

SECOND EDITION

TEACHERS GUIDE

OCTOBER



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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' x 4' bulletin board or on two 6' x 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.

Number Corner Grade 3 Teachers Guide



October Daily Planner

Day	Date	Calendar Grid	Calendar Collector	Computational Fluency	Number Line	Solving Problems	Assessment
1		Activity 1 Introducing the October Calendar Markers (p. 9)					
2		Update	Activity 1 Introducing the Calendar Collector (p. 19)				
3		Update	Update	Activity 1 Introducing Frog Jump Multiplication (p. 28)			
4		Update	Update			Activity 1 Problem Strings: Jumping by 10s (p. 44)	
5		Update	Update		Activity 1 Changing Endpoints (p. 34)		
6		Activity 2 Identifying Right Angles (p. 11)	Update				
7		Update	Activity 2 Charting Milliliters & Liters (p. 23)				
8		Update	Update	Activity 2 Frog Jump Multiplication Rematch (p. 31)			
9		Update	Update			Activity 1 Problem Strings: Friendly Tens (p. 45)	
10		Update	Activity 2 Charting Milliliters & Liters (p. 23)		Activity 2 Put It on the Line, Game 1 (p. 37)		
11		Activity 3 Identifying Lines of Symmetry (p. 12)	Update				
12		Update	Activity 3 Hands-On Measuring (p. 25)				
13		Update	Update	Activity 3 Frog Jump Multiplication with a Partner (p. 31)			
14		Activity 4 Sorting Quadrilaterals (p. 14)	Update				
15		Update	Activity 2 Charting Milliliters & Liters (p. 23)		Activity 3 Put It on the Line, Game 2 (p. 30)		
16		Activity 5 Congruent Shapes (p. 15)	Update				
17		Update	Update			Activity 1 Problem Strings: Removing vs. Adding On (p. 46)	
18		Update	Update				Number Corner Checkup 1, Part 1 (p. 48)
19		Update	Update				Number Corner Checkup 1, Part 2 (p. 49)
20		Update	Activity 4 Total Volume of the Collection (p. 26)				

Note On days when the *Calendar Grid* or *Calendar Collector* are not featured in an activity, a student helper will update one or both either before or after *Number Corner*. Summaries of the update routines appear below.

Calendar Grid – If the *Calendar Grid* isn't one of the featured workouts for the day, the student helper posts the marker before or after the class meets for *Number Corner* and records the day's date on the whiteboard.

Calendar Collector – If the *Calendar Collector* isn't one of the featured workouts for the day, the student helper measures out 250 milliliters of tinted water from a pitcher you've provided, adds it to the liter bottle that is being filled at the time, and marks the new water level on the bottle.

Number Corner

October

Overview

This month, students revisit concepts of multiplication in a new context during the Computational Fluency workouts, and they continue to review efficient strategies for adding and subtracting 2- and 3-digit numbers during the Number Line and Solving Problems workouts. The other two workouts introduce measurement of liquid volume in metric units, fractions, and a host of geometry terms and concepts.

Activities

Workouts	Day	Activities	D	G	SB
Calendar Grid Two-Dimensional Shapes Students add a new polygon marker to the Calendar Grid for each day this month. During whole group discussions, they identify, investigate, and compare properties of the polygons posted to date, including number of sides and angles, types of angles, congruence, and symmetry. Later in the month, the teacher introduces the idea of classification systems for quadrilaterals.	1	1 Introducing the October Calendar Markers	●		
	6	2 Identifying Right Angles	●		
	11	3 Identifying Lines of Symmetry	●		
	14	4 Sorting Quadrilaterals	●		
	16	5 Congruent Shapes	●		●
Calendar Collector Collecting Liters & Milliliters The class pours 250 milliliters—a fourth of a liter—of tinted water into a 1-liter container each school day. When the container is filled, the teacher provides another. The class keeps a chart to show the growing collection of milliliters and liters over the course of the month. Mid-month, the teacher sets up a simple measuring station in one corner, designed for pairs of students to visit as time allows. At the end of the month, students use their experiences to help solve a set of story problems related to liquid volume.	2	1 Introducing the Calendar Collector	●		
	7, 10, 15	2 Charting Milliliters & Liters	●		
	12	3 Hands-On Measuring	●		
	20	4 Total Volume of the Collection	●		●
Computational Fluency Frog Jump Multiplication Students play a game similar to Loops & Groups using the number line this month. Teams or partners take turns rolling a die numbered 1–6 twice. The first roll determines the number of jumps they get to take, and the second roll determines the length of each jump. After four turns, they find the sum of the products.	3	1 Introducing Frog Jump Multiplication		●	●
	8	2 Frog Jump Multiplication Rematch		●	●
	13	3 Frog Jump Multiplication with a Partner		●	●
Number Line Changing Endpoints Students investigate how changing the value of the endpoint affects the numbers along a line that starts at 0 and shows 10 more marks. They also learn to play a new game called Put It on the Line.	3	1 Changing Endpoints	●		●
	8	2 Put It on the Line, Game 1		●	●
	13	3 Put It on the Line, Game 2		●	●
Solving Problems Subtracting Two- & Three-Digit Numbers Students solve and discuss problem strings designed to elicit efficient strategies for subtracting 2- and 3-digit numbers that involve using multiples of 10 and adding up to find the difference.	4, 9, 17	1 Problem Strings 4, 5, & 6	●		●
Assessment Number Corner Checkup 1 The teacher administers a written assessment to the entire class in place of two regular Number Corner workouts during the last week of the month.	18	Number Corner Checkup 1, Part 1 Completing Pages 1 & 2			
	19	Number Corner Checkup 1, Part 2 Completing Pages 3–5			

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

Teaching Tips

Because the activities in Number Corner are intended to be so fast paced, it is important to keep students focused. It's also a good idea to reinforce those classroom norms that build the classroom as a community of learners. Taking time at the beginning of the year to set and review expectations is essential. Some teachers also find it helpful to set up some kind of reward system. We favor systems that reward the entire group, rather than individuals, as this emphasizes collaboration and cooperation rather than competition. Consider choosing one or two behaviors to reinforce this month—perhaps transitioning from tables or desks to the Number Corner discussion area quickly and quietly; listening carefully and thoughtfully to the person speaking, whether it be a classmate or an adult; or persevering with problems even when they seem too challenging.

Once you've decided on the behaviors you want to recognize and reward, set up a very simple system (marbles in a jar, cubes in a cup), share it with the students at the beginning of the month, and be consistent at "catching" students when they display the desired behaviors. Every time you notice even a few of them doing the right thing, comment on it, and drop that cube in the cup or that marble in the jar, you reinforce the kinds of behaviors that lead to a robust community of learners. This type of arrangement also makes it a little easier to stay on the positive side of behavior management. When the cup or the jar is filled, reward the entire class with a predetermined treat—5 or 10 extra minutes of recess, an extra story time or rereading a very popular picture book. Simplicity in all of this is good.

Another thing to remember about student management is that third graders tend to misbehave when they are bored. Providing a list of things to do when students complete assignments is a helpful strategy to cut down on the number of misbehaviors. One of the things that could easily be added to the list are any of the Number Corner Games. Run off extra copies of the record sheets and allow students to play the games in their spare time. Students will get extra practice, and you may notice less boredom-bred misbehavior.

