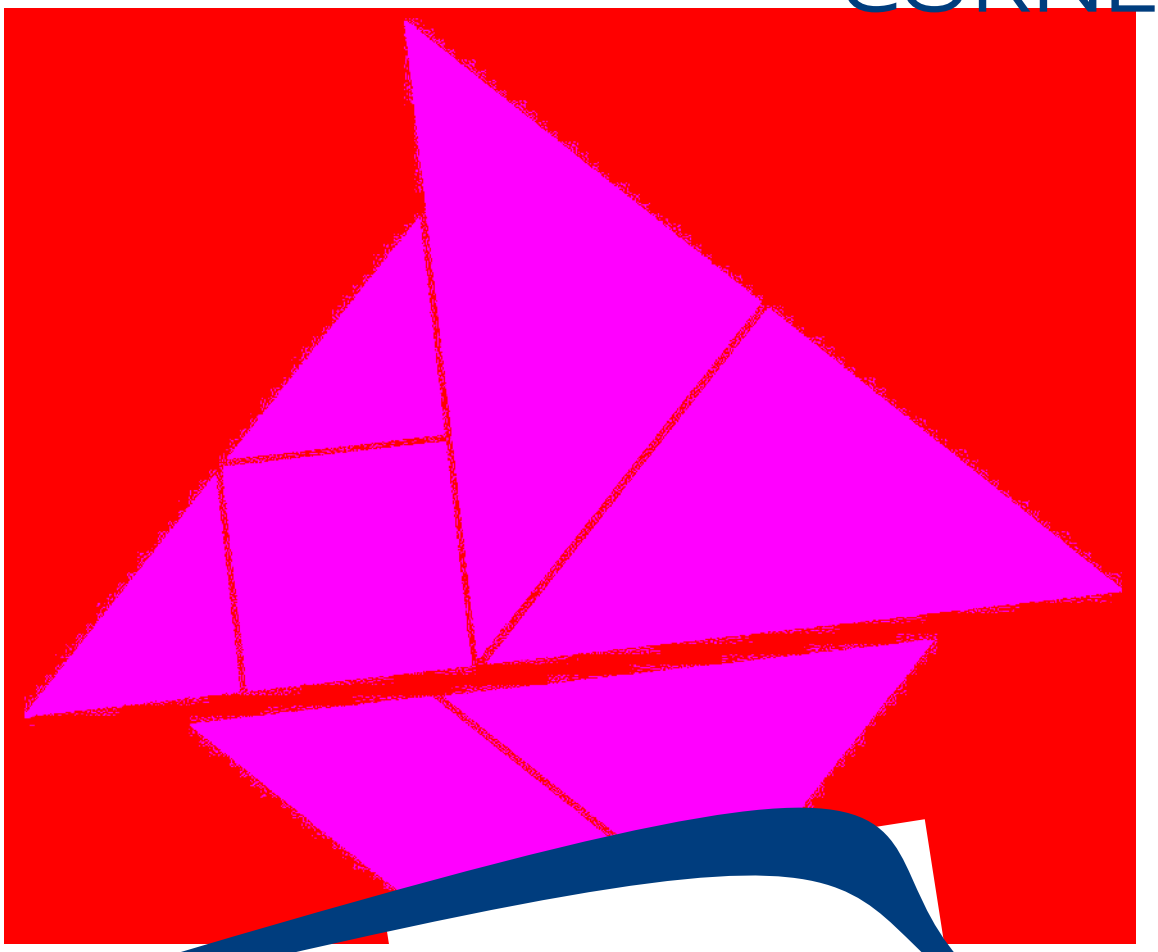
NUMBER® CORNER



SECOND EDITION

TEACHERS GUIDE

MAY

GRADE 3

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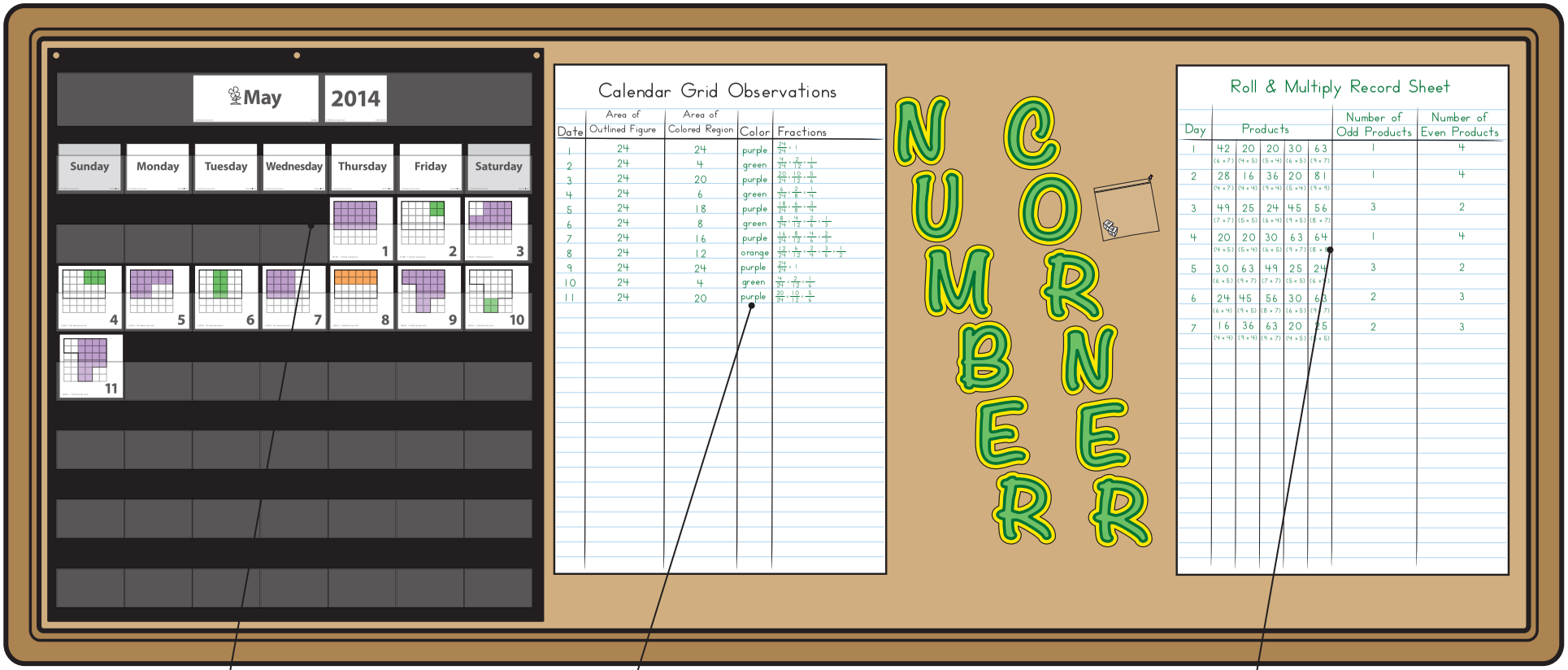
May Sample Display

Of the items shown below, some are ready-made and included in your kit; you'll prepare others from classroom materials and the included teacher masters. Refer to the Preparation section in each workout 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.



Calendar Grid Pocket Chart

Remember to consult a calendar for the starting day of this month and year.

Calendar Grid Observations Chart

You might use 24″ × 36″ chart paper. If you laminated a sheet in previous months, you can erase and reuse it now.

Calendar Collector Record Sheet

Students will roll and collect multiplication products in this month's Calendar Collector. See the Preparation section of the workout for details.

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☑ May Daily Planner

Day	Date	Calendar Grid	Calendar Collector	Computational Fluency	Number Line	Solving Problems	Assessment
1				**Activity 1** Quick Facts & Flashcards (p. 26)			
2		**Activity 1** Introducing the Calendar Grid (p. 7)					
3		*Update*	**Activity 1** Introducing Roll & Multiply (p. 17)				
4		*Update*	*Update*		**Activity 1** Introducing Put It on the Line with Mixed Numbers (p. 34)		
5		**Activity 2** Focus on Fractions & Division (p. 10)	*Update*				
6		*Update*	*Update*			**Activity 1** Solving & Discussing Problems (p. 42)	
7		*Update*	**Activity 2** Showing the Data on a Chart and Graph (p. 19)				
8		*Update*	*Update*	**Activity 2** Playing Ten to Win Multiplication as a Class (p. 28)			
9		**Activity 3** Finding the Area of Rectilinear Figures (p. 11)	*Update*				
10		*Update*	*Update*		**Activity 2** Playing Put It on the Line as a Class (p. 36)		
11		*Update*	*Update*			**Activity 1** Solving & Discussing Problems (p. 42)	
12		*Update*	**Activity 3** Thinking About the Data So Far (p. 21)				
13		*Update*	*Update*		**Activity 3** Playing Put It on the Line with a Partner (p. 38)		
14		*Update*	*Update*	**Activity 3** Focusing with Flashcards (p. 30)			
15		*Update*	*Update*			**Activity 1** Solving & Discussing Problems (p. 42)	
16		*Update*	**Activity 4** Drawing Conclusions About the Data and Experiment (p. 23)				
17		**Activity 4** Comparing Fractions (p. 13)	*Update*				Number Corner Checkup 4, Part 1 (p. 44)
18		*Update*	*Update*				
19		*Update*	*Update*				Number Corner Checkup 4, Part 2 (p. 45)
20		*Update*	*Update*	**Activity 4** Playing Ten to Win Multiplication in Pairs (p. 31)			

Note *The Calendar Grid and Calendar Collector are updated by student helpers, except when the workout is the subject of an activity. Computational Fluency, Number Line, and Solving Problems do not have updates. Update routines are explained in detail in the workout text. Summaries of the update routines appear below.*

Calendar Grid – Post one or more calendar markers so that the Calendar Grid is complete up to the current date. After the Observations Chart is posted, update the chart as well.
Calendar Collector – Roll two 4–9 dice, multiply the number shown and record the product on the Roll & Multiply Record Sheet, repeat the rolling, multiplying, and recording 4 more times, and then record how many products are odd and how many products are even.

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Number Corner
May

Overview

Workouts this month review and extend many key third grade skills and concepts. The Calendar Grid and Number Line workouts focus on fractions while the Calendar Collector, Computational Fluency, and Solving Problems workouts address multiplication facts and properties. The month ends with an assessment that will provide useful information for the end of the school year.

Activities

Workouts	Day	Activities	D	G	SB
Calendar Grid Fractions & Area with Rectilinear Figures Each calendar marker this month features a figure with an area of 24 square units, and some fraction of those square units are colored. Students explore different ways of finding the area of rectilinear figures and of portions of rectilinear figures. They also revisit many key fraction concepts, including equivalent fractions, comparison of fractions, and emphasizing the use of benchmark fractions like ½ to compare other fractions. They deepen their work with these skills and concepts, and apply them to story problems at the end of the month.	2	**1** Introducing the Calendar Grid	●		●
	5	**2** Focus on Fractions & Division	●		●
	9	**3** Finding the Area of Rectilinear Figures	●		●
	17	**4** Comparing Fractions	●		●
Calendar Collector Roll & Multiply Students collect data from repeated trials of a probability experiment in which they roll two dice marked 4–9 and multiply the two numbers. Before conducting the experiment, they predict how likely it is that a given product will be odd and how likely it is to be even, then revisit those predictions as they gather more data throughout the month.	3	**1** Introducing Roll & Multiply	●		
	7	**2** Showing the Data on a Chart & Graph	●		●
	12	**3** Thinking About the Data So Far	●		●
	16	**4** Drawing Conclusions About the Data & Experiment	●		●
Computational Fluency More Quick Facts & Games Students continue using the Quick Facts routine to demonstrate mastery of multiplication facts with products to 100. To practice the facts, they play a game called Ten to Win Multiplication and make their own flashcards featuring arrays and equations that illustrate strategies for quickly calculating select products.	1	**1** Quick Facts & Flashcards	●		
	8	**2** Playing Ten to Win Multiplication as a Class	●	●	
	14	**3** Focusing with Flashcards	●		
	20	**4** Playing Ten to Win Multiplication in Pairs	●	●	●
Number Line Put It on the Line with Fractions & Mixed Numbers In Put It on the Line, teams or players take turns solving problems and placing the answer to each problem on a number line. At the end of the game, teams or players estimate who will have the greater total score (the sum of all their answers) and then calculate each score to determine the winner. This month, the answers include fractions and mixed numbers.	4	**1** Introducing Put It on the Line with Mixed Numbers	●	●	
	10	**2** Playing Put It on the Line as a Class	●	●	
	13	**3** Playing Put It on the Line with a Partner	●	●	●
Solving Problems More Multiplication & Division Practice The Solving Problems workout this month gives students an opportunity to think about the properties of multiplication, the relationship between multiplication and division, and strategies for solving some of the more challenging multiplication combinations. This work supports and extends the Quick Facts routine, which is the focus of the Computational Fluency workouts. It is intended to provide the practice with multiplication and division that students need to demonstrate fluency with products to 100 before the end of the year.	6, 11, 15	**1** Solving & Discussing Problems	●		●
Assessment Number Corner Checkup 4 During the last week of the month, the teacher administers a written assessment to the entire class, half in place of Number Corner workouts one day, and the other half in place of workouts the following day. Number Corner Checkup 4 is designed to help teachers get a sense of students' skills and understandings at the end of the year.	18	**Number Corner Checkup 4, Part 1** Completing Pages 1–3			
	19	**Number Corner Checkup 4, Part 2** Completing Pages 4–6			

D – Discussion, **G** – Game, **SB** – Number Corner Student Book

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Teaching Tips

If your school year goes into June, as most do, you can stretch out the activities to last through the end of the school year. Some ways to do this include spending one activity working on a Number Corner Student Book page and the next activity sharing and discussing it, spending extra sessions playing the Computational Fluency games, or revisiting games from earlier in the year.

Use the results of Number Corner Checkup 4 to make recommendations for work over the summer.

Target Skills

The table below shows the major skills and concepts addressed this month. It is meant to provide a quick snapshot of the expectations for students' learning during this month of Number Corner.

Major Skills/Concepts Addressed	CG	CC	CF	NL	SP
3.OA.2 Interpret quotients of whole numbers	●				●
3.OA.2 Write story problems or describe problem situations to match a division expression or equation					●
3.OA.4 Solve for the unknown in a multiplication or division equation involving 3 whole numbers			●		●
3.OA.5 Multiply using the commutative, associative, or distributive property			●		●
3.OA.6 Solve division problems by finding an unknown factor			●		●
3.OA.7 Fluently divide with dividends to 100 using strategies	●		●		●
3.OA.7 Recall from memory all products of two 1-digit numbers			●		●
3.OA.7 Fluently multiply with products to 100 using strategies	●	●	●		●
3.OA.9 Identify patterns among basic multiplication facts			●		
3.OA.9 Explain patterns among basic multiplication facts by referring to properties of the operation	●	●			
3.G.2 Partition shapes into parts with equal areas and express the area of each part as a unit fraction of the whole	●				
3.NBT.3 Multiply whole numbers from 1–9 by multiples of 10 from 10–90 using strategies based on place value and properties of operations					
3.NF.2 Locate fractions on a number line				●	
3.NF.2 Place fractions in their correct positions on a number line				●	
3.NF.2a Represent a fraction 1/*b* on a number line diagram by defining the interval from 0 to 1 as the whole and partitioning it into *b* equal parts. Recognize that each part has size 1/*b* and that the endpoint of the part based at 0 locates the number 1/*b* on the number line.	●				
3.NF.2a Locate 1/*b* on the number line after partitioning the interval from 0 to 1 into b equal parts				●	
3.NF.3a Identify equivalent fractions by comparing their sizes and by comparing locations on a number line				●	
3.NF.3b Recognize and generate simple equivalent fractions; explain what two fractions must be equivalent	●			●	
3.NF.3c Express whole numbers as fractions, and recognize fractions that are equivalent to whole numbers.	●			●	
3.MD.3 Make a scaled bar graph to represent a data set with several categories		●			
3.MD.5a Demonstrate an understanding that a square with a side length of 1 unit is called a "unit square" and has 1 square unit of area	●				
3.MD.5a Demonstrate an understanding that unit squares can be used to measure the areas of other plane figures	●				
3.MD.5b Demonstrate an understanding that a plane figure that can be covered without gaps or overlaps by *n* unit squares has an area of *n* square units	●				
3.MD.7a Find the area of a rectangle with whole-number side lengths by tiling it	●				
3.MD.7a Demonstrate that the area of a rectangle with whole-number side lengths can be found by multiplying the side lengths	●				

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Major Skills/Concepts Addressed	CG	CC	CF	NL	SP
3.MD.7d Find the area of a rectangle by multiplying its side lengths; find the area of a figure that can be decomposed into non-overlapping rectangles; solve related story problems	●				
3.MP.1 Make sense of problems and persevere in solving them					●
3.MP.2 Reason abstractly and quantitatively					●
3.MP.3 Construct viable arguments and critique the reasoning of others		●		●	●
3.MP.4 Model with mathematics	●				
3.MP.5 Use appropriate tools strategically					
3.MP.6 Attend to precision			●	●	
3.MP.7 Look for and make use of structure			●		
3.MP.8 Look for and express regularity in repeated reasoning	●	●			

CG – Calendar Grid, **CC** – Calendar Collector, **CF** – Computational Fluency,
NL – Number Line, **DS** – Days in School

Assessments

Number Corner Checkup 4 is the last in a series of assessment, spread out across the school year. Although each assessment focused on somewhat different areas, you can still use the last assessment to gauge improvement over the course of the year. This assessment focuses on a number of important third grade skills and concepts. Touching on work students have done throughout the year, the assessment should offer insight into student understanding of writing, interpreting, and solving story problems; multiplication and division concepts and properties; fractions, including equivalent fractions, fractions on a number line, and fractions as whole numbers; area and the relationship between area and multiplication; and work with equations. Like all of the other checkups, this one takes place over two days toward the end of the month.

Materials

Each workout includes a list of required materials by activity. You can use the table below to prepare materials ahead of time for the entire month.

Materials		Done
Copies	Run copies of Teacher Masters T1–T17 according to the instructions at the top of each master.	
	If students do not have their own Number Corner Student Books, run a class set of pages 69–83.	
	Run a single display copy of Number Corner Student Book pages 69–76 and 78–83.	
Charts	Prepare this month's Observations Chart according to Preparation instructions in the Calendar Grid workout.	
	Prepare this month's Record Sheet according to Preparation instructions in the Calendar Collector workout.	
Special Items	Before Number Line Activities 1 and 2, prepare the Put It on the Line, Game Teacher Masters by covering each problem with a sticky note. If you are using an overhead projector, you may need to use a stack of sticky notes or card stock to ensure the problems are hidden.	
	Before Number Line Activity 3, get enough sticky notes for pairs of students to cover the problems on the Put It on the Line, Game 6 Teacher Master.	

