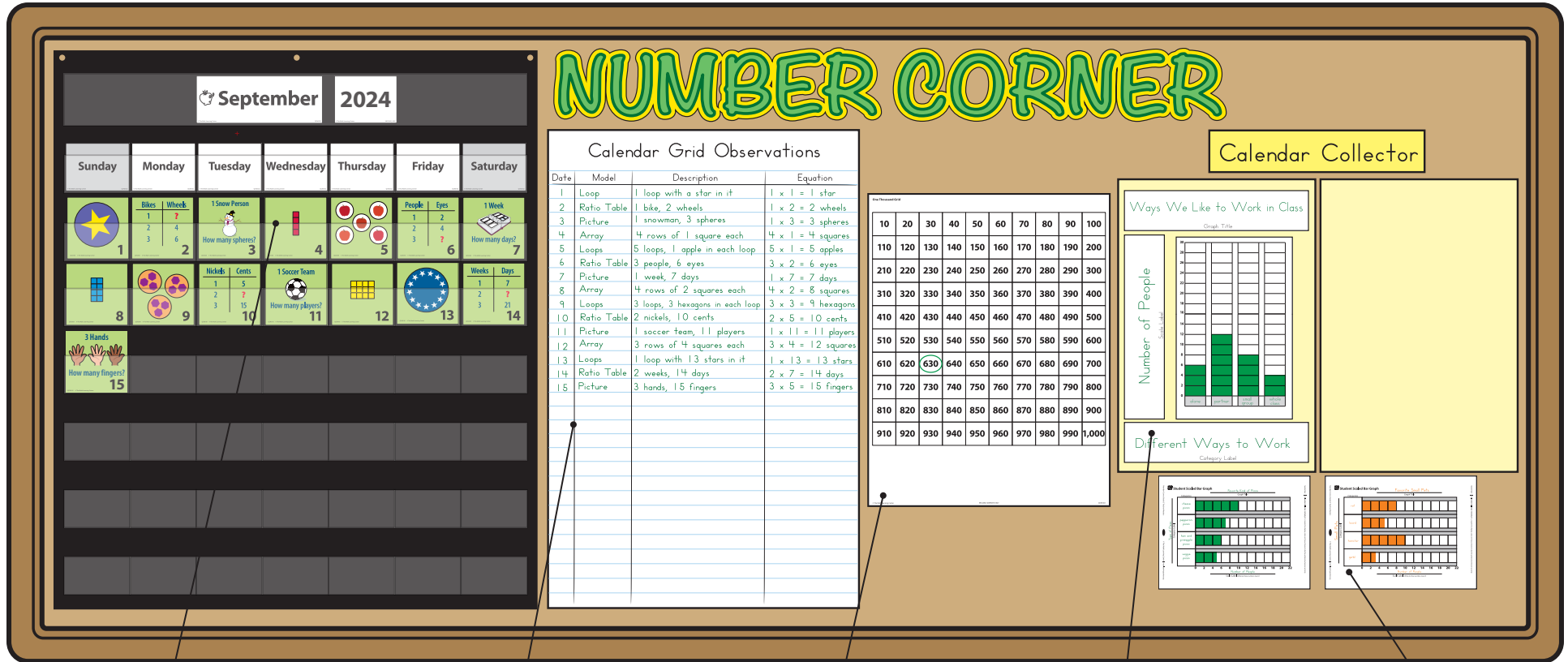
Update On days when *Calendar Grid* is not a featured workout, student helpers will update it. A summary of the update appears below; see the *Update Routine* section for details.

Calendar Grid Post the day's marker and record the date on the whiteboard.

September Sample Display

Of the items shown below, some are ready-made and included in your kit; you'll prepare others from classroom materials and the included print originals. Refer to the Preparation section in each workout overview for details about preparing the items shown. The display layout shown fits on a 10' × 4' bulletin board or on two 6' × 4' bulletin boards. Other configurations can be used according to classroom needs. If you have extra space to work with, a Number Corner header may be made from bulletin board letters, student-drawn letters, or other materials.

SAMPLE 0922



Calendar Grid Pocket Chart
Remember to consult a calendar for the starting day for this month and year.

Calendar Grid Observations Chart
You might use 24" × 36" chart paper. Laminate the chart to reuse it in the future.

One Thousand Chart
The One Thousand Chart is 17" wide by 22" tall. Remember to use an dry-erase marker.

Calendar Collector Graphs
These graphs are made from copies of print originals with half sentence strips or other strips of paper for labels. Laminate the graphs to reuse them in the future. You'll post the first graph during Day 1 and a second graph during Day 17.

Scaled Bar Graphs
You'll record data on these copies of print originals while students conduct surveys of their classmates during Days 7 and 12.

Number Corner September

Workouts

Overview

The workouts in the first month of school introduce key multiplication concepts and give students opportunities to use surveys to learn a little about their new classmates. September's workouts also provide a review of place value through 1,000 and strategies for adding multidigit numbers.

Copies & Display

- ☐ Visit the Bridges Educator Site to review the Interactive Display Materials for this month of Number Corner. Decide whether you will use interactive materials for display or copies of print originals and student book pages. Make copies as needed.
- ☐ If students do not have Number Corner Student Books, run a class set of pages 1–3.
- ☐ Additional resources, including printable sets of key questions for each September workout, are available on the Bridges Educator Site.

Teaching Tips

- Establish these types of procedures to ensure Number Corner runs smoothly all year:
 - » Moving quietly between desks and the Number Corner discussion area
 - » Picking up and putting away materials
 - » Responding to one another's thinking respectfully
 - » Discussing in pairs effectively
- Plan to spend more time on the Number Corner workouts this month.



Calendar Grid: Multiplication Models

Overview

The Calendar Grid markers this month introduce key multiplication concepts and models. Each day, a student helper adds a marker to the Calendar Grid pocket chart and records the day's date on the board. On days devoted to discussing the Calendar Grid, students make observations about the markers, generate equations to match the visuals on the markers, search for and describe emerging patterns in the sequence, and make predictions about future markers based on their observations.

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Day 11 Making Predictions & Writing Equations, Part 1	pg. 49
Day 16 Making Predictions & Writing Equations, Part 2.....	pg. 59
Day 19 Completing the Multiplication Models Page.....	pg. 69
Day 20 Making Predictions & Writing Equations, Part 3.....	pg. 71

Preparation

Kit Materials	<ul style="list-style-type: none"> • Calendar Grid pocket chart • Month, Day & Year Cards • Multiplication Models calendar markers
Classroom Materials	chart paper, lined

☐ Prepare the Calendar Grid display

Post the Calendar Grid pocket chart in your Number Corner display area. Place the September month card and the appropriate year card in the top pocket. Post the days of the week cards in the next row of pockets. Place the Multiplication Models calendar markers face-down, in number sequence, so that the visuals are hidden from students.

☐ Prepare the Calendar Grid Observations chart

Draw a four-column chart on lined chart paper. Title the chart *Calendar Grid Observations*. Label the columns in order, left to right: *Date*, *Model*, *Description*, and *Equation*. Laminate the chart to reuse it in the future. Post the chart near the Calendar Grid pocket chart.

Calendar Grid Observations			
Date	Model	Description	Equation

Mathematical Background

Students predominantly used addition to find the total number of objects in an array in second grade. The Calendar Grid activities this month launch the transition from additive thinking to multiplicative thinking. Learners begin to think in terms of groups of things, rather than counting individual objects.



Math Teaching Practice

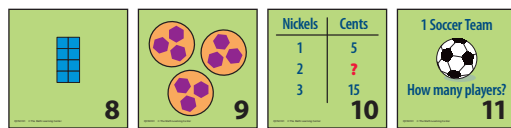
Use and connect mathematical representations

This month, students make connections among visuals that depict multiplication in the form of equal groups, arrays, and successive entries on a ratio table. As they observe and describe these models, they generate equations to represent what they see. These connected representations serve to introduce the concept of multiplication.

Vocabulary

*Word Resource Card available

array*
column
date
day
equation*
even number*
group
month
multiply*
observe/observation
odd number*
pattern*
product*
ratio table*
rectangular array
row
week
year



Along with the familiar arrays, the Calendar Grid markers use equal groups of items in loops, ratio tables, and familiar objects that come naturally grouped to model multiplicative situations. For example, in the markers above, we see 3 groups of 3 hexagons (or 3×3). We also see a ratio table indicating that if there are 5 cents in 1 nickel, there must be double that number in 2 nickels (or 2×5). The problem situation marker gets at the fact that there are 11 players on a soccer team (or 1×11). By using words and numbers to describe the markers through the month, students learn that multiplication is a means to determine the total number of objects when there are a specific number of groups and each group has the same number of objects. Furthermore, they learn that the multiplication symbol \times can be interpreted as *groups of*, and expressions such as 3×2 can be understood as *3 groups of 2*.

About the Pattern

Revealing one calendar marker each day allows students to make and test predictions, discovering patterns as new markers are added and their predictions are confirmed or found to be unsupportable. Don't tell them what the patterns are; instead, allow them to pursue their own ideas and investigations.

- The first pattern students will likely become aware of is the ABCD pattern in the types of visuals/models shown on the markers: looped groups, ratio table, picture, rectangular array.
- Students might observe within the first week or two that the product always matches the date. The rectangular array on marker 8 is composed of 8 squares. There are 3 hexagons in each of 3 loops on marker 9.
- The arrays are patterned by color: red, blue, yellow; red, blue, yellow.
- The arrays of squares on markers 4, 8, 12, 16, 20, and so on, are arranged into 4 rows, 4 rows, 3 rows; 4 rows, 4 rows, 3 rows (i.e., 4×1 , 4×2 , 3×4 ; 4×4 , 4×5 , 3×8).
- The rectangular arrays are all multiples of 4: 4, 8, 12, 16, 20, 24, and so on. It might be noted that these numbers are all even.



Equity-Based Practice

Going deep with mathematics

In this month's Calendar Grid, students might encounter disequilibrium while making predictions about future markers and writing equations to represent the visuals on the calendar grid. Because there are multiple solutions in most cases, students will frequently have the opportunity to hone their skills with analyzing, comparing, justifying, and proving their solutions.



Note

The Betsy Ross flag referred to on Marker 26 was designed during the American Revolution and features 13 white stars arranged in a circle on a blue background (similar to the display on Marker 13). Each star represents 1 of the original 13 colonies.

Key Questions

Learning to search for, describe, and extend patterns facilitates algebraic thinking. Use these questions to help your students investigate this month's pattern.

- What will today's marker look like? What number and model will it show? How do you know?
- When will you see the next set of looped groups (the next ratio table, the next every-day object, or the next rectangular array)? How do you know?
- Can you make more detailed predictions about today's marker? We know it will have 9 (13, 17, 21, 25, 29) items, and they'll be grouped into loops. Can you predict how many loops there will be, and how many items we will see in each loop?
- We know tomorrow's marker will show an array. Can you predict how many rows and how many columns the array will have? Can you use some of our colored tiles to build your prediction?
- We know the marker for today will show objects that come in groups, like the hands on marker 15 each show 5 fingers. The date today is the 19th. Can you imagine how that might be pictured? Can you think of anything that comes in groups of 19, or in equal groups that add up to 19?
- What multiplication equation(s) can we write to represent the model on today's marker?



Calendar Collector: Class Data

Overview

This month's Calendar Collector focuses on collecting information about the class in the form of survey data. The class shares ideas about surveys and participates in one, and the teacher displays the results on a scaled bar graph. The class brainstorms ideas for surveys, and each student plans a survey to conduct with their classmates. Later in the month, the teacher selects the plans of two students and works with them to conduct their surveys in class. An optional extension suggests how to have all the students conduct their surveys at another time. In the last activity, the class creates a scaled picture graph to show the results of a final survey.

Day 1	Introducing the Calendar Collector.....	pg. 20
Day 2	What Would You Like to Know About Our Class?.....	pg. 25
Day 7	Student Surveys, Part 1	pg. 39
Day 12	Student Surveys, Part 2.....	pg. 51
Day 17	Which Read-Aloud?.....	pg. 63

Preparation

Copies & Display	PO P1 Scaled Bar Graph Sheet PO P2 Scaled Bar Graph Extension Sheet (optional) PO P3 Scaled Picture Graph Sheet PO P4 Scaled Picture Graph Extension Sheet (optional) PO P5 Picture Graph Markers
Classroom Materials	<ul style="list-style-type: none"> • sentence strips (3) • small zip top bag

☐ Prepare scaled bar and picture graphs

You will conduct surveys with the class on Days 1 and 17 this month, recording students' responses on scaled graphs.

- Run one copy each of the Scaled Bar Graph Sheet and the Scaled Picture Graph Sheet print originals. If your class is large, run copies of the graph extension print originals for both graphs. Trim and attach the extensions to the graphs ahead of time, or keep the extensions on hand in case you need them during the activities.
- On the bar graph, label the bottom of each column with one of four work preferences: *alone*, *partner*, *small group*, and *whole class*. Laminate both graphs to reuse them in the future. Post the bar graph in your Number Corner display area for Day 1. You'll post the picture graph on Day 17.

☐ Prepare graph labels

Cut three sentence strips in half to produce six 3" × 12" strips. Use five of the strips to create labels for the two graphs you will make with the class this month. You'll write labels on these strips with student input, but for now write a small caption on each strip:

- 2 strips with the caption *Graph Title*
- 2 strips with the caption *Category Label*
- 1 strip with the caption *Scale Label*

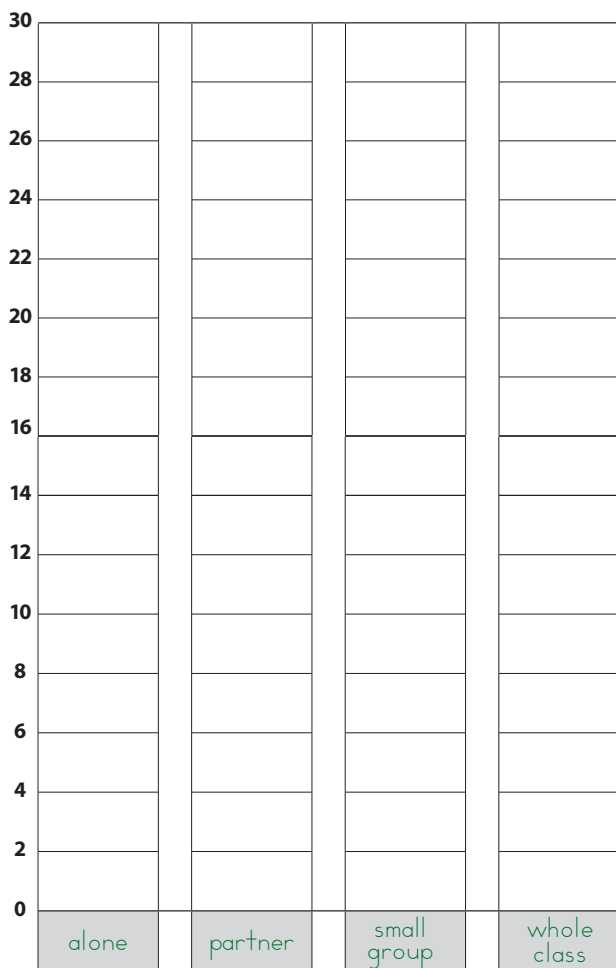
Laminate the strips to reuse them in the future. You will need one of each type of strip for the bar graph on Day 1, and the Graph Title and Category Label strips for the picture graph on Day 17.

Vocabulary

**Word Resource Card available*

bar graph*
 category/categories
 collect
 compare
 data*
 display
 fewer/fewest
 information
 least
 more
 most
 picture graph*
 popular
 results
 scale*
 survey
 title

Graph Title



Blank Scaled Bar Graph (with extension) for Day 1

KEY:

Blank Scaled Picture Graph for Day 17

**Prepare books and picture graph markers**

- For Day 17, choose four books you particularly enjoy reading to students, and have them available to display.
- On the picture graph you prepared, write one book title in the first space of each row.
- Run a copy of the Picture Graph Markers print original, cut the markers apart, and put them in a small zip-top bag or envelope.