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.1 Interpret products of whole numbers			●		
3.OA.1 Describe problem situations to match a multiplication expression or equation			●		
3.OA.8 Solve two-step story problems using addition, subtraction, and multiplication				●	
3.NBT.2 Use strategies based on place value, properties of operations, or the relationship between addition and subtraction to add and subtract fluently with sums and minuends to 1,000		●		●	●
3.NF.1 Demonstrate an understanding of a unit fraction $1/b$ as 1 of b equal parts into which a whole has been partitioned		●			
3.NF.1 Demonstrate an understanding of a fraction a/b as a equal parts, each of which is $1/b$ of a whole		●			
3.NF.3b Recognize simple equivalent fractions		●			
3.NF.3c Write a whole number as a fraction		●			
3.MD.2 Estimate and measure liquid volume in milliliters and liters		●			
3.MD.2 Solve story problems involving addition and subtraction of volume measurements given in liters		●		●	
3.G.1 Identify rhombuses, rectangles, and squares as quadrilaterals	●				
3.G.1 Identify shared attributes of shapes in different categories	●				
3.G.1 Group shapes in different categories according to shared attributes that define a broader category	●				
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 **SP** – Solving Problems

Assessments

Toward the end of the month, you will administer a four-page written assessment—Number Corner Checkup 1—in two parts: the first two sheets during Number Corner on Day 18, and the last two during Number Corner the following day. The checkup replaces regular workouts on both days. The table below lists the skills assessed in the first Number Corner checkup.

Number Corner Checkup 1 provides a snapshot of individual students' current skills in areas that have been emphasized over the past two months—multiplication concepts, adding and subtracting 2- and 3-digit numbers, solving story problems, estimating and measuring liquid volume, making and reading scaled graphs, and reasoning about two-dimensional shapes and their attributes. If you want to gauge students' growth and progress over time with regard to the entire set of Common Core State Standards, you can use the optional Comprehensive Growth Assessment, located in the Grade 3 Assessment Guide.

- Interpret products of whole numbers (3.OA.1)
- Solve multiplication story problems with products to 100 involving situations of equal groups and arrays (3.OA.3)
- Solve two-step story problems using addition, subtraction, and multiplication (3.OA.8)
- Use strategies based on place value, properties of operations, or the relationship between addition and subtraction to add and subtract fluently with sums and minuends to 1,000 (3.NBT.2)
- Estimate and measure liquid volume in liters (3.MD.2)
- Solve story problems involving addition and subtraction of volume measurements given in liters (3.MD.2)
- Make a scaled bar graph to represent a data set with several categories (3.MD.3)
- Solve one-step comparison problems using data shown on a scaled bar graph with several categories (3.MD.3)
- Identify rhombuses, rectangles, and squares as quadrilaterals (3.G.1)
- Identify shared attributes of shapes in different categories (3.G.1)
- Group shapes in different categories according to shared attributes that define a broader category (3.G.1)

Materials Preparation

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.

Task		Done
Copying	Run copies of Teacher Masters T1–T12 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 4–10.	
	Run a single display copy of Number Corner Student Book pages 4, 5, 8, and 9.	
Charts	Prepare the Calendar Grid Observations Chart according to preparation instructions in the workout.	
	Prepare the Milliliters & Liters Record Sheet according to preparation instructions in the Calendar Collector workout.	
Special Items	Gather the following items and prepare them according to the preparation instructions in the Calendar Collector workout: <ul style="list-style-type: none"> • 1 empty 1-quart carton • 6 clear or translucent 1-liter bottles with tops • 1 plastic pitcher • 1 funnel (optional) • a small bottle of food coloring • a cafeteria tray • paper or cloth toweling • 4 or 5 plastic drinking cups or containers of various sizes 	

October Calendar Grid

Two-Dimensional Shapes

Overview

Students add a new polygon marker to the Calendar Grid for each day this month. During whole group discussions, they identify, investigate, and compare properties of the polygons posted to date, including number of sides and angles, types of angles, congruence, and symmetry. Later in the month, the teacher will introduce the idea of classification systems for quadrilaterals.

Skills & Concepts

- Identify rhombuses, rectangles, and squares as quadrilaterals (3.G.1)
- Identify shared attributes of shapes in different categories, and group shapes in different categories according to shared attributes that define a broader category (3.G.1)
- Use appropriate tools strategically (3.MP.5)
- Look for and make use of structure (3.MP.7)

Materials

Activities	Day	Copies	Kit Materials	Classroom Materials
Activity 1 Introducing the October Calendar Markers	1	TM T1 Right Angle Measures (see Preparation)	<ul style="list-style-type: none"> • Calendar Grid pocket chart (used in all October Calendar Grid activities) • Day, Month, and Year markers (used in all October Calendar Grid activities) 	<ul style="list-style-type: none"> • Calendar Grid Observations Chart (see Preparation) • erasable markers
Activity 2 Identifying Right Angles	6	TM T2 Jumbo Shapes (see Preparation)	<ul style="list-style-type: none"> • Shape Sorts Calendar Markers (used in all October Calendar Grid activities) 	
Activity 3 Identifying Lines of Symmetry	11		<ul style="list-style-type: none"> • Word Resource Cards identified by asterisk [*] in the vocabulary list at right 	<ul style="list-style-type: none"> • Calendar Grid Observations Chart • erasable markers • ruler
Activity 4 Sorting Quadrilaterals	14	TM T3 Quadrilateral Sorting Tree Poster	<ul style="list-style-type: none"> • Word Resource Card: <i>parallel</i> 	<ul style="list-style-type: none"> • Calendar Grid Observations Chart
Activity 5 Congruent Shapes	16	NCSB 4* Polygon Concepts Review	<ul style="list-style-type: none"> • Word Resource Card: <i>congruent</i> 	

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

* Run 1 copy of this page for display.

Vocabulary

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

acute angle*
angle*
closed
concave
congruent*
equilateral triangle*
hexagon*
irregular
isosceles triangle*
line*
line of symmetry*
obtuse angle*
open
parallel*
parallelogram*
pentagon*
point
polygon*
quadrilateral*
rectangle*
regular
rhombus*
right angle*
scalene triangle*
side
square*
trapezoid*
triangle*

Preparation

Calendar Grid Observations Chart

Erase the Calendar Grid Observations Chart from September. Redraw the lines to create four columns. Label the columns at the top of the first sheet as shown below for use with this month's markers. The chart may be extended 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 each month.

Calendar Grid Observations				
Date	Shape Name	Color		Other Observations

Right Angle Measures for Activity 2

Run 1 copy of the Right Angle Measures Teacher Master on an overhead transparency for display, plus additional copies on transparency if you want to allow students to use them. Cut the two angle measures apart and store them in an envelope or zip-top bag beside the Calendar Grid for use during Activity 2 and at other times through the month.

Jumbo Shapes for Activity 3

Run enough copies of the Jumbo Shapes Teacher Master so that each pair of students will have one shape to share. (There are 10 Jumbo Shapes, so if you have a class of 30 students, two copies of the Jumbo Shapes page will give you enough shapes with extras to spare.) It's fine if two or more pairs of students work with the same shape.

Cut out the shapes and store them near the Calendar Grid for use during Activity 3.

Mathematical Background

This month's Calendar Grid workout will be the students' first exploration of geometry in third grade. The October calendar markers are sequenced in a simple pattern reflecting color and number of sides. The shapes in the collection provide a wealth of opportunities to introduce and develop geometry concepts and vocabulary through the month.

Common Core standards stress that third graders need to understand concepts of quadrilaterals, and we find that presenting students with nonexamples can sometimes be the best route to developing this understanding. For example, the concept of congruence can be compared with that of similarity, and attributes specific to quadrilaterals can be compared with those of other polygons such as triangles.

Here, you'll find a list of the terms that might be useful during Calendar Grid discussions, along with their definitions and the relevant markers.