May

CG

May Calendar Grid

Fractions & Area with Rectilinear Figures

Overview

Each calendar marker this month features a figure with an area of 24 square units, and some fraction of those square units are colored. Students explore different ways of finding the area of rectilinear figures and of portions of rectilinear figures. They also revisit many key fraction concepts, including equivalent fractions, comparison of fractions, and emphasizing the use of benchmark fractions like ½ to compare other fractions. They use Number Corner Student Book pages to deepen their work with these skills and concepts, and to apply them to story problems at the end of the month.

Skills & Concepts

- Interpret whole-number quotients of whole numbers (3.OA.2)
- Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division or properties of operations (3.OA.7)
- Identify equivalent fractions by comparing their sizes (3.NF.3a)
- Recognize and generate simple equivalent fractions and explain why two fractions must be equivalent (3.NF.3b)
- Compare two fractions with same numerator or the same denominator; demonstrate that fractions can be compared only when they refer to the same whole; explain why one fraction must be greater or less than another fraction; use the symbols >, =, and < to record comparisons of two fractions (3.NF. 3d)
- Demonstrate an understanding that a square with a side length of 1 unit is called a "unit square" and has 1 square unit of area (3.MD.5a)
- Demonstrate an understanding that unit squares can be used to measure the areas of other plane figures (3.MD.5a)
- Demonstrate an understanding that a plane figure that can be covered without gaps or overlaps by *n* unit squares has an area of *n* square units (3.MD.5b)
- Find the area of a rectangle with whole-number side lengths by tiling it (3.MD.7a)
- Demonstrate that the area of a rectangle with whole-number side lengths can be found by multiplying the side lengths (3.MD.7a)
- Find the area of a rectangle by multiplying its side lengths; find the area of a figure that can be decomposed into non-overlapping rectangles; solve related story problems (3.MD.7d)
- Partition shapes into parts with equal areas and express the area of each part as a unit fraction of the whole (3.G.2)
- Model with mathematics (3.MP.4)
- Look for and express regularity in repeated reasoning (3.MP.8)

Materials

Activities	Day	Copies	Kit Materials	Classroom Materials
Activity 1 Introducing the Calendar Grid	2	**NCSB 69*** Area & Fractions	• Calendar Grid pocket chart • Day, Month, and Year markers • Rectilinear Figures calendar markers	Used in all Calendar Grid activities this month: • Calendar Grid Observations Chart (see Preparation) • plastic sleeve and dry-erase markers
Activity 2 Focus on Fractions & Division	5	**NCSB 70*** Fractions of Other Areas		
Activity 3 Finding the Area of Rectilinear Figures	9	**NCSB 71*** Areas of Rectilinear Figures		
Activity 4 Comparing Fractions	17	**NCSB 72–73*** Area & Fractions Story Problems		• student whiteboards, markers and erasers (class set)

TM – Teacher Master, **NCSB** – Number Corner Student Book
Copy instructions are located at the top of each teacher master.

** Run 1 copy of these pages for display.*

Vocabulary

An asterisk [*] identifies those terms for which Word Resource Cards are available.

area*
denominator*
equal*
equivalent fraction*
fraction*
greater than
less than
numerator*

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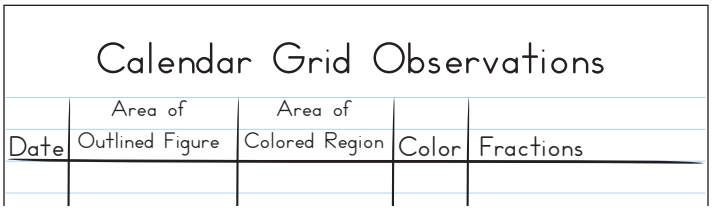
Preparation

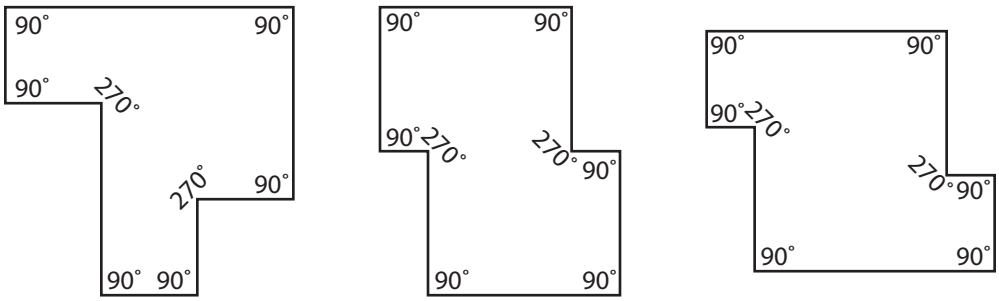
Calendar Grid Observations Chart

Erase the Calendar Grid Observations Chart from April. Create 5 columns and label the top of the first sheet as shown below for use with this month's markers. You'll extend the chart midway through the month using the second sheet of laminated chart paper. Use an erasable marker to record students' observations so that you can reuse the chart next year.

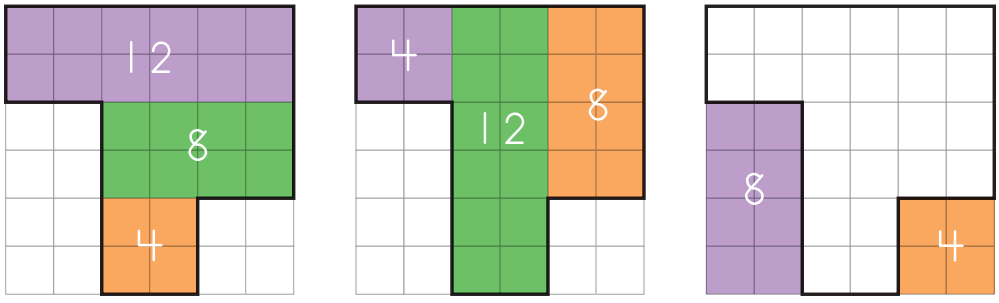


Mathematical Background

The markers this month feature rectilinear figures. A rectilinear figure is one in which all sides meet at right angles, which means that every interior angle is either 90° or 270°.



Rectilinear figures can be decomposed into non-overlapping rectangles. You can find the area of the figure by finding the area of each of these rectangles and then adding them. The figures on the markers are superimposed upon a grid of 36 square units, and students can subtract the areas of the parts of the grid that are not part of the figure to determine the area of each figure as well.



12 + 8 + 4 = 24 4 + 12 + 8 = 24 36 – 8 – 4 = 24

The area of each figure on the markers is 24 square units. For eight days in a row, a single figure is shaded in differently to represent the following fractions: $^{24}/_{24}$, $^{4}/_{24}$, $^{20}/_{24}$, $^{6}/_{24}$, $^{18}/_{24}$, $^{8}/_{24}$, $^{16}/_{24}$, $^{12}/_{24}$. Students divide the figures into equal parts in different ways to express each fraction in as many different ways as possible. This gives them the opportunity to consider equivalent fractions and to compare fractions.

All of this work with area and fractions requires students to use multiplication and division, which has been a focus all year long.

Because the calendar markers this month can be used to touch on so many skills and concepts related to area, fractions, and multiplication and division, consider your students' needs as you plan your instruction this month. If you feel students need more practice finding area, plan to emphasize that. If they need a lot more work fractions, spend more time talking about fractions.

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About the Pattern

The markers this month appear in sets of eight. Each set features a single rectilinear figure that is shaded in different ways to represent different fractions. The fractions always appear in the same order: $\frac{24}{24}$, $\frac{4}{24}$, $\frac{20}{24}$, $\frac{6}{24}$, $\frac{18}{24}$, $\frac{8}{24}$, $\frac{16}{24}$, $\frac{12}{24}$. Students will quickly notice a color pattern: purple, green, purple, green, purple, green, purple, orange. All purple markers show a fraction greater than ½; all green markers show a fraction less than ½; and all orange markers show exactly ½.

Update

Starting after Activity 1, have the student helper(s) complete this update procedure every day that the Calendar Grid is not a featured activity. You'll update the Calendar Grid as part of Activities 2, 3, and 4 as well.

Procedure

- Reveal new calendar makers up to and including the day's date.
- Record information about the new marker(s) on the Observations Chart.

Key Questions

Use the following questions to guide students' discussion this month:

- What do all the purple markers have in common? [They all represent fractions that are greater than ½.]
- What do all the green markers have in common? [They all represent fractions that are less than ½.]
- What is special about the orange marker? When do you think we'll see another orange marker? [It is exactly ½.]
- If we made a marker that had this same figure on it and we filled in 13 square units, should we use purple, green, or orange? Why? What if we filled in 7 square units? 21 square units?
- What is greater: $\frac{4}{6}$ or $\frac{3}{4}$ ($\frac{1}{3}$ or $\frac{5}{6}$, $\frac{2}{3}$ or $\frac{4}{6}$, $\frac{1}{4}$ or $\frac{1}{3}$, and so on)? Use the markers and Observations Chart to prove it. [$\frac{3}{4} > \frac{4}{6}$]
- We talk about the fractions on markers 6 and 7 as some number of thirds. Can we do that for marker 5? Why or why not?
- What is the same about markers 2 and 10 [or any pair of markers that shows the same number of shaded square units]? What is different about these markers?
- Can you say that the two fractions on markers 3 and 11 [or any pair of markers that shows the same number of shaded square units] are equal? Why or why not?

Date	Area of Outlined Figure	Area of Colored Region	Color	Fractions
1	24	24	purple	$24/24 = 1$
2	24	4	green	$4/24 = 2/12 = 1/6$
3	24	20	purple	$20/24 = 10/12 = 5/6$
4	24	6	green	$6/24 = 2/8 = 1/4$
5	24	18	purple	$18/24 = 6/8 = 3/4$
6	24	8	green	$8/24 = 4/12 = 2/6 = 1/3$
7	24	16	purple	$16/24 = 8/12 = 4/6 = 2/3$
8	24	12	orange	$12/24 = 6/12 = 2/4 = 3/6 = 1/2$
9	24	24	purple	$24/24 = 1$
10	24	4	green	$4/24 = 2/12 = 1/6$
11	24	20	purple	$20/24 = 10/12 = 5/6$
12	24	6	green	$6/24 = 2/8 = 1/4$
13	24	18	purple	$18/24 = 6/8 = 3/4$
14	24	8	green	$8/24 = 4/12 = 2/6 = 1/3$
15	24	16	purple	$16/24 = 8/12 = 4/6 = 2/3$
16	24	12	orange	$12/24 = 6/12 = 2/4 = 3/6 = 1/2$
17	24	24	purple	$24/24 = 1$
18	24	4	green	$4/24 = 2/12 = 1/6$
19	24	20	purple	$20/24 = 10/12 = 5/6$
20	24	6	green	$6/24 = 2/8 = 1/4$
21	24	18	purple	$18/24 = 6/8 = 3/4$
22	24	8	green	$8/24 = 4/12 = 2/6 = 1/3$
23	24	16	purple	$16/24 = 8/12 = 4/6 = 2/3$
24	24	12	orange	$12/24 = 6/12 = 2/4 = 3/6 = 1/2$
25	24	24	purple	$24/24 = 1$
26	24	4	green	$4/24 = 2/12 = 1/6$
27	24	20	purple	$20/24 = 10/12 = 5/6$
28	24	6	green	$6/24 = 2/8 = 1/4$
29	24	18	purple	$18/24 = 6/8 = 3/4$
30	24	8	green	$8/24 = 4/12 = 2/6 = 1/3$
31	24	16	purple	$16/24 = 8/12 = 4/6 = 2/3$

About the Pattern

The markers this month appear in sets of eight. Each set features a single rectilinear figure that is shaded in different ways to represent different fractions. The fractions always appear in the same order: $\frac{24}{24}$, $\frac{4}{24}$, $\frac{20}{24}$, $\frac{6}{24}$, $\frac{18}{24}$, $\frac{8}{24}$, $\frac{16}{24}$, $\frac{12}{24}$. Students will quickly notice a color pattern: purple, green, purple, green, purple, green, purple, orange. All purple markers show a fraction greater than ½; all green markers show a fraction less than ½; and all orange markers show exactly ½.

Notes:

CALENDAR GRID OBSERVATIONS

DATE	AREA OF OUTLINED FIGURE	AREA OF COLORED REGION	COLOR	FRACTIONS

May Calendar Collector

Roll & Multiply

Overview

Students collect data from repeated trials of a probability experiment in which they roll two dice marked 4–9 and multiply the two numbers. Before conducting the experiment, they predict how likely it is that a given product will be odd and how likely it is to be even. In the middle of the month, after conducting five trials every day, students revise their predictions and then continue making five trials a day through the end of the month. They continue compiling and analyzing data in order to draw conclusions about the probability of getting an odd or an even product with each roll.

Skills & Concepts

- Fluently multiply with products to 100 using strategies (3.OA.7)
- Identify patterns among basic multiplication facts (3.OA.9)
- Explain patterns among basic multiplication facts by referring to properties of the operation (3.OA.9)
- Make a scaled bar graph to represent a data set with several categories (3.MD.3)
- Construct viable arguments and critique the reasoning of others (3.MP.3)
- Look for and express regularity in repeated reasoning (3.MP.8)

Materials

Activities	Day	Copies	Kit Materials	Classroom Materials
Activity 1 Introducing Roll & Multiply	3		• 2 dice numbered 4–9	• black felt-tip marker • yellow highlighter • Calendar Collector Record Sheet Chart (see Preparation)
Activity 2 Showing the Data on a Chart & Graph	7	**NCSB 74*** Roll & Multiply Data Chart		
Activity 3 Thinking About the Data So Far	12	**NCSB 75*** Thinking About Roll & Multiply		
Activity 4 Drawing Conclusions About the Data & Experiment	16	**NCSB 76*** One More Look at Roll & Multiply		

TM – Teacher Master, **NCSB** – Number Corner Student Book
Copy instructions are located at the top of each teacher master. ** Run 1 copy of these pages for display.*

Vocabulary

An asterisk [*] identifies those terms for which Word Resource Cards are available.

even number*
odd number*
factor*
multiple*
product*

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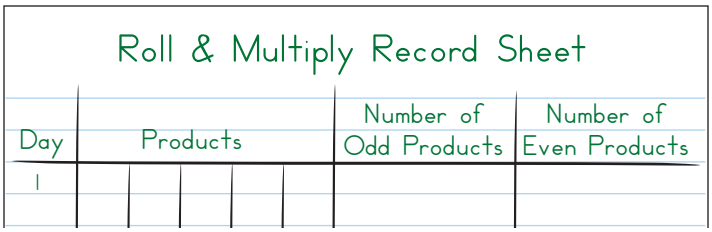
Preparation

Calendar Collector Record Sheet

Erase the entries from last month's Calendar Collector Record Sheet. Use an erasable marker and straight edge to create the columns and rows and label them as shown here for use with this month's collection.



Activity 4

Before the last activity, make sure the Record Sheet is up to date. Also, fill out the table on the top of your copy of the One More Look at Roll & Multiply Number Corner Student Book page.

Mathematical Background

Roll & Multiply is a great Calendar Collector for the end of third of fourth grade. While exploring more complicated concepts of probability, products and factors, data collection and analysis, and patterns in multiplication, this collector also provides practice and review with single-digit multiplication facts. Students generate data by multiplying two digits between 4 and 9 five times for each day of school in May, recording the products on a chart.

This workout provides exposure to and review of different ways of representing and interpreting data. Three times during the month, students compile data from the experiment and represent it on a table. Earlier in the month, they use the data to make a bar graph. Later in the month they match data to the appropriate pie graph. Students also explore probability as they consider the outcomes of their rolls, and use probability vocabulary (impossible, unlikely, equally likely as unlikely, likely, and certain) to describe their predictions. The data generated encourages them to compare the results, making observations such as "there are three times as many even products as odd products" and "there are 11 odd products out of a total of 40 products. That means about ¼ of the products are odd."

As the month continues, students realize that more products are even than odd. This realization prompts them to wonder why. As they consider the factors that result in even or odd products, they notice patterns among basic multiplication facts. They also deepen their understanding of factors and products, focusing on the relationship between the two. This month's calendar collector reviews important third grade skills and concepts while challenging students with a preview of fourth grade work.

Update

Starting after Activity 1, have the student helper(s) complete this update procedure every day that the Calendar Collector is not a featured activity. You'll update the Calendar Collector as part of Activities 2, 3, and 4 as well.

Procedure

The student helper:

- Rolls two 4–9 dice
- Multiplies the number shown and records the product on the Roll & Multiply Record Sheet
- Repeats the rolling, multiplying, and recording 4 more times
- Records how many products are odd and how many products are even

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ROLL & MULTIPLY

RECORD SHEET

DATE	PRODUCTS					NUMBER OF ODD PRODUCTS	NUMBER OF EVEN PRODUCTS

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May Computational Fluency

More Quick Facts & Games

Overview

Students continue using the Quick Facts routine to demonstrate mastery of multiplication facts with products to 100. To practice the facts and develop mastery, they play a game called Ten to Win Multiplication and make their own flashcards featuring arrays and equations that illustrate strategies for quickly calculating select products.

Skills & Concepts

- Solve for the unknown in a multiplication or division equation involving 3 whole numbers (3.OA.4)
- Multiply using the commutative, associative, or distributive property (3.OA.5)
- Solve division problems by finding an unknown factor (3.OA.6)
- Fluently multiply with products to 100 and divide with dividends to 100 using strategies (3.OA.7)
- Recall from memory all products of two 1-digit numbers (3.OA.7)
- Identify patterns among basic multiplication facts (3.OA.9)
- Attend to precision (3.MP.6)
- Look for and make use of structure (3.MP.7)

Materials

Activities	Day	Copies	Kit Materials	Classroom Materials
Activity 1 Quick Facts & Flashcards	1	**TM T1** Quick Facts Worksheet **TM T2–4** Quick Facts, Mixed Facts **TM T5** Multiplication & Division Flashcards **TM T6** Large Array Grids (optional for Challenge suggestion)		• timer, to use for timing students • colored pencils • class set of envelopes • Multiplication Facts Class Checklist (from April) • students' Quick Facts Tracking Sheet (NCSB 59)
Activity 2 Playing Ten to Win Multiplication as a Class	8	**TM T1** Quick Facts Worksheet **TM T2–4** Quick Facts, Mixed Facts **TM T7** Ten to Win Multiplication Game	• spinner overlay	• timer, to use for timing students • colored pencils in 2 colors • Multiplication Facts Class Checklist (from April) • students' Quick Facts Tracking Sheet (NCSB 59)
Activity 3 Focusing with Flashcards	14	**TM T1** Quick Facts Worksheet **TM T2–4** Quick Facts, Mixed Facts **TM T5** Multiplication & Division Flashcards **TM T6** Large Array Grids (optional for Challenge suggestion)		• timer, to use for timing students • colored pencils • class set of envelopes • Multiplication Facts Class Checklist (from April) • students' Quick Facts Tracking Sheet (NCSB 59)
Activity 4 Playing Ten to Win Multiplication in Pairs	20	**TM T1** Quick Facts Worksheet **TM T2–4** Quick Facts, Mixed Facts **NCSB 77** Ten to Win Multiplication Game	• spinner overlay, half-class set	• timer, to use for timing students • colored pencils • Multiplication Facts Class Checklist (from April) • students' Quick Facts Tracking Sheet (NCSB 59)

TM – Teacher Master, **NCSB** – Number Corner Student Book
Copy instructions are located at the top of each teacher master.