Mathematical Background

This month's workout revolves around data collected from surveys. A *survey* is a method of collecting a sample of data by asking people questions. To conduct a survey, one must choose a topic and develop the questions to be asked or the choices to be given. In most situations, the people conducting the survey must also choose what type of people to ask, and then identify an exact group of participants. In this setting, however, the population is already given — the group of students in the classroom.

The data collected in a survey can be displayed in different ways. In the case of the surveys conducted this month, students respond to questions by show of hands, and the information will be recorded directly onto a graph. The class creates two types of graphs: picture and bar graphs. A *picture graph*, sometimes called a pictograph, uses pictures or symbols to represent data. A *bar graph* uses bars to show quantities or numbers for easy comparison.

Students might remember working with both types of graphs in second grade. The idea of making and reading a *scaled graph*, or a graph in which each increment or picture stands for more than one person or object, will be new, however. Third graders are also ready to learn to use the accepted conventions for creating and labeling graphs:

- Bar graphs include a title, a scale, a scale label, categories, a category label, and data.
- Picture graphs include a title, categories, a category label, a key, and data.

Key Questions

Use the following questions to guide students in creating, reading, and interpreting scaled graphs this month.

- What is this survey about? What choices does it offer the people who participate?
- What might be a good title for the graph on which we're going to display the results of this survey?

- Let's look at the scale for this graph. What does each rectangle or each picture stand for?
- Which of the choices offered by the survey was the most or the least popular?
- How many more students chose _____ than _____?
- How many fewer students chose _____ than _____?
- What is the difference between the number of people who voted for the most popular choice and the number of people who voted for the least popular choice?
- How many students participated in their survey?
- Who would find these results interesting or useful?
- Do you think the results would be the same or similar if this survey was conducted in another third grade in our school? What about a third grade in another town, state, or country? What about a different grade level?



Computational Fluency: Loops & Groups

Overview

Students play a game in which they find the product of two numbers between 1 and 6. They sketch equal groups and write equations to represent the results. After four turns, they find the sum of the products. Over the course of the month, the teacher plays the game twice with the whole class and then has students play it again in pairs.

Day 3 Introducing Loops & Groups pg. 27

Day 14 Loops & Groups Rematch pg. 55

Day 18 Loops & Groups with a Partner pg. 67

Mathematical Background

Loops & Groups is a simple but effective game that helps incoming third graders begin to extend what they know about repeated addition to the operation of multiplication. The game introduces and reinforces the following basic multiplication concepts:

- Multiplication is a way to determine the total number of objects when there is a specific number of groups with the same number of objects in each group.
- Multiplication requires thinking in terms of groups of things instead of individual things.
- The multiplication symbol can be interpreted as *groups of*, and expressions such as 4×6 can be understood as 4 *groups of* 6.

Key Questions

Use questions such as these to maintain a high level of student engagement while playing Loops & Groups.

- I spun a 3 on the Loops spinner, and I landed on the triangles when I spun the Groups spinner. How many triangles will I get in all? How did you figure it out?
- The class just spun a 4 on the Loops spinner. What would you have to spin on the Groups spinner to get a product greater than mine?
- How does your product for the second turn compare with mine? Which product is greater? By how much?
- Now that both teams have had three turns, let's figure out who's ahead. If you add my three products, what's the total? What is the total of your three products? Which team is ahead? By how much?
- What will you need to spin on your last turn to win? Is there more than one possibility?

Vocabulary

**Word Resource Card available*

equation*

group/groups

multiply*

product*

repeated addition

sum*



Number Line: Up to 1,000

Overview

In the September Number Line workout, students learn to play a new counting game, make their own number paths, and use their paths to solve a variety of number riddles. Throughout these activities, the focus is on reading numbers to 1,000 using base ten numerals and expanded form, and looking for and describing patterns in the multiples of 10 and 100 to 1,000 as they appear on a grid and on a number path.

Day 6 Introducing Spud — the Counting Game..... pg. 37

Day 10 Spud Revisited pg. 47

Day 13 From Grid to Number Path pg. 53

Day 15 Number Riddles..... pg. 57

Preparation

Kit Materials	One Thousand Chart
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☐ Post the One Thousand Chart wall display in your Number Corner display area.

Mathematical Background

The Number Line workout this month provides a review of key place value skills and concepts which students were to have developed proficiency with in second grade, including reading numbers and counting by 10s and 100s to 1,000, and understanding the relationship between 100s and 10s. Specifically, students will review the fact that a number such as 250 is 2 hundreds and 5 tens, but it can also be expressed as 25 tens.

Key Questions

Use the following questions to guide students' discussion during Number Line this month.

- What comes before ____?
- What comes after ____?
- What is in between ____ and ____?
- How many tens are there in 70? How do you know?
- How many hundreds and tens are there in 150? If you traded in the hundred for tens, how many tens would there be in 150? How did you figure it out?
- If you trade in all the hundreds for tens, how many tens are there in 230 (380, 410, 500, 670, and so on)? How do you know?

Vocabulary

**Word Resource Card available*

after
before
between
digit
hundreds
ones
place value
tens
thousand



Solving Problems: Adding 2- & 3-Digit Numbers

Overview

This month, students are introduced to number strings and use them to review strategies for adding 2- and 3-digit numbers.

Day 5 Number String 1 pg. 33

Day 9 Number String 2 pg. 43

Day 16 Number String 3 pg. 59

Preparation

The Solving Problems workout changes from month to month. During some months, students will work on problem-solving skills such as interpreting and solving problem situations, making estimates, writing equations, and checking work. This month, students participate in several number strings, each designed to elicit a particular strategy for adding multidigit numbers.

- ☐ Decide where you want to do the number string and set up that area—you'll need plenty of space to write where everyone can see. This can be on a whiteboard, document camera or projector, or chart paper. The write-up that follows presumes you will gather students in the Number Corner discussion area, as sitting close together in a circle or semicircle facilitates student-to-student dialog. If this is not possible in your classroom, figure out what works best for you.

Vocabulary

**Word Resource Card available*

add/addition
digit
hundreds
ones
open number line
strategy
sum*
tens

Mathematical Background

The strings this month have a twofold purpose: to accustom students to the number string routine and to deepen their understanding of efficient strategies for adding multidigit numbers. Use this month to set high expectations for students to share in strings, whether through sharing a strategy, asking questions, or using something learned during a string in a new context.

Mathematically, the strings this month build on the addition strategies of place value splitting and using friendly numbers for 2- and 3-digit addition introduced and developed in second grade. These strategies, along with the models best used to represent them, are described below. They should be familiar to students who worked with Number Corner in first and second grade.

Place Value Splitting

As students calculate with 2- and 3-digit numbers, they often make sense of such problems by splitting (or “decomposing”) the number into its component parts based on place values. For example, consider the problem $34 + 17$. A student using place value splitting will split 34 into 30 and 4, and split 17 into 10 and 7. Next, the student adds the tens ($30 + 10 = 40$), then adds the ones ($4 + 7 = 11$). Finally, they add the tens and ones to get 51. As second graders, students had many opportunities to use base ten number pieces and sketches, which allowed them to see the different units (in this case, tens and ones) and then group and add like parts. We suggest using a series of equations similar to the following to represent student thinking when place value splitting strategies are shared.

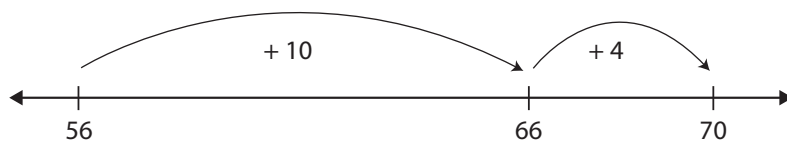
$$\begin{aligned}
 34 + 17 &= (30 + 4) + (10 + 7) \\
 &= (30 + 10) + (4 + 7) \\
 &= 40 + 11 \\
 &= 51
 \end{aligned}$$

This strategy works equally well when adding 3-digit numbers. Students add the hundreds, the tens, and the ones, and then go back to find the grand total. While not always as efficient as other addition strategies, place value splitting is a valuable strategy. Because it puts the place value of each digit in the forefront, we can think of it as a precursor to understanding the standard algorithm.

Multidigit Addition Strategies

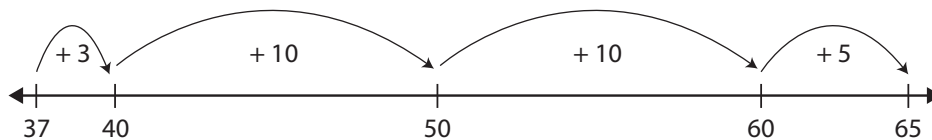
- **Add a Friendly Number**

As students develop confidence with adding by (and via) tens, they recognize the value of keeping one number whole and operating from there. They can use the place value patterns to jump by friendly numbers, often multiples of 10. Consider the problem $56 + 14$. A student might start on 56 and then decompose (split) the 14 into a group of 10 and 4. Then they add 10 to 56 to arrive at 66. Next, they add 4 more to arrive at a total of 70.



- **Get to a Friendly Number**

With this addition strategy, students keep one addend whole and then add enough to get to a friendly number (usually 10, or a multiple of 10, but sometimes a landmark number like 25). From this new friendly number, they can then jump by a multiple of 10 or some other fruitful number. To add $37 + 28$, a student might start at 37 and add 3 to get to 40. From 40, they must add 25 more, which might be done in a number of ways (e.g., jump by 20, then 5 more; jump by 10, 10, and 5).



Key Questions

Use these questions to help your students investigate this month's strings.

- What do you know that could help you solve this problem?
- What strategy could you use?
- How can you show your thinking?
- What model could you use to show your thinking?
- How can solving one problem in a string help you solve a problem later in the string?
- What is the big idea of this string?
- How can your work with this string help you with other problems?

Number Corner September

Update Routines

You'll usually update Calendar Grid before moving on to the day's featured activity. This brief update creates consistency for students as they practice noticing and predicting patterns and explore the month's mathematics.

Calendar Grid

Starting Day 2, have a student helper follow this update procedure every day that Calendar Grid is not a featured workout.

Procedure

1. Post one or more calendar markers so that the Calendar Grid is complete up to the current date.
2. Record today's date on the classroom whiteboard.

Calendar Collector

There are no updates for this month's Calendar Collector. However, if interest is high, consider implementing the optional extension that appears at the end of Day 12.

Number Corner September

Focus Standards

Calendar Grid Multiplication Models

- 3.OA.1** Interpret products of whole numbers
- 3.OA.3** Solve multiplication story problems with products to 100 involving situations of equal groups and arrays
- 3.MP.7** Look for and make use of structure

Calendar Collector Class Data

- 3.MD.3** Make a scaled bar graph or picture graph to represent a data set with several categories
- 3.MD.3** Solve one- and two-step comparison problems using data shown on a scaled bar or picture graph with several categories
- 3.MP.2** Reason abstractly and quantitatively

Computational Fluency Loops & Groups

- 2.NBT.6** Add up to four 2-digit numbers using strategies based on place value and properties of operations
- 3.OA.1** Interpret products of whole numbers
- 3.MP.2** Reason abstractly and quantitatively

Number Line Up to 1,000

- 2.NBT.1** Demonstrate an understanding that the digits in a 3-digit number represent amounts of hundreds, tens, and ones
- 2.NBT.2** Skip-count by 10s and 100s up to 1,000
- 3.OA.9** Identify arithmetic patterns among multiples of 10 to 1,000
- 3.MP.7** Look for and make use of structure

Solving Problems Adding 2- & 3-Digit Numbers

- 3.NBT.2** Use strategies based on place value, properties of operations, or the relationship between addition and subtraction to add fluently with sums to 1000
- 3.MP.1** Make sense of problems and persevere in solving them

Day 1



Calendar Grid: Introducing the September Calendar Markers

Kit Materials | prepared Calendar Grid display

- 1 Invite students to join you in the Number Corner area, then introduce the Calendar Grid.
 - Post today's calendar marker and any markers that come before it if you are not starting on the first of the month.
 - Explain that starting tomorrow, you will select a helper each day to post the new calendar marker for that day (and for Saturday and Sunday if that day is a Monday) and record the day's date on the whiteboard.
- 2 Read the date aloud while pointing to the days of the week, the month, the date, and the year.



"Tuesday, September third, 2024"

- 3 Write the date on the class whiteboard, using the abbreviation *Sept.* for September. Then review that there is another abbreviated or shortcut way to write the date.
 - Ask students to name the months, January through September, as you keep count.
 - Explain that September is the ninth month of the year, and record the short form of the date.

Sept. 3, 2024
9/3/24

- 4 Discuss the markers posted so far.
 - Invite the class to look at the calendar markers quietly and show thumbs-up when they have something to share.
 - Have students share their observations, first with a partner and then as a class.



Instructional Routine

Think-pair-share

As they make observations about the calendar markers, think-pair-share provides an opportunity for students to discuss their ideas with a peer before sharing them publicly. The opportunity to rehearse their thinking increases student engagement in both the mathematical content and the classroom discourse.



Calendar Collector: Introducing the Calendar Collector

Classroom Materials

- prepared scaled bar graph
- crayons or markers in 4 colors
- prepared graph labels

The crayon or marker colors you choose should show up easily on the prepared bar graph but not obscure the lines. Try bright versions of green, red, blue, and orange.

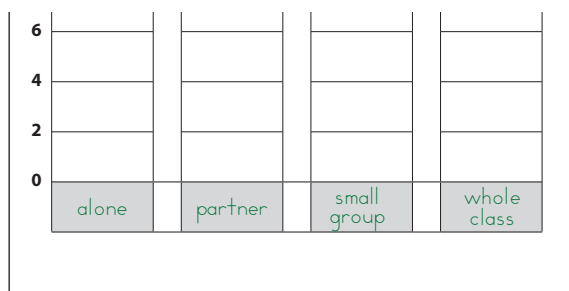
- 1 To introduce the new Calendar Collector, explain that this month's collection will focus on data.
Write the word *data* on the board. Read it with the class, and ask students to share anything they already know about the term, first in pairs and then as a class. Here are some questions to spark students' thinking:
 - *What is data?*
 - *How do people collect data?*
 - *Why do people collect data?*
- 2 After a brief discussion, let students know that this month, the class will collect data by conducting surveys.
 - Review that a *survey* is a way to collect data by asking people questions. Perhaps some students remember conducting surveys with their classmates last year, or seeing survey results in a book, a newspaper, or online.
 - Explain that groups conduct surveys about all sorts of things, usually to help make decisions of one sort or another.
 - Invite students to share situations in which surveys might be used.
- 3 Let students know that you want to conduct a survey today about their work preferences.
- 4 Explain that the first thing people have to do when they conduct a survey is to ask a question. This is your question for the class today: When working in class on a challenging math problem or an interesting science experiment, do you most prefer to do the work alone, with a partner, in a small group, or with the whole class?
While we require students to work independently on some assignments and in pairs or groups on others, it can be very helpful to know which students would prefer to work alone rather than with others and which need the security, support, and relative anonymity of working in small-group or even whole-class settings.
- 5 Draw students' attention to the graph you posted (blank except for the four preferences listed at the bottom). Explain the process you will follow to conduct the survey.



Equity-Based Practice

Drawing on multiple resources of knowledge

Allowing students to generate data using questions that interest them and providing the opportunity to mathematize information about their classmates creates connections between students' lived experiences and the math classroom.



- In a minute, you will ask students to close their eyes while you read the options.
 - You will ask them to make their choice without telling anyone. As they choose, they should remember that you're talking about situations where they're working on a challenging math problem or doing an interesting science experiment, rather than reading a book or writing a story.
 - While their eyes are still closed so their choice will be private, you will name each way of working and ask them to raise their hand when you name their favorite.
 - You will count the number of hands raised for each work preference and record those numbers on the board.
- 6 When students understand the procedure, have them close their eyes. Conduct the survey with the class, and record the results where everyone can see them.
- 7 Have the class open their eyes and look at the results. Then work with their input to display the results on the blank graph you've prepared.
- Explain that this is a *scaled* graph, and each of the rectangles stands for more than one person or one vote.
 - Give them a few moments to examine the graph, and then ask them to talk in pairs about the number of rectangles you should shade in to show how many people chose *working alone* as their preferred way of working.
 - Call on a few volunteers to share and explain their answers.
 - You might need to ask students how an odd data value will be represented in the graph, since only even numbers appear on the vertical axis. Students should suggest shading in half of a rectangle in the appropriate column.