Literature Connections

These would be good books to share with your students this month:

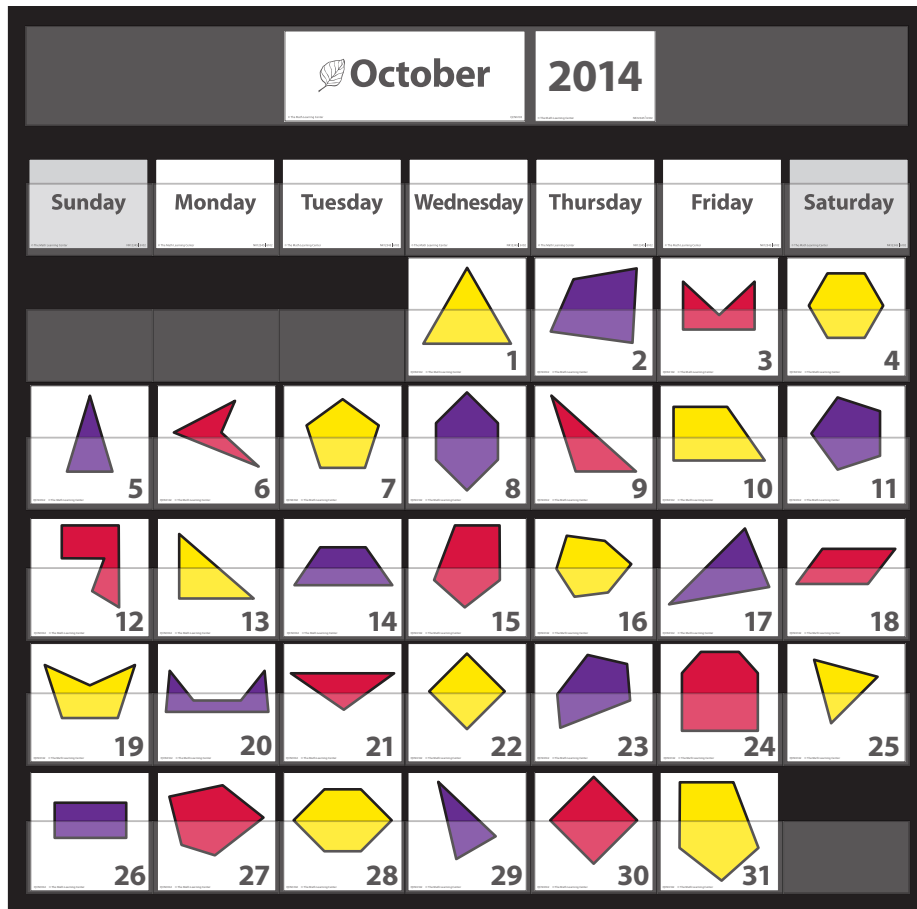
- *Mouse Shapes* by Ellen Stoll Walsh
- *Icky Bug Shapes* by Jerry Pallotta

Term/Concept	Definition	Markers
Polygon	<p>A polygon is a closed two-dimensional figure made up of 3 or more line segments.</p> <ul style="list-style-type: none"> A regular polygon is one with equal side lengths and equal angles. An irregular polygon is one with sides and angles that vary in length and measure. 	<p>Polygons: 1–31</p> <ul style="list-style-type: none"> Regular polygons: 1, 4, 7, 11, 22, 25, 30
Triangles	<p>A triangle is a 3-sided polygon. Triangles are classified by side length and angle measure:</p> <ul style="list-style-type: none"> The three sides of an equilateral triangle are equal in length. Two sides of an isosceles triangle are equal, while none of the sides of a scalene triangle are equal. A right triangle has 1 right angle. All 3 angles in an acute triangle are less than 90°, or acute. One of the angles of an obtuse triangle is greater than 90°, or obtuse. <p>Each of the triangles on the calendar markers this month can be classified by both side length and angle measure. Marker 1, for example, is an acute equilateral triangle because all the side lengths are equal, and all the angles are acute.</p>	<ul style="list-style-type: none"> Acute equilateral triangles: 1, 25 Acute isosceles triangles: 5, 29 Obtuse isosceles triangle: 21 Obtuse scalene triangle: 9 Right scalene triangle: 13 Acute scalene triangle: 17 Regular triangle: 1, 25
Quadrilaterals	<p>A quadrilateral is a 4-sided polygon. Like triangles, quadrilaterals are classified by their sides and angles:</p> <ul style="list-style-type: none"> A parallelogram is a quadrilateral with 2 pairs of parallel sides. (Rhombuses, rectangles, and squares are all parallelograms, each with specific attributes. A square is also known as a regular quadrilateral, meaning all 4 sides are the same and all 4 angles are the same.) A trapezoid is a quadrilateral with exactly 1 pair of parallel sides. Irregular quadrilaterals have no parallel lines. 	<ul style="list-style-type: none"> Trapezoids: 10, 14 Parallelograms: 18, 22, 26, 30 <ul style="list-style-type: none"> Rhombuses: 22, 30 Rectangles: 22, 26, 30 Squares (regular quadrilaterals): 22, 30
Pentagons	<p>A pentagon is a 5-sided polygon.</p> <ul style="list-style-type: none"> A regular pentagon has equal side lengths and equal angles An irregular pentagon has side lengths and angle measures that vary 	<ul style="list-style-type: none"> Regular pentagons: 7, 11
Hexagons	<p>A hexagon is a 6-sided polygon.</p> <ul style="list-style-type: none"> A regular hexagon has equal side lengths and equal angles An irregular hexagon has side lengths and angle measures that vary 	<ul style="list-style-type: none"> Regular hexagon: 4
Congruent Shapes	If two figures are congruent, they are exactly the same shape and size.	<ul style="list-style-type: none"> The following pairs of markers are congruent: 5 & 29, 7 & 11, and 8 & 28
Similar Shapes	If two figures are similar, they are the same shape but different sizes.	<ul style="list-style-type: none"> The following pairs of markers are similar: 1 & 25, 22 & 30, and 15 & 31
Concave Shapes	A shape is said to be concave if it includes at least one interior reflex angle—that is, an interior angle that is greater than 180 degrees. The reflex angle results in a “dent” in the polygon.	<ul style="list-style-type: none"> 3, 6, 12, 19, and 20
Lines of Symmetry	A line of symmetry is a line that divides a figure into two mirror images. Some of the shapes in the set of markers for this month have no lines of symmetry. Others have exactly 1 line of symmetry, and several have more than 1 line of symmetry.	<ul style="list-style-type: none"> Zero lines of symmetry: 2, 6, 9, 10, 12, 13, 15, 16, 17, 18, 23, 27, 31 One line of symmetry: 3, 5, 14, 19, 20, 21, 24, 29 Two lines of symmetry: 8, 22, 26, 28, 30 Three lines of symmetry: 1 & 25 Five lines of symmetry: 7 & 11 Six lines of symmetry: 4
Angles (Right, Acute, Obtuse)	<p>An angle is made up of two rays that share an endpoint:</p> <ul style="list-style-type: none"> A right angle measures exactly 90°. An acute angle measures less than 90°. An obtuse angle measures more than 90°. 	<ul style="list-style-type: none"> Shapes with at least one right angle: 3, 10, 12, 13, 15, 24, 26, 31

About the Pattern

Several patterns will emerge in this month's Calendar Grid. Allow your students to discover these as the month progresses:

- Number of sides: 3 sides, 4 sides, 5 sides, 6 sides; 3 sides, 4 sides, 5 sides, 6 sides, and so on
- Type of polygons: Triangle, quadrilateral, pentagon, hexagon; triangle, quadrilateral, pentagon, hexagon, and so on
- Color: Yellow, purple, red; yellow, purple, red, and so on



Key Questions

Learning to search for, describe, and extend patterns facilitates algebraic thinking. Use any of the questions below to help your students think about this month's pattern:

- When do you think we'll see the next quadrilateral (triangle, pentagon, hexagon)? How can you tell?
- What is the name of the shape on today's marker? How do you know?
- What is it that makes these shapes all triangles (quadrilaterals, pentagons, hexagons)?
- What types of angles do you see in this shape—right, obtuse, or acute?
- Is this shape regular or irregular? How do you know?
- Can you spot two shapes on the Calendar Grid that are congruent? Which ones? How do you know they're congruent?
- Describe the shape on today's marker in as much detail as you can.
- I'm thinking of one of the markers we can see on the Calendar Grid. On this marker there is a polygon with 3 sides and 1 right angle. Which marker am I thinking of?
- I'm thinking of one of the markers we can see on the Calendar Grid. On this marker there is a polygon with 4 sides and 4 right angles. Which marker am I thinking of?