Vocabulary

An asterisk [*] identifies those terms for which Word Resource Cards are available.

dividend*
divisor*
equation*
factor*
product*
quotient*

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Preparation

Check your Class Record Sheet to see how students are doing with the Quick Facts. Students who have mastered multiplying by 2, 3, 4, and 5 can move on to multiplying by 6 or to Mixed Facts 2–6. Also, make sure you have plenty of copies of the Quick Facts Worksheets for this month as you will continue doing Quick Facts at the beginning of each activity.

Make sure students have access to their past Quick Facts papers. If you gave each student a folder last month, they will be stored in those folders.

Mathematical Background

This month students continue using the Quick Facts routine to track their progress mastering multiplication facts with products to 100. By now, the routine should be very familiar for students and should be running smoothly. Help students think about strategies that can facilitate this mastery, including solving the easiest facts first, using the commutative property to identify problems with the same product ($6 \times 9 = 9 \times 6$), and using related problems to solve other problems (since $8 \times 4 = 32$, 8×8 is twice that: 64).

Much of students' work in third grade has focused on developing a deep understanding of the properties of multiplication; ideally, that work will help them recall facts quickly and easily. This combination of understanding and fact fluency will support students as they continue working with multiplication (and division) in later years. You can use the results of the Quick Facts to make recommendations for work at home, over the summer, and into the next school year.

May Number Line

Put It on the Line with Fractions & Mixed Numbers

Overview

In Put It on the Line, players take turns solving problems and placing the answer to each problem on a number line. At the end of the game, players estimate who will have the greater total score (the sum of all their answers) and then calculate each score to determine the winner. Last month, the answers to the problems were fractions from 0 to 1. This month, the answers include mixed numbers as well.

Skills & Concepts

- Locate fractions on a number line (3.NF.2)
- Place fractions in their correct positions on a number line (3.NF.2)
- Locate 1/*b* on the number line after partitioning the interval from 0 to 1 into *b* equal parts (3.NF.2a)
- Identify equivalent fractions by comparing their sizes or by comparing their locations on a number line (3.NF.3a)
- Recognize and generate simple equivalent fractions, and explain why two fractions must be equivalent (3.NF.3b)
- Write a whole number as a fraction (3.NF.3c)
- Recognize fractions that are equivalent to whole numbers (3.NF.3c)
- Construct viable arguments and critique the reasoning of others (3.MP.3)
- Attend to precision (3.MP.6)

Materials

Activities	Day	Copies	Kit Materials	Classroom Materials
Activity 1 Introducing Put It on the Line with Mixed Numbers	4	**TM T8** Put It on the Line, Game 4 **TM T11** Put It on the Line, Answer Key	• more/less die	• class set of whiteboards, pens, and erasers • 2 different colored fine-tips markers or pens • scratch paper • 1 ½″ by 2″ sticky notes, 30–50 for Activities 1 and 2, and about 30 for each student in Activity 3
Activity 3 Playing Put It on the Line as a Class	10	**TM T9** Put It on the Line, Game 5 **TM T11** Put It on the Line, Answer Key		
Activity 3 Playing Put It on the Line with a Partner	13	**TM T10** Put It on the Line, Game 6 **TM T11** Put It on the Line, Answer Key		

TM – Teacher Master, **NCSB** – Number Corner Student Book
Copy instructions are located at the top of each teacher master.

Vocabulary

An asterisk [*] identifies those terms for which Word Resource Cards are available.

denominator*
equivalent fraction*
fraction*
improper fraction*
mixed number*
number line*
numerator*

Preparation

Before Activities 1 and 2, prepare the game teacher master by covering each problem with a sticky note. If you are using an overhead projector, you may need to use a stack of sticky notes or card stock to ensure the problems are hidden.

In Activity 3, students play with partners. You might want to assign partners ahead of time. Students will need to cover the problems on the game board with sticky notes before playing the game, or you can cover them yourself before handing out the copies.

Mathematical Background

The game Put It on the Line was introduced last month. In Put It on the Line, teams take turns solving problems and placing the solutions to each problem on a number line. At the end of the game, each team adds up their solutions. Then they roll the more/less die to see whether the team with the greater or lesser sum wins. Last month, the solutions were all fractions from 0 to 1. This month, the solutions are fractions from 0 to 3, which means students will be working with fractions, mixed numbers, and whole numbers. In labeling the number line for each game, students must think about the equivalencies between whole numbers and mixed numbers and fractions. While solving problems during the game, they use models and strategies they've been developing all year to add, subtract, and multiply fractions, compare fractions, and consider equivalencies.

Key Questions

Use the following questions to guide students' discussion this month:

- What fractions could go on this number line?
- Name some fractions that are equivalent to 1 ½ (1 ⅓, 2 ¼, etc.). How do you know they are equivalent?
- What is 1 ⅔ as an improper fraction?
- What is ⅝ as a mixed number?
- Anna spent 30 minutes at the park and 45 minutes at the pool. How much time (in hours) did Anna spend at the park and the pool?
- How can you write 2 as a fraction?

May
SP

May Solving Problems

More Multiplication & Division Practice

Overview

The Solving Problems workout this month gives students an opportunity to think about the properties of multiplication, the relationship between multiplication and division, and strategies for solving some of the more challenging multiplication combinations. This work supports and extends the Quick Facts routine, which is the focus of the Computational Fluency workouts. It is intended to provide the practice with multiplication and division that students need to demonstrate fluency with products to 100 before the end of the year.

Skills & Concepts

- Interpret quotients of whole numbers (3.OA.2)
- Write story problems or describe problem situations to match a division expression or equation (3.OA.2)
- Solve for the unknown in a multiplication or division equation involving 3 whole numbers (3.OA.4)
- Multiply using the commutative, distributive, and associative properties (3.OA.5)
- Solve division problems by finding an unknown factor (e.g., Solve 32 ÷ 8 by finding the number that makes 32 when multiplied by 8) (3.OA.6)
- Fluently multiply and divide with products and dividends to 100 using strategies (3.OA.7)
- Make sense of problems and persevere in solving them (3.MP.1)
- Reason abstractly and quantitatively (3.MP.2)
- Construct viable arguments and critique the reasoning of others (3.MP.3)

Materials

Activities	Day	Copies	Classroom Materials
Activity 1 Solving & Discussing Problems	6, 11, 15	**SB 78–83*** Multiplication & Division Problems	• students' completed and scored Quick Facts Worksheets from each week's Computational Fluency activity • colored pencils

TM – Teacher Master, **NCSB** – Number Corner Student Book
Copy instructions are located at the top of each teacher master. ** Run 1 copy of these pages for display*

Mathematical Background

The activities this month are meant to support students' development of fluency with multiplication facts and related division facts. Each week, students complete a new page in the Number Corner Student Book that features multiplication with the array model, fact families, straight multiplication and division practice in the form of number puzzles, and story problems. Students also use the results of the Quick Facts they are doing in this month's Computational Fluency workout to select multiplication combinations they want to focus on to build fluency with their facts to 10 × 10. The emphasis is on using the relationship between multiplication and division to solve problems, writing equations to represent multiplication and division problems, and developing computational strategies to build fluency.

Vocabulary

An asterisk [*] identifies those terms for which Word Resource Cards are available.

dividend*
divisor*
equation*
factor*
product*
quotient*
unknown*
variable*

May
A

May Assessment
Number Corner Checkup 4

Overview

During the last week of the month, the teacher administers a written assessment to the entire class, half in place of Number Corner workouts one day, and the other half in place of workouts the following day. Number Corner Checkup 4 is designed to help teachers ascertain students' current understandings and skills in the areas of: writing, interpreting, and solving story problems, multiplication and division concepts including multiplication properties, fractions, and area.

Skills & Concepts

- Write story problems or describe problem situations to match a multiplication expression or equation (3.OA.1)
- Write story problems or describe problem situations to match a division expression or equation (3.OA.2)
- Solve division story problems with dividends to 100 involving situations of equal groups (3.OA.3)
- Solve for the unknown in a multiplication or division equation involving 3 whole numbers (3.OA.4)
- Multiply using the commutative, associative, and distributive property (3.OA.5)
- Solve division problems by finding an unknown factor (3.OA.6)
- Fluently multiply and divide with products to 100 using strategies; recall from memory all products of two 1-digit numbers (3.OA.7)
- Solve two-step story problems using addition and subtraction; assess the reasonableness of answers to story problems using rounding and other estimation strategies (3.OA.8)
- Identify patterns among basic multiplication facts and in the multiplication table; explain patterns among basic multiplication facts by referring to properties of the operation (3.OA.9)
- Fluently add with sums to 1000 and subtract with minuends to 1000 (3.NBT.2)
- Multiply whole numbers from 1–9 by multiples of 10 from 10–90 (3.NBT.3)
- Place fractions in their correct positions on a number line (3.NF.2)
- Recognize fractions that are equivalent to whole numbers (3.NF.3c)
- Compare two fractions with the same numerator; explain why one fraction must be greater than or less than another fraction (3.NF.3d)
- Generate data by measuring lengths to the nearest half or fourth of an inch; Make a line plot to show measurement data, with a horizontal scale marked in quarter inches (3.MD.4)
- Find the area of a rectangle by multiplying its side lengths (3.MD.7b)
- Use the area model for multiplication to illustrate the distributive property (3.MD.7c)

Materials

Assessments	Day	Copies	Classroom Materials
Number Corner Checkup 4 Part 1 Completing Pages 1–3	18	**TM T12–14** Number Corner Checkup 4, pages 1–3	• colored pencils, 1 per student
Number Corner Checkup 4 Part 2 Completing Pages 4–6	19	**TM T15–17** Number Corner Checkup 4, pages 4–6	• rulers, class set • colored pencils, 1 per student

TM – Teacher Master, **NCSB** – Number Corner Student Book
Copy instructions are located at the top of each teacher master.

Vocabulary

An asterisk [*] identifies those terms for which Word Resource Cards are available.

area*
centimeters (cm)*
data*
divide*
equation*
estimation
even*
fraction*
grid
group
half*
inch (in.)*
line plot
multiply*
number line*
odd number*
product*
rectangle*
rounding*
square centimeters
whole

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Mathematical Background

Number Corner Checkup 4 give teachers an opportunity to gauge students' proficiency with some of skills that have been most heavily addressed in April and May, but also brings back skills and concepts from earlier in the year. These skills and concepts include multiplication, division, multiplication properties, the connection between multiplication and area, determining unknowns in equations, adding and subtracting 3-digit numbers, comparing fractions, and identifying fractions on a number line. Multi-step story problems occur throughout the assessment as well.

Conducting year end assessments is valuable for both the current teacher and the students' teacher for the following year. Comparing this assessment to the baseline and Number Corner Checkup 1 will provide information about growth made over the course of the year. Sharing the results of this final assessment with future teachers will help them know where students are and what was explored this year. Teachers can also use the results of these assessments to make recommendations for summer work. The results of this Number Corner Checkup will also reflect, to some extent, how effective the instruction has been for each student, and provide information about each child's current proficiency with key grade-level skills that can be shared with parents, administrators, paraprofessionals and resource room teachers.

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Day 1

Date:

Calendar Grid	Calendar Collector	Computational Fluency
		Activity 1 – Quick Facts & Flashcards (pg. 26)
Number Line	**Solving Problems**	**Assessment**

Activity 1

Quick Facts & Flashcards — Day 1

Before this activity, mark the number of products each student got correct on their last Quick Facts paper so that they can select a multiplier for today's Quick Facts routine.

1 Open today's activity by letting students know they will continue doing Quick Facts this month. Commend them for the effort they have made with their multiplication facts this year.

Remind them that Quick Facts are designed to help them see what they know and to track their progress with what they are learning. Remind students that because the multiplier is always the same, some problems can help them with other problems. For example, knowing 4 times 6 can help with 4 times 7 because that is just one more group of 4.

2 Then, have students take out their Number Corner Student Books and do the Quick Facts routine.

- First have them record the results from the last Quick Facts on their tracking sheet. This will let them know what their next multiplier is.
- Have students do the Quick Facts routine for their next multiplier. Students who have demonstrated mastery for all multipliers to 10 can move on to collections of mixed facts by using copies of the Quick Facts, Mixed Facts Teacher Master.
- Students have been doing Quick Facts since the beginning of last month. These steps are provided here to refresh your memory. You can also review the Quick Facts process with students if needed.
  - » Each student records the multiplier they are working with in the box.
  - » Students have 4 minutes to complete as many of the problems on the page as they can while you keep track of the time.
  - » First, you'll write 0–1 on the whiteboard.
  - » Then, after they have been working for a minute, you'll write 1–2 on the board.
  - » After 2 minutes have passed, you'll record 2–3. After 3 minutes have passed, you'll write 3–4, and after 4 minutes have passed, you'll call time.
  - » As soon as they have finished the 40 multiplication facts, they should turn their paper over, look up at the board, and record the last range of minutes you recorded. If, for instance, they turn their paper over, look up, and see 1–2, they should write 1–2 on the back of their paper to indicate that they completed the work in 1–2 minutes.
  - » Everyone remains silent for the entire 4 minutes, even if many of them finish before the time is up, so that they can concentrate without distraction.
  - » After 4 minutes have passed, students stop working, even if they're not finished.
  - » Students transfer the number of minutes it took them to complete the 40 facts from the back of the sheet to the line at the top of the sheet.
  - » If students did not finish all the problems, they should write "4 +" minutes in the How Many Minutes? box.
  - » Then, demonstrate how to complete the division section at the bottom of the page, using your display copy of the page.

3 When students have completed the timed multiplication part of Quick Facts, have them work on the division section at the bottom of the page.

- Students write 10 different products of their choice from the grid in the dividend boxes.
- Then they record their focus multiplier as the divisor on each line.
- Then they find all 10 quotients, based on the multiplication facts they just solved.

4 Collect students' Quick Facts Worksheets so that you can mark them before the next Solving Problems or Computational Fluency activity.

5 Now ask students to look at their Quick Facts Tracking Sheets and at their previously completed Quick Facts Worksheets to think about which facts are most challenging for them so that they can make their own flashcards for these facts. Which ones do they have trouble recalling or recall incorrectly?

6 After students have had a few minutes to think, invite them to talk in pairs about the challenging facts.

You might do this step together as a whole class too.

- Ask each student to tell the other which facts are most challenging.
- Invite students to think of a few ways to solve those more challenging facts.
- Invite them to identify which way of solving each fact makes the best sense to them.

7 Then explain that students will create their own flashcards for the facts they have selected and model how to make a flashcard for the combination 8×7.

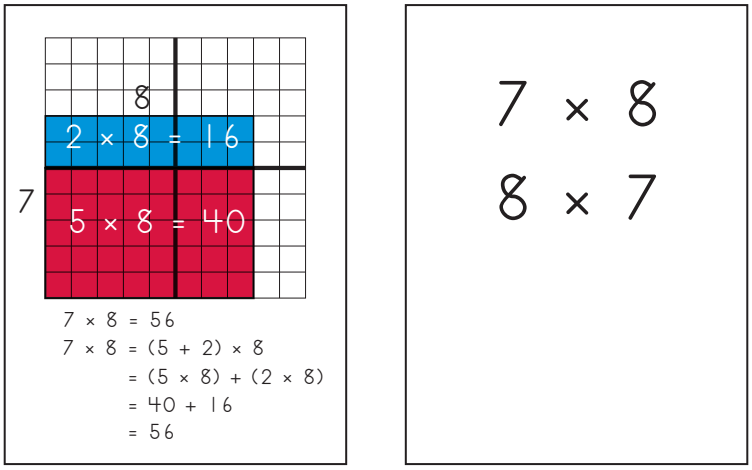
- Explain that each student will select the strategy that makes the best sense to them for solving their challenging facts.
- Explain that you will model how to do this with their input.
- On the front of a blank flashcard, displayed so everyone can see, write 8×7 and 7×8.
- On the back, outline a 7 by 8 array and invite students to think about how they could break the array apart to make it easier to find the product.
- Invite them to talk in pairs about this and then share some ideas as a class.
- Select one of the strategies shared and use colored pencils to shade in each partial product. Label the partial products and write an equation or series of equations beneath the array to show the strategy symbolically.

Key Questions

Use the following questions to guide students' discussion this month:

- How can knowing 6 times 6 help you with 6 times 7?
- What strategies can you use if you don't know a multiplication fact right away?
- Draw an array to show this fact. How can you break the array apart to make it easier to find the total product?
- Why do you think this fact, and not others, is hard for you? What about this fact is tricky?

Teacher *Patty said she likes to think about 8 × 5 and 8 × 2 and then add them together. Marcus said he likes to think about 8 × 3 and 8 × 4 and add them together. Both ways work, of course. But multiplying by 5 and by 2 is pretty easy for me, so I'm going to go 7 times 8 equals 5 times 8 plus 2 times 8.*



front of card **back of card**

8 Make sure each student has some blank flashcards and colored pencils. Then give them the rest of the period to make their own flashcards.

SUPPORT Consider gathering a small group of students to work on the flashcards together.

CHALLENGE Invite students who have mastered their facts to work together to make posters featuring a variety of strategies for some of the more difficult facts, including: 8 × 7, 7 × 7, 7 × 9, 9 × 8, 6 × 7, and so on. Students can use copies of the Large Array Grids to illustrate each strategy with an array.

9 Let students know how much time they will have to work, let them know when they have five minutes left, and then close the period by having them put away their materials. Ask them to initial each of the their flashcards, and then give them envelopes for storing their cards.

Students will use these flashcards in future Computational Fluency and Problem Solving activities. You can also have students use them for practice during other small periods of time during the school day. Send them home at the end of the year and encourage students to use them over their summer break.