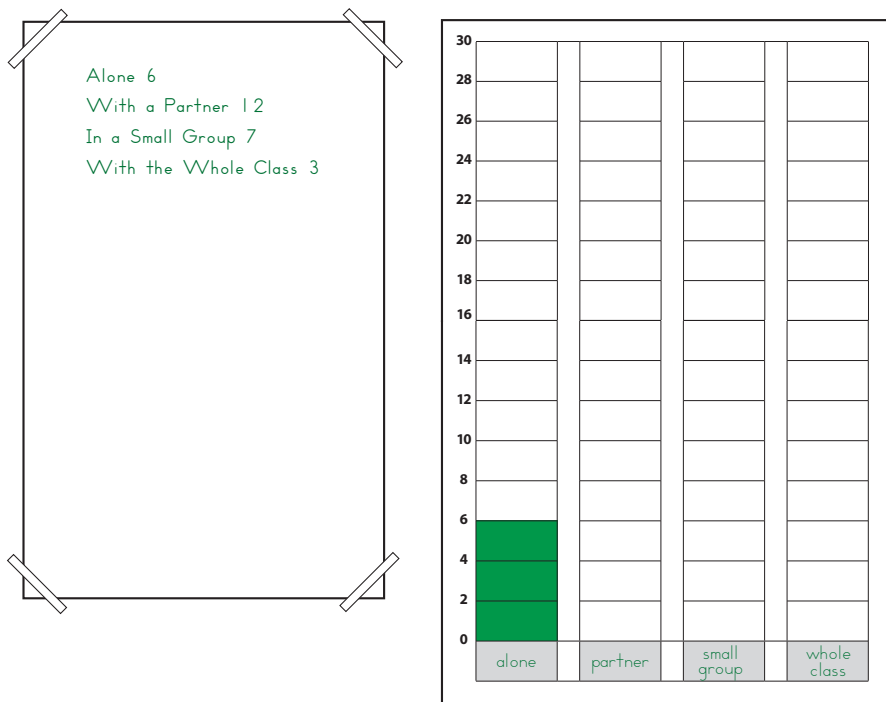
Marco Six people said they like working alone, so you should color in three of those rectangles.

Teacher How are you thinking about that, Marco?

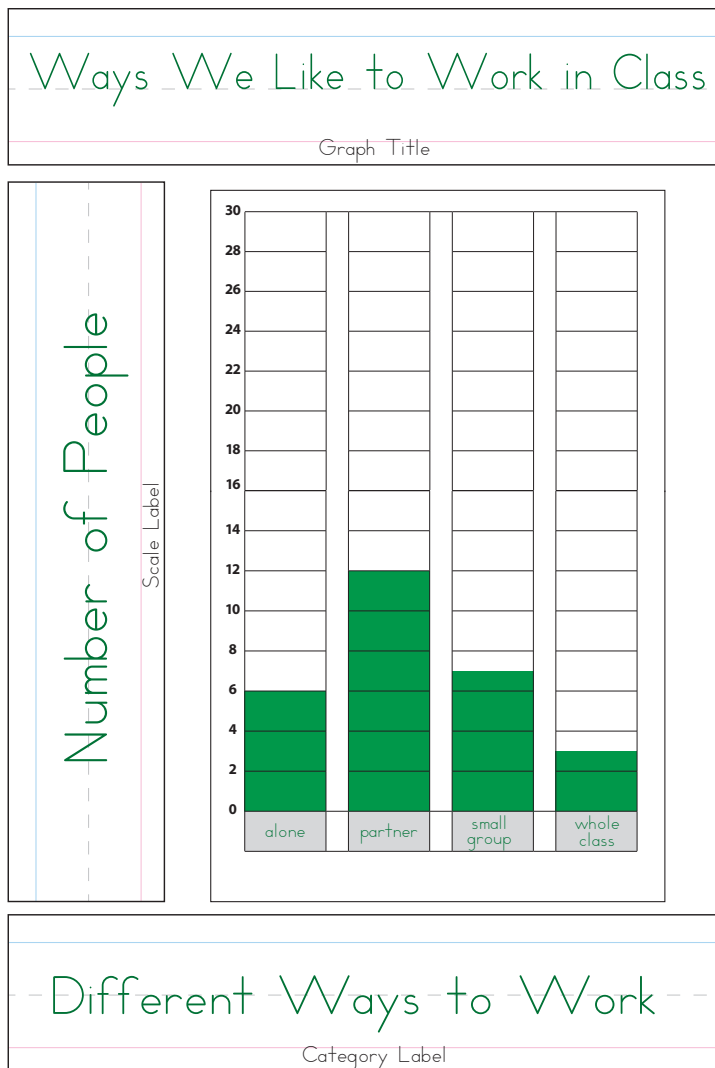
Marco Well, each rectangle is for two people, so 2, 4, 6. You need three rectangles.

Teacher Janelle, what do you think?

Janelle I agree that it should be three because 3 and 3 is 6.



- 8 Repeat this process to display the rest of the data on the graph. Then work with the students to label the graph using the sentence strips you prepared for this activity.
- 9 Explain that there are certain conventions people follow when they make graphs so everyone understands the information. The first is to give the graph a title.
 - Give students a few moments to discuss ideas for graph titles.
 - Call on a few volunteers and select one of the ideas shared.
 - Record the title on the *graph title* label, and post it above the graph.
- 10 Then draw students' attention to the bottom of the graph. Explain that the choices offered in a survey are called *categories*.
 - Read the four categories with the students.
 - Work with students to come up with a general name for the four categories, such as *ways to work*, or *ways of working in class*, or *work preferences*.
 - Record and post the general name below the graph, and explain that this is called a *category label*.
- 11 Finally, draw students' attention to the numbers running up the side of the graph. Explain that these numbers form a *scale* for the graph, and they need to be labeled so people know what they mean.
 - Solicit agreement from the class that the numbers indicate the number of people that chose each way of working.
 - Record the information on the third label, post it to the left of the graph, and explain that it's called a *scale label*.



- 12 When the graph is complete, thank the class for participating in your survey. Let them know that you'll spend a little more time discussing this survey with them during the next Calendar Collector activity, and that they will have a chance to think of other survey questions they'd like to ask their classmates.

Note

Leave the graph on display in the Number Corner area for Day 2. After that, move it to a different location in the room if you like.

✓ Updates

Complete the update routine for Calendar Grid.



Calendar Collector: What Would You Like to Know About Our Class?

Copies & Display	PO P6 Student Survey Planning Sheet
Classroom Materials	<ul style="list-style-type: none"> • scaled bar graph with student data from Day 1 • whiteboard or chart paper • grocery or gift bag

- Spend a few minutes discussing the graph the class made on Day 1. Draw students' attention to the display and give them a few moments to examine it quietly. Then ask them to respond to the following questions:

 - » *What does this graph tell you about our class?*
 - » *Which of these four ways of working is most popular in our class?*
 - » *Which is least popular?*
 - » *Did more people choose working alone or working in a small group? How many more? How do you know?*
 - » *Did fewer people choose working with the whole class or working in pairs? How many fewer? How can you use the graph to help find the answer?*
 - » *Who might find this information useful, and why?*
 - » *If you conducted the same survey in another third grade classroom in the school, would you get the same results? Why or why not?*
 - » *What if you conducted the same survey in a third grade classroom in a school in another town, state, or country?*
- Let the class know they are going to conduct student-posed surveys this month. Today, they will brainstorm survey questions, and each student will fill out a survey planning form.
- Ask them to discuss ideas for survey questions in pairs. What kinds of topics would interest people their age? What sorts of things would they like to know about their classmates?
- After a minute or two, call on volunteers to share their ideas with the class as you record them on the board or a piece of chart paper.
- As you list each idea, or after you have listed several, go back and have students generate four choices they would give their classmates if they were to pose that particular survey question. Record those as well.

Survey Questions

What is your favorite sport to play?
(soccer, dance, gymnastics, basketball)

What is your favorite after-school activity?
(TV, video games, play outside, go to the park)

Which snack do you like best?
(granola bar, apple, cheese, carrots)

Which is your favorite subject in school?
(reading, writing, math, science)

What color do you like best?
(blue, red, purple, green)

6 Display the Student Survey Planning Sheet.

- Read and explain the instructions to the class.
- When you review item 3, invite observations and questions about the horizontal bar graph, in comparison to the vertical orientation of the bar graph they completed on Day 1.
- Be sure students understand that the mini-graph is just for planning purposes, not something they'll use to record data. They need to use it to plan their graph title, categories, and labels; that's all.

SUPPORT Work with the class to complete one of these sheets, using one of the survey questions they just brainstormed, before students complete their own sheets.

- When students understand what to do, distribute the planning sheets and send them back to their desks or table spots to fill it in.
- As they finish, have them check to be sure their name is on their planning sheet, fold it in half, and place it in a grocery or gift bag.
- Let students know that the next time the class does Calendar Collector together, you'll pull one of their sheets out of the bag and have that student conduct their survey right then and there.

Note

Consider going through the students' planning sheets before you conduct the next Calendar Collector activity to make sure their questions make sense and that they have specified four choices. If you find plans that aren't complete, return them to the students and assist them to complete the forms (or see whether a classmate can assist them).



Math Teaching Practice

Elicit and use evidence of student thinking

By reviewing students' planning sheets, you can formatively assess student understanding and provide feedback or give support before moving forward.

✓ Updates

Complete the update routine for Calendar Grid.

Computational Fluency: Introducing Loops & Groups

Copies & Display	PO P7 Loops & Groups record sheet
Kit Materials	die numbered 1–6
Classroom Materials	student whiteboards, markers, and erasers (class set)

- 1 Explain to the class that you're going to play a new game today that will help them learn more about multiplication.
The class will work together as one team, and you'll play as the other team.
- 2 Display the Loops & Groups record sheet. Label Player 1 for yourself and Player 2 for the students.
- 3 Briefly explain the game.
 - Players take turns rolling a die numbered 1–6 two times. The first roll tells how many loops to draw; the second roll tells how many shapes to draw in each loop. For example, if a player rolls a 4 and then a 3, they draw four loops and three small shapes inside each loop.
 - Players find the product of the two numbers rolled, and write a multiplication equation ($4 \times 3 = 12$) or sentence (4 groups of 3 equals 12) to match.
 - Each player takes five turns and then adds their products to find the sum. The player with the greater sum wins.
- 4 Let students know that you'll take the first turn so they can see how the game works.
 - Explain that you'll keep track of the action for both teams on your record sheet, and they'll do the work for their team on their individual whiteboards today.
 - Have helpers give each student a whiteboard, marker, and eraser.
- 5 Take your turn.
 - Roll the die and draw the designated number of loops in your 1st Turn space .
 - Roll the die again and draw the designated number of shapes in each loop.
 - Engage the students in a discussion to determine the product of your spins.

Teacher *Let's see, I got a 4 on my first roll, so I made four loops. I got a 3 on my second roll. That means I draw three little shapes in each loop. I think I'll make squares. Now I have four loops with three squares in each loop. How many squares do I have in all?*




Math Teaching Practice

Use and connect mathematical representations

The game of Loops & Groups helps students move toward multiplicative thinking, which involves thinking in terms of groups rather than individual items. The first roll of a 1–6 die tells how many loops to draw; the second roll tells how many items to draw in each group. Students then record a multiplication equation to represent the drawing, which in turn scaffolds their understanding of the operation: 4×3 literally represents 4 loops with 3 items in each loop.


September | Computational Fluency 3 copies for display, plus class set

NAME _____ | DATE _____

 **Loops & Groups Record Sheet**

Player 1 Teacher Player 2 Students

For each turn, record your loops and groups. Write a multiplication equation for each turn. Then use the space provided to find the sum of the 5 products.

1st Turn		
2nd Turn		
3rd Turn		

Tyler There are four 3s, so that's 3 plus 3 plus 3 plus 3 equals 12, because 3 and 3 is 6, and 6 plus 6 is 12.

Teacher Talk to the person sitting next to you about my sketch. Where can you see 4 in the picture? What does the 3 represent? Can you both see the 12?

Camila We saw that there are 4 circles and each circle has 3 in it. That makes 12 in all.

Teacher I'm going to record some of our ideas under my drawing. We can see 4 groups of 3. We know it's 12 in all. How could we use an equation to represent this situation of 4 loops with 3 squares in each loop?

Cole You could write $3 + 3 + 3 + 3 = 12$.


Teacher That's true, and I'll record that.

Isabella You could also write $4 \times 3 = 12$.

Teacher OK, I'll record that under my drawing, too.


September | Computational Fluency 3 copies for display, plus class set

NAME _____ | DATE _____

 **Loops & Groups Record Sheet**

Player 1 Teacher Player 2 Students

For each turn, record your loops and groups. Write a multiplication equation for each turn. Then use the space provided to find the sum of the 5 products.

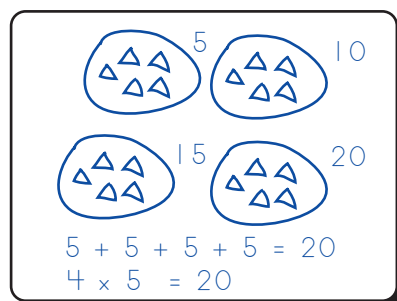
1st Turn	 4 groups of 3 equals 12 $3 + 3 + 3 + 3 = 12$ $4 \times 3 = 12$	
2nd Turn		
3rd Turn		

- 6 Take turns with the class until both teams have had five turns. Begin by sketching for both teams, but gradually move students toward creating and sharing the sketches for their team.
- Invite a different volunteer to roll the die each time it's the students' turn.
 - Have students erase their boards between each of their turns so they have plenty of room to work.
 - On students' first and second turns, record the student's thinking with sketches on the Loops & Groups display as they work on their whiteboards. Have them talk to each other about where they see the results of each roll and the total (the product) in their drawings. Record the results with repeated addition and then multiplication as students do so on their whiteboards.

- On students' third and fourth turns, have them take the lead in sketching and recording the results of their rolls. As they finish, ask them to share and compare their work with the people sitting nearest them, and then invite a volunteer to display their whiteboard to the class so they can share and explain their work as you record on the record sheet.

Teacher Hannah, do you want to bring your work up to share with the class?

Hannah Sure! OK, we got a 4 on our first roll, so I made four loops. Then we got a 5, so I put five little triangles in each loop. I saw I could count the triangles by 5s, like 5, 10, 15, 20. Then I added the numbers up, and then I wrote $4 \times 5 = 20$.



Teacher Show thumbs-up if you agree with Hannah's work. OK, I see most thumbs up, so I'll record the same thing on your side of the record sheet. But tell me something. The last thing Hannah wrote was a multiplication equation — $4 \times 5 = 20$. What does the 4 in that equation mean?

Students Groups of something!

That's how many loops we made.

Teacher What does the 5 in the equation mean?

Students It's how many there are in each group.

There are 4 loops, and we put 5 little shapes in each one.

Teacher And where do you see the 20 in Hannah's sketch?

Students It's all the triangles!

You can count them and see — 5, 10, 15, 20. It's 20 in all.

Teacher And when we record 20 as the result of 4 groups of 5, we call it the product.

- When both teams have taken five turns, ask students to share how they would find the sum of your five products.
 - Write the products separately on the board to make it easier for students to see which numbers they'll need to add.
 - As students share their strategies for finding the total, record on the board so everyone can follow along.
- Give students a minute or two to find the sum of their five products. As they finish, have them share and compare their answers with the people sitting nearby. Then have a volunteer or two share their sums with the class and explain the strategies they used for finding their answers.
- Finally, have students compare your sum to theirs. Whose sum was greater? By how much?
The team with the greater sum wins the game.