Update

Begin Updating After Activity 1. Follow this update procedure every school day that the Calendar Grid is not one of the designated activities.

Procedure

- Have a student helper post the calendar marker and fill in the Calendar Grid Observations Chart to show the date, shape name, color, and at least one other observation about the shape. You might choose to assign one student to take this role for the entire week.
- Challenge the student helpers to be as precise as possible about the name of the shape. If it is a quadrilateral, what kind of quadrilateral? If it is a triangle, is it equilateral, isosceles, or scalene? If it is a pentagon or a hexagon, is it regular or irregular?



October

Date	Shape Name	Color	Other Observations
1	triangle	yellow	Add observations from students.
2	quadrilateral	purple	
3	pentagon	red	
4	hexagon	yellow	
5	triangle	purple	
6	quadrilateral	red	
7	pentagon	yellow	
8	hexagon	purple	
9	triangle	red	
10	quadrilateral	yellow	
11	pentagon	purple	
12	hexagon	red	
13	triangle	yellow	
14	quadrilateral	purple	
15	pentagon	red	
16	hexagon	yellow	
17	triangle	purple	
18	quadrilateral	red	
19	pentagon	yellow	
20	hexagon	purple	
21	triangle	red	
22	quadrilateral	yellow	
23	pentagon	purple	
24	hexagon	red	
25	triangle	yellow	
26	quadrilateral	purple	
27	pentagon	red	
28	hexagon	yellow	
29	triangle	purple	
30	quadrilateral	red	
31	pentagon	yellow	

About the Pattern

Several patterns will emerge in this month's Calendar Grid. Allow your students to discover these as the month progresses:

- Number of sides: 3 sides, 4 sides, 5 sides, 6 sides; 3 sides, 4 sides, 5 sides, 6 sides, and so on
- Type of polygons: Triangle, quadrilateral, pentagon, hexagon; triangle, quadrilateral, pentagon, hexagon, and so on
- Color: Yellow, purple, red; yellow, purple, red, and so on

Notes:

CALENDAR GRID OBSERVATIONS

[illegible]

October Calendar Collector

Collecting Liters & Milliliters

Overview

This month, the class pours 250 milliliters—a fourth of a liter—of tinted water into a 1-liter container each school day and keeps a chart to show the growing collection of milliliters and liters over the course of the month. Mid-month, the teacher sets up a simple measuring station in one corner of the room, designed for pairs of students to visit as time allows. At the end of the month, students use their experiences to help solve a set of story problems related to liquid volume. These are rich opportunities to develop a sense of metric units of liquid measure as well as to apply skills in reading, understanding, and adding multi-digit numbers, fractions, and mixed numbers.

Skills & Concepts

- Fluently add with sums to 1,000 (3.NBT.2)
- Demonstrate an understanding of a unit fraction $\frac{1}{b}$ as 1 of b equal parts into which a whole has been partitioned (e.g., $\frac{1}{4}$ is 1 of 4 equal parts of a whole) (3.NF.1)
- Demonstrate an understanding of a fraction $\frac{a}{b}$ as a equal parts, each of which is $\frac{1}{b}$ of a whole (e.g., $\frac{3}{4}$ is 3 of 4 equal parts of a whole or 3 parts that are each $\frac{1}{4}$ of a whole) (3.NF.1)
- Recognize simple equivalent fractions (3.NF.3b)
- Write a whole number as a fraction (3.NF.3c)
- Solve story problems involving addition and subtraction of volume measurements given in liters (3.MD.2)
- Attend to precision (3.MP.6)
- Look for and express regularity in repeated reasoning (3.MP.8)

Materials

Activities	Day	Copies	Kit Materials	Classroom Materials
Activity 1 Introducing the Calendar Collector	2		<ul style="list-style-type: none"> • 1-cup/250-milliliter measuring cup • Word Resource Cards for <i>liquid volume</i>, <i>liter</i>, and <i>milliliter</i> 	<ul style="list-style-type: none"> • 2–3 pieces of chart paper (see Preparation) • erasable markers • 1 empty, clean 1-quart milk or juice carton (see Preparation)
Activity 2 Charting Milliliters & Liters	7, 10, 15			<ul style="list-style-type: none"> • 6 clear or translucent plastic 1-liter bottles with tops (see Preparation)
Activity 3 Hands-On Measuring	12	TM T4 Investigating Liters & Milliliters	<ul style="list-style-type: none"> • 1-cup/250-milliliter measuring cup • 1-quart/1-liter measuring cup 	<ul style="list-style-type: none"> • plastic pitcher (see Preparation) • masking tape (see preparation) • funnel (optional, see Preparation)
Activity 4 Total Volume of the Collection	20	NCSB 5* Solving Liquid Volume Story Problems		<ul style="list-style-type: none"> • permanent fine-tip black marker • small bottle of food coloring, red, blue or green (see Preparation) • cafeteria tray • paper or cloth toweling • 4 or 5 paper or plastic drinking cups of various sizes (see Preparation)

Vocabulary

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

estimate*
fraction*
liquid volume*
liter (l)*
measure
metric system*
milliliter (ml)*
running sum or total
sum or total*

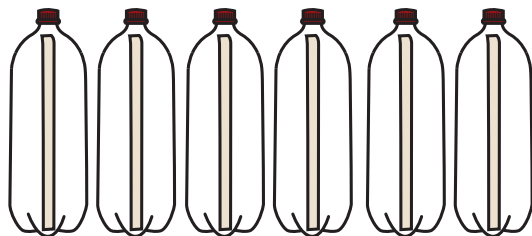
TM – Teacher Master, NCSB – Number Corner Student Book
Copy instructions are located at the top of each teacher master.

* Run 1 copy of this page for display.

Preparation

Gathering and Preparing the Containers

- Gather one empty, clean 1-quart milk or juice carton and 6 clear or translucent plastic one-liter bottles with tops or lids. If you don't already have such items in your classroom, the best source (after you check your science kit or the school science supplies) is your local grocery store. Many brands of bottled water and soda come in 1-liter bottles. Try to find bottles that are relatively straight-sided, rather than curved.
- Run a strip of masking tape up the side of each of the six 1-liter bottles, from the bottom all the way to the top so students can mark the water level each day.



- Get a plastic pitcher that holds about 2 quarts and can be easily managed by your students.

Setup for Activity 1

Place the following items on a tray prior to conducting Activity 1:

- 1-cup/250 ml measuring cup from your Number Corner Kit
- Empty 1-liter bottle, with masking tape up the side
- Permanent fine-tip black marking pen
- 1-quart milk or juice container filled with 1 quart of colored water (use a few drops of red, blue, or green food coloring to color the water so it's easier to see); measure the amount of water as you fill the carton to make sure it's exactly 4 cups or 32 ounces
- Pitcher, with about a cup of the colored water in it
- A few paper towels in case of spills

Put the remaining 1-liter bottles away for now, so they're out of students' sight.

Setup for Activity 2

Laminate a piece of chart paper, then use an erasable marker and yardstick to make it into a Milliliters & Liters Record Sheet as shown below. You'll erase and reuse the laminated sheet in future Calendar Collector workouts. You may need to extend the chart with a second laminated sheet partway through the month.