Day 2

Date:

Calendar Grid	Calendar Collector	Computational Fluency
Activity 1 – Introducing the Calendar Grid (pg. 7)		
Number Line	**Solving Problems**	**Assessment**

Activity 1

Introducing the Calendar Grid — Day 2

1 Begin by asking students to bring their Number Corner Student Books and a pencil and gather where they can see the Calendar Grid clearly.

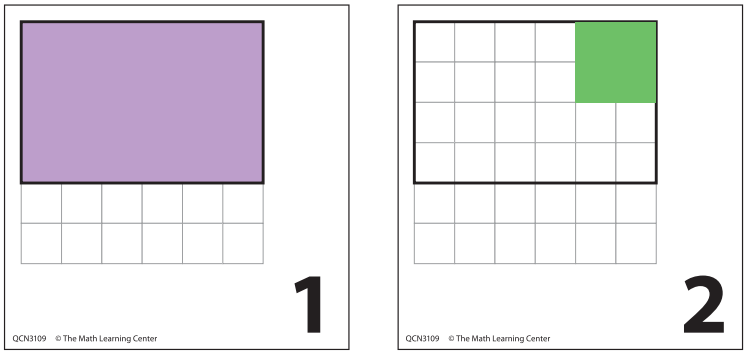
2 When students are settled, invite a volunteer to reveal only the first calendar marker. Ask students to study the marker in silence and then share observations, first in pairs and then as a class.

3 Draw out conversation about the area of the grid and the area of the outlined figure, and use the Word Resource Card to support students' understanding of the word *area*.

Students will likely notice the following things about the first marker:

- The total area of the grid is 36 square units. It is a 6-by-6 square.
- The total area of the purple rectangle is 24 square units. They might see that the rectangle is a 4-by-6 square and find the product of 4 and 6, or they might subtract the 2 rows of 6 (12 in all) from the 36 total squares.
- The purple rectangle takes up more than half the total grid.
- The purple rectangle is exactly ⅔ of the entire grid.

4 Then invite a volunteer to reveal the second marker. Again give students time to study the marker in silence before sharing observations in pairs and then as a class. Invite them to compare the two markers: how are they similar and how are they different?



Students *The first one was filled in all the way, but this one is only partly filled in.*

The same rectangle is outlined on both of them.

They also both have the same 6-by-6 grid.

There are only 4 green squares filled in on the second one.

5 Display your copy of the Area & Fraction page and ask students to turn to the page in their Number Corner Student Books. Ask them to shade in part of the rectangle to match the green region on marker 2.

Key Questions

Use the following questions to guide students' discussion this month:

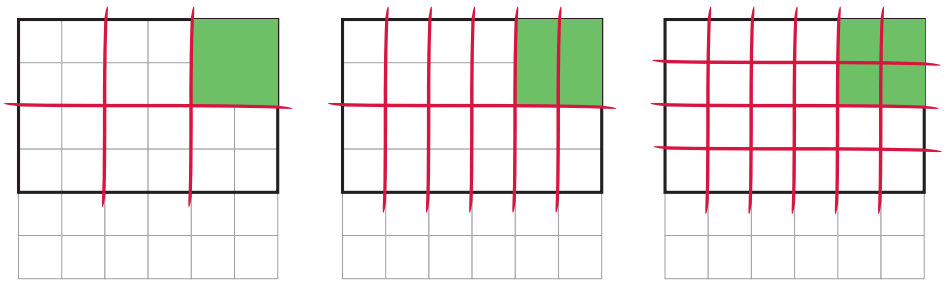
- What do all the purple markers have in common? [They all represent fractions that are greater than ½.]
- What do all the green markers have in common? [They all represent fractions that are less than ½.]
- What is special about the orange marker? When do you think we'll see another orange marker? [It is exactly ½.]
- If we made a marker that had this same figure on it and we filled in 13 square units, should we use purple, green, or orange? Why? What if we filled in 7 square units? 21 square units?
- What is greater: ⅘ or ¾ (⅓ or ⅚, ⅔ or ⅘, ¼ or ⅓, and so on)? Use the markers and Observations Chart to prove it. [¾ > ⅘]
- We talk about the fractions on markers 6 and 7 as some number of thirds. Can we do that for marker 5? Why or why not?
- What is the same about markers 2 and 10 [or any pair of markers that shows the same number of shaded square units]? What is different about these markers?
- Can you say that the two fractions on markers 3 and 11 [or any pair of markers that shows the same number of shaded square units] are equal? Why or why not?

6 Then ask them to talk in pairs about what fraction of the whole rectangle is represented by the green region.

- Ask them to come up with more than one fraction name.
- Invite them to divide the large rectangle into equal parts to justify their thinking to each other.
- While they work, circulate to see how they are thinking and select students to share with the whole group.

7 Now invite select students to share their work one at a time.

- Ask the students you selected to share the fraction names and the work they did dividing the rectangle into equal parts to justify their thinking.
- Invite students, also, to talk about the area that is not shaded in. If, for example, ⅙ is shaded, how much is not shaded? [⅚] What is the area, in square units, of the area that is not shaded? [⅚ of 24 is 20]



⅙ 2/12 4/24

8 Now turn students' attention to the Observations Chart, and fill in the information for the first two markers.

Calendar Grid Observations

Date	Area of Outlined Figure	Area of Colored Region	Color	Fractions
1	24	24	purple	$\frac{24}{24} = 1$
2	24	4	green	$\frac{4}{24} = \frac{2}{12} = \frac{1}{6}$

9 Explain that when students update the Calendar Grid markers, they will also need to record information on this chart. They can leave the Fractions column blank if they don't feel comfortable filling it in, or they can ask a classmate to help.

10 If you have time, review items 3 and 4 on the Number Corner Student Book page and then give students time to complete them, either alone or with a partner. Have them share their work with another student or pair of students when they're done. You might also consider having students complete these items at their desk and then having the class do a gallery walk to consider others' work.

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Day 3

Date:

Calendar Grid	Calendar Collector	Computational Fluency
Update	**Activity 1 –** Introducing Roll & Multiply (pg. 17)	
Number Line	**Solving Problems**	**Assessment**

Update

Starting after Activity 1, have the student helper(s) complete this update procedure every day that the Calendar Grid is not a featured activity. You'll update the Calendar Grid as part of Activities 2, 3, and 4 as well.

Procedure

- Reveal new calendar makers up to and including the day's date.
- Record information about the new marker(s) on the Observations Chart.

Key Questions

Use the following questions to guide students' discussion this month:

- What do all the purple markers have in common? [They all represent fractions that are greater than ½.]
- What do all the green markers have in common? [They all represent fractions that are less than ½.]
- What is special about the orange marker? When do you think we'll see another orange marker? [It is exactly ½.]
- If we made a marker that had this same figure on it and we filled in 13 square units, should we use purple, green, or orange? Why? What if we filled in 7 square units? 21 square units?
- What is greater: ⅘ or ¾ (⅓ or ⅚, ⅔ or ⅘, ¼ or ⅓, and so on)? Use the markers and Observations Chart to prove it. [¾ > ⅘]
- We talk about the fractions on markers 6 and 7 as some number of thirds. Can we do that for marker 5? Why or why not?
- What is the same about markers 2 and 10 [or any pair of markers that shows the same number of shaded square units]? What is different about these markers?
- Can you say that the two fractions on markers 3 and 11 [or any pair of markers that shows the same number of shaded square units] are equal? Why or why not?

Activity 1

Introducing Roll & Multiply — Day 3

At this early stage, encourage several predictions and hypotheses about what will happen throughout the month. Avoid giving away too much information about the pattern.

1 Gather students in the Number Corner discussion area, in front of the Calendar Collector Record Sheet.

2 Introduce the new Calendar Collector.

- Explain that every school day this month, students will roll two dice marked 4–9 and multiply the numbers on the dice.
- They will do this five times each school day to collect five products per day.
- They will make observations about the products that will help them learn more about multiplication, patterns, and probability.

3 Before modeling this process, ask students to think about what products you might get: what numbers is it possible to roll, and what are the products of the resulting combinations?

- Have students think silently and then share with a partner.
- Then invite students to share quickly as a group.
- Ask them to identify whether each product is odd or even and explain how they know.
- Ask students to think of some numbers that it would be impossible for them to get by multiplying pairs of numbers rolled on these dice.

ELL/SUPPORT Review the terms factor, multiple, product, odd, and even, if necessary, using the Word Resource Cards for support.

4 Next, have students talk, first in pairs and then as a whole group, about the following questions.

Take time to build discussion. It is likely that students will disagree with one another, and they might be unsure about how to answer these questions. Over the course of the month, they will use the data they gather to come back to these questions.

- Is there a better chance of getting an odd product or an even product, or is the chance that you will get an odd product equal to the chance that you will get an even product.
- What if you repeated the experiment 100 times?
- Would you get odd products more than even, even more than odd, or about the same number of even or odd?

> ***Students*** *There are the same amount of even and odd numbers, so I think there will be the same amount of even and odd products.*
>
> *We're multiplying the numbers 4, 5, 6, 7, 8, and 9. Half of those are odd and half are even. I think the products will also be half odd and half even.*
>
> *I'm not sure. When you multiply an even number with an odd number, I think you get an even number. Maybe there will be more of one than another.*

Key Questions

Use the following questions to guide students' discussion this month:

- When you multiply two even numbers, is the product even or odd?
- When you multiply two odd numbers, is the product even or odd?
- When you multiply an even number by an odd number, is the product even or odd?
- Why are there more even products than odd products on the multiplication table?
- So far this month, about what fraction of products have been odd?
- So far this month, about what fraction of products have been even?

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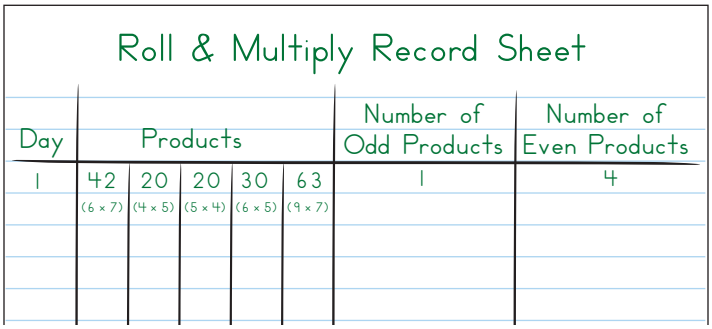
5 Work with students to generate and record five products for the first day of the month.



Roll & Multiply Record Sheet

Day	Products					Number of Odd Products	Number of Even Products
1	42 (6 × 7)	20 (4 × 5)	20 (5 × 4)	30 (6 × 5)	63 (9 × 7)	1	4

6 Pause to have students consider the following questions.

You don't need to have students turn and talk for each question, as long as students are engaged in thinking and talking about the questions. If you want more participation, have students share first in pairs and then as a class.

- If we roll the dice 5 times a day for each day of school this month, about how many rolls will that be in all? [5 × the number of school days in May]
- Do we really need to collect that much data? How many times do you think we need to roll to determine the chances of rolling an odd or even product? [Answers will vary.]
- How many rolls do we need to make today? [The number of rolls depends on how many days have passed this month.]

7 Work with students to fill in the Record Sheet for each day of school that has passed so far.

- You can have one student roll and multiply for an entire day (5 rolls, 5 products) or you can have different students roll and multiply for each roll.

8 Make sure students understand what to do when it is their turn to update this month's Calendar Collector.

9 Wrap up today's activity by asking students to share observations and predictions about the likely outcomes of this experiment over the course of the month.

Encourage several students to share their thoughts. Avoid giving any suggestion about what will actually happen. Student learning will be more powerful when they make a conjecture and then see whether their ideas are accurate or not. For example, some students may be convinced that they are just as likely to roll an even or odd product because there are 3 even numbers and 3 odd numbers on the dice. When the data does not match their idea, they will have to figure out why.

Day 4

Date:

Calendar Grid	Calendar Collector	Computational Fluency
Update	*Update*	
Number Line	**Solving Problems**	**Assessment**
Activity 1 – Introducing Put It on the Line with Mixed Numbers (pg. 34)		

Update

Starting after Activity 1, have the student helper(s) complete this update procedure every day that the Calendar Grid is not a featured activity. You'll update the Calendar Grid as part of Activities 2, 3, and 4 as well.

Procedure

- Reveal new calendar makers up to and including the day's date.
- Record information about the new marker(s) on the Observations Chart.

Key Questions

Use the following questions to guide students' discussion this month:

- What do all the purple markers have in common? [They all represent fractions that are greater than ½.]
- What do all the green markers have in common? [They all represent fractions that are less than ½.]
- What is special about the orange marker? When do you think we'll see another orange marker? [It is exactly ½.]
- If we made a marker that had this same figure on it and we filled in 13 square units, should we use purple, green, or orange? Why? What if we filled in 7 square units? 21 square units?
- What is greater: ⅘ or ¾ (⅓ or ⅚, ⅔ or ⅘, ¼ or ⅓, and so on)? Use the markers and Observations Chart to prove it. [¾ > ⅘]
- We talk about the fractions on markers 6 and 7 as some number of thirds. Can we do that for marker 5? Why or why not?
- What is the same about markers 2 and 10 [or any pair of markers that shows the same number of shaded square units]? What is different about these markers?
- Can you say that the two fractions on markers 3 and 11 [or any pair of markers that shows the same number of shaded square units] are equal? Why or why not?

Update

Starting after Activity 1, have the student helper(s) complete this update procedure every day that the Calendar Collector is not a featured activity. You'll update the Calendar Collector as part of Activities 2, 3, and 4 as well.

Procedure

The student helper:

- Rolls two 4–9 dice
- Multiplies the number shown and records the product on the Roll & Multiply Record Sheet
- Repeats the rolling, multiplying, and recording 4 more times
- Records how many products are odd and how many products are even

Day 5

Date:

Calendar Grid	Calendar Collector	Computational Fluency
Activity 2 – Focus on Fraction & Division (pg. 10)	*Update*	
Number Line	**Solving Problems**	**Assessment**

Activity 2

Focus on Fractions & Division — Day 5

1 Begin by asking students to spend a little time studying the Calendar Grid Observations Chart in silence.

- Have all the rows been filled out completely and correctly?
- Do they notice any patterns within rows? How about among different rows?

2 Work with students' input to add to or amend the information shown on the chart so that it is correct and complete.

3 Then invite students to make some predictions about what today's new marker will look like.

- What color will it be?
- What shape will it be?
- How many square units will be shaded in?

In making predictions about the new marker, students will probably begin to speculate about what the color means. If you happen to do this activity on the 8th of the month, students will likely be surprised that the region is orange.

4 Have a student volunteer add the new marker to the calendar. Spend some time talking about the new marker and then adding information about it to the Observations Chart.

5 Now ask students to turn to the Fractions of Other Areas page in their Number Corner Student Books while you display your copy of the page.

6 Review the directions together as a class and then give students time to work alone or in pairs. If you feel students need more support, work together as a class.

7 When you have about 5 minutes left in the period, invite students to talk in pairs about how they solved problems 2 and 3.

CHALLENGE Invite students who need a challenge to focus instead on problem 4 or to think about a rectangle with an area of 300.

8 Then invite students to talk as a class about any patterns or similarities they noticed in how they were thinking about the fractions of each rectangle.

We want students to see that they can divide each total area by 6 every time to determine the area of ⅙ of each rectangle. The last problem intentionally does not include a visual so that students are pressed to use what they did in problems 2 and 3 to think about fractions of a much larger rectangle.

Update

Starting after Activity 1, have the student helper(s) complete this update procedure every day that the Calendar Collector is not a featured activity. You'll update the Calendar Collector as part of Activities 2, 3, and 4 as well.

Procedure

The student helper:

- Rolls two 4–9 dice
- Multiplies the number shown and records the product on the Roll & Multiply Record Sheet
- Repeats the rolling, multiplying, and recording 4 more times
- Records how many products are odd and how many products are even

Day 6

Date:

Calendar Grid	Calendar Collector	Computational Fluency
Update	*Update*	
Number Line	**Solving Problems**	**Assessment**
	Activity 1 – Solving & Discussing Problems (pg. 42)	

Update

Starting after Activity 1, have the student helper(s) complete this update procedure every day that the Calendar Grid is not a featured activity. You'll update the Calendar Grid as part of Activities 2, 3, and 4 as well.

Procedure

- Reveal new calendar makers up to and including the day's date.
- Record information about the new marker(s) on the Observations Chart.

Key Questions

Use the following questions to guide students' discussion this month:

- What do all the purple markers have in common? [They all represent fractions that are greater than ½.]
- What do all the green markers have in common? [They all represent fractions that are less than ½.]
- What is special about the orange marker? When do you think we'll see another orange marker? [It is exactly ½.]
- If we made a marker that had this same figure on it and we filled in 13 square units, should we use purple, green, or orange? Why? What if we filled in 7 square units? 21 square units?
- What is greater: ⅘ or ¾ (⅓ or ⅚, ⅔ or ⅘, ¼ or ⅓, and so on)? Use the markers and Observations Chart to prove it. [¾ > ⅘]
- We talk about the fractions on markers 6 and 7 as some number of thirds. Can we do that for marker 5? Why or why not?
- What is the same about markers 2 and 10 [or any pair of markers that shows the same number of shaded square units]? What is different about these markers?
- Can you say that the two fractions on markers 3 and 11 [or any pair of markers that shows the same number of shaded square units] are equal? Why or why not?

Update

Starting after Activity 1, have the student helper(s) complete this update procedure every day that the Calendar Collector is not a featured activity. You'll update the Calendar Collector as part of Activities 2, 3, and 4 as well.

Procedure

The student helper:

- Rolls two 4–9 dice
- Multiplies the number shown and records the product on the Roll & Multiply Record Sheet
- Repeats the rolling, multiplying, and recording 4 more times
- Records how many products are odd and how many products are even

Activity 1

Solving & Discussing Problems — Days 6, 11, 15

Each time you repeat this activity, you'll use a different Number Corner Student Book page. Every page invites students to select some of their own problems based on the results of their most recent Quick Facts. Be sure to mark students' Quick Facts papers in time for this activity.

1 Introduce this week's Number Corner Student Book page using your display copy of the page.

- Read over each problem with students.
- Together as a class, do part a of items 1 and 2 if needed.

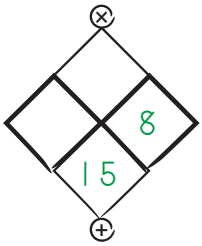
2 Return students' most recent Quick Facts papers, and explain how they will use them for today's activity.