Math Practices in Action

Attend to precision

Adding points to determine a winner is a low-stakes way to encourage students to make accurate calculations and to use clear and precise language when explaining their work.



Calendar Grid: Charting Observations, Part 1

Kit Materials	Calendar Grid display
Classroom Materials	prepared Calendar Grid Observations chart

- Before posting the marker for today, ask students to pair up and make predictions about the marker.
- After a few moments, choose two or three student pairs to share their predictions with the class.

Press students to explain or justify their predictions.

Anita *I think it's going to have something about 5 on it.*

Teacher *Can you say more about that, Anita? Why do you think we'll see something about 5 on today's marker?*

Anita *So far, every marker has something about its number. There's 1 star on 1, a chart where 2 is the missing number on 2, a snowman made out of 3 circles on 3, and a line of 4 squares on 4. So I think it has to be something with 5 today.*

Teacher *Show thumbs-up if you agree with Anita.*

Teacher *Let's have one more prediction. Jose, what do you think?*

Jose *It'll be something about 5 for sure. Maybe it'll be a hand with 5 fingers or a foot with 5 toes, or something like that.*

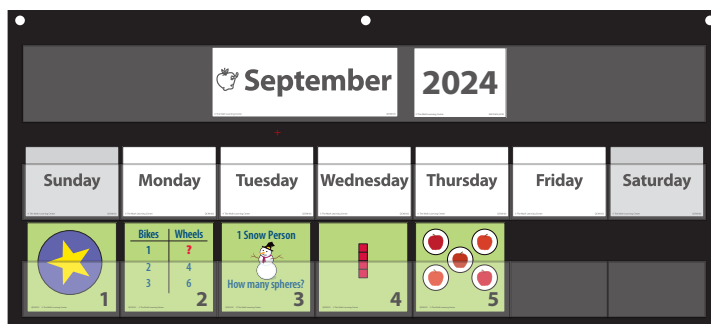
- Have your student helper post the marker and record the date on the whiteboard. Then introduce the Calendar Grid Observations chart.
 - Show students the Calendar Grid Observations chart you prepared.
 - Explain that this chart will help them keep track of the information on the calendar markers. They can use this information to learn more about the models and find patterns in the sequence of markers during the month.
- With students' help, fill in the Calendar Grid Observations chart for all the markers that have been posted so far this month.
 - Fill in the date column through today, recording just a number for each day.
 - Explain that this month's markers feature several different ways to model or show multiplication. Have a helper point to the first marker as you describe the model briefly and record it on the chart.
 - Work with input from the class to write a brief description of the visual on the marker and to write a multiplication equation that represents the visual.



Equity-Based Practice

Leveraging multiple mathematical competencies

Inviting students to share observations and make predictions about the calendar markers provides multiple entry points in a low-risk environment since the markers have many features to analyze. Some markers elicit visual patterning observations while others draw on students' understanding of number and number relationships. The variety allows students to use their own mathematical strengths to engage in discussion.



Teacher The first model is loops and groups, just like in the game we played during the last session. The rule with this model is that you can have any number of loops you like, but the number of objects in each loop must be the same. Do you see other examples of the loops and groups model in the markers posted so far?

Students Yes! It's on marker 5! There are 5 loops, and there's 1 apple in each loop.

Teacher How would you describe the first marker to someone who couldn't see it?

Molly It's just 1 star in 1 loop.

Teacher OK, so what multiplication equation could we write for our first marker?

Students It would have to be 1 group of 1.

Teacher I can write $1 \times 1 = 1$ to show that. Let's read it together, ready? One group of 1 equals — is the same value as — 1.

- Continue this type of dialog with the class for each of the markers displayed.

Teacher The second marker shows an example of a ratio table. A ratio tells us how much or many of one thing there is compared to another thing. For example, the information on marker 2 tells us how many wheels there are compared with the number of bikes. If we have 1 bike, how many wheels will we see?

Students Two!

And it keeps going like that. On 2 bikes there are 4 wheels.

It just doubles the number, like 3 and 3 is 6.

Teacher You mentioned that 1 bike has 2 wheels — let's use that for our description. And what multiplication equation should we write for marker 2?

Shawn I think it should be 1 times 2 because a bike is like 1 group of 2.

- Your chart will look something like this when you've completed it up through the present date:

Calendar Grid Observations			
Date	Model	Description	Equation
1	Loop	1 loop with a star in it	$1 \times 1 = 1$ star
2	Ratio Table	1 bike, 2 wheels	$1 \times 2 = 2$ wheels
3	Picture	1 snow person, 3 spheres	$1 \times 3 = 3$ spheres
4	Array	4 rows of 1 square each	$4 \times 1 = 4$ squares
5	Loops	5 loops, 1 apple in each loop	$5 \times 1 = 5$ apples

Note

When you conduct this activity again on Day 8, you will work with the class to bring the observations chart up to date.

✓ Updates

Complete the update routine for Calendar Grid.



Solving Problems: Number String 1

Classroom Materials

whiteboard or chart paper

- 1 Gather students in your discussion area and explain that they will participate in a Solving Problems workout as part of Number Corner. The Solving Problems activities this month feature sets of problems called *number strings*. Briefly explain what a number string is and how they work:
 - A number string is a series of related problems that students will solve mentally and discuss one at a time.
 - Sometimes, number strings start with easier problems and then move to more challenging problems as the string continues.
 - The problems or strategies from the beginning of the number string can often be used to help solve the problems later in the number string.
 - Solving the problems in a string involves thinking like a mathematician because students want to find powerful strategies that work for lots of problems.
 - There is a process the class will use to solve each problem, share strategies and answers, and discuss each other's thinking.
 - When students explain their thinking, the teacher will usually represent their work for everyone to see.
 - After the number string, students will sometimes record a summary and example problem in their Number Corner Student Book.
- 2 Introduce the number string by posing and writing the first problem, $25 + 25$, on the board or a piece of chart paper.
 - Ask students to solve the problem mentally and to put their thumb up in front of their chest when they have an answer.
 - Students can show additional fingers if they think of additional strategies for solving the problem.
 - When you see most thumbs up, invite a few students to share the answer.

Record all answers without comment or indication that any of them are correct or incorrect.



Instructional Routine

Number string

Often, number strings begin with accessible problems for which students should have multiple entry points. This intentional design feature provides entry for students with a range of skills and a basis for all to solve other problems in the number string.

- 3 Ask several volunteers to explain how they figured it out.
- Record students' thinking on the board or chart paper for everyone to see. For today's number string, use equations to represent students' thinking.
 - When a student shares a strategy that aligns with the goals of the number string, ask the class to reflect on the student's thinking. For example:
 - » *Why does it make sense to _____?*
 - » *How does _____'s thinking connect to the (representation)?*
 - » *Does anyone have a question for _____?*
 - » *What connections do you notice among the strategies shared?*
- 4 Deliver the rest of the number string shown in the following table.

Sample strategies are shown and explained in detail in the sample dialog. Problems and answers are provided for your convenience. When you present the problems to the students, do not include the answers.

Problems	Sample Strategies & Recording	Connections
$25 + 25 = 50$	$25 + 25$ is like adding 2 quarters. $25 + 25 = (20 + 5) + (20 + 5)$ $= (20 + 20) + (5 + 5)$ $= 40 + 10$ $= 50$	These problems are selected to elicit the strategy of using familiar doubles within 100 to solve near doubles. Big Idea If a problem is close to a doubles combination you already know, you can use the doubles combination to help find the sum.
$25 + 26 = 51$	$25 + 26 = 25 + (25 + 1)$ $= (25 + 25) + 1$ $= 50 + 1$ $= 51$ $25 + 26 = (20 + 5) + (20 + 6)$ $= (20 + 20) + (5 + 6)$ $= 40 + 11$ $= 51$	
$25 + 24 = 49$	$25 + 24 = 25 + (25 - 1)$ $= (25 + 25) - 1$ $= 50 - 1$ $= 49$ $25 + 24 = (20 + 5) + (20 + 4)$ $= (20 + 20) + (5 + 4)$ $= 40 + 9$ $= 49$	



Math Teaching Practice

Facilitate meaningful mathematical discourse

By inviting students to share and compare their solution strategies for the problems in the number string, you have the opportunity to build a mutual understanding of math concepts in the classroom.

Problems	Sample Strategies & Recording	Connections
$40 + 40 = 80$	4 tens and 4 tens is 8 tens, and that's 80.	
$38 + 40 = 78$	$38 + 40 = (40 - 2) + 40$ $= (40 + 40) - 2$ $= 80 - 2$ $= 78$ $38 + 40 = (30 + 8) + 40$ $= (30 + 40) + 8$ $= 70 + 8$ $= 78$	
$38 + 41 = 79$	$38 + 41 = (40 - 2) + (40 + 1)$ $= (40 + 40) - 2 + 1$ $= (80 - 2) + 1$ $= 78 + 1$ $= 79$ $38 + 41 = (30 + 8) + (40 + 1)$ $= (30 + 40) + (8 + 1)$ $= 70 + 9$ $= 79$	

Teacher Hayden, can you tell us how you solved $25 + 26$?

Hayden Well, 26 is $25 + 1$. You know $25 + 25 = 50$, then add 1 more for the 26.

Teacher Let me see if I can use equations to represent your thinking.

$$\begin{aligned}
 25 + 26 &= 25 + (25 + 1) \\
 &= (25 + 25) + 1 \\
 &= 50 + 1 \\
 &= 51
 \end{aligned}$$

Teacher Kalani, can you explain what you did?

Kalani I put the tens together, then the ones, and added them up. So, 20 and 20 is 40. Then 5 and 6 is 11, and 40 plus 11 is 51.

Teacher So you split both addends by place value, like this?

$$25 + 26 = (20 + 5) + (20 + 6)$$

Kalani Yes, then I went $20 + 20$ and $5 + 6$.

Teacher And can you do that? Add the numbers in a different order?

Kalani Sure. You are adding it all together anyway, so you would get the same thing.

Teacher I'll write the equations to show how you combined the tens and then the ones.

$$\begin{aligned}
 25 + 26 &= (20 + 5) + (20 + 6) \\
 &= (20 + 20) + (5 + 6) \\
 &= 40 + 11 \\
 &= 51
 \end{aligned}$$

Teacher How are Hayden's and Kalani's strategies alike? How are they different?

Students They both got 51.

Hayden thought about doubles with 25 and 25. Kalani thought about the tens and ones.

It's funny, though, because Kalani had a double also — with $20 + 20$.

SUPPORT If students have trouble strategizing about how to use doubles to solve, invite them to think about friendly numbers. For example, both 38 and 41 are close to 40.

- 5 Ask students to explain in their own words how they solved the problems in today's number string. Have them share their thoughts as you record a class summary on the board.

Sample Summary: Use Doubles to Solve Near Doubles

If you know the answer to a doubles combination, you can use it to help solve a near doubles problem. To do this, rewrite the problem to show the doubles combination and the amount you're adding or subtracting.

$$\begin{aligned} 38 + 40 &= (40 - 2) + 40 \\ &= (40 + 40) - 2 \\ &= 80 - 2 \\ &= 78 \end{aligned}$$

- 6 Conclude by telling students they will do more number strings this month. In the next one, they will look at strategies for adding on the open number line.

✓ Updates

Complete the update routine for Calendar Grid.



Number Line: Introducing Spud — the Counting Game

Kit Materials	One Thousand Chart
Classroom Materials	pointer

- 1 Draw students' attention to the One Thousand Chart you posted in the Number Corner display area. Ask them to share, first in pairs, and then as a whole class, any observations they can make about the chart.
 - When they've had about a minute to make observations in pairs, call on volunteers to share observations with the class.
 - Invite each volunteer to come up to the chart and use the pointer to show, as well as describe, their observation.
 - Guide the discussion in such a way that students see and understand that as they read each row from left to right, the numbers increase by 10, and as they read each column from top to bottom, the numbers increase by 100. This information is likely to come from the students, but if it doesn't, you'll need to elicit it from them.

10	20	30	40	50	60	70	80	90	100
110	120	130	140	150	160	170	180	190	200
210	220	230	240	250	260	270	280	290	300
310	320	330	340	350	360	370	380	390	400
410	420	430	440	450	460	470	480	490	500
510	520	530	540	550	560	570	580	590	600
610	620	630	640	650	660	670	680	690	700
710	720	730	740	750	760	770	780	790	800
810	820	830	840	850	860	870	880	890	900
910	920	930	940	950	960	970	980	990	1,000

Dylan The numbers go by tens, starting on 10, see? It goes 10, 20, 30, 40, 50, and it keeps on going like that.

Nick The last column going down starts with 100 and goes by hundreds — 100, 200, 300, 400, and it goes all the way to 1,000.



Digital Resources

The Number Pieces app can provide the visual place value support for this discussion as students refer to the number of tens or hundreds that make up a number.

The Number Chart app can be used to generate grids of numbers, and the grids can support students as the class plays Spud.

Apps are available at apps.mathlearningcenter.org.

Danielle If you go down any column it's counting by 100. Like this column that starts with 30, if you go down, it's 130, then 230, then 330, then 430.

- 2 Explain that the class is going to use the One Thousand Chart to help them play a new counting game called Spud.
 - Tell students that in a minute, they will stand up and make a circle in the Number Corner discussion area to play the game.
 - They will take turns counting by 10s clockwise around the circle.
 - There is one rule about counting in this game that they will have to remember. When a multiple of 100 is reached — that is, 100 and then every hundred thereafter — that person needs to say “spud” instead of the actual number.
- 3 While they are still seated, have the whole class practice counting by 10s, using the word “spud” in place of each multiple of 100.
 - Start at 10 and point to each number on the One Thousand Chart as students count by 10s with you — 10, 20, 30, 40, 50, and so on.
 - When you get to 100, remind everyone to say “spud” and keep going — 110, 120, 130, 140, 150, 160, 170, 180, 190, spud, 210, 220, and so on.
 - Continue through 300 or 400, long enough so that most students have the idea.

SUPPORT Before you play the game, work with student input to circle each of the “spud” numbers on the chart: 100, 200, 300, 400, 500, and so on, up through 1,000.
- 4 When most students understand what to do, have them form a circle in the Number Corner discussion area.
- 5 Quickly explain the rules of the game.
 - Tell students they will take turns counting clockwise around the circle with the first person starting the count at 10, the next person calling out 20, and so on.
 - When 100 is reached, and then every multiple of 100 thereafter, that person needs to say “spud” instead of the actual number.
 - The next person must then take up the count for the number that comes directly after the multiple of 100.
 - If the person accidentally says the name for 100 or a multiple of 100 instead of “spud,” they must sit down.
 - If the person after a “spud” number doesn’t know what number comes next, they must sit down.
- 6 Start the game and continue playing until the count reaches 990, and then the final “spud” on 1,000.
 - Remind students that they can use the One Thousand Chart on the wall if they are having trouble remembering what comes before or after a number.
 - At the end of the game, let students know you’ll play Spud again later this month.

CHALLENGE If this game is easy for your class and time allows, play it again. This time, start with a number in the hundreds such as 125, 137, or 141. Students still count by 10s from the starting number, but the first “spud” number is the starting number plus 100. The second “spud” number is the starting number plus 200, the third is the starting number plus 300, and so on. For example, if the first student starts with 125, the count around the circle would go 135, 145, 155, 165, 175, 185, 195, 205, 215, spud, 235, 245, 255, and so on. The count stops at the starting number plus 1,000, so in this case, it would end with the last person saying “spud” in place of 1,125.