Milliliters & Liters Record Sheet		
Day	Milliliters (Running Total)	Liters (Running Total)

Post the chart in the Number Corner area before the second Calendar Collector activity.

Setup for Activity 3

Prior to conducting this activity, set up a small work station in a corner of the room. On a small table or double desk, set up the tray, the pitcher filled with colored water, the two measuring cups from your Number Corner kit (1 cup/250 milliliters and 1 quart/1 liter), and 4 or 5 paper or plastic drinking cups or small containers of varying sizes (e.g., a 3-ounce paper cup, an 8-ounce yogurt container, a 12-ounce paper cup, a 1-pint cottage cheese tub, a super-size plastic cup, and so on). Use a black permanent marker to write a different letter of the alphabet on each of the paper or plastic drinking cups or containers. Students will visit this work station in pairs over the latter half of the month, but this should not interfere with the ongoing process of collecting a quarter of a liter of water each day, even though you have probably borrowed the tray, the pitcher, and the 1 cup/250 milliliter measuring cup for the work station.



Key Questions

Use questions like these through the month to guide students to think more deeply about measures of liquid volume.

- How many milliliters (liters) of water have we collected so far?
- How many liters (milliliters) is that?
- How many more milliliters do we need to make 1 liter (2 liters, 3 liters)?
- How many liters do you think we will have collected by the end of the month?
- Can you spot any containers around our classroom that would hold about $\frac{1}{4}$ a liter of water? Half a liter? A whole liter?
- If you were going to invite 10 kids to your birthday party, how many liters of juice or soda would you like to have on hand? Why?
- If you were fixing breakfast for your family, would 1 liter of orange juice be enough, not enough, or too much?

Mathematical Background

Common Core Standard 3.MD.2 reads, “Estimate and measure liquid volume in milliliters and liters.” If you’re wondering why the term *liquid volume* is used instead of *capacity*, consider the fact that while we speak of the *capacity* of a particular container, we use the word *volume* to refer to the amount of a liquid itself.

This standard asks for students to reason about units of volume, which is possible only if they have some sense of the size of the units in and of themselves, and in relation to one another. Until students have some direct experience of how much liquid there is in a liter, there is little point in posing story problems related to liquid measure, or having them perform conversion exercises.

This month’s activities are designed to give students who may already be familiar with cups and quarts a sense of the size and measure of the two metric units of liquid volume—liters and milliliters. The activities provide ongoing experience with fractions, mixed numbers, and multi-digit computation. Students will be able to watch a collection that grows by one-fourth of a liter each school day. By the third instructional day in October, they will see $\frac{3}{4}$ of a liter. By the ninth instructional day, they will see $2\frac{1}{4}$ liters. Because they will be tracking the total number of milliliters at the same time, they will have an ongoing opportunity to add multi-digit numbers as well as fractions and mixed numbers.



Update

Begin Updating After Activity 1. Follow this procedure every school day on which the Calendar Collector is not one of the designated activities.

Procedure

The calendar helper for the day adds 250 milliliters (ml) of tinted water to the 1-liter bottle currently in use and marks the water level on the masking tape running up the side of the bottle.

Note

Remember to fill the pitcher with colored water and put out a new liter bottle every few days. (If you forget, the students will most likely remind you.)

Literature Connections

This informative and amusing book about metric measurement would be a good choice this month.

Millions to Measure by
David Schwartz



Notes About This Activity

You will need the tray of items described in the Preparation section above to conduct this activity. You’ll want to have access to board space or a piece of chart paper, and the Word Resource Cards for *liquid volume*, *liter*, and *milliliter* as well.

MILLILITERS & LITERS

RECORD SHEET

[illegible]

October Computational Fluency

Frog Jump Multiplication

Overview

Students play a game similar to Loops & Groups using the number line this month. Teams or partners take turns rolling a die numbered 1–6 twice. The first roll determines the number of jumps they can take, and the second roll determines the length of each jump. After four turns, they find the sum of the products. Over the course of the month, the teacher plays the game twice with the whole class and then has students play it again in pairs.

Skills & Concepts

- Add up to four 2-digit numbers using strategies based on place value and properties of operations (2.NBT.6)
- Interpret products of whole numbers (3.OA.1)
- Use and explain additive strategies (e.g., repeated addition and skip-counting) to demonstrate an understanding of multiplication (supports 3.OA)
- Reason abstractly and quantitatively (3.MP.2)
- Model with mathematics (3.MP.4)

Materials

Activities	Day	Copies	Kit Materials	Classroom Materials
Activity 1 Introducing Frog Jump Multiplication	3	TM T5 Whole Class Frog Jump Multiplication Game Sheet NCSB 6 Frog Jump Multiplication, Record Sheet 1	• 1 die numbered 1–6	
Activity 2 Frog Jump Multiplication Rematch	8	TM T5 Whole Class Frog Jump Multiplication Game Sheet NCSB 7 Frog Jump Multiplication, Record Sheet 2		
Activity 3 Frog Jump Multiplication with a Partner	13	NCSB 8* Frog Jump Multiplication, Record Sheet 3	• dice numbered 1–6 (1 die per student pair)	

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

* Run 1 copy of this page for display.

Vocabulary

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

equation*
group
multiplication
multiply*
number line*
product*
repeated addition
skip-counting
sum or total*

Mathematical Background

Frog Jump Multiplication is a simple but effective game that helps incoming third graders begin to extend what they know about skip-counting to the operation of multiplication. The game introduces and reinforces the following basic multiplication concepts:

- Multiplication can be used to determine the total distance traveled when there are a specific number of jumps, and each jump is the same length.
- Multiplication requires thinking in terms of groups of things rather than individual things.
- The multiplication symbol means “groups of” and expressions such as 4×6 refer to 4 groups of 6, or in the case of the Frog Jump game, 4 jumps of 6 along the number line.

October Number Line

Changing Endpoints

Overview

This month, students investigate how changing the value of the endpoint affects the numbers along a line that starts at 0 and shows 10 has marks. They also learn to play a new game called Put It on the Line.

Skills & Concepts

- Solve two-step story problems using addition, subtraction, and multiplication (3.OA.8)
- Fluently add and subtract with sums and minuends to 1,000 (3.NBT.2)
- Solve story problems involving addition and subtraction of volume measurements given in liters and milliliters (3.MD.2)
- Reason abstractly and quantitatively (3.MP.2)
- Model with mathematics (3.MP.4)
- Look for and make use of structure (3.MP.7)

Materials

Activities	Day	Copies	Kit Materials	Classroom Materials
Activity 1 Changing Endpoints	5	NCSB 9* Changing Endpoints		
Activity 2 Put It on the Line, Game 1	10	TM T6 Put It on the Line Game 1 (see Preparation) NCSB 10 Put It on the Line Record Sheet		<ul style="list-style-type: none"> twelve 1 ½" × 2" sticky notes (see Preparation) red and blue markers red and blue colored pencils (class set) half-sheets of scratch paper (1 per student)
Activity 3 Put It on the Line, Game 2	15	TM T7 Put It on the Line Game 2 (see Preparation) NCSB 10 Put It on the Line Record Sheet		

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

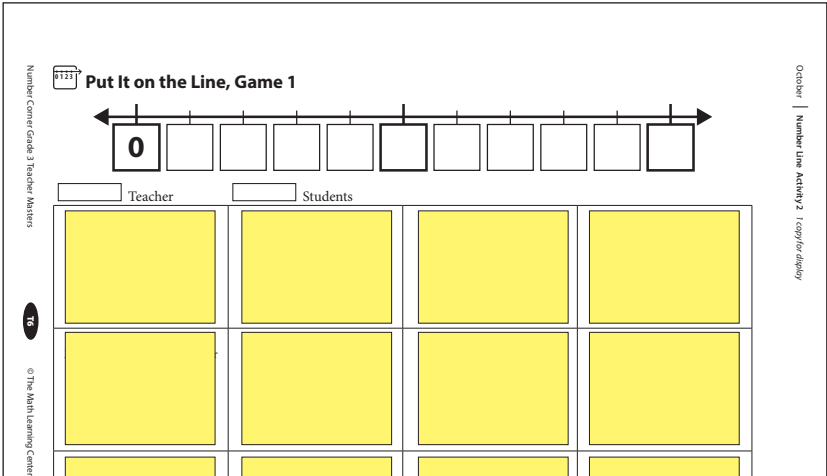
Preparation

Run one copy each of the Put It on the Line Game 1 and Game 2 Teacher Masters. Cover each of the 12 boxes at the bottom of both sheets with a 1 ½" × 2" sticky note. You and the students will remove the sticky notes one by one when you play the game during Activities 2 and 3.