- Students will review the multiplication facts they completed.
- They should identify which ones were most challenging; these might be the problems they got incorrect or those they had to think about longer before solving.
- They will select three of those challenging facts and focus on them in item 3 by:
  - » drawing an array to represent the combination
  - » using the array to illustrate a strategy for calculating the product that works well for them

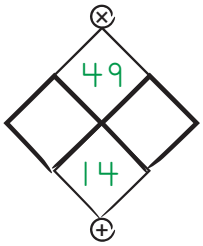
SUPPORT The first time students encounter diamond puzzles (on day 11), complete one or all of them together as a class or small group.

CHALLENGE If students felt very comfortable with these facts, invite them to select some facts for the multiplier they will be working on next. For example, if they demonstrated mastery of multiplying by 2, they might be moving on to multiplying by 3. In that case, they might want to think about strategies for calculating 3×6, 3×7 and 3×8. Another alternative is for students to think about combinations that are often most challenging. These combinations include: 3×7, 3×8, 3×9, 6×7, 7×7, 8×7, 7×9.

CHALLENGE You can also invite students to make and exchange their own mazes and diamond puzzles. You might also share with interested students how you can use equations with unknowns to represent the information in each diamond puzzle.



$8 + ___ = 15$
$8 \times ___ = ___$



$a \times b = 49$
$a + b = 14$

3 Answer students' questions, and then give them all but the last five minutes or so to complete the page.

While students work, circulate to make observations, answer questions, and provide differentiated instruction as needed. Pay attention to the facts students select for item 3, and make note of any common points of confusion so that you can focus on them when you reconvene the class.

4 Wrap up the activity by discussing the equations students wrote for the story problems or addressing any common points of confusion.

Key Questions

Use the following questions to guide students' discussion this month:

- What smaller arrays do you see in the larger array?
- Which of those smaller arrays can you use to make it easier to calculate the product?
- How does knowing your multiplication facts help with division?
- What equation can you write to represent this story problem? Where in the equation do you see the numbers you know? Where in the equation is there space for the number you are trying to find?

Literature Connections

Use the following books as read-alouds this month.

- *The King's Chessboard* by David Birch
- *Anno's Magic Seeds* by Mitsumasa Anno

Day 7

Date:

Calendar Grid	Calendar Collector	Computational Fluency
Update	**Activity 2 –** Showing the Data on a Chart and Graph (pg. 19)	
Number Line	**Solving Problems**	**Assessment**

Update

Starting after Activity 1, have the student helper(s) complete this update procedure every day that the Calendar Grid is not a featured activity. You'll update the Calendar Grid as part of Activities 2, 3, and 4 as well.

Procedure

- Reveal new calendar makers up to and including the day's date.
- Record information about the new marker(s) on the Observations Chart.

Key Questions

Use the following questions to guide students' discussion this month:

- What do all the purple markers have in common? [They all represent fractions that are greater than ½.]
- What do all the green markers have in common? [They all represent fractions that are less than ½.]
- What is special about the orange marker? When do you think we'll see another orange marker? [It is exactly ½.]
- If we made a marker that had this same figure on it and we filled in 13 square units, should we use purple, green, or orange? Why? What if we filled in 7 square units? 21 square units?
- What is greater: ⅘ or ¾ (⅓ or ⅚, ⅔ or ⅘, ¼ or ⅓, and so on)? Use the markers and Observations Chart to prove it. [¾ > ⅘]
- We talk about the fractions on markers 6 and 7 as some number of thirds. Can we do that for marker 5? Why or why not?
- What is the same about markers 2 and 10 [or any pair of markers that shows the same number of shaded square units]? What is different about these markers?
- Can you say that the two fractions on markers 3 and 11 [or any pair of markers that shows the same number of shaded square units] are equal? Why or why not?

Activity 2

Showing the Data on a Chart & Graph — Day 7

1 Open today's activity by updating the collection as a class and then giving students time to study the Record Sheet and then share observations.

2 Then, display the table on the top of the Roll & Multiply Data Chart Number Corner Student Book page. Explain that today, students will gather data, organize it in a table and a graph, and then make observations about the data.

3 Have students turn to a partner and determine the total number of odd products and the total number of even products shown on the Record Sheet.

4 Invite several pairs to share their totals to make sure that students have determined the accurate number of odd and even products. Then, enter the date and the total number of odd and even products on your display copy of the Number Corner Student Book page, and ask students to do the same.

If there is disagreement, have students share their strategies for determining the number of odd and even products.

5 Ask students to determine the total number of products.

Students can simply add the number of even and odd products, but listen for a student who remembers that they are rolling 5 times a day and multiplies 5 by the number of days so far to find the total.

6 Ask students to share any comments or observations they have about the data in the table.

> ***Students*** *There are more even products than odd.*
>
> *Yeah! More than twice as many.*
>
> *I think it will even out as we keep collecting.*
>
> *I'm not so sure. I think we'll get more even than odd.*

7 Reveal the rest of the page as you explain that students will transfer the data from the table to the bar graph. Give students a minute to look over the bar graph and then point to the lines for the labels. Ask students what the labels should say and fill them in on your copy.

SUPPORT/ELL You may want to review the *x*- and *y*-axes as well as how to label and fill in a bar graph. On this graph, the *x*-axis has two labels, Odd Products and Even Products, and the *y*-axis has one, which can be something like Number of Products.

8 Then, read questions 3 and 4 together and have students share their current understandings of the terms *impossible*, *unlikely*, *equally likely or unlikely*, *likely*, and *certain*.

Students' understandings of these terms are often intuitive and that is fine.

> ***Students*** *Well, impossible is easy. We know what that means. I get unlikely and likely but I'm not sure about equally likely as unlikely.*
>
> *I think that is like a fifty-fifty chance. It has the same chance of happening as not happening. It is equally likely or unlikely to happen.*

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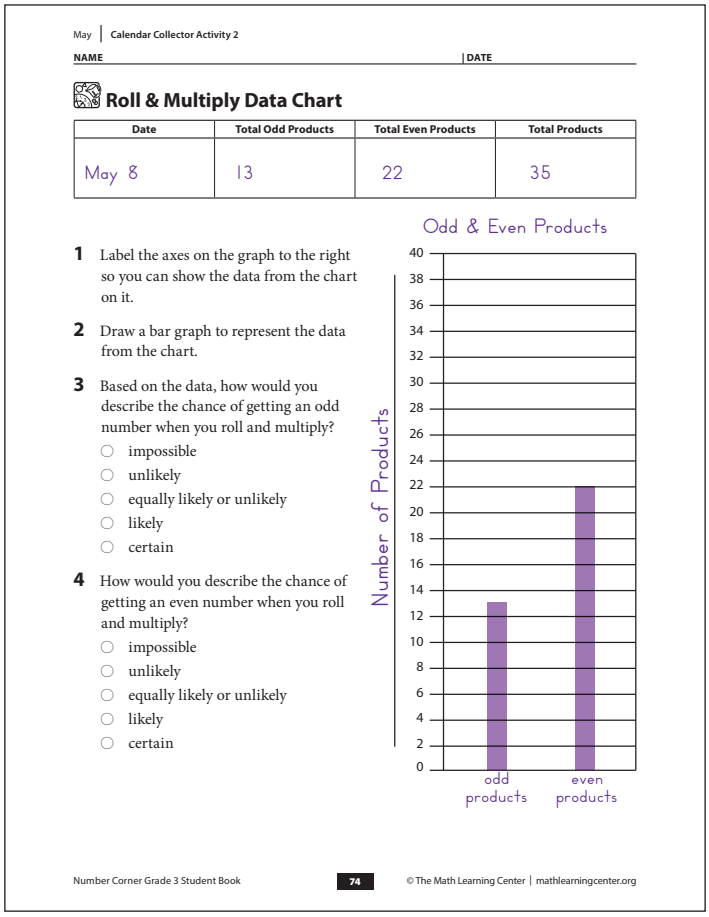
9 Explain that students will now finish the page on their own. They will transfer what you have done so far and then finish making the bar graph and answer questions 3 and 4.

10 Ask students if they have any questions and then have them find the Roll & Multiply Chart in their Number Corner Student Books and get started.

SUPPORT/ELL You might need to help students decide how to fill in the bar graph and understand what the questions are asking. Help students understand the probability vocabulary with an example such as flipping a coin or rolling dice. Ask questions that would result in answers of impossible, unlikely, equally likely as unlikely, likely and certain. For example, what is the probability of getting a 7 on a 1–6 die? What would you say about the chance of getting heads when you flip a penny?

CHALLENGE Have students think about whether there is a rule they can generalize about what kinds of factors yield odd products and what kinds of factors yield even products.



May | Calendar Collector Activity 2

NAME | DATE

Roll & Multiply Data Chart

Date	Total Odd Products	Total Even Products	Total Products
May 8	13	22	35

1 Label the axes on the graph to the right so you can show the data from the chart on it.

2 Draw a bar graph to represent the data from the chart.

3 Based on the data, how would you describe the chance of getting an odd number when you roll and multiply?

- ○ impossible
- ○ unlikely
- ○ equally likely or unlikely
- ○ likely
- ○ certain

4 How would you describe the chance of getting an even number when you roll and multiply?

- ○ impossible
- ○ unlikely
- ○ equally likely or unlikely
- ○ likely
- ○ certain

Number Corner Grade 3 Student Book 74 © The Math Learning Center | mathlearningcenter.org

11 As students finish working on their Number Corner Student Book pages, have them meet in pairs to share, check, and discuss their work.

12 Wrap up today's activity by letting students know they will continue looking at patterns as the month continues.

Day 8

Date:

Calendar Grid	Calendar Collector	Computational Fluency
Update	*Update*	**Activity 2 –** Playing Tens to Win Multiplication as a Class (pg. 28)
Number Line	**Solving Problems**	**Assessment**

Update

Starting after Activity 1, have the student helper(s) complete this update procedure every day that the Calendar Grid is not a featured activity. You'll update the Calendar Grid as part of Activities 2, 3, and 4 as well.

Procedure

- Reveal new calendar makers up to and including the day's date.
- Record information about the new marker(s) on the Observations Chart.

Key Questions

Use the following questions to guide students' discussion this month:

- What do all the purple markers have in common? [They all represent fractions that are greater than ½.]
- What do all the green markers have in common? [They all represent fractions that are less than ½.]
- What is special about the orange marker? When do you think we'll see another orange marker? [It is exactly ½.]
- If we made a marker that had this same figure on it and we filled in 13 square units, should we use purple, green, or orange? Why? What if we filled in 7 square units? 21 square units?
- What is greater: ⅘ or ¾ (⅓ or ⅚, ⅔ or ⅘, ¼ or ⅓, and so on)? Use the markers and Observations Chart to prove it. [¾ > ⅘]
- We talk about the fractions on markers 6 and 7 as some number of thirds. Can we do that for marker 5? Why or why not?
- What is the same about markers 2 and 10 [or any pair of markers that shows the same number of shaded square units]? What is different about these markers?
- Can you say that the two fractions on markers 3 and 11 [or any pair of markers that shows the same number of shaded square units] are equal? Why or why not?

Update

Starting after Activity 1, have the student helper(s) complete this update procedure every day that the Calendar Collector is not a featured activity. You'll update the Calendar Collector as part of Activities 2, 3, and 4 as well.

Procedure

The student helper:

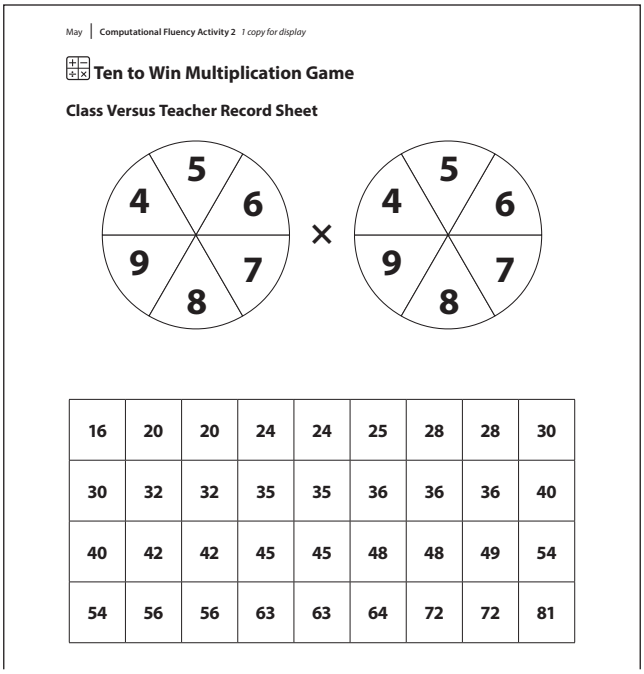
- Rolls two 4–9 dice
- Multiplies the number shown and records the product on the Roll & Multiply Record Sheet
- Repeats the rolling, multiplying, and recording 4 more times
- Records how many products are odd and how many products are even

Activity 2

Playing Ten to Win Multiplication as a Class — Day 8

1 Open today's activity with the Quick Facts routine. (See Activity 1 if you need to review the process.)

2 Then, let students know they will learn a new game today. Display the Ten to Win Game Record Sheet (Class Versus Teacher Version) Teacher Master.



May | Computational Fluency Activity 2 *1 copy for display*

Ten to Win Multiplication Game

Class Versus Teacher Record Sheet

16	20	20	24	24	25	28	28	30
30	32	32	35	35	36	36	36	40
40	42	42	45	45	48	48	49	54
54	56	56	63	63	64	72	72	81

3 Tell students that you are going to play the Ten to Win Game as the class against the teacher to help them review multiplication facts for 5–9.

4 Take the first turn to model how the game is played, and solicit input from the class.

- Select a color to highlight captured answers for yourself.
- Spin both spinners.
- Multiply the two factors spun and find a cell on the grid containing that product.
- Color lightly over it in your color to "capture" that cell.

5 Next, have the class take a turn.

- Select a student to play for the class team.
- Have him or her select the color that will be used to capture cells for the class.
- Finally have the student spin, multiply, and color in the captured product.

6 Take turns until you or the students have captured ten cells, thereby winning the game.

- Have a different student spin for the class each time.
- Provide enough quiet think time for most students to compute the product.

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- Invite students to share strategies for calculating the product. At this point, many students will simply recall many products from memory. Sharing strategies is helpful for all students, though, particularly those who are still working toward fluency.
- If the product has already been captured, the player (you or students) loses that turn.

7 Wrap up today's activity by having students reflect on the game. The following questions may help:

- How does this game help with multiplication facts?
- Why are there only certain numbers on the gameboard? Why are there not all the numbers from 16 to 81 or from 0 to 81?
- What happens when you multiply an even number by an even number? An odd number by an odd number? An even number by an odd number?

.....

.....

Day 9

Date:

Calendar Grid	Calendar Collector	Computational Fluency
Activity 3 – Finding the Area of Rectilinear Figures (pg. 11)	*Update*	
Number Line	**Solving Problems**	**Assessment**

Activity 3

Finding the Area of Rectilinear Figures — Day 9

By the 9th day of school, marker 9 will have already been revealed. Students will probably already have determined the area of the figure that first appeared on that marker. The Student Book page in this activity focuses on exploring different ways of decomposing the figure to determine its total area. The rest of the activity focuses on exploring the fractions represented on each marker.

1 Begin by updating the Calendar Grid as a class and making additions and corrections to the Observations Chart as needed.

2 Then invite students to turn to the Areas of Rectilinear Figures page in their Number Corner Student Books and spend some time finding two different ways to determine the area of the figure that first appeared on marker 9.

You might need to explain that even if they already determined that the area is 24 square units, the point of this item is to show different ways to break the figure into rectangles to find the area. You might ask them to imagine they are teaching someone who has never seen this figure before how to calculate its area.

3 After students have had a few minutes to work, invite a few to share their strategies, showing how they divided the figures.

4 After a few different students have shared, invite everyone to record a third way of finding the area. This might be one of the strategies described by a classmate, or it might be a new idea that occurred to them during the discussion.

5 Now spend some time talking about the calendar markers and the fractions on the Calendar Grid Observations Chart.

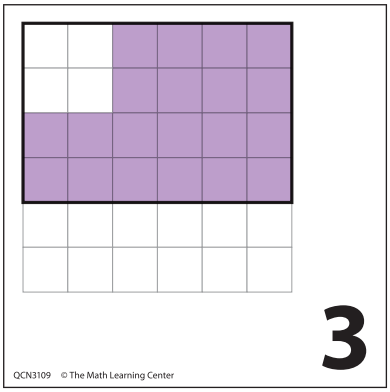
Calendar Grid Observations

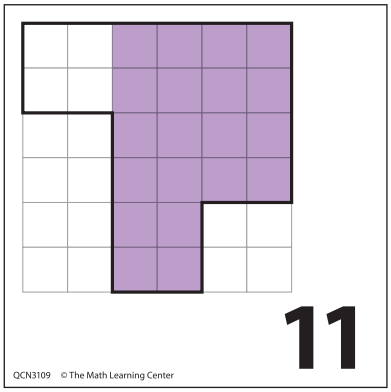
Date	Area of Outlined Figure	Area of Colored Region	Color	Fractions
1	24	24	purple	$\frac{24}{24} = 1$
2	24	4	green	$\frac{4}{24} = \frac{2}{12} = \frac{1}{6}$
3	24	20	purple	$\frac{20}{24} = \frac{10}{12} = \frac{5}{6}$
4	24	6	green	$\frac{6}{24} = \frac{2}{8} = \frac{1}{4}$
5	24	18	purple	$\frac{18}{24} = \frac{6}{8} = \frac{3}{4}$
6	24	8	green	$\frac{8}{24} = \frac{4}{12} = \frac{2}{6} = \frac{1}{3}$
7	24	16	purple	$\frac{16}{24} = \frac{8}{12} = \frac{4}{6} = \frac{2}{3}$
8	24	12	orange	$\frac{12}{24} = \frac{6}{12} = \frac{2}{4} = \frac{3}{6} = \frac{1}{2}$
9	24	24	purple	$\frac{24}{24} = 1$
10	24	4	green	$\frac{4}{24} = \frac{2}{12} = \frac{1}{6}$
11	24	20	purple	$\frac{20}{24} = \frac{10}{12} = \frac{5}{6}$

You might ask questions like these to prompt discussion. Select questions based on students' needs and the direction the conversation seems to be taking. You can also slide the markers under a plastic sleeve and have students use dry-erase pens to partition the figures into equal parts to show their thinking.

- What do all the purple markers have in common? [They all represent fractions that are greater than ½.]

- What do all the green markers have in common? [They all represent fractions that are less than ½.]
- What is special about the orange marker? When do you think we'll see another orange marker? [It is exactly ½.]
- If we made a marker that had this same figure on it and we filled in 13 square units, should we use purple, green, or orange? Why? What if we filled in 7 square units? 21 square units?
- What is greater: ⁴⁄₆ or ¾ (⅓ or ⁵⁄₆, ⅔ or ⁴⁄₆, ¼ or ⅓, and so on)? Use the markers and Observations Chart to prove it. [¾ > ⁴⁄₆]
- We talk about the fractions on markers 6 and 7 as some number of thirds. Can we do that for marker 5? Why or why not?
- What is the same about markers 2 and 10 (or 3 and 11)? What is different about these markers?
- Can you say that the two fractions on markers 3 and 11 are equal? Why or why not?