✓ Updates

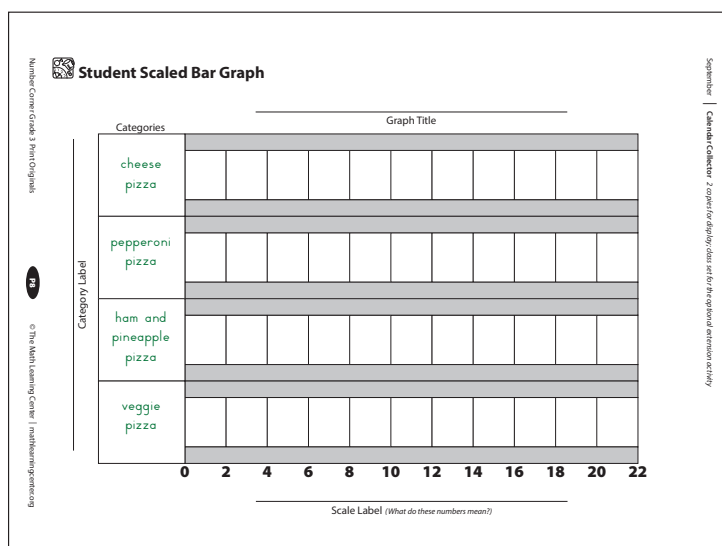
Complete the update routine for Calendar Grid.



Calendar Collector: Student Surveys, Part 1

Copies & Display	PO P8 Student Scaled Bar Graph
Classroom Materials	bag of completed Student Survey Planning Sheets from Day 2

- 1 When students join you in the Number Corner area, explain that you are going to pick one of their planning sheets out of the bag and help that student conduct their survey right now.
- 2 Display the Student Scaled Bar Graph.
Note that the bar graph on this sheet runs horizontally instead of vertically, and that students will see graphs in both formats as they start noticing them in the world around them.
- 3 As students watch, mix up the planning sheets, then pull one from the bag. Show the sheet to the class.
- 4 Have the student who wrote the plan read their question and the four related choices to the class. Record the choices on the display.



5 Briefly review the survey process. Explain that the student conducting the survey will:

- Ask students to close their eyes while they listen to the options.
- Name each choice one last time and ask students to raise their hand when their favorite is named.
- Count the hands raised for each choice, and record the numbers on the board.

Students should keep their eyes closed so their choices are private.

6 Help the student follow the steps to conduct the survey.

7 When the information has been recorded, have students open their eyes and examine the results. Then have the student conducting the survey enter the results on the graph with the help of their classmates.

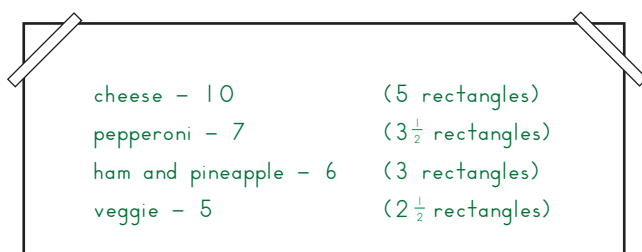
8 If time is running short, have the class work together to determine how many rectangles should be colored in for each choice, bearing in mind that each increment on the graph stands for 2 students, rather than 1. The student who conducted the survey can fill in the data, labels, and graph title later in the day.



Math Teaching Practice

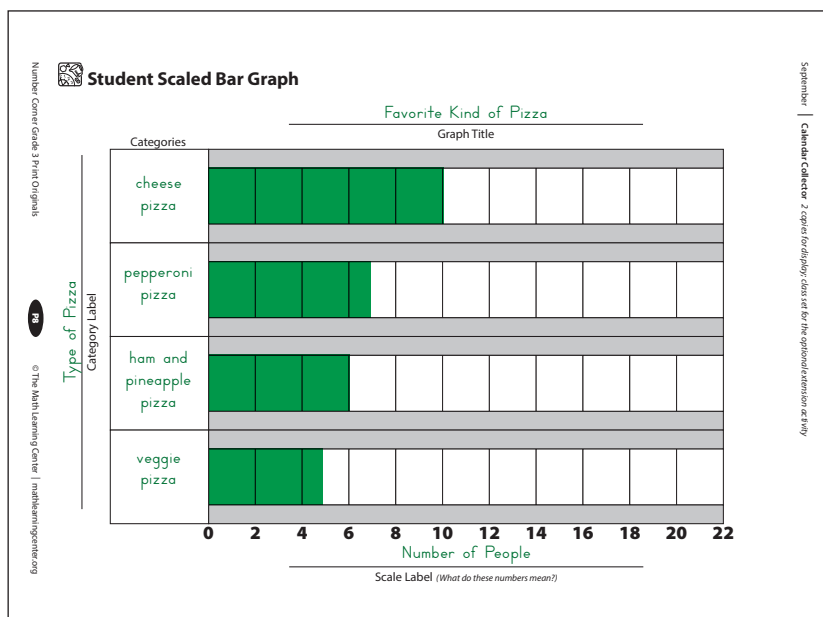
Implement tasks that promote reasoning and problem solving

Inviting students to think about how to represent numbers on the scaled bar graph will encourage problem solving as they consider how to represent an odd number on a graph with a scale of 2.



Note

If possible, give the student who conducted the survey time to share their completed graph with the class when everyone is gathered. If time doesn't allow for this, have the student post their graph in the classroom where classmates can examine it at their leisure.





Calendar Grid: Charting Observations, Part 2

Kit Materials	Calendar Grid display
Classroom Materials	Calendar Grid Observations chart

- 1 Before posting the new marker for the day, ask students to pair up and make predictions about the marker.
- 2 After students have had time to make predictions, choose two or three student pairs to share and explain their predictions.
- 3 Have your student helper post the marker and record the date on the whiteboard.
- 4 With students' help, fill in the Calendar Grid Observations chart for all the markers that have been posted since your last Calendar Grid activity.



Math Teaching Practice

Support productive struggle in learning mathematics

Having students work in pairs might better position them to engage in productive struggle. Together, they can work to make predictions based on shared mathematical understanding.

✓ Updates

Complete the update routine for Calendar Grid.



Solving Problems: Number String 2

Classroom Materials

whiteboard or chart paper

- 1 Gather students in your discussion area with their Number Corner Student Books. Briefly review numbers strings and how they work.
- 2 Let students know that today's number string will focus on multidigit addition strategies.
Students consider the idea of splitting one of the addends by place value, adding the tens, and then the ones to the other addend — in effect, jumping by a “friendly” ten or multiples of 10 first.
- 3 Deliver the number string shown in the following table.
 - Sample strategies are shown and explained in detail in the sample dialog. Problems and answers are provided for your convenience. When you present the problems to students, do not include the answers.
 - Use number lines or equations to record students' strategies.
 - When a student shares a strategy that aligns with the goals of the number string, ask the class to reflect on the student's thinking. For example:
 - » *Why does it make sense to _____?*
 - » *How does _____'s thinking connect to the (representation)?*
 - » *Does anyone have a question for _____?*
 - » *What connections do you notice among the strategies shared?*



Instructional Routine

Number string

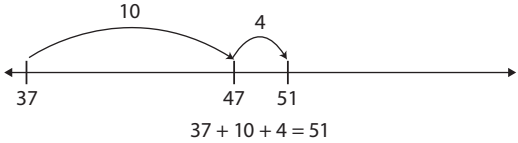
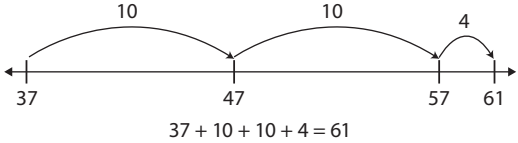
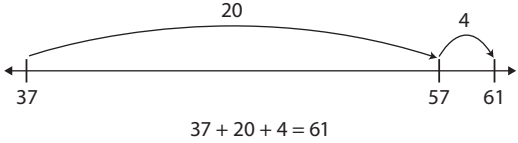
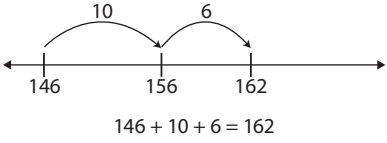
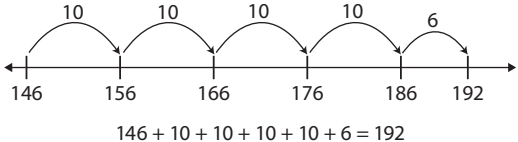
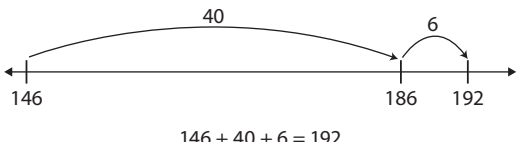
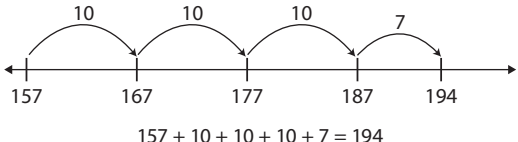
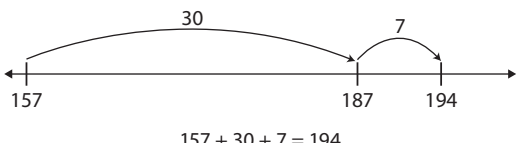
Often, number strings begin with accessible problems for which students should have multiple entry points. This intentional design feature provides entry for students with a range of skills and a basis for all to solve other problems in the number string.



Equity-Based Practice

Affirming mathematics learners' identities

Although number strings are often designed to elicit a particular strategy or to highlight a specific representation or tool, it is important to invite and honor all student contributions and strategies. Connecting students' strategies with the strategies that are intended to be highlighted is crucial to showing students that their ideas are valued and relevant. In doing so, you validate students' knowledge and experiences and support their development as capable and confident problem solvers.

Problems	Sample Strategies & Recording	Connections
$37 + 10 = 47$	Many students will likely “just know” the answer to this problem.	<p>These problems are selected to elicit the strategy of splitting the lesser of two addends apart by place value and adding the tens, then the ones, to the greater addend.</p> <p>Big Idea You can start from the greater of the two addends, then jump by tens or multiples of 10, and then by ones to find the sum.</p>
$37 + 14 = 51$		
$37 + 24 = 61$		
		
$146 + 10 = 156$	Many students will likely “just know” the answer to this problem.	
$146 + 16 = 162$		
$146 + 46 = 192$		
		
$157 + 37 = 194$		
		

SUPPORT If students are less familiar with solving problems on the number line, take time in your discussion to talk about how the number line works.

Teacher India, can you tell us how you solved $37 + 24$?

India I thought about starting with 37 and adding 10. That’s 47. Then I added another 10 to get up to 57. Then I added 4 more, and that got me up to 61.

Teacher Let me model what you just said on an open number line.

$$37 + 24 = 61$$



Teacher Nathan, can you explain what you did?

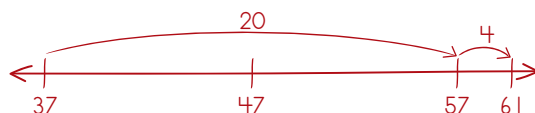
Nathan I started with 37 and added 20. That was 57, then I added 4 more to get 61.

Teacher Where did the 20 come from?

Nathan It's from the 24. I just added the 20 first and then the 4 at the end.

Teacher OK. Let me model what you said for everyone to see.

$$37 + 24 = 61$$



Teacher How are India's and Nathan's strategies alike? How are they different?

Students They both started with 37.

They both added the tens from the 24 first, then the ones.

The only thing that's really different is India added 10, then 10 more. Nathan added the 20 all at the same time.

Teacher Both India and Nathan added the tens first. Some people call that strategy "adding a friendly number." It seems pretty efficient, doesn't it?

Dante Yeah, you break apart one of the numbers into tens and ones. Then you add the easy part first.

Teacher Why is it easier to add the tens first?

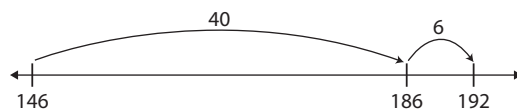
Students Tens are friendly for us.

You can add them 10 at a time, or do them all together.

- 4 Ask students to explain in their own words the strategy that many of them used in today's number string. Have them share their thoughts as you record a class summary on the board.

Sample Summary: Add a Friendly Number

When we add a friendly number, we break one of the addends into parts. The friendly number parts are easy to add. Then we can add the rest in one or more parts.



$$146 + 40 + 6 = 192$$

✓ Updates

Complete the update routine for Calendar Grid.



Number Line: Spud Revisited

Kit Materials	One Thousand Chart
Classroom Materials	<ul style="list-style-type: none"> • dry-erase markers in 2 colors (1 of each color) • chart paper

Prior to today's activity, erase any marks on the One Thousand Chart wall display.

- Let students know they will play Spud again today. This time, you're going to use the One Thousand Chart to help keep track of the counts. Draw their attention to the Number Corner display area. Explain that you will stand at the grid and cross out certain numbers and circle others. After the game is finished, you'll have the class sit back down and take a good look at the circled numbers.
- Have the students stand up and form a circle.
 - Briefly review the rules of the game from Day 6, then have them begin counting, starting with 10.
 - Stand at the One Thousand Chart and use a dry-erase marker in one color to make a slash through each number as the student says it. In another color, circle one number at random in each row, rather than marking it with a slash.
- When the game is over, have the students sit down in the Number Corner discussion area, facing the One Thousand Chart. Give student pairs a few moments to make observations about the chart.

10	20	30	40	50	60	70	80	90	100
110	120	130	140	150	160	170	180	190	200
210	220	230	240	250	260	270	280	290	300
310	320	330	340	350	360	370	380	390	400
410	420	430	440	450	460	470	480	490	500
510	520	530	540	550	560	570	580	590	600
610	620	630	640	650	660	670	680	690	700
710	720	730	740	750	760	770	780	790	800
810	820	830	840	850	860	870	880	890	900
910	920	930	940	950	960	970	980	990	1,000

- 4 Work with input from the class to describe each circled number in terms of how many hundreds and tens it is composed of.

- Record the information on a piece of chart paper as you talk with students in a manner similar to the dialog below.

Teacher What number is circled in the first row?

Students Sixty!

Teacher How many hundreds are there in 60?

Students What? There aren't any hundreds in 60. It's not even as big as 100.

Teacher OK then — how many tens are there in 60?

Students Sixty!

No, 6 — it's 6 tens, not 60 tens. Sixty tens would be really a lot.

Teacher OK, I'll write that down on our chart paper here. Sixty equals—is the same as—6 tens. Let's look at the next circled number on the grid. What is it?

Students 130!

Teacher How many hundreds are there in 130?

Students One! It's 1 hundred, 3 tens, and no ones.

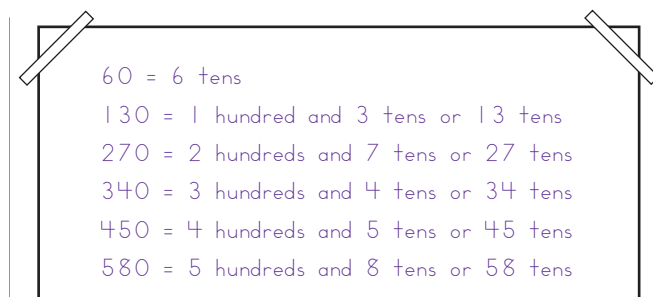
Teacher OK, I'll record that. What if you wanted to tell how many tens there are in 130, and you could only use tens, no hundreds?

Students You can't do it.

Yes, you can if you split up the hundred into tens. It's 10 tens for the hundred, and then 3 more tens for the 30.

It's 13 tens, and the number kind of looks like that — 13 with a 0 after it.

- Continue in this fashion until you have recorded the number of hundreds and tens, and then the number of tens, for each circled number on the chart.



60 = 6 tens
130 = 1 hundred and 3 tens or 13 tens
270 = 2 hundreds and 7 tens or 27 tens
340 = 3 hundreds and 4 tens or 34 tens
450 = 4 hundreds and 5 tens or 45 tens
580 = 5 hundreds and 8 tens or 58 tens

- 5 Ask students to make a generalization about the quantity of tens in *any* number on the chart.

- First, have students look at the 1,000 on the chart and note that since they don't have a thousands piece they need to "trade in" 1,000 for ten hundreds. Then they can "trade in" hundreds for tens.
- Point to several of the crossed-out numbers at random and ask students how many tens there are in each, given that they have "traded in" all the hundreds for tens.
- Then ask what you have to do to determine how many tens there are in any number on the chart. Give students a minute to share ideas in pairs, and then call on several volunteers to share their thinking with the class.