Vocabulary

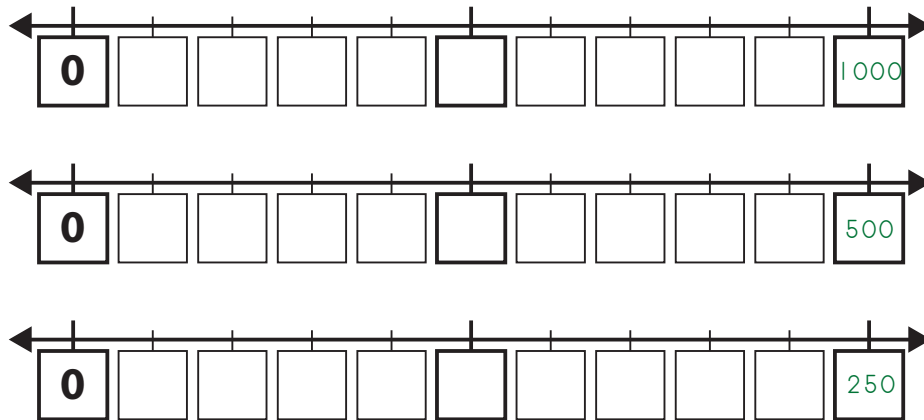
An asterisk [*] identifies those terms for which Word Resource Cards are available.

add
addition
endpoint
equation*
expression*
hundreds
multiply*
number line*
ones
subtract
subtraction
tens
thousand
two-step story problem



Mathematical Background

There is a growing body of research to suggest the importance of the number line as a tool for helping children develop greater flexibility in mental arithmetic as they actively construct mathematical meaning, number sense, and understandings of number relationships. This month, students investigate what happens when a marked line is numbered at either end, but the second number varies from one line to the next. When the starting point is 0 and the endpoint is 1,000, many third graders will readily see that the missing numbers run from 100 through 900. Less obvious are the numbers that belong in the boxes when the endpoint changes from 1,000 to 500, and then to 250. Capable students may also be invited to consider what the missing numbers would be if the endpoint was 150 or 120.



October Solving Problems

Subtracting Two- & Three-Digit Numbers

Overview

This month, students solve and discuss problem strings designed to elicit efficient strategies for subtracting 2- and 3-digit numbers that involve using multiples of 10 and adding up to find the difference.

Skills & Concepts

- Use strategies based on place value, properties of operations, or the relationship between addition and subtraction to subtract fluently with minuends to 1,000 (3.NBT.2)
- 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	Kit Materials	Classroom Materials
Activity 1 Problem Strings 4–6	4, 9, 17	NCSB Appendix Problem String Work Space		• chart paper or space to write on the whiteboard

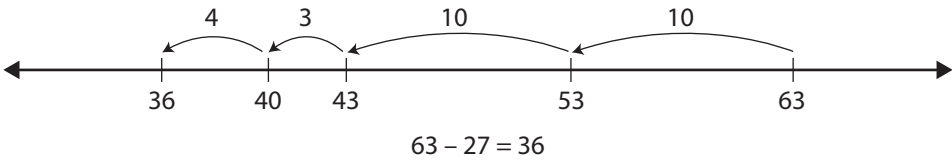
TM – Teacher Master, NCSB – Number Corner Student Book
Copy instructions are located at the top of each teacher master.

Mathematical Background

The first two problem strings this month mirror strategies addressed during last month’s addition strings that involved using multiples of 10. The final problem string this month invites students to consider the nature of the numbers involved in particular combinations. For all three strings, you will represent students’ thinking using the number line, which makes multi-digit subtraction more accessible to a wider range of students.

Subtracting Friendly Numbers

Many children respond to the task of subtracting by counting backward or jumping backward, and the number line is a very effective model for illustrating such strategies. This month’s strings guide students toward subtracting by beginning with the minuend (63 in the example below) and then jumping backward by 10s or multiples of 10 and finally subtracting the 1s that are left. The total of the jumps is equal to the subtrahend (27), and the landing place is the difference (36).



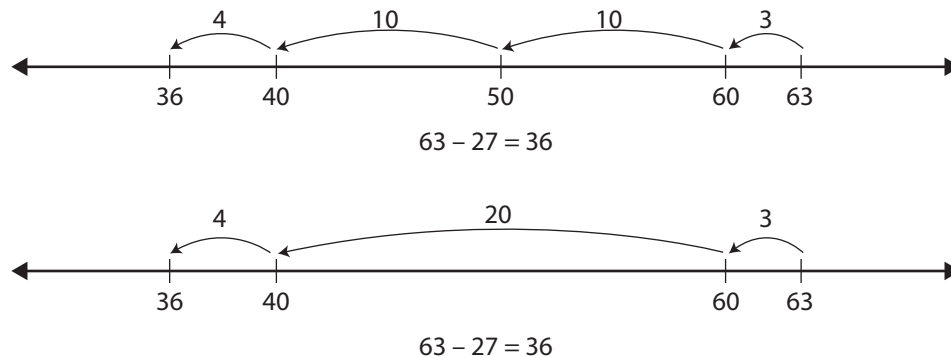
Vocabulary

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

adding on
backward
difference*
digit
forward
hundreds
jumping strategy
minuend
ones
open number line
subtract
subtrahend
tens

Getting to the Next Friendly Ten

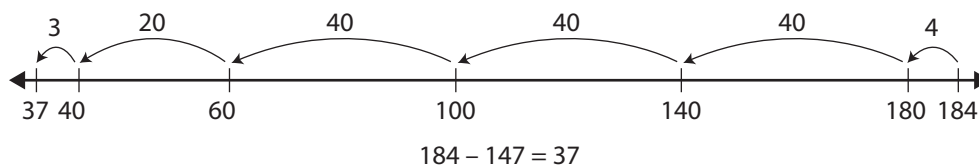
Students can also subtract by starting with the minuend, subtracting enough 1s to get to the nearest multiple of 10, then jumping backward by 10s or multiples of 10, and finally subtracting any 1s that are left over. Again, the total of the jumps is equal to the subtrahend and the landing place is the difference.



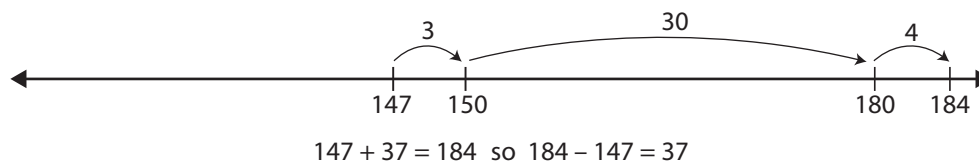
Adding On to Subtract

The strategies of subtracting friendly numbers and getting to the next friendly ten both rely on students' skills with counting backward easily and accurately by 1s, 10s, and multiples of 10. The first two strings this month will elicit these strategies, and provide exactly that kind of counting practice. The third string will bring another strategy to the fore, and may invite class discussion about when it's best used. This is the idea of adding on to subtract—starting with the subtrahend and building up to the minuend to find the difference between the two.