This final question might elicit quite a lot of debate among students. Both markers feature ⁵⁄₆ of a figure. Because the figures look different, some students will probably argue that the wholes are different, so the fractions cannot be said to be equal. Others might see that the whole in both cases is 24 square units. The square units are configured differently in each case, but quantitatively, the fractions are the same: each represents 20 out of 24 square units. To press the issue of configuration a bit further, you might ask students if 20 square units shaded in differently on each figure could be said to be equal to the ⁵⁄₆ currently shown on each. Why or why not?

You might also invite students to consider the question in context. Imagine the rectangle on marker 3 represents one family's yard and the purple region shows how much of the yard is covered in grass. Imagine that the figure on marker 11 represents another family's yard and the purple region shows how much of their yard is covered in grass. In both cases, each square represents 1 square meter. Which family's yard has more grass?

6 If there is time left in the period, have students complete items 2 and 3 or item 4 on the Number Corner Student Book page. They can work in pairs or independently. You might also assign these problems for homework or seatwork at another time of day.

Update

Starting after Activity 1, have the student helper(s) complete this update procedure every day that the Calendar Collector is not a featured activity. You'll update the Calendar Collector as part of Activities 2, 3, and 4 as well.

Procedure

The student helper:

- Rolls two 4–9 dice
- Multiplies the number shown and records the product on the Roll & Multiply Record Sheet
- Repeats the rolling, multiplying, and recording 4 more times
- Records how many products are odd and how many products are even

Day 10

Date:

Calendar Grid	Calendar Collector	Computational Fluency
Update	*Update*	
Number Line	**Solving Problems**	**Assessment**
Activity 2 – Playing Put It on the Line as a Class (pg. 36)		

Update

Starting after Activity 1, have the student helper(s) complete this update procedure every day that the Calendar Grid is not a featured activity. You'll update the Calendar Grid as part of Activities 2, 3, and 4 as well.

Procedure

- Reveal new calendar makers up to and including the day's date.
- Record information about the new marker(s) on the Observations Chart.

Key Questions

Use the following questions to guide students' discussion this month:

- What do all the purple markers have in common? [They all represent fractions that are greater than ½.]
- What do all the green markers have in common? [They all represent fractions that are less than ½.]
- What is special about the orange marker? When do you think we'll see another orange marker? [It is exactly ½.]
- If we made a marker that had this same figure on it and we filled in 13 square units, should we use purple, green, or orange? Why? What if we filled in 7 square units? 21 square units?
- What is greater: ⅘ or ¾ (⅓ or ⅚, ⅔ or ⅘, ¼ or ⅓, and so on)? Use the markers and Observations Chart to prove it. [¾ > ⅘]
- We talk about the fractions on markers 6 and 7 as some number of thirds. Can we do that for marker 5? Why or why not?
- What is the same about markers 2 and 10 [or any pair of markers that shows the same number of shaded square units]? What is different about these markers?
- Can you say that the two fractions on markers 3 and 11 [or any pair of markers that shows the same number of shaded square units] are equal? Why or why not?

Update

Starting after Activity 1, have the student helper(s) complete this update procedure every day that the Calendar Collector is not a featured activity. You'll update the Calendar Collector as part of Activities 2, 3, and 4 as well.

Procedure

The student helper:

- Rolls two 4–9 dice
- Multiplies the number shown and records the product on the Roll & Multiply Record Sheet
- Repeats the rolling, multiplying, and recording 4 more times
- Records how many products are odd and how many products are even

Activity 2

Playing Put It on the Line as a Class — Day 10

Decide how you want to split your class in half. If your class has a hard time with competitive games, plan to discuss some strategies for playing competitive games successfully.

1 Open today's activity by explaining that students will play Put It on the Line in teams. The class will be split in half to play against each other.

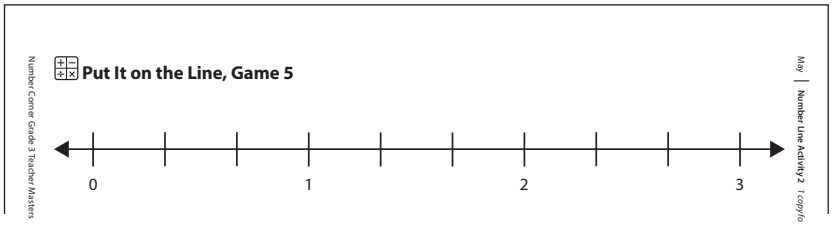
2 Briefly review the directions for Put It on the Line.

See Activity 1, step 3.

3 Then, divide the class in half. If necessary, review a few tips for good sportsmanship and camaraderie.

- Remind students that they will play this game several times before the end of the school year. Sometimes, they will win and sometime they will not. The point is to have fun while practicing important math skills.
- Encourage them to support their own teammates. Ask them for examples of what that looks like and sounds like.
- Elicit suggestions for how to respond when their team does and does not win. How can they make sure no feelings are hurt? How can they recognize the efforts of both teams?

4 Display the Put It on the Line, Game 5 Teacher Master. Focus students' attention on the number line above the problems. Ask them what numbers would go on the dashes on the number line, and encourage them to use mathematical reasoning to determine the missing numbers.



Students *This one goes to 3!*

I bet this one will be thirds.

It will have more mixed numbers and improper fractions.

5 After discussing what numbers will be filled in on the number line, ask students to think of some examples of mixed numbers and improper fractions that would go on this number line.

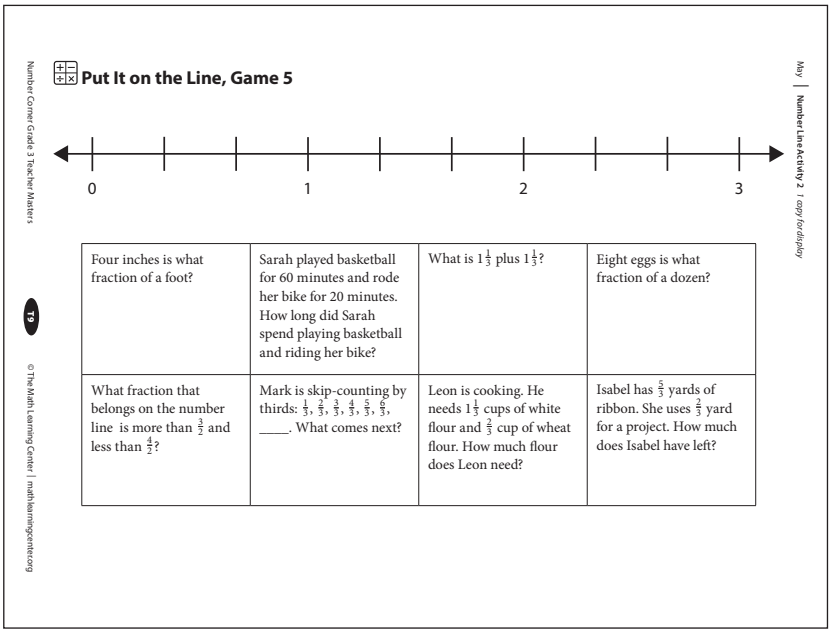
Student *I think we will see a 1 and a 2 on this line. In between 1 and 2, we will see 1 ⅓ and 1 and ⅔.*

Teacher *How can we say 1 ⅓ and 1 ⅔ as improper fractions?*

Student *1 ⅓ is the same as ⁴⁄₃ because 1 is the same as ³⁄₃ and then just one more third. So, 1 ⅔ is ⁵⁄₃.*

6 Ask students if they have any questions and then begin playing the game.

- Invite student volunteers from each team to reveal problems for the teams to solve.
- Be sure to allow time for all students to solve the problems.
- Encourage students to share and explain their strategies as well as answers. If they use estimation strategies, be sure to emphasize these. Try to elicit participation from as many students as possible.
- As students share, encourage them to state their answer in thirds as a mixed number or improper fraction. Even though there are other equivalent fractions, it will help them locate the answer on the number line in they think about thirds.
- Use the differentiated instruction tips from Activity 1, if applicable.



7 After playing Put It on the Line, have students reflect on how the game works. Ask them if there is a strategy for getting more points or if it is all up to chance.

It is up to chance. The number of points depends on what problems each team chooses, as the answer is the score. Students should, however, make sure their answer is correct, because they will not get any points for an incorrect answer. Look for students who notice that because the numbers on the number line are the answers, they can use those numbers to check their answers. For example, if a student gets ½ for an answer in this game, it is not correct because that number is not on this number line.

CHALLENGE Challenge students to consider what the total sum must be for all of the answers (the sum of their score and your score). Is the total of all these thirds greater or less than the total of all the halves from last week? Why is this so? What if they divided last week's number line, which went from 0 to 2, into thirds? Would the total of all the thirds be greater than or less than the total of all the halves? Why?

8 Wrap up today's activity by recognizing students for their participation. Close the activity by asking them to summarize some of the key math skills and concepts involved in the problems they solved today.

> ***Students*** *We solved problems with mixed numbers and improper fractions.*
>
> *And regular fractions and whole numbers too.*
>
> *We had to add and subtract with fractions.*
>
> *And, compare fractions or find equivalent fractions.*

Day 11

Date:

Calendar Grid	Calendar Collector	Computational Fluency
Update	*Update*	
Number Line	**Solving Problems**	**Assessment**
	Activity 1 – Solving & Discussing Problems (pg. 42)	

Update

Starting after Activity 1, have the student helper(s) complete this update procedure every day that the Calendar Grid is not a featured activity. You'll update the Calendar Grid as part of Activities 2, 3, and 4 as well.

Procedure

- Reveal new calendar makers up to and including the day's date.
- Record information about the new marker(s) on the Observations Chart.

Key Questions

Use the following questions to guide students' discussion this month:

- What do all the purple markers have in common? [They all represent fractions that are greater than ½.]
- What do all the green markers have in common? [They all represent fractions that are less than ½.]
- What is special about the orange marker? When do you think we'll see another orange marker? [It is exactly ½.]
- If we made a marker that had this same figure on it and we filled in 13 square units, should we use purple, green, or orange? Why? What if we filled in 7 square units? 21 square units?
- What is greater: ⅘ or ¾ (⅓ or ⅚, ⅔ or ⅘, ¼ or ⅓, and so on)? Use the markers and Observations Chart to prove it. [¾ > ⅘]
- We talk about the fractions on markers 6 and 7 as some number of thirds. Can we do that for marker 5? Why or why not?
- What is the same about markers 2 and 10 [or any pair of markers that shows the same number of shaded square units]? What is different about these markers?
- Can you say that the two fractions on markers 3 and 11 [or any pair of markers that shows the same number of shaded square units] are equal? Why or why not?

Update

Starting after Activity 1, have the student helper(s) complete this update procedure every day that the Calendar Collector is not a featured activity. You'll update the Calendar Collector as part of Activities 2, 3, and 4 as well.

Procedure

The student helper:

- Rolls two 4–9 dice
- Multiplies the number shown and records the product on the Roll & Multiply Record Sheet
- Repeats the rolling, multiplying, and recording 4 more times
- Records how many products are odd and how many products are even

Activity 1

Solving & Discussing Problems — Days 6, 11, 15

Each time you repeat this activity, you'll use a different Number Corner Student Book page. Every page invites students to select some of their own problems based on the results of their most recent Quick Facts. Be sure to mark students' Quick Facts papers in time for this activity.

1 Introduce this week's Number Corner Student Book page using your display copy of the page.

- Read over each problem with students.
- Together as a class, do part a of items 1 and 2 if needed.

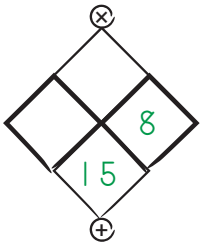
2 Return students' most recent Quick Facts papers, and explain how they will use them for today's activity.

- Students will review the multiplication facts they completed.
- They should identify which ones were most challenging; these might be the problems they got incorrect or those they had to think about longer before solving.
- They will select three of those challenging facts and focus on them in item 3 by:
  - » drawing an array to represent the combination
  - » using the array to illustrate a strategy for calculating the product that works well for them

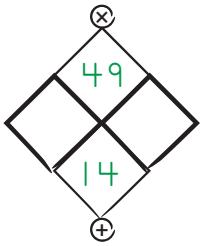
SUPPORT The first time students encounter diamond puzzles (on day 11), complete one or all of them together as a class or small group.

CHALLENGE If students felt very comfortable with these facts, invite them to select some facts for the multiplier they will be working on next. For example, if they demonstrated mastery of multiplying by 2, they might be moving on to multiplying by 3. In that case, they might want to think about strategies for calculating 3×6, 3×7 and 3×8. Another alternative is for students to think about combinations that are often most challenging. These combinations include: 3×7, 3×8, 3×9, 6×7, 7×7, 8×7, 7×9.

CHALLENGE You can also invite students to make and exchange their own mazes and diamond puzzles. You might also share with interested students how you can use equations with unknowns to represent the information in each diamond puzzle.



$8 + ___ = 15$
$8 \times ___ = ___$



$a \times b = 49$
$a + b = 14$

3 Answer students' questions, and then give them all but the last five minutes or so to complete the page.

While students work, circulate to make observations, answer questions, and provide differentiated instruction as needed. Pay attention to the facts students select for item 3, and make note of any common points of confusion so that you can focus on them when you reconvene the class.

4 Wrap up the activity by discussing the equations students wrote for the story problems or addressing any common points of confusion.

Key Questions

Use the following questions to guide students' discussion this month:

- What smaller arrays do you see in the larger array?
- Which of those smaller arrays can you use to make it easier to calculate the product?
- How does knowing your multiplication facts help with division?
- What equation can you write to represent this story problem? Where in the equation do you see the numbers you know? Where in the equation is there space for the number you are trying to find?

Literature Connections

Use the following books as read-alouds this month.

- *The King's Chessboard* by David Birch
- *Anno's Magic Seeds* by Mitsumasa Anno

Day 12

Date:

Calendar Grid	Calendar Collector	Computational Fluency
Update	*Update*	**Activity 3 –** Thinking About the Data So Far (pg. 21)
Number Line	**Solving Problems**	**Assessment**

Update

Starting after Activity 1, have the student helper(s) complete this update procedure every day that the Calendar Grid is not a featured activity. You'll update the Calendar Grid as part of Activities 2, 3, and 4 as well.

Procedure

- Reveal new calendar makers up to and including the day's date.
- Record information about the new marker(s) on the Observations Chart.

Key Questions

Use the following questions to guide students' discussion this month:

- What do all the purple markers have in common? [They all represent fractions that are greater than ½.]
- What do all the green markers have in common? [They all represent fractions that are less than ½.]
- What is special about the orange marker? When do you think we'll see another orange marker? [It is exactly ½.]
- If we made a marker that had this same figure on it and we filled in 13 square units, should we use purple, green, or orange? Why? What if we filled in 7 square units? 21 square units?
- What is greater: ⅘ or ¾ (⅓ or ⅚, ⅔ or ⅘, ¼ or ⅓, and so on)? Use the markers and Observations Chart to prove it. [¾ > ⅘]
- We talk about the fractions on markers 6 and 7 as some number of thirds. Can we do that for marker 5? Why or why not?
- What is the same about markers 2 and 10 [or any pair of markers that shows the same number of shaded square units]? What is different about these markers?
- Can you say that the two fractions on markers 3 and 11 [or any pair of markers that shows the same number of shaded square units] are equal? Why or why not?

Update

Starting after Activity 1, have the student helper(s) complete this update procedure every day that the Calendar Collector is not a featured activity. You'll update the Calendar Collector as part of Activities 2, 3, and 4 as well.

Procedure

The student helper:

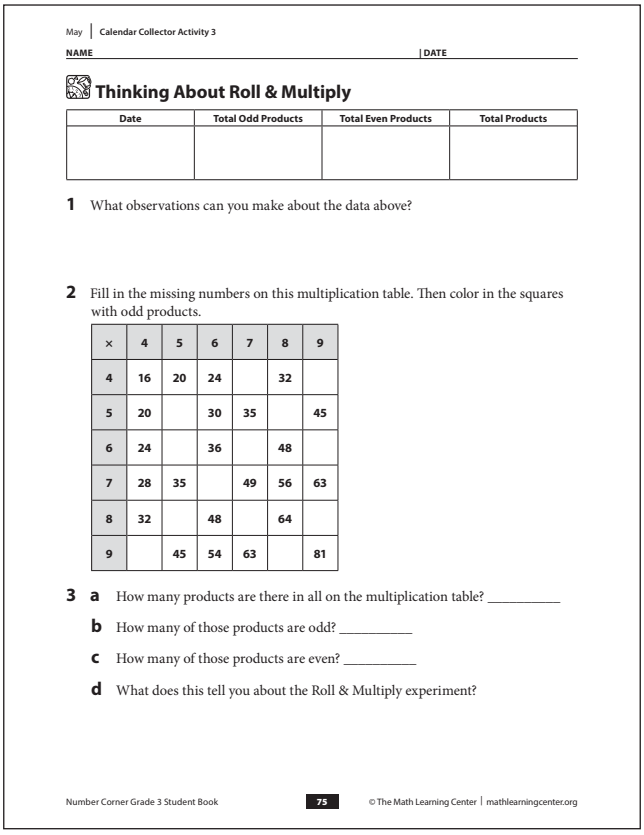
- Rolls two 4–9 dice
- Multiplies the number shown and records the product on the Roll & Multiply Record Sheet
- Repeats the rolling, multiplying, and recording 4 more times
- Records how many products are odd and how many products are even

Activity 3

Thinking About the Data So Far — Day 12

1 Open today's activity by updating the collection as a class and then giving students time to study the Record Sheet and then share observations.

2 Then display the table on the Thinking About Roll & Multiply Number Corner Student Book page. Have students turn to a partner and determine the total number of odd products and the total number of even products shown on the Record Sheet, just as they did the last time.



May | Calendar Collector Activity 3

NAME _____ | DATE _____

Thinking About Roll & Multiply

Date	Total Odd Products	Total Even Products	Total Products

1 What observations can you make about the data above?

2 Fill in the missing numbers on this multiplication table. Then color in the squares with odd products.

×	4	5	6	7	8	9
4	16	20	24		32	
5	20		30	35		45
6	24		36		48	
7	28	35		49	56	63
8	32		48		64	
9		45	54	63		81

3 a How many products are there in all on the multiplication table? _____

b How many of those products are odd? _____

c How many of those products are even? _____

d What does this tell you about the Roll & Multiply experiment?