Note

Erase the markings on the One Thousand Chart when you are finished with this activity.



Digital Resources

The Number Pieces app can provide the visual place value support for this discussion as students refer to the number of tens or hundreds that make up a number.

The Number Chart app can be used to generate grids of numbers, and the grids can support students as they class plays Spud.

Apps are available at apps.mathlearningcenter.org.



Calendar Grid: Making Predictions & Writing Equations, Part 1

Kit Materials	Calendar Grid display
Classroom Materials	<ul style="list-style-type: none"> • Calendar Grid Observations chart • student whiteboards, markers, and erasers (class set) • whiteboard or chart paper

- 1 Ask students to bring whiteboards, markers, and erasers with them to the Number Corner discussion area today.
- 2 Take a few minutes with the class to update the Calendar Grid Observations chart through the previous day.
Have students record an equation for each marker on their whiteboards as you do the same on the observations chart.
- 3 Before your student helper posts the new marker for today, ask students to share predictions, first in pairs, and then as a whole group.

By the time you conduct this activity, you'll be well into the month, and many students will be familiar with the models. At this point, you can start pressing for a little more detail from students. If the next marker will feature the array model, how might the squares be arranged? If today's marker will show an example of the loops and groups model, can students predict how many loops there might be, and how many items in each loop?

CHALLENGE Ask students to show their predictions on their whiteboards, using numbers, labeled sketches, or words.



Equity-Based Practice

Affirming mathematics learners' identities

Inviting students to make predictions helps them to see themselves as mathematical learners who have valuable contributions to make. Using non-permanent recording tools, such as whiteboards and dry-erase markers, allows students to revise their thinking. It also encourages them to regard errors as a potential source of learning.



Kelsey It has to be an array with 16 squares in it.

Teacher Show thumbs-up if you agree with Kelsey. I'm seeing lots of thumbs up. Who'd like to explain why they agree?

Morgan It has to be 16 because the number of things is always the same as the date. And it has to be an array because that's the pattern — loops, ratio table, picture, array.

Teacher Can anyone tell us more about the array we might see on today's marker?

Students It could be one long row of 16, but that wouldn't fit very well.

It could be 2 rows of 8 because 8 and 8 make 16.

I don't think it's going to have 3 rows, because if you go by 3s, you don't land on 16.

It could be in 4s though, because 4, 8, 12, then 13, 14, 15, 16.

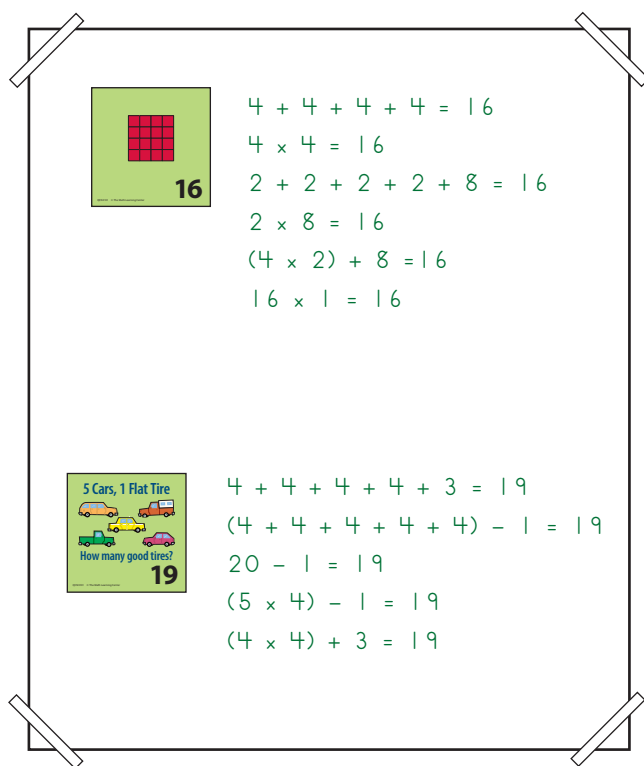
- 4 Have your helper post today's marker and write the date on the whiteboard. Have the rest of the students examine the new marker carefully and write at least one equation on their whiteboards to represent what they see.
- 5 When they have had a minute or so to record their ideas, ask students to share their equations with a neighbor. Then invite volunteers to share their equations with the class.
 - Record each suggestion on the whiteboard or a piece of chart paper posted near the Number Corner display area.
 - After students run out of suggestions, work with their input to select one equation to record on the observations chart.



Math Teaching Practice

Use and connect mathematical representations

By asking for equations without stipulating that they involve multiplication, you'll give students an opportunity to connect what they know about repeated addition to multiplication. Also, some of the calendar markers present opportunities to respond creatively and flexibly.



Examples equations students might generate for markers that appear in the middle of the month

✓ Updates

Complete the update routine for Calendar Grid.



Calendar Collector: Student Surveys, Part 2

Copies & Display	PO P8 Student Scaled Bar Graph
Classroom Materials	bag of completed Student Survey Planning Sheets from Day 2

- 1 Explain that you are going to pick one of the students' planning sheets out of the bag and help that student conduct their survey right now.
- 2 Display a blank Student Scaled Bar Graph.
- 3 As students watch, mix up the planning sheets, then pull one from the bag. Show the sheet to the class.
- 4 Have the student who wrote the plan read their question and the four related choices to the class. Record the choices on the display.
- 5 Briefly review the survey process. Explain that the student conducting the survey will:
 - Ask students to close their eyes while they listen to the options.
 - Name each choice one last time and ask students to raise their hand when their favorite is named.
 - Count the number of hands raised for each choice, and record those numbers on the board.

Students should keep their eyes closed so their choices are private.
- 6 Help the student follow the steps to conduct the survey.
- 7 When the information has been recorded, have the students open their eyes and examine the results. Then have the student conducting the survey enter the results on the graph with the help of their classmates.
- 8 If time is running short, have the class work together to determine how many rectangles should be colored in for each choice, bearing in mind that each increment on the graph stands for 2 students, rather than 1. The student who conducted the survey can fill in the data, labels, and graph title later in the day.

Note

If possible, give the student who conducted the survey a little time to share their completed graph with the class at a time when everyone is gathered. If time doesn't allow for this, have the student post the graph in the classroom where classmates can examine it at their leisure.

Optional Extension: More Student Surveys

Copies & Display	PO P8 Student Scaled Bar Graph PO P9 Survey Report Sheet (optional)
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- 1 Give all the students a chance to conduct the surveys they planned on Day 2.
Pull a Survey Planning Sheet out of the bag each day during Number Corner. Have the student whose plan is selected conduct their survey over the course of the day with one classmate at a time and then record the data on a copy of the Student Scaled Bar Graph print original. At the end of the day, allow the student to briefly share their graph and survey results with the class. Then have them post it on the wall alongside the other graphs you've made this month.
- 2 Once all the students have conducted their surveys, consider placing the entire collection on display in the hall outside your classroom for other students, teachers, and parents to read. As an alternative, you might bind the surveys together into a large book to enjoy throughout the year.

Note

The optional Survey Report Sheet asks students to reflect on and interpret their survey results in several ways. You might use it in conjunction with the extension suggestion here.

✓ Updates

Complete the update routine for Calendar Grid.



Number Line: From Grid to Number Path

Copies & Display	PO P10 Individual Student Number Path 10 to 1,000 PO P11 Number Path Clues
Classroom Materials	<ul style="list-style-type: none"> • scissors (class set) • glue sticks (class set) • crayons (class set) • small envelopes (half-class set) • paper (1 sheet, for screen)

- 1 Display the Individual Student Number Path print original where everyone can see it; give each student a copy.
Give students a few moments to examine the sheet quietly.
- 2 Explain that students will cut out the 10 rows and use a glue stick to attach them at the parts marked “tab” to create their own number paths.
Have each student get scissors, glue sticks, and crayons.
Because of the length of these number paths (almost 60 inches), many teachers find it helpful to allow some of the students to stretch out on the floor while others work on the tables or desks.
- 3 Before students start cutting, ask them to use a yellow crayon to lightly color in all the multiples of 100 — the “spud” numbers (100, 200, 300, and so on).
- 4 Use the display to model how to cut out and attach the first two rows.

10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180	190	200	tab
----	----	----	----	----	----	----	----	----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----

- 5 Give students a few minutes to assemble their own number paths.
Ask students who finish the task quickly and easily to help someone sitting near them.
- 6 Once students have all constructed their number paths, tell them you are going to have them color in some more of the numbers on their number paths by following a set of clues you’ll give them.
- 7 Display the Number Path Clues print original, screening all but the top line with a piece of paper.
 - Read the top line with the class. Then slide the paper down the Number Path Clues print original to reveal the clues one at a time.
 - Read each clue with the students and give them time to find and color the numbers. Encourage students to help one another as they work.

SUPPORT Have students circle or underline the numbers for each clue before they color them in.

- 8 As you work through the clues, call on volunteers to share and explain their answers.

Record correct answers below each clue on the display as students provide them.

- 9 Give each pair of students a small envelope. Explain that they're going to create pockets in the back of their Number Corner Student Books for storing their number paths.
- Show students how to seal the envelope. Then have students cut the envelope in half along its width to form two small pockets, one for each partner.
 - Show students how to glue the pocket to the inside back covers of their student books.
 - Finally, show them how to fold their number paths down small enough to fit into the pocket.
- 10 Let students know they will be using their number paths in future activities.

✓ Updates

Complete the update routine for Calendar Grid.



Computational Fluency: Loops & Groups Rematch

Copies & Display	PO P7 Loops & Groups record sheet NCSB 1 Loops & Groups record sheet
Kit Materials	die numbered 1–6

- 1 Display a fresh copy of the Loops & Groups record sheet, and have students find the page in their Number Corner Student Books.
- 2 Explain that you're going to play another game of Loops & Groups with the class.
 - Briefly review the rules of the game.
 - Let students know they are going to record the results of the game on their record sheets today, but only for their team.
 - Explain that you will keep track of your own results on the display.

- 3 Play the game with the class, just as you did the first time.

Use questions such as these to keep student engagement high while playing:

- *I rolled a 3 for the number of loops, and a 5 for the number of shapes I get to draw in each loop. How many shapes will I get in all? How did you figure it out?*
- *The class just rolled a 4 for the number of loops. What would you have to roll for the number of shapes in each loop to wind up with a product greater than mine?*
- *How does your product for the second turn compare with mine? Which of the two is greater? By how much?*
- *Now that both teams have had four turns, let's figure out who's ahead. If you add my four products, what's the total? What is the total of your four products? Which team is ahead? By how much?*
- *What will you need to roll on your last turn to win? Is there more than one possibility?*



Math Teaching Practice

Pose purposeful questions

Posing questions that invite students to discuss different scenarios in which they can win or lose the game encourages flexible thinking and improves number sense. Students' responses provide valuable formative assessment.

✓ Updates

Complete the update routine for Calendar Grid.



Number Line: Number Riddles

Kit Materials	One Thousand Chart
Classroom Materials	students' number paths from Day 13

Prior to today's activity, erase any marks on the One Thousand Chart wall display.

- 1 Ask students to get out the individual number paths they made during the previous Number Line activity. Tell them you are going to share some number riddles. Their job is to identify each number you are thinking of.

Have the students sit in pairs to work these riddles. Explain that some of the riddles are challenging, so they'll really need to work together to solve them.

- 2 Pose riddles similar to the ones listed below.

These riddles are sequenced from less to more challenging. You can change them to best meet the needs and strengths of your class.

- *I'm thinking of the number that's between 420 and 440 on your number path. What's my number? (430)*
- *I'm thinking of a number. If you jump by 100 four times starting at 370, you'll be on my number. What's my number? (770)*
- *I'm thinking of a number that's 5 tens more than 150. What's my number? (200)*
- *I'm thinking of a number that's 12 tens more than 400. What's my number? (520)*
- *I'm thinking of a number that is 33 tens more than 300. What's my number? (630)*
- *I'm thinking of a number. If you double 2 hundreds and 2 tens, you'll know my number. What's my number? (440)*
- *I'm thinking of a number. If you start at 200 and add half of my number, you'll be at 600. What's my number? (800)*
- *I'm thinking of a number. It is 99 tens less than 1,000. What's my number? (10)*

- 3 As you pose each riddle, give student pairs time to work together to find the answer.
 - Have student pairs show thumbs-up when they believe they have the solution.
 - Call on different students to share and explain their answers.

- 4 Circle the correct answer to each riddle on the One Thousand Chart.

- 5 At the end of the activity, have students fold and store their number paths in the pocket at the back of their Number Corner Student Books for future reference.



Digital Resources

The Number Pieces app can provide the visual place value support for this discussion as students refer to the number of tens or hundreds that make up a number.

Apps are available at apps.mathlearningcenter.org.



Calendar Grid: Making Predictions & Writing Equations, Part 2

Kit Materials	Calendar Grid display
Classroom Materials	student whiteboards, markers, and erasers (class set)

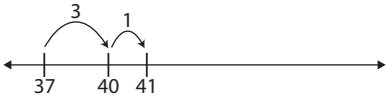
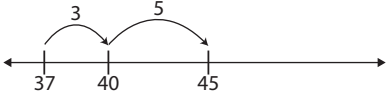
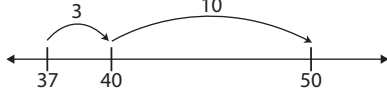

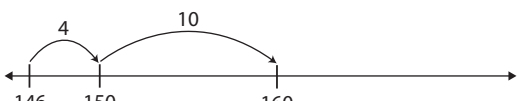
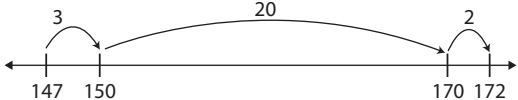
- 1 Ask students to bring whiteboards, markers, and erasers with them to the Number Corner discussion area today.
- 2 Take a few minutes with the class to update the Calendar Grid Observations chart through the previous day.
- 3 Before your student helper posts the new marker for today, ask the class to share predictions, first in pairs, and then as a whole group.
- 4 Have your helper post today's marker and write the date on the whiteboard. Have the rest of the students examine the new marker carefully and write at least one equation on their whiteboards to represent what they see.
- 5 When they have had a minute or so to record their ideas, ask students to share their equations with a neighbor. Then invite volunteers to share their equations with the class.



Solving Problems: Number String 3

Classroom Materials	whiteboard or chart paper
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- 1 Let students know that today's Number String will focus on multidigit addition strategies. If needed, review the number string routine.
Students consider the idea of adding enough to the greater addend to get to the nearest multiple of 10, then jumping by tens or multiples of 10, and finally adding the remaining ones.
- 2 Deliver the number string shown in the following table.
Students might share various strategies for solving these problems, including different strategies and jump intervals. Use number lines and equations to record their strategies.

Problems	Sample Strategies & Recording	Connections
$37 + 4 = 41$	 $4 = 3 + 1$ $37 + 3 = 40$ $40 + 1 = 41$	<p>These problems are selected to elicit the strategy of getting to a friendly number, e.g., the nearest multiple of 10, then adding tens or multiples of 10 until that's no longer possible, and finally adding any remaining ones.</p> <p>Big Idea You can start with the first or greater addend on the number line and jump to the closest friendly number. Then use the leftover part of the second addend to jump by tens, fives, or ones.</p>
$37 + 8 = 45$	 $8 = 3 + 5$ $37 + 3 = 40$ $40 + 5 = 45$	
$37 + 13 = 50$	 $13 = 10 + 3$ $37 + 3 = 40$ $40 + 10 = 50$	
$149 + 4 = 153$	 $4 = 1 + 3$ $149 + 1 = 150$ $150 + 3 = 153$	
$146 + 14 = 160$	 $14 = 4 + 10$ $146 + 4 = 150$ $150 + 10 = 160$	
$147 + 25 = 172$	 $25 = 3 + 2 + 20$ $147 + 3 = 150$ $150 + 20 = 170$ $170 + 2 = 172$	

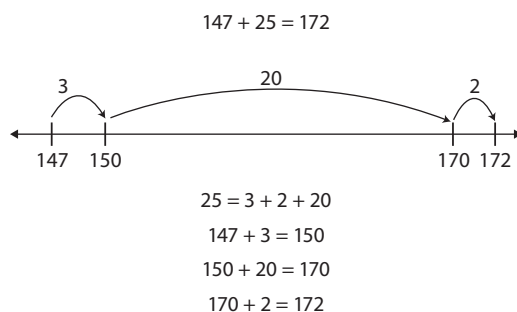
SUPPORT The strategy of getting to a friendly number requires decomposing one of the addends in a way that's more complex than simply splitting it into tens and ones. To add $136 + 28$, for example, students have to determine how much to add to 136 to reach the next multiple of 10. Then they have to figure out how much remains to be added after they take 4 from the 28. To support students in doing this, you might offer some targeted practice, first with identifying the multiple of 10 that comes after a given number, then determining how much needs to be added to that given number to get to the next multiple of 10. When that becomes more or less automatic, offer a short series of different addends that can be decomposed to get the first number up to the next multiple of 10. Here are some sample prompts you might use.