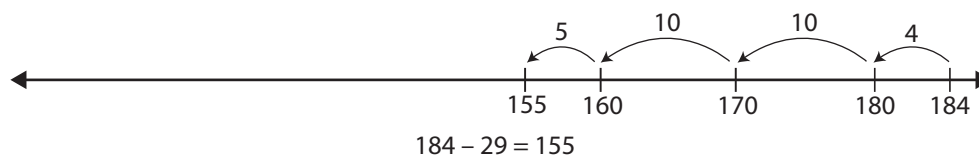
The strategy of adding on, which highlights the relationship between subtraction and addition, makes particularly good sense when the numbers in question are close together. Consider a combination like $184 - 147$. It is very tedious to start at 184 and take jumps totaling 147 backward along the line, even if the jumps are very large.



Starting at 147, however, and building forward to 184 to find the difference between the two is relatively quick and easy. Notice that in the example above, the total of the jumps is equal to the subtrahend (147), and the landing place (37) is the difference. When adding on to find the difference, however, the starting place represents the subtrahend (147), the landing place represents the minuend (184), and the total of the jumps (37) represents the difference.



On the other hand, if two numbers are far apart, say $184 - 29$, it often makes sense to work backward, rather than starting with the subtrahend and adding up to the minuend.



Key Questions

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

- What do you know that could help you solve this problem?
- How can you show your thinking?
- How can one of the problems you solved earlier help you solve this problem?
- What is the big idea of this string?
- Can you think of some other problems you could solve in this way? In other words, if you were adding problems to this string, what problems would you add?

October Assessment

Number Corner Checkup 1

Overview

During the last week of the month, the teacher administers a written assessment to the entire class, the first two pages in place of Number Corner workouts one day, and the last three pages in place of workouts the following day. Number Corner Checkup 1 is designed to help teachers ascertain students' current understandings and skills in the areas of multiplication, 3-digit addition and subtraction, story problems, liquid volume, graphs, and two-dimensional shapes.

Skills & Concepts

- Interpret products of whole numbers (3.OA.1)
- Solve multiplication story problems with products to 100 involving situations of equal groups and arrays (3.OA.3)
- Solve two-step story problems using addition, subtraction, and multiplication (3.OA.8)
- Use strategies based on place value, properties of operations, or the relationship between addition and subtraction to add and subtract fluently with sums and minuends to 1,000 (3.NBT.2)
- Solve story problems involving subtraction of volume measurements given in liters (3.MD.2)
- Make a scaled bar graph to represent a data set with several categories (3.MD.3)
- Solve one- and two-step comparison problems using data shown on a scaled bar graph with several categories (3.MD.3)
- Identify rhombuses, rectangles, and squares as quadrilaterals (3.G.1)
- Identify shared attributes of shapes in different categories (3.G.1)
- Group shapes in different categories according to shared attributes that define a broader category (3.G.1)

Materials

Activities	Day	Copies	Classroom Materials
Number Corner Checkup 1 Part 1 Completing Pages 1 & 2	18	TM T8–T9 Number Corner Checkup 1, Pages 1 & 2	<ul style="list-style-type: none"> • scratch paper (class set) • red crayons, 1 per student
Number Corner Checkup 1 Part 2 Completing Pages 3–5	19	TM T10–T12 Number Corner Checkup 1, Pages 3–5	<ul style="list-style-type: none"> • scratch paper (class set) • crayons, including yellow, for student use

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

Mathematical Background

Number Corner Checkup 1 give teachers an opportunity to gauge students' proficiency with some of skills that have been most heavily addressed in the first two months of Number Corner instruction: multiplication concepts, multi-digit addition and subtraction, story problems, liquid volume, graphs, and shapes.

Having conducted these assessments, teachers will be in a better position to plan daily instruction and make the minute-to-minute instructional decisions so crucial to good teaching. On the basis of students' strengths and weaknesses, teachers may decide to emphasize certain aspects of Number Corner instruction while minimizing others, and will have more of the information needed to pitch questions and prompts at levels appropriate to different students. The results of the first Number Corner Checkup will also reflect, to some extent, how effective the instruction has been for each student, and provide information that might be shared with stakeholders other than the classroom teacher (e.g., parents, administrators, paraprofessionals and resource room teachers) about each child's current proficiency with key grade-level skills.

Vocabulary

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

array*
attributes
category/categories
column
data*
equal groups
equation*
groups
liquid volume*
liter (l)*
milliliter (ml)*
multiply*
quadrilateral*
rectangle*
rhombus*
row
scale*
scaled bar graph
square*
survey

Day 1

Date:

Calendar Grid	Calendar Collector	Computational Fluency
Activity 1 – Introducing the October Calendar Markers (pg. 9)		
Number Line	Solving Problems	Assessment



Activity 1

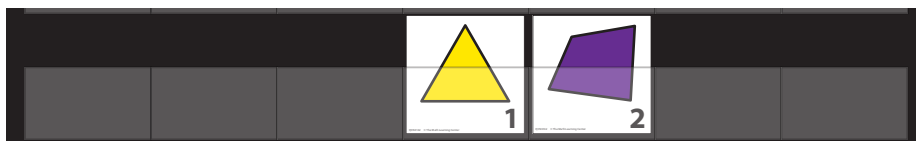
Introducing the October Calendar Markers

Day 1

1 Introduce the new calendar markers.

- Seat students close to the Number Corner display.
- Post the first two markers, even if your first day of Number Corner instruction lands on a weekday. Let students know that you're giving them a sneak preview of the marker for the next day so they have enough information to make observations and predictions.

Note If you need to display more than two markers because the first day of instruction happens to land on the 3rd of October, for example, that's fine.



- #### 2 Ask students to look at the markers silently for a few moments.
- #### 3 Have students share mathematical observations about the markers, first in pairs, and then as a whole group.

Students I think maybe the pattern is all about different shapes this month.

They go yellow, then purple, and maybe they'll go over and over like that.

The first one has 3 sides so it's a triangle. I don't know about the next one that has 4 sides.

The shape on today's marker is weird. It looks kind of like a funny kite.

- #### 4 Have students make predictions about the marker that will be posted next, and share their thinking with a partner. Then choose students to justify their thinking with the class.

Students OK, the first one is a triangle. The second one is pointy like a triangle.

Yeah, but it has 4 sides. Look, 1, 2, 3, 4. So it can't be a triangle.

Triangles only have 3 sides.

Maybe the next one will have 5 sides. Three sides, 4 sides, then 5 sides, like that.

Or maybe it'll go back to being a triangle.

It might be yellow, because maybe the pattern is yellow, purple, yellow, purple.

- #### 5 Listen carefully to the language and vocabulary students use as they offer descriptions and predictions about the markers. As you facilitate the discussion, introduce helpful geometry vocabulary.

- If there is a formal term that would further the discussion or might be used to describe a shape with greater accuracy, press students to see if someone in class already knows the term. If not, introduce and define it for the students yourself. See the chart in Mathematical Background for possible vocabulary that may be inserted into Calendar Grid discussions this month.

Day 2

Date:

Calendar Grid	Calendar Collector	Computational Fluency
<i>Update</i>	Activity 1 – Introducing the Calendar Collector (pg. 19)	
Number Line	Solving Problems	Assessment

Update

Begin Updating After Activity 1. Follow this update procedure every school day that the Calendar Grid is not one of the designated activities.