Number Corner Grade 3 Student Book 75 © The Math Learning Center | mathlearningcenter.org

3 Invite a few pairs to share their totals. Make sure students have determined the accurate number of odd and even products.

4 Then, enter the date and the total number of odd and even products on the Number Corner Student Book page. Ask students to determine the total number of products.

5 Ask students to share any comments or observations they have about the data in the table. The following questions may help build discussion:

- Has your thinking changed? Why or why not?
- Do you have a strong opinion about whether you are more likely to get an even product or an odd product? Explain.
- When do you get even products and when do you get odd products?
- Could you predict the likelihood of getting an odd or even product when you multiply any two numbers, not just the ones shown on the dice?

> ***Students*** *Now there are really more evens than odds.*
>
> *Before I thought there might be about the same amount of even and odd products, but now I'm pretty certain that you will get an even product more than you will get an odd one.*
>
> *When we multiply an even number by an even number, the product is even. When you multiply two odd numbers, the product is odd.*
>
> *Is that always true?*
>
> *I think so. But, what happens when you multiply an even number and an odd number?*
>
> ***Teacher*** *Turn to a partner and find out: what does happen when you multiply an even number and an odd number? Multiply several even numbers by odd numbers and get ready to report back.*

6 Reveal the rest of the page. Go over the questions with the class, emphasizing how to read and use the multiplication table.

7 Tell students that they will transfer the data you have written and then answer the questions on their Thinking About Roll & Multiply page. Ask students if they have any questions. Then, have them find the page in their Number Corner Student Books and get started.

CHALLENGE Have students consider the relationship between the number of odd products and the total number of products. Can they think about this relationship as a fraction or percent? What does the fraction or a percent tell us about this experiment?

8 As students finish the page, have them meet with a partner to share and compare their work.

9 When mostly everyone is finished, bring the class back together to discuss the last question. Explain that question 4 is asking them to generalize what is happening in Roll & Multiply. In other words, what happens when they multiply two numbers? Why are they seeing more even products than odd products?

10 Wrap up the activity by letting students know they will discuss Roll & Multiply one more time, at the end of the month.

Day 13

Date:

Calendar Grid	Calendar Collector	Computational Fluency
Update	*Update*	
Number Line	**Solving Problems**	**Assessment**
Activity 3 – Playing Put It on the Line with a Partner (pg. 38)		

Update

Starting after Activity 1, have the student helper(s) complete this update procedure every day that the Calendar Grid is not a featured activity. You'll update the Calendar Grid as part of Activities 2, 3, and 4 as well.

Procedure

- Reveal new calendar makers up to and including the day's date.
- Record information about the new marker(s) on the Observations Chart.

Key Questions

Use the following questions to guide students' discussion this month:

- What do all the purple markers have in common? [They all represent fractions that are greater than ½.]
- What do all the green markers have in common? [They all represent fractions that are less than ½.]
- What is special about the orange marker? When do you think we'll see another orange marker? [It is exactly ½.]
- If we made a marker that had this same figure on it and we filled in 13 square units, should we use purple, green, or orange? Why? What if we filled in 7 square units? 21 square units?
- What is greater: ⅘ or ¾ (⅓ or ⅚, ⅔ or ⅘, ¼ or ⅓, and so on)? Use the markers and Observations Chart to prove it. [¾ > ⅘]
- We talk about the fractions on markers 6 and 7 as some number of thirds. Can we do that for marker 5? Why or why not?
- What is the same about markers 2 and 10 [or any pair of markers that shows the same number of shaded square units]? What is different about these markers?
- Can you say that the two fractions on markers 3 and 11 [or any pair of markers that shows the same number of shaded square units] are equal? Why or why not?

Update

Starting after Activity 1, have the student helper(s) complete this update procedure every day that the Calendar Collector is not a featured activity. You'll update the Calendar Collector as part of Activities 2, 3, and 4 as well.

Procedure

The student helper:

- Rolls two 4–9 dice
- Multiplies the number shown and records the product on the Roll & Multiply Record Sheet
- Repeats the rolling, multiplying, and recording 4 more times
- Records how many products are odd and how many products are even

Activity 3

Playing Put It on the Line with a Partner — Day 13

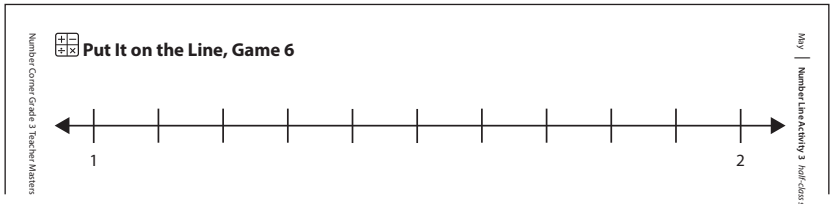
Make sure to put sticky notes over the questions on your copy of the Put It on the Line, Game 6 page before you display it. Optionally, you can cover the problems on the half-class set of copies before you pass them out as well.

1 Open today's activity by explaining that students will play Put It on the Line with a partner.

2 Distribute copies of the Put It on the Line, Game 6 Teacher Master to student pairs along with sticky notes. Have them cover the questions with sticky notes to get ready to play the game.

Tell students to try not to read the problems as they attach the sticky notes.

3 Display your copy of the Put It on the Line, Game 6 Teacher Master. Focus students' attention on the number line above the problems. Ask them what numbers would go on the dashes on the number line.



Students *It's just from 1 to 2 but there are so many lines.*

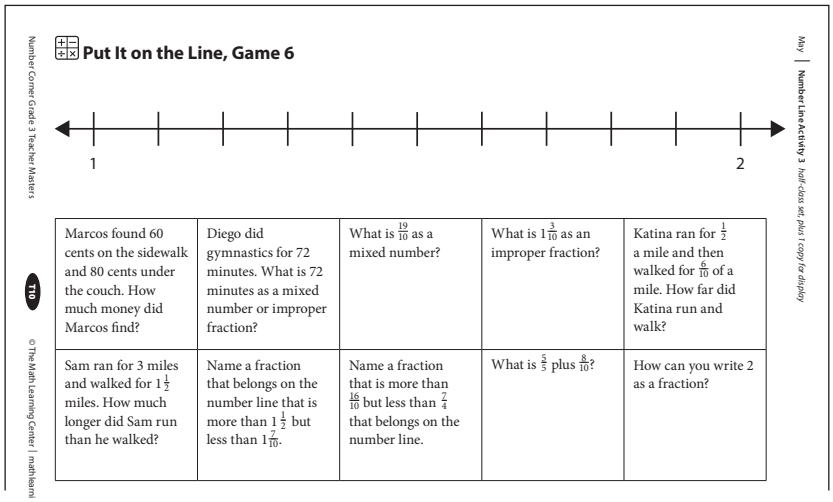
Is it eighths?

I bet it is tenths. It's kind of like one we did before only it goes from 1 to 2 instead of 0 to 1.

4 After discussing what numbers will be filled in on the number line, ask students to think of some mixed numbers and improper fractions that will go on the line.

- Ask them if they have any questions.
- If necessary, review the directions for playing the game.

5 Have students get two different colored pens or pencils and then begin playing the game with their partners. Encourage them to share and explain their strategies as well as answers.



Number Corner Grade 3 Teacher Masters

Put It on the Line, Game 6

Marcos found 60 cents on the sidewalk and 80 cents under the couch. How much money did Marcos find?	Diego did gymnastics for 72 minutes. What is 72 minutes as a mixed number or improper fraction?	What is $\frac{19}{10}$ as a mixed number?	What is $1\frac{3}{10}$ as an improper fraction?	Katina ran for $\frac{1}{2}$ a mile and then walked for $\frac{6}{10}$ of a mile. How far did Katina run and walk?
Sam ran for 3 miles and walked for $1\frac{1}{2}$ miles. How much longer did Sam run than he walked?	Name a fraction that belongs on the number line that is more than $1\frac{1}{2}$ but less than $1\frac{7}{10}$.	Name a fraction that is more than $\frac{16}{10}$ but less than $\frac{7}{4}$ that belongs on the number line.	What is $\frac{9}{5}$ plus $\frac{8}{10}$?	How can you write 2 as a fraction?

T10

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May | Number Line Activity 3 *half-class set, plus 1 copy for display*

6 As students play, circulate around the room to make observations, answer questions, and offer differentiated instruction.

ELL/SUPPORT Make sure students understand the questions. Emphasize or review key vocabulary. You may want to have them work in pairs to discuss and solve the problems. Help them find and use resources around the room that may help them with the questions.

CHALLENGE Have students make up some of their own questions that could go on a Put It on the Line game board. Have them compare all three number lines they have used this month. Do they see equivalent fractions across the boards? Could they use the questions from Game 4 with Game 5? Why or why not?

7 Toward the end of your time, have students stop playing and add up their scores. Offer the more/less die as an option for deciding who wins.

8 Wrap up this month's workout by asking students to reflect on the game. What did they think of the game? What skills and concepts did they work on by playing it?

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Day 14

Date:

Calendar Grid	Calendar Collector	Computational Fluency
Update	**Activity 3 –** Thinking About the Data so Far (pg. 21)	
Number Line	**Solving Problems**	**Assessment**

Update

Starting after Activity 1, have the student helper(s) complete this update procedure every day that the Calendar Grid is not a featured activity. You'll update the Calendar Grid as part of Activities 2, 3, and 4 as well.

Procedure

- Reveal new calendar makers up to and including the day's date.
- Record information about the new marker(s) on the Observations Chart.

Key Questions

Use the following questions to guide students' discussion this month:

- What do all the purple markers have in common? [They all represent fractions that are greater than ½.]
- What do all the green markers have in common? [They all represent fractions that are less than ½.]
- What is special about the orange marker? When do you think we'll see another orange marker? [It is exactly ½.]
- If we made a marker that had this same figure on it and we filled in 13 square units, should we use purple, green, or orange? Why? What if we filled in 7 square units? 21 square units?
- What is greater: ⅘ or ¾ (⅓ or ⅚, ⅔ or ⅘, ¼ or ⅓, and so on)? Use the markers and Observations Chart to prove it. [¾ > ⅘]
- We talk about the fractions on markers 6 and 7 as some number of thirds. Can we do that for marker 5? Why or why not?
- What is the same about markers 2 and 10 [or any pair of markers that shows the same number of shaded square units]? What is different about these markers?
- Can you say that the two fractions on markers 3 and 11 [or any pair of markers that shows the same number of shaded square units] are equal? Why or why not?

Activity 3

Focusing with Flashcards — Day 14

1 Open today's activity with the Quick Facts routine. (See Activity 1 if you need to review the process.)

2 Now ask students to look at their Quick Facts Tracking Sheets and at their previously completed Quick Facts Worksheets to think about which facts are most challenging for them so that they can make their own flashcards for these facts. Which ones do they have trouble recalling or recall incorrectly?

3 After students have had a few minutes to think, invite them to talk in pairs about the challenging facts.

You might do this step together as a whole class too.

- Ask each student to tell the other which facts are most challenging.
- Invite students to think of a few ways to solve those more challenging facts.
- Invite them to identify which way of solving each fact makes the best sense to them.

4 Make sure each student has some blank flashcards and colored pencils. Then give them the rest of the period to make their own flashcards.

SUPPORT Consider gathering a small group of students to work on the flashcards together.

CHALLENGE Invite students who have mastered their facts to work together to make posters featuring a variety of strategies for some of the more difficult facts, including: 8×7, 7×7, 7×9, 9×8, 6×7, and so on. Students can use copies of the Large Array Grids to illustrate each strategy with an array.

5 Let students know how much time they will have to work, let them know when they have five minutes left, and then close the period by having them put away their materials. Ask students to initial each of the their flashcards, and give them envelopes for storing their cards.

Students can use these flashcards in future Computational Fluency and Problem Solving activities. You might also have students use them for practice at other times. Send them home at the end of the year and encourage students to use them during their summer break.

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Day 15

Date:

Calendar Grid	Calendar Collector	Computational Fluency
Update	*Update*	
Number Line	**Solving Problems**	**Assessment**
	Activity 1 – Solving & Discussing Problems (pg. 42)	

Update

Starting after Activity 1, have the student helper(s) complete this update procedure every day that the Calendar Grid is not a featured activity. You'll update the Calendar Grid as part of Activities 2, 3, and 4 as well.

Procedure

- Reveal new calendar makers up to and including the day's date.
- Record information about the new marker(s) on the Observations Chart.

Key Questions

Use the following questions to guide students' discussion this month:

- What do all the purple markers have in common? [They all represent fractions that are greater than ½.]
- What do all the green markers have in common? [They all represent fractions that are less than ½.]
- What is special about the orange marker? When do you think we'll see another orange marker? [It is exactly ½.]
- If we made a marker that had this same figure on it and we filled in 13 square units, should we use purple, green, or orange? Why? What if we filled in 7 square units? 21 square units?
- What is greater: ⅘ or ¾ (⅓ or ⅚, ⅔ or ⅘, ¼ or ⅓, and so on)? Use the markers and Observations Chart to prove it. [¾ > ⅘]
- We talk about the fractions on markers 6 and 7 as some number of thirds. Can we do that for marker 5? Why or why not?
- What is the same about markers 2 and 10 [or any pair of markers that shows the same number of shaded square units]? What is different about these markers?
- Can you say that the two fractions on markers 3 and 11 [or any pair of markers that shows the same number of shaded square units] are equal? Why or why not?

Update

Starting after Activity 1, have the student helper(s) complete this update procedure every day that the Calendar Collector is not a featured activity. You'll update the Calendar Collector as part of Activities 2, 3, and 4 as well.

Procedure

The student helper:

- Rolls two 4–9 dice
- Multiplies the number shown and records the product on the Roll & Multiply Record Sheet
- Repeats the rolling, multiplying, and recording 4 more times
- Records how many products are odd and how many products are even

Activity 1

Solving & Discussing Problems — Days 6, 11, 15

Each time you repeat this activity, you'll use a different Number Corner Student Book page. Every page invites students to select some of their own problems based on the results of their most recent Quick Facts. Be sure to mark students' Quick Facts papers in time for this activity.

1 Introduce this week's Number Corner Student Book page using your display copy of the page.

- Read over each problem with students.
- Together as a class, do part a of items 1 and 2 if needed.

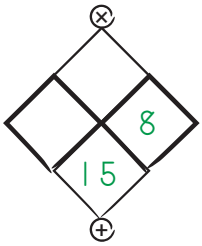
2 Return students' most recent Quick Facts papers, and explain how they will use them for today's activity.

- Students will review the multiplication facts they completed.
- They should identify which ones were most challenging; these might be the problems they got incorrect or those they had to think about longer before solving.
- They will select three of those challenging facts and focus on them in item 3 by:
  - » drawing an array to represent the combination
  - » using the array to illustrate a strategy for calculating the product that works well for them

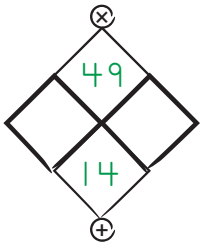
SUPPORT The first time students encounter diamond puzzles (on day 11), complete one or all of them together as a class or small group.

CHALLENGE If students felt very comfortable with these facts, invite them to select some facts for the multiplier they will be working on next. For example, if they demonstrated mastery of multiplying by 2, they might be moving on to multiplying by 3. In that case, they might want to think about strategies for calculating 3×6, 3×7 and 3×8. Another alternative is for students to think about combinations that are often most challenging. These combinations include: 3×7, 3×8, 3×9, 6×7, 7×7, 8×7, 7×9.

CHALLENGE You can also invite students to make and exchange their own mazes and diamond puzzles. You might also share with interested students how you can use equations with unknowns to represent the information in each diamond puzzle.



$8 + ___ = 15$
$8 \times ___ = ___$



$a \times b = 49$
$a + b = 14$

3 Answer students' questions, and then give them all but the last five minutes or so to complete the page.

While students work, circulate to make observations, answer questions, and provide differentiated instruction as needed. Pay attention to the facts students select for item 3, and make note of any common points of confusion so that you can focus on them when you reconvene the class.

4 Wrap up the activity by discussing the equations students wrote for the story problems or addressing any common points of confusion.

Key Questions

Use the following questions to guide students' discussion this month:

- What smaller arrays do you see in the larger array?
- Which of those smaller arrays can you use to make it easier to calculate the product?
- How does knowing your multiplication facts help with division?
- What equation can you write to represent this story problem? Where in the equation do you see the numbers you know? Where in the equation is there space for the number you are trying to find?

Literature Connections

Use the following books as read-alouds this month.

- *The King's Chessboard* by David Birch
- *Anno's Magic Seeds* by Mitsumasa Anno

Day 16

Date:

Calendar Grid	Calendar Collector	Computational Fluency
Update	**Activity 4 –** Drawing Conclusions About the Data and Experiment (pg. 23)	
Number Line	**Solving Problems**	**Assessment**

Update

Starting after Activity 1, have the student helper(s) complete this update procedure every day that the Calendar Grid is not a featured activity. You'll update the Calendar Grid as part of Activities 2, 3, and 4 as well.

Procedure

- Reveal new calendar makers up to and including the day's date.
- Record information about the new marker(s) on the Observations Chart.

Key Questions

Use the following questions to guide students' discussion this month:

- What do all the purple markers have in common? [They all represent fractions that are greater than ½.]
- What do all the green markers have in common? [They all represent fractions that are less than ½.]
- What is special about the orange marker? When do you think we'll see another orange marker? [It is exactly ½.]
- If we made a marker that had this same figure on it and we filled in 13 square units, should we use purple, green, or orange? Why? What if we filled in 7 square units? 21 square units?
- What is greater: ⅘ or ¾ (⅓ or ⅚, ⅔ or ⅘, ¼ or ⅓, and so on)? Use the markers and Observations Chart to prove it. [¾ > ⅘]
- We talk about the fractions on markers 6 and 7 as some number of thirds. Can we do that for marker 5? Why or why not?
- What is the same about markers 2 and 10 [or any pair of markers that shows the same number of shaded square units]? What is different about these markers?
- Can you say that the two fractions on markers 3 and 11 [or any pair of markers that shows the same number of shaded square units] are equal? Why or why not?