- What's the next multiple of 10 after 27 (48, 63, 85, 113, 206, etc.)?
- How much do you have to add to 25 (68, 97, 116, 254, etc.) to get to the next multiple of 10?
- Let's say we want to add 68 and 5. How can you split the 5 to get from 68 to the next multiple of 10? How much is still left to add after that?
- What if we want to add $97 + 8$ ($97 + 13$, $97 + 24$, $97 + 36$)?

- 3 Ask students to explain in their own words the strategy that many of them used in today's number string. Have them share their thoughts as you record a class summary on the board.

Sample Summary: Get to a Friendly Number

When we use the get to a friendly number strategy, we break one of the addends apart to get what we need to get the other addend up to the next multiple of 10. Then, we can add the rest in one or more parts.



Digital Resources

Consider using the Number Line or Number Chart apps to provide visual support as you pose problems like these.

Apps are available at apps.mathlearningcenter.org.

✓ Updates

Complete the update routine for Calendar Grid.



Calendar Collector: Which Read-Aloud?

Classroom Materials

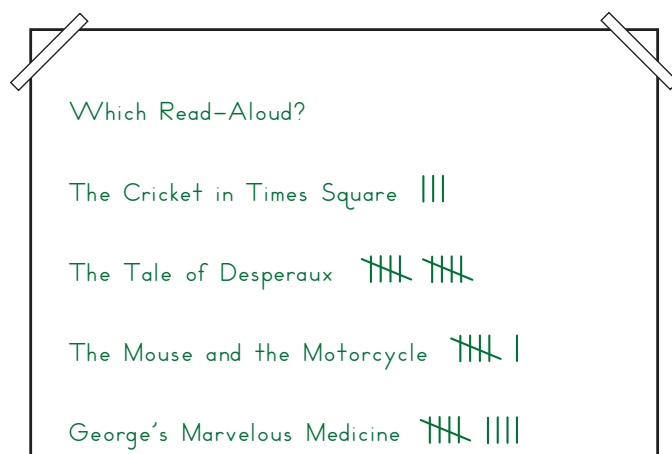
- prepared scaled picture graph
- prepared picture graph markers
- graph labels
- prepared read-aloud books
- whiteboard or chart paper
- glue stick
- scissors
- student whiteboards, markers, and erasers (class set)

Prior to this activity, post the scaled picture graph you prepared. Place the four read-aloud books on a shelf, ledge, or small table nearby. Write the name of each book on the board or chart paper.

- When the first few students enter the classroom today, show them the list of books you've written on the board or chart paper, along with the graph you've prepared, and explain the survey.
 - Have them each make a tally mark beside the book they'd most like you to read.
 - Then leave a student stationed at the board or chart paper to explain the survey to the other students as they arrive, and have them make tally marks to indicate their choices.

Note

This illustration shows four of our favorite chapter books; they are not meant to influence your choice of books.



- Make sure everyone has had a chance to mark their choice on the board or chart paper before you gather the class for Number Corner.

- 3 Ask students to bring whiteboards, markers, and erasers with them to the Number Corner discussion area.
- 4 When everyone is seated, draw students' attention to the blank graph and the four books on display.
 - Briefly explain the survey.
 - Show students the picture graph markers you've prepared. As they watch, glue one into place in the Key section, and label it to show that each book stands for 2 votes.



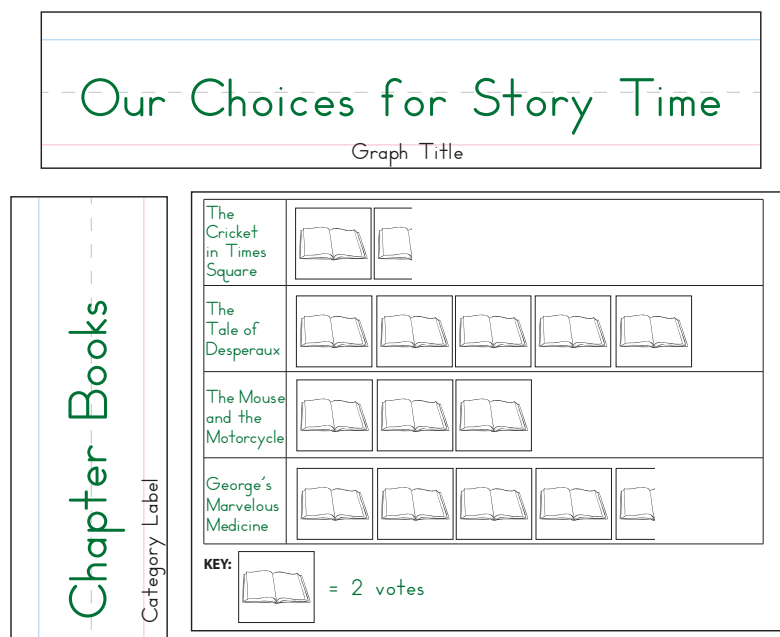
- 5 Ask students to figure out how many picture graph markers to glue into each row of the graph to show the results of the survey.
- 6 When most students have finished, work with their input to glue the correct number of markers into each row.
- 7 Discuss with them how you can cut the picture graph markers in half to accommodate odd numbers of votes if necessary.
- 8 Work with student input to generate a title and a category label for your picture graph.
 - Use the sentence strip labels you prepared.
 - Note with students that a picture graph does not have a scale, and challenge them to explain why that is the case.



Math Practices in Action

Look for and make use of structure

Students will use what they have seen in previous graphs to determine how to represent new results.

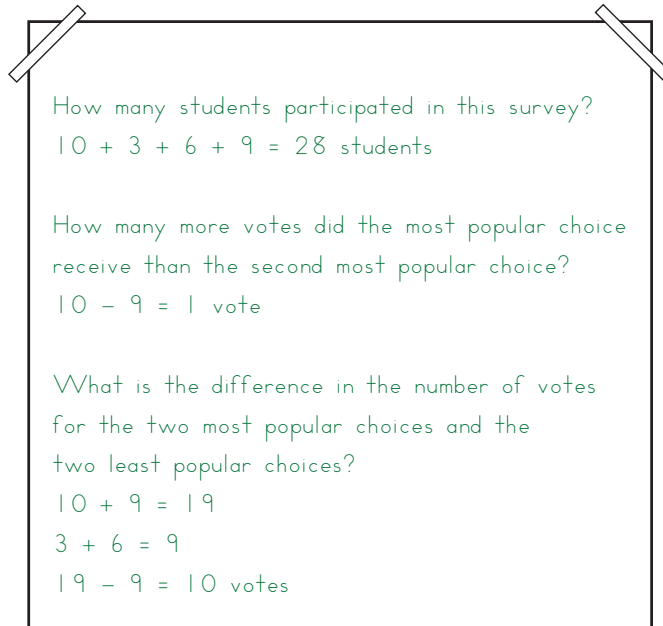


- 9 Pose questions and prompts these about the graph.
 - Erase the board or put aside the piece of chart paper displaying the votes, so students read the graph to get their information.
 - Have students respond to each question in writing on their whiteboards.

- » Which book got the most votes? The fewest?
- » How many more students chose the book that got the most votes, compared with the book that got the fewest votes?
- » Use the greater than or less than sign to compare the number of votes two of the books got. Show your inequality statement to the person next to you and see if they can figure out which two books you are comparing.

- 10 Write several questions about the graph on a piece of chart paper. After you write each one, have students respond by writing and solving one or more equations.

Invite a volunteer to read their equation to the class as you add it to the chart.



How many students participated in this survey?
 $10 + 3 + 6 + 9 = 28$ students

How many more votes did the most popular choice receive than the second most popular choice?
 $10 - 9 = 1$ vote

What is the difference in the number of votes for the two most popular choices and the two least popular choices?
 $10 + 9 = 19$
 $3 + 6 = 9$
 $19 - 9 = 10$ votes

- 11 Post the labeled graph and the chart of questions and equations in the display area along with the work preferences graph from Day 1 and the other graphs previously made by students.

✓ Updates

Complete the update routine for Calendar Grid.



Computational Fluency: Loops & Groups with a Partner

Copies & Display	PO P7 Loops & Groups record sheet
Kit Materials	dice numbered 1–6 (half-class set)

- 1 Display a blank Loops & Groups record sheet, and explain that students are going to play the game again today, this time in pairs.
- 2 Briefly review the rules of the game. Then have students pair up. Give each pair two copies of the record sheet and a die numbered 1–6.
- 3 Give students the remainder of the time to play the game.
Circulate as they work to observe and assist as needed.
SUPPORT If you anticipate that some students will run into difficulty playing the game on their own, you might invite a small group to play with you in a corner of the room while the rest of the class is engaged in pairs.
- 4 At the end of the activity, collect students' record sheets to look over at a later time.



Math Teaching Practice

Elicit and use evidence of student thinking

Students' papers will give you a sense of how they are doing with the multiplication concepts the class has addressed this month.

✓ Updates

Complete the update routine for Calendar Grid.



Calendar Grid: Completing the Multiplication Models Page

Copies & Display	NCSB 2–3 Multiplication Models
Kit Materials	colored tiles (optional)

- 1 Display the first page of Multiplication Models and explain to students that they're going to do an assignment in their Number Corner Student Book today, rather than meeting in the discussion area.
 - Have students find the Multiplication Models pages in their student books.
 - Give them a few moments to examine both pages quietly.
- 2 Preview and explain the instructions on both pages to the class. When students understand what to do, give them the rest of the session to complete the assignment.
 - While students work, circulate to observe and provide assistance as needed.
 - As students finish, have them share and compare their answers with a classmate. Encourage them to work together to reexamine problems for which they got different answers, or consult with another classmate to resolve their differences.

SUPPORT Make colored tiles available to help students solve some of the problems.

SUPPORT If some of your students aren't able to complete the assignment within the Number Corner session, give them additional time to finish their work over the next day or so.



Calendar Grid: Making Predictions & Writing Equations, Part 3

Kit Materials	Calendar Grid display
Classroom Materials	<ul style="list-style-type: none"> • Calendar Grid Observations chart • student whiteboards, markers, and erasers (class set)

- 1 Ask students to bring whiteboards, markers, and erasers with them to the Number Corner discussion area today.
- 2 Take a few minutes with the class to update the Calendar Grid Observations chart through the previous day.
- 3 Before your student helper posts the new marker for today, ask students to make and justify predictions, first in pairs, and then as a whole group.
- 4 Have your helper post today's marker and write the date on the whiteboard. Have the rest of the students examine the new marker carefully and write at least one equation on their whiteboard to represent what they see.
- 5 When they have had a minute or so to record their ideas, ask students to share their equations with a neighbor. Then invite volunteers to share their equations with the class.



Math Practices in Action

Construct viable arguments and critique the reasoning of others

Students will have an opportunity to share with a partner, and then are invited to justify predictions for future markers by using mathematical reasoning.

Print Originals

GRADE 3 – SEPTEMBER





Scaled Bar Graph Sheet

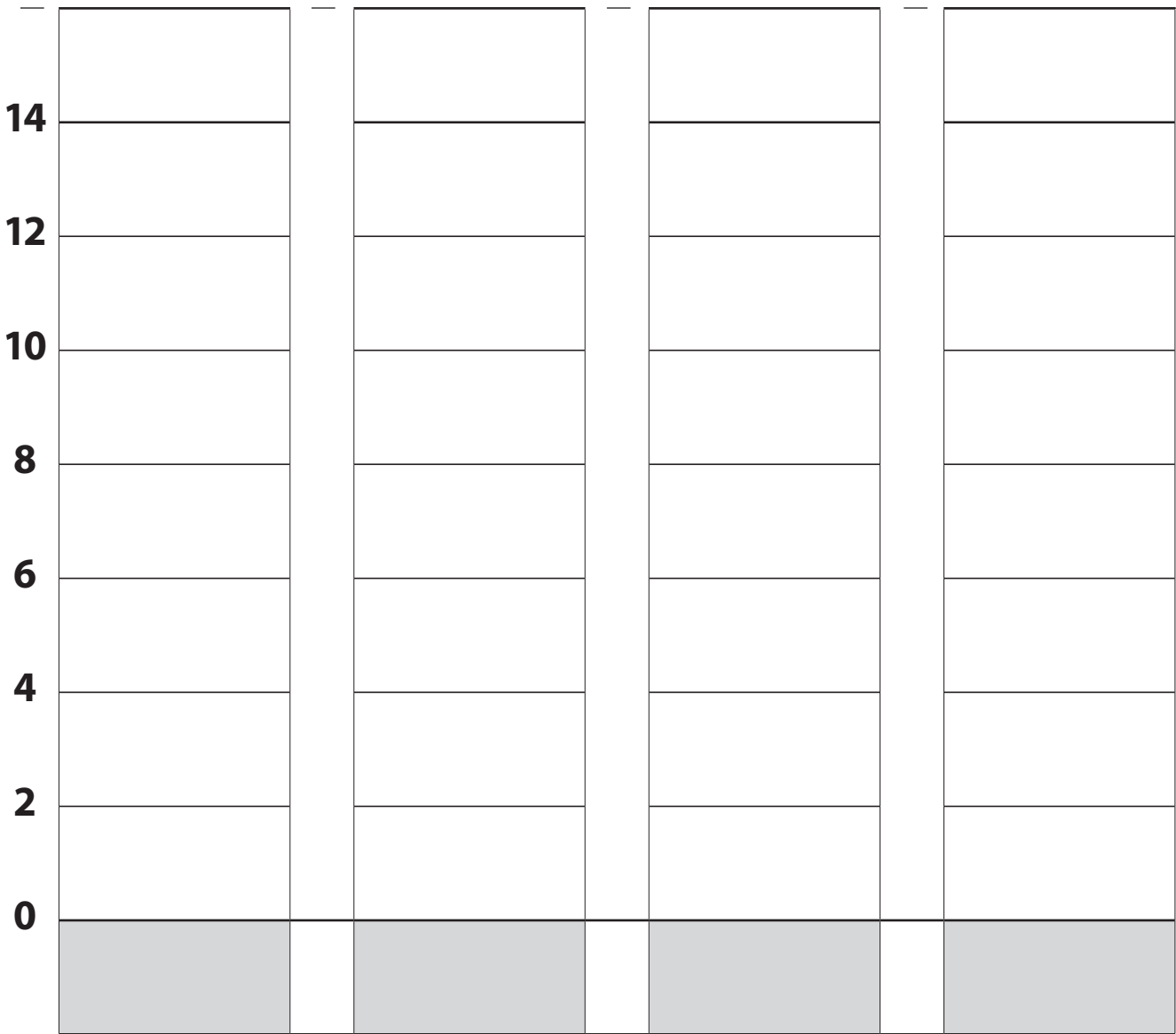
Number Corner Grade 3 Print Originals

SAMPLE 0922

P1

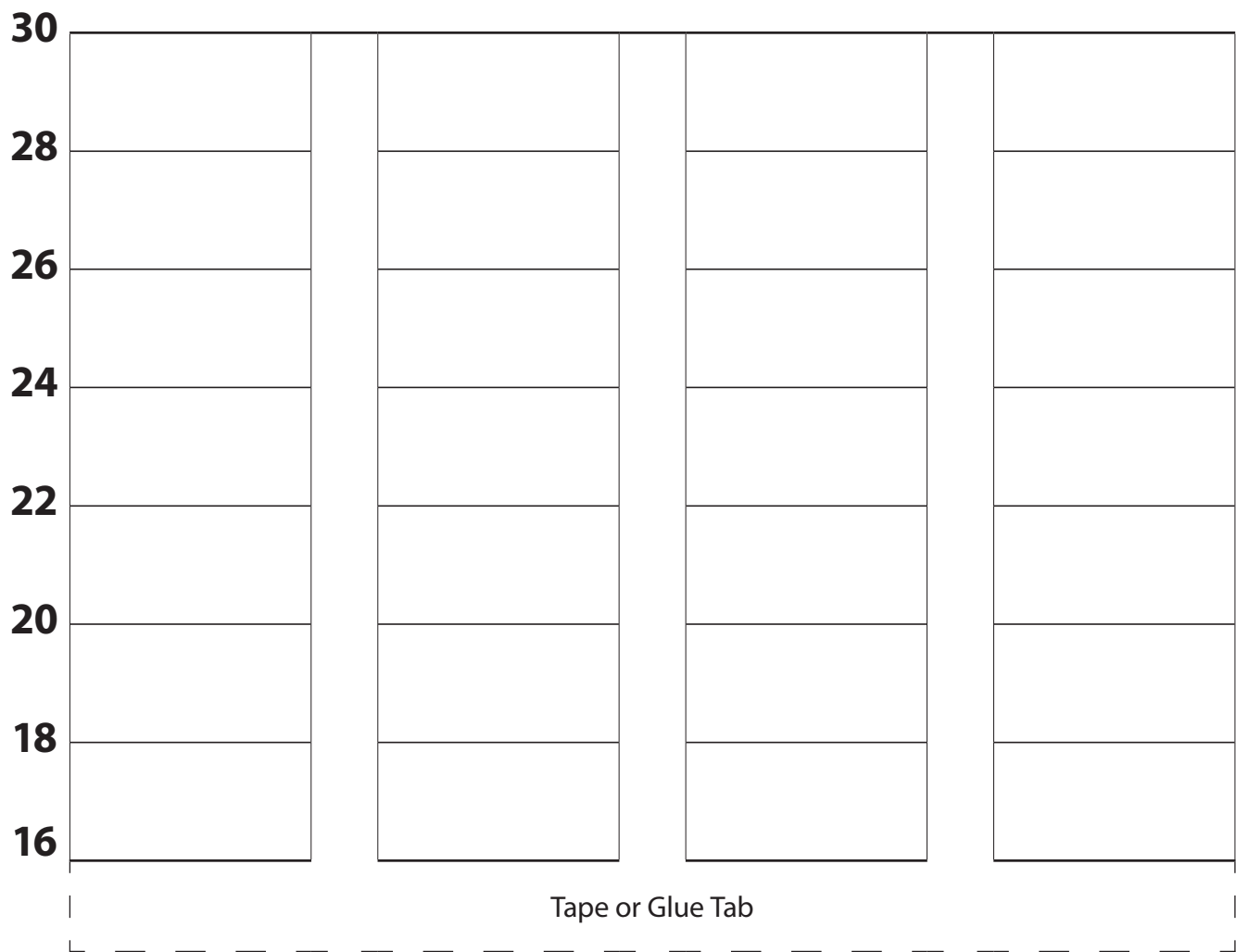
© The Math Learning Center | mathlearningcenter.org

Cut sheet along dashed line and attach to P2 where indicated.





Scaled Bar Graph Extension Sheet



↓ Cut sheet along dashed line and attach to P9 where indicated.



Scaled Picture Graph Sheet

KEY:






































Scaled Picture Graph Extension Sheet

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tape or glue



Picture Graph Markers

NAME _____

DATE _____



Student Survey Planning Sheet

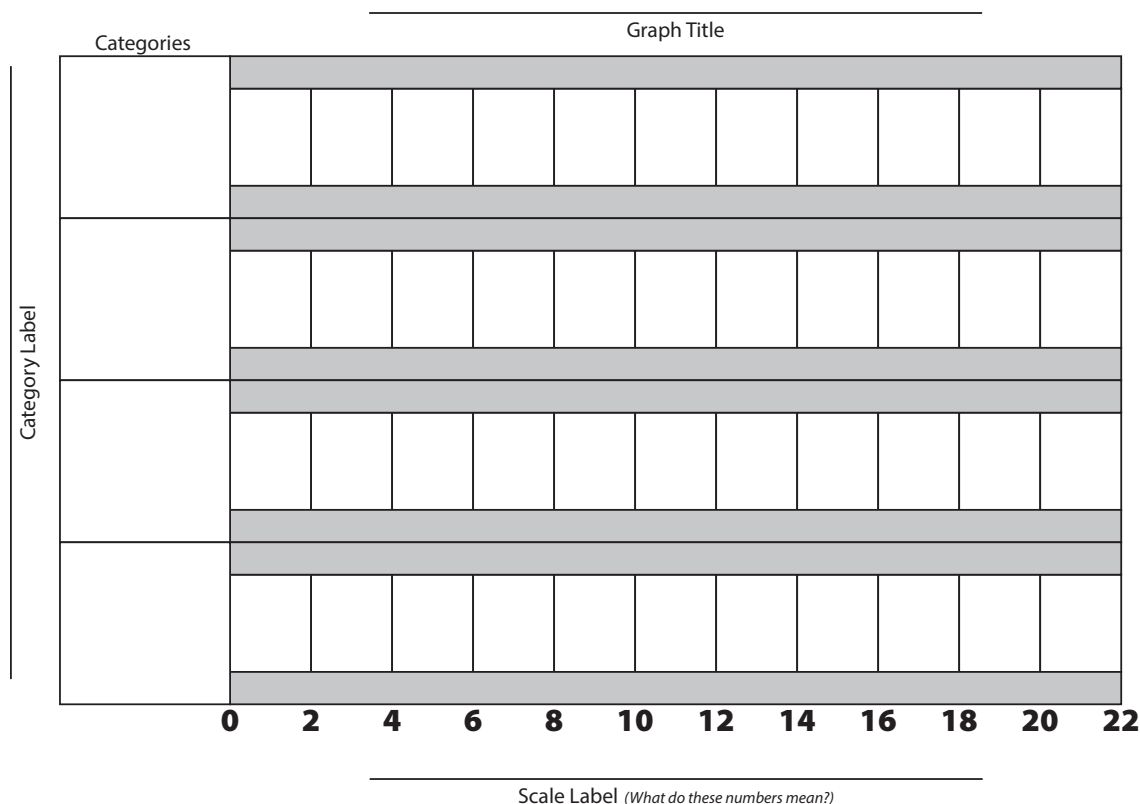
What would you like to know about our class?

1 My survey question: _____

2 The four choices I will offer:

3 Fill in the following information on the mini-graph below to show your data display plan:

- Graph Title (This is a title, so it cannot be a question.)
- Scale Label (The scale is 2; tell what the numbers across the bottom mean.)
- Categories (These are the four choices you're offering.)
- Category Label (This tells what all your categories have in common.)



NAME _____

DATE _____

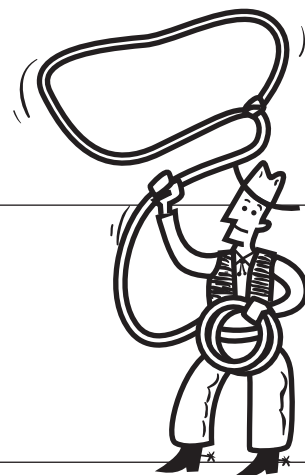


Loops & Groups Record Sheet

Player 1 _____ Player 2 _____

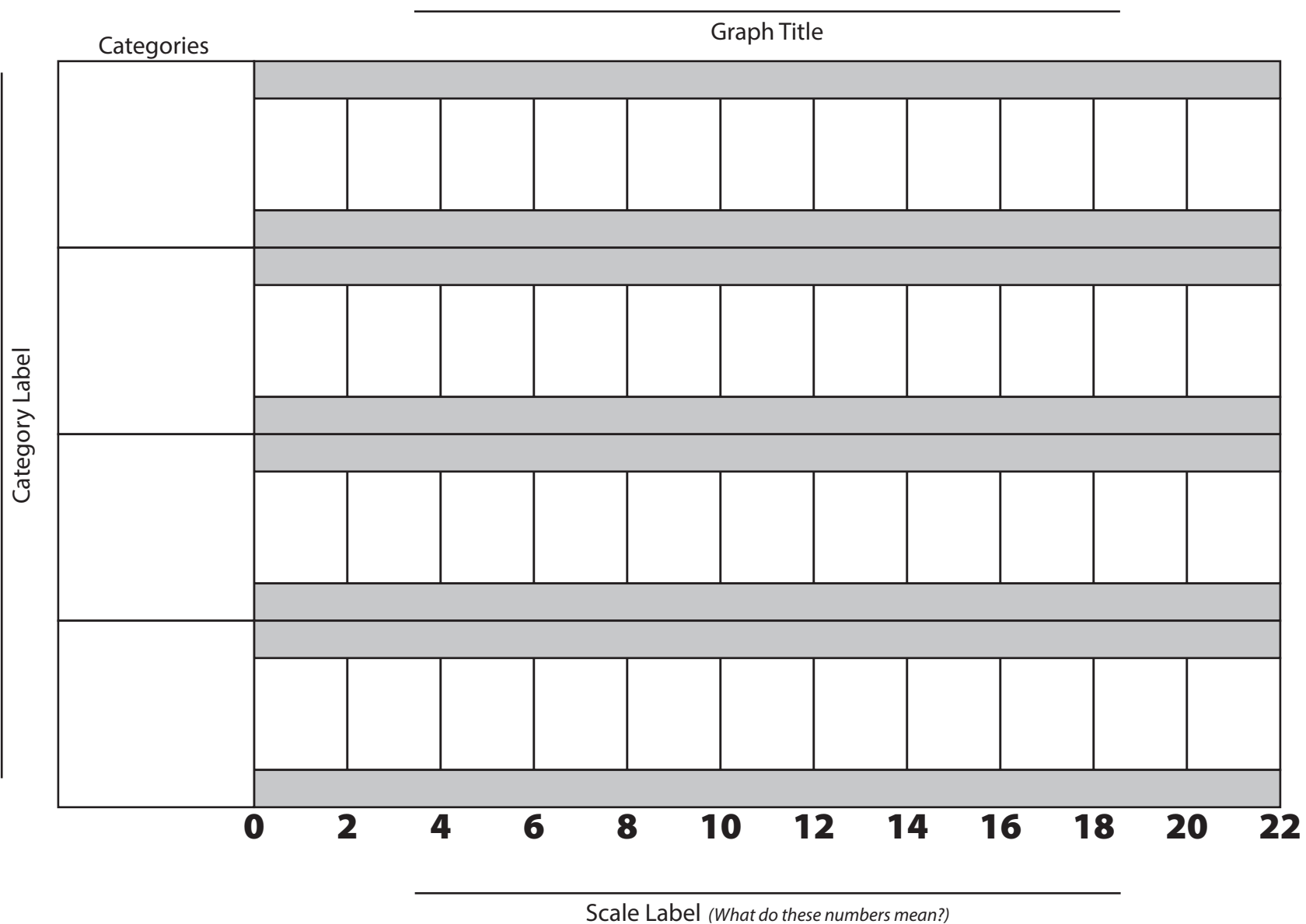
For each turn, record your loops and groups. Write a multiplication equation for each turn. Then use the space provided to find the sum of the 5 products.

1st Turn	
2nd Turn	
3rd Turn	
4th Turn	
5th Turn	
Find the Sum	





Student Scaled Bar Graph



NAME _____

DATE _____



Survey Report Sheet

1 I conducted a survey about _____

because _____

2 Here are some of the things I learned.

a The most popular choice was _____.

b The least popular choice was _____.

3 Here is one more thing I learned from my survey, or one thing that surprised me:

4 Here are some equations that will tell you more about the results of my survey.

a Total number of people who participated in my survey:

Write an equation on the line.

b Difference between the number of people who picked the most popular choice and the number of people who picked the least popular choice:

Write an equation on the line.

c Difference between the number of people who picked one of the top two choices and the number of people who picked one of the bottom two choices.

Write an equation on the line.

NAME _____

DATE _____



Individual Student Number Path 10 to 1,000

10	20	30	40	50	60	70	80	90	100	tab
110	120	130	140	150	160	170	180	190	200	tab
210	220	230	240	250	260	270	280	290	300	tab
310	320	330	340	350	360	370	380	390	400	tab
410	420	430	440	450	460	470	480	490	500	tab
510	520	530	540	550	560	570	580	590	600	tab
610	620	630	640	650	660	670	680	690	700	tab
710	720	730	740	750	760	770	780	790	800	tab
810	820	830	840	850	860	870	880	890	900	tab
910	920	930	940	950	960	970	980	990	1,000	tab



Number Path Clues

Follow the clues one by one to color in some of the numbers on your number path.

- ☐ Use a **BLUE** crayon to color in all the numbers with an 8 in the tens place.
- ☐ Use a **RED** crayon to color in all the numbers with a 3 in the hundreds place.
- ☐ Use an **ORANGE** crayon to color in the number that has exactly 13 tens.
- ☐ Use a **PINK** crayon to color in the number that has exactly 42 tens.
- ☐ Use a **BROWN** crayon to color in the number that is equal to 9 hundreds plus 2 tens plus 0 ones. How many tens are there in this number if you trade in all the hundreds for tens?
- ☐ Use a **PURPLE** crayon to color in the number that has a 0 in the ones place, a 6 in the tens place and a 4 in the hundreds place. How many tens are there in this number if you trade in all the hundreds for tens?
- ☐ Use a **GREEN** crayon to color in:
 - ☐ The number that is 200 more than 150.
 - ☐ The number that is 190 less than 400.
 - ☐ The number that is 180 less than 670.

Student Book

GRADE 3 – SEPTEMBER



NAME _____

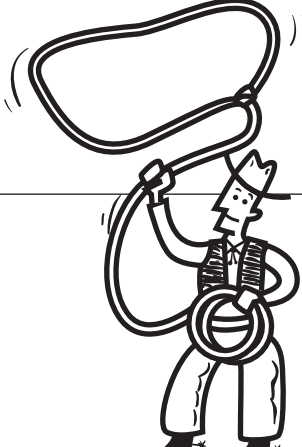
DATE _____



Loops & Groups Record Sheet

Player 1 _____ Player 2 _____

For each turn, record your loops and groups. Write a multiplication equation for each turn. Then use the space provided to find the sum of the 5 products.

1st Turn	
2nd Turn	
3rd Turn	
4th Turn	
5th Turn	
Find the Sum	

NAME _____

DATE _____



Multiplication Models page 1 of 2

- 1** Draw a line from each of the multiplication models to the matching equation. Then fill in the blank to show the answer.



$4 \times 5 = \underline{\quad}$



$3 \times 4 = \underline{\quad}$



$3 \times 6 = \underline{\quad}$

cars	tires
1	4
2	8
3	—

$2 \times 7 = \underline{\quad}$

- 2** Make a sketch of one of the multiplication models you studied this month to match each expression. Choose a different model for each expression.

2×4	
3×5	
6×2	

(continued on next page)

Multiplication Models page 2 of 2

3 One day, Jacob saw 4 ladybugs sitting on a leaf. Each ladybug had 4 spots.

a How many spots in all? Show your thinking.

b Which equation matches this problem? Fill in the bubble to show.

☐ $4 + 4 = 8$ spots

☐ $4 \times 4 = 16$ spots

☐ $4 + 4 + 4 = 12$ spots

☐ $4 - 4 = 0$ spots

4 Write a story situation to match this equation: $8 \times 2 = 16$.

5 CHALLENGE There was a tree with 3 branches. On each branch there were 3 cages. In each cage there were 3 birds. How many birds in all? Show your thinking.