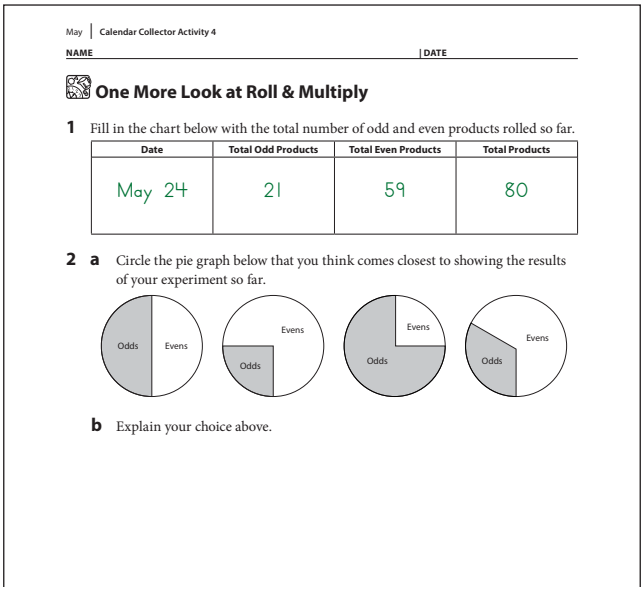
Activity 4

Drawing Conclusions About the Data & Experiment Day 16

Before you begin today's activity, make sure that the Record Sheet is up to date. Determine the total of odd and even products for this month so far and record them on the table on your copy of the One More Look at Roll & Multiply Number Corner Student Book page.

1 Open today's activity by updating the collection as a class.

2 Then display your copy of the One More Look at Roll & Multiply Number Corner Student Book page with the table filled out.



May | Calendar Collector Activity 4

NAME | DATE

One More Look at Roll & Multiply

1 Fill in the chart below with the total number of odd and even products rolled so far.

Date	Total Odd Products	Total Even Products	Total Products
May 24	21	59	80

2 a Circle the pie graph below that you think comes closest to showing the results of your experiment so far.

b Explain your choice above.

3 Ask students to turn to a partner and share observations about the data in the table. Then, invite a few pairs to share their observations with the class.

4 Then, ask students to think about how the total number of odd products relates to the total number of even products.

It is likely that students will notice that there are about 3 times as many even products as there are odd products and that about one-fourth of the products are odd. If they do not make observations like this, help them think about the relationships more deeply. You may want to give an example in which the number of even products is a multiple of the odd products, but do be clear to students that you are describing a hypothetical situation and not actually altering their data.

> ***Teacher*** *Your data is really interesting. And, you know what? It's really similar to what last year's third graders got. I think they had exactly 20 odd products and 60 even products. So, 20 out of 80 were odd. Do you notice anything about those numbers? Are they similar to yours?*

5 Give students a few minutes to find and complete the One More Look at Roll & Multiply page in their Number Corner Student Books.

SUPPORT/ELL If students have not had much experience with pie graphs, take a moment to go over pie graphs; describe in general terms how to read them and how they are made.

6 Bring the class back together. Invite several students to share their responses to questions 2a and 2b. If there is disagreement, build discussion and encourage students to support and justify their thinking.

If students change their minds during the discussion, welcome them to write more on their Number Corner Student Book page. This is a nice opportunity to show students that it is OK to change their thinking.

7 If there are a few days remaining, ask students to think about whether the additional data is likely to alter their conclusions. Have them turn and talk with a partner and then invite a few students to share with the group.

8 If there is high interest, continue having students update the Record Sheet for the rest of the month, and if you have time, take a few minutes at the very end of the month to re-examine the totals one last time.

Day 17

Date:

Calendar Grid	Calendar Collector	Computational Fluency
Activity 4 – Comparing Fractions (pg. 13)	*Update*	
Number Line	**Solving Problems**	**Assessment**
		Number Corner Checkup 4 – Part 1 (pg. 44)

Activity 4

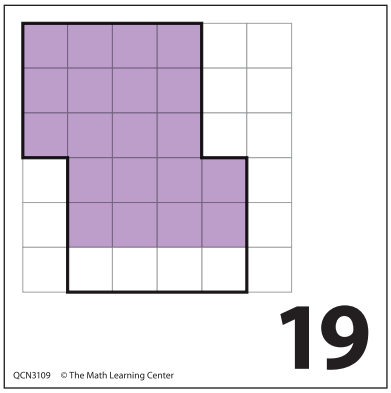
Comparing Fractions — Day 17

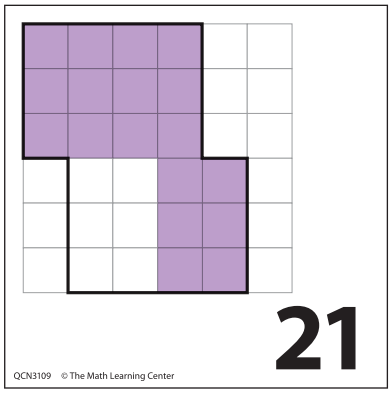
1 Begin by updating the Calendar Grid as a class and making additions and corrections to the Observations Chart as needed.

2 Now ask students to talk in pairs about which is greater ⅔ or ⅚. Ask them to study the markers and the Observations Chart to think about this question.

SUPPORT Provide a little more scaffolding for this task by asking students to look at the Observations Chart to find two markers: one that represents ⅔ and one that represents ⅚. Can they tell which one is greater and which one is less? It might also be most straightforward for students who are struggling to consider each fraction represented on the rectangles.

3 Invite students to share their thinking as a class and use the calendar markers to explain why one fraction must be greater than the other. Record students' thinking symbolically.





Students can use any pair of markers that show ⅚ and ⅔. It is probably easiest to compare the fractions if they select markers that show each fraction represented on the same figure.

$\frac{5}{6} > \frac{2}{3}$ and $\frac{2}{3} < \frac{5}{6}$

$\frac{2}{3} = \frac{4}{6}$ and $\frac{4}{6} < \frac{5}{6}$, so $\frac{2}{3} < \frac{5}{6}$

$\frac{5}{6} = \frac{20}{24}$ and $\frac{2}{3} = \frac{16}{24}$, so $\frac{5}{6} > \frac{2}{3}$

CHALLENGE Invite students to determine the exact difference between ⅚ and ⅔. They can use the markers or convert to fractions with a common denominator to determine that ⅚ is greater than ⅔ by exactly ⅙ (or ⁴⁄₂₄).

4 Repeat steps 2 and 3 with different pairs of fractions. Select from the list shown here.

As students get more comfortable with the exercise, you might invite them to write the inequalities on their whiteboards and hold them up. Then select students to share how they made each comparison.

Note that some comparisons involve fractions that are both greater than ½, both less than ½, or one that is less and one that is greater than ½. Encourage students to use ½ as a benchmark (which is made very clear by the color coding of the markers) and to justify their reasoning by converting to fractions with a common denominator as well.

- ⅝ and ⅚
- ⅜ and ⅓
- ⅘ and ⅜
- ½ and ⅔
- ¼ and ⅔
- ⅝ and ⅓

5 Display your copy of the Area & Fractions Story Problems Number Corner Student Book page.

- Read each problem aloud or invite a student volunteer to read each one aloud.
- Answer questions students have about the problems or about what they should do.

6 Give students the rest of the period to complete the page.

You can decide to:

- Have students work alone or with a partner.
- Work in a small group with you if they need more support.
- Return to any of the other pages you did this month to complete any problems they didn't have time to finish.

7 You can collect students' books and review their work on this page as a form of assessment. You could also close this Number Corner period by having students compare their work with another student or by reviewing one of the more challenging problems as a class.

Update

Starting after Activity 1, have the student helper(s) complete this update procedure every day that the Calendar Collector is not a featured activity. You'll update the Calendar Collector as part of Activities 2, 3, and 4 as well.

Procedure

The student helper:

- Rolls two 4–9 dice
- Multiplies the number shown and records the product on the Roll & Multiply Record Sheet
- Repeats the rolling, multiplying, and recording 4 more times
- Records how many products are odd and how many products are even

Number Corner Checkup 4, Part 1

Completing Pages 1–3 Day 17

1 Open the session by reminding students what a Number Corner Checkup is and describing how you'd like students to work on the assessment they will start today during Number Corner and complete on the next day.

Review the key ideas behind Checkups: a checkup is a way of finding out how everyone is doing with some of the skills you've been working on over the last couple of months during Number Corner. The assessment will help you and the students spot their strengths and weaknesses with respect to the skills and concepts that have been covered so far this year. It will help you do a better job of teaching because you'll see more clearly what each student already knows, and what they still need to work on.

Explain that you would like students to do the following things as they work on the first Number Corner Checkup:

- Listen carefully to the instructions for each problem.
- Stay with the class; don't move ahead to the next problem until instructed to do so.
- Work independently.
- Raise your hand if you have a question.
- Try to answer all of the problems, even those you don't fully understand.
- Explain how you solved a problem when the directions ask you to. You can use pictures, numbers, and words in your explanations.

2 Display your copy of Number Corner Checkup 3, pages 1–3, and give each student a copy.

- Give students a few moments to examine the pages quietly.
- Remind them to write their name and date at the top on the lines provided.

SUPPORT Apart from the first item, this assessment does not need to be timed. If there are students who are unable to complete the assessment in the given amount of time, have them do so later, perhaps during math stations or a seatwork period.

3 Tell students they will have one minute to complete as many of the multiplication problems on the top half of the first page. They will use a colored pencil for the multiplication problems and a regular pencil for the rest of the problems.

4 Have students pick up a colored pencils. Tell them when to begin and give them one minute to complete as many multiplication facts as possible.

5 When one minute has passed, have students put down their colored pencils and pick up their regular pencils. Give them the rest of the time to finish pages 1–3 of the assessment.

You may want to pick up their colored pencils while they continue working or collect the first page as soon as they finish it as there is a multiplication table on page 2.

6 At the end of Number Corner time today, have students stop working on their assessment. Recognize them for their effort and remind them that an assessment like this is only one way of showing their understanding. Let them know they will finish the assessment tomorrow.

Assessment Guide

See the Grade 3 Assessment Guide for scoring and intervention suggestions.

Day 18

Date:

Calendar Grid	Calendar Collector	Computational Fluency
Update	*Update*	
Number Line	**Solving Problems**	**Assessment**

Update

Starting after Activity 1, have the student helper(s) complete this update procedure every day that the Calendar Grid is not a featured activity. You'll update the Calendar Grid as part of Activities 2, 3, and 4 as well.

Procedure

- Reveal new calendar makers up to and including the day's date.
- Record information about the new marker(s) on the Observations Chart.

Key Questions

Use the following questions to guide students' discussion this month:

- What do all the purple markers have in common? [They all represent fractions that are greater than ½.]
- What do all the green markers have in common? [They all represent fractions that are less than ½.]
- What is special about the orange marker? When do you think we'll see another orange marker? [It is exactly ½.]
- If we made a marker that had this same figure on it and we filled in 13 square units, should we use purple, green, or orange? Why? What if we filled in 7 square units? 21 square units?
- What is greater: ⅘ or ¾ (⅓ or ⅚, ⅔ or ⅘, ¼ or ⅓, and so on)? Use the markers and Observations Chart to prove it. [¾ > ⅘]
- We talk about the fractions on markers 6 and 7 as some number of thirds. Can we do that for marker 5? Why or why not?
- What is the same about markers 2 and 10 [or any pair of markers that shows the same number of shaded square units]? What is different about these markers?
- Can you say that the two fractions on markers 3 and 11 [or any pair of markers that shows the same number of shaded square units] are equal? Why or why not?

Update

Starting after Activity 1, have the student helper(s) complete this update procedure every day that the Calendar Collector is not a featured activity. You'll update the Calendar Collector as part of Activities 2, 3, and 4 as well.

Procedure

The student helper:

- Rolls two 4–9 dice
- Multiplies the number shown and records the product on the Roll & Multiply Record Sheet
- Repeats the rolling, multiplying, and recording 4 more times
- Records how many products are odd and how many products are even

Day 19

Date:

Calendar Grid	Calendar Collector	Computational Fluency
Update	*Update*	
Number Line	**Solving Problems**	**Assessment**
		Number Corner Checkup 4 – Part 2 (pg. 45)

Update

Starting after Activity 1, have the student helper(s) complete this update procedure every day that the Calendar Grid is not a featured activity. You'll update the Calendar Grid as part of Activities 2, 3, and 4 as well.

Procedure

- Reveal new calendar makers up to and including the day's date.
- Record information about the new marker(s) on the Observations Chart.

Key Questions

Use the following questions to guide students' discussion this month:

- What do all the purple markers have in common? [They all represent fractions that are greater than ½.]
- What do all the green markers have in common? [They all represent fractions that are less than ½.]
- What is special about the orange marker? When do you think we'll see another orange marker? [It is exactly ½.]
- If we made a marker that had this same figure on it and we filled in 13 square units, should we use purple, green, or orange? Why? What if we filled in 7 square units? 21 square units?
- What is greater: ⅘ or ¾ (⅓ or ⅚, ⅔ or ⅘, ¼ or ⅓, and so on)? Use the markers and Observations Chart to prove it. [¾ > ⅘]
- We talk about the fractions on markers 6 and 7 as some number of thirds. Can we do that for marker 5? Why or why not?
- What is the same about markers 2 and 10 [or any pair of markers that shows the same number of shaded square units]? What is different about these markers?
- Can you say that the two fractions on markers 3 and 11 [or any pair of markers that shows the same number of shaded square units] are equal? Why or why not?

Update

Starting after Activity 1, have the student helper(s) complete this update procedure every day that the Calendar Collector is not a featured activity. You'll update the Calendar Collector as part of Activities 2, 3, and 4 as well.

Procedure

The student helper:

- Rolls two 4–9 dice
- Multiplies the number shown and records the product on the Roll & Multiply Record Sheet
- Repeats the rolling, multiplying, and recording 4 more times
- Records how many products are odd and how many products are even

Number Corner Checkup 4, Part 2

Completing Pages 4–6 Day 19

1 Let students know that they are going to do the second half of the first Number Corner Checkup today.

Have them get out their pencils for today's problems. Let them know that they will also each need one colored pencil and a ruler that can be used to measure length to the nearest quarter-inch.

1 Display your copy of Number Corner Checkup 4, pages 4–6, and give each student a copy.

Give students a few moments to examine both sheets quietly.

2 Then, have students get started. Give them the rest of the time to finish the assessment.

If students finish before others, have them look over finish the first three pages of the assessment.

SUPPORT Remember that this is not a reading test. If students are struggling to read any part of the assessment, you can read the problems aloud for them. Also remember that besides the multiplication facts on page 1, this is not timed test. If students need extra time, they can have it at another time that works for you.

3 At the end of Number Corner time today, have students stop working on their assessment. Recognize them for their effort and remind them the assessment will help you understand what they have learned this year.

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Day 20

Date:

Calendar Grid	Calendar Collector	Computational Fluency
Update	*Update*	**Activity 4 –** Playing Tens to Win Multiplication in Pairs (pg. 31)
Number Line	**Solving Problems**	**Assessment**

Update

Starting after Activity 1, have the student helper(s) complete this update procedure every day that the Calendar Grid is not a featured activity. You'll update the Calendar Grid as part of Activities 2, 3, and 4 as well.

Procedure

- Reveal new calendar makers up to and including the day's date.
- Record information about the new marker(s) on the Observations Chart.

Key Questions

Use the following questions to guide students' discussion this month:

- What do all the purple markers have in common? [They all represent fractions that are greater than ½.]
- What do all the green markers have in common? [They all represent fractions that are less than ½.]
- What is special about the orange marker? When do you think we'll see another orange marker? [It is exactly ½.]
- If we made a marker that had this same figure on it and we filled in 13 square units, should we use purple, green, or orange? Why? What if we filled in 7 square units? 21 square units?
- What is greater: ⅘ or ¾ (⅓ or ⅚, ⅔ or ⅘, ¼ or ⅓, and so on)? Use the markers and Observations Chart to prove it. [¾ > ⅘]
- We talk about the fractions on markers 6 and 7 as some number of thirds. Can we do that for marker 5? Why or why not?
- What is the same about markers 2 and 10 [or any pair of markers that shows the same number of shaded square units]? What is different about these markers?
- Can you say that the two fractions on markers 3 and 11 [or any pair of markers that shows the same number of shaded square units] are equal? Why or why not?

Update

Starting after Activity 1, have the student helper(s) complete this update procedure every day that the Calendar Collector is not a featured activity. You'll update the Calendar Collector as part of Activities 2, 3, and 4 as well.

Procedure

The student helper:

- Rolls two 4–9 dice
- Multiplies the number shown and records the product on the Roll & Multiply Record Sheet
- Repeats the rolling, multiplying, and recording 4 more times
- Records how many products are odd and how many products are even

Activity 4

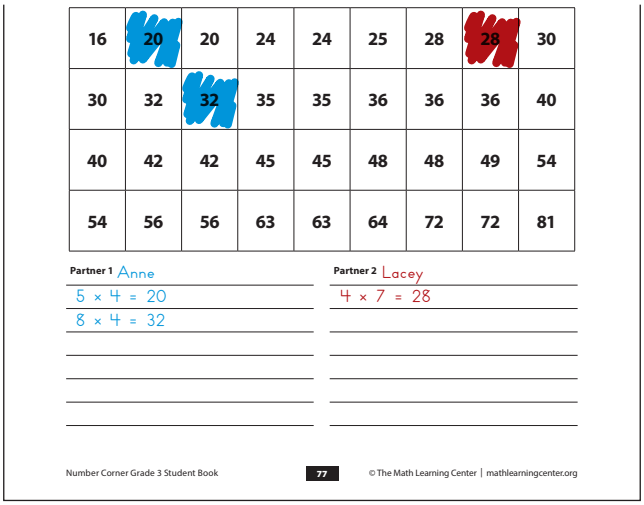
Playing Ten to Win Multiplication in Pairs — Day 20

1 Open today's activity with the Quick Facts routine. (See Activity 1 if you need to review the process.)

2 Then, have students get their Number Corner Student Books out and open to the Ten to Win Spinner and Record Sheet (Partner Version) pages.

3 Review how to play Ten to Win in pairs.

- Explain that students will play Ten to Win in pairs instead of as a class against you.
- Invite a student to summarize the directions.
- Explain that the rules are the same except that as they spin factors, they need to record each equation spun in the correct column on their side of the record sheet.



16	20	20	24	24	25	28	28	30
30	32	32	35	35	36	36	36	40
40	42	42	45	45	48	48	49	54
54	56	56	63	63	64	72	72	81

Partner 1 Anne

5 × 4 = 20

8 × 4 = 32

Partner 2 Lacey

4 × 7 = 28

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- They can decide which partner's book to use first and which partner will use which side of the page.
- About five minutes before time is up, you will signal to the class that they should stop and find out who has captured the most cells on the grid.

4 Ask students if they have any questions. Then, have students find a partner (or assign partners). Hand out spinner overlays to each pair of students and have them get started.

5 At the end of Number Corner time, have students determine who has captured the greatest amount of squares. Then, have them put away their materials.