Procedure

- Have a student helper post the calendar marker and fill in the Calendar Grid Observations Chart to show the date, shape name, color, and at least one other observation about the shape. You might choose to assign one student to take this role for the entire week.
- Challenge the student helpers to be as precise as possible about the name of the shape. If it is a quadrilateral, what kind of quadrilateral? If it is a triangle, is it equilateral, isosceles, or scalene? If it is a pentagon or a hexagon, is it regular or irregular?



Key Questions

Learning to search for, describe, and extend patterns facilitates algebraic thinking. Use any of the questions below to help your students think about this month's pattern:

- When do you think we'll see the next quadrilateral (triangle, pentagon, hexagon)? How can you tell?
- What is the name of the shape on today's marker? How do you know?
- What is it that makes these shapes all triangles (quadrilaterals, pentagons, hexagons)?
- What types of angles do you see in this shape—right, obtuse, or acute?
- Is this shape regular or irregular? How do you know?
- Can you spot two shapes on the Calendar Grid that are congruent? Which ones? How do you know they're congruent?
- Describe the shape on today's marker in as much detail as you can.
- I'm thinking of one of the markers we can see on the Calendar Grid. On this marker there is a polygon with 3 sides and 1 right angle. Which marker am I thinking of?
- I'm thinking of one of the markers we can see on the Calendar Grid. On this marker there is a polygon with 4 sides and 4 right angles. Which marker am I thinking of?



Activity 1

Introducing the Calendar Collector

Day 2

- 1 Set the stage for this month's Calendar Collector by briefly reviewing the meaning of the word *measure*.

Write the word *measure* on the board or a piece of chart paper. Read it with the class, and ask students to share, first in pairs and then as a whole class, the meaning of the word.

- What do people do when they measure?
- Why do we measure things?
- Who measures things in their daily work, and what kinds of things do they measure?

- 2 Talk with students briefly about their experiences with measuring in second grade.

- Recall with them that they learned a lot about measuring length last year.
- Ask them to recall some of the tools and units they used in second grade to measure length.

If students draw a blank, remind them that they used rulers and perhaps tape measures, yardsticks, or meter sticks to measure the lengths of objects, using inches and feet as well as centimeters and meters.

- 3 Let students know that one of the things they're going to learn to measure this year is liquid volume.

- Display the Word Resource Card for *liquid volume* and ask if anyone knows the meaning of the term. If no one does, share and discuss the definition on the back of the Word Resource Card.
- When students understand that liquid volume is a measure of how much liquid there is in a container of any size, ask whether anyone can think of any tools or units people use to measure liquid volume.
- To spur students' thinking, write the words *quart* and *gallon* on the board or chart paper, and discuss them. Has anyone heard of either unit of measure? Where? In relation to what?

- 4 Show and discuss with the class the 1-quart milk or juice carton you prepared for this activity.

- Ask students if they have seen a container like this before. Where? When?
- Explain that in the United States, liquid volume is usually measured in cups, quarts, and gallons. In most other parts of the world, however, as well as in science labs the world over, people use metric units of liquid measure.

- 5 Let students know that they are going to learn about and use the metric units for measuring liquid volume this year.

Ask students if anyone can name the metric units for measuring liquid volume.

Literature Connections

This informative and amusing book about metric measurement would be a good choice this month.

Millions to Measure by David Schwartz



Notes About This Activity

You will need the tray of items described in the Preparation section above to conduct this activity. You'll want to have access to board space or a piece of chart paper, and the Word Resource Cards for *liquid volume*, *liter*, and *milliliter* as well.

- 6 Pull out the empty 1-liter bottle and place it next to the quart carton. Discuss and demonstrate how the two units of measure compare.

This is a deliberate move to connect something that may be unfamiliar to most students with something they likely know more about. Very conveniently, a liter is just a little bit bigger than a quart. (A quart is equivalent to 32 ounces, while there are 33.814 ounces in a liter.)

- Ask students to compare the two containers by size. Which do they think would hold more liquid? Why?
- As they watch, pour the tinted water from the quart carton into the 1-liter bottle, and ask them to discuss the results.

If you measured the water into the quart container very accurately, students should be able to see that the 1-liter container holds the entire quart with a little room to spare at the top. After they share their observations, confirm for them that a liter is just a little more than a quart.

- 7 Now let students know that they're going to collect colored water each day they're in class this month. Then work with their input to show how much they'll collect each day.

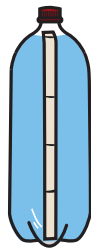
- Pour the colored water out of the 1-liter bottle into the pitcher.
- Show students the smaller of the two measuring cups from your Number Corner kit, and then carefully fill it with colored water from the pitcher up to the 250 milliliter mark.
- Ask students to estimate how much of the 1-liter bottle this measuring cupful will fill—the entire bottle? Less than the entire bottle? More than the entire bottle? If less, about what part or fraction of the bottle?
- As the students watch, pour the contents of the small measuring cup into the liter bottle, and mark the masking tape to show the water level. Then ask students to talk in pairs about the part or fraction of the bottle that has been filled.

This may be difficult for students to ascertain, especially if your 1-liter bottle is very curvy. If so, simply establish with the class that less than half the bottle has been filled so far, and ask them how many more cupfuls of water this size they think it will take to fill the bottle.



- 8 Repeat the process of using the water in the pitcher to fill the small measuring cup to the 250 milliliter mark, then pouring the water into the 1-liter bottle and marking the level on the masking tape, until the bottle is full.
- 9 Then work with the students to establish that each measuring cupful of water is one-fourth a liter.

If your 1-liter bottle is curved at all, as is quite likely, the marks you've made on the masking tape will not be evenly spaced. This may make it a little more challenging for students to understand that each measuring cupful of water fills exactly one-fourth of the bottle.



Teacher Our 1-liter bottle is full. How many of these small measuring cups full of water did it take?

Students Four!

Teacher Did I put exactly the same amount of water in the measuring cup each time?

Students Yes.

You filled it up to the same mark every time—I was up close and I could see really well.

Teacher If it takes 4 cupfuls to fill the bottle, what part or fraction of a liter does our little measuring cup hold? Please talk to the person next to you, and then I'll call on a few people to share their thinking with the class.

Students We said each little cupful is one-fourth of a liter because it takes 4 of them to fill the bottle.

We're not sure, but we know it's less than one-half.

We were thinking maybe a third, but now we think one-fourth because of what the other kids said. If it's 4 and they're all the same, each one must be one-fourth.

Teacher So, if each measuring cupful of water fills one-fourth of our liter bottle, why are the marks on the masking tape not evenly spaced? Why are the marks on the lower part of the masking tape closer together than the marks at the top?

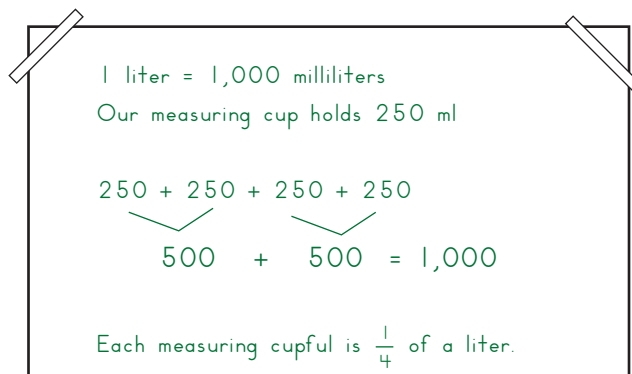
Students The bottle isn't all even.

It's curved on the bottom and at the top, and more straight in the middle.

The curve at the top kind of squishes the water in and up further.

- 10 Tell students that there is a much smaller unit of metric measure for liquid volume called a *milliliter*, and use that information to help them understand that each measuring cupful of water is one-fourth of a liter.

- Post the Word Resource Cards for *liter* and *milliliter*, and let students know that it takes 1,000 milliliters to make a liter. (Give them a few moments to consider how tiny a millimeter is, and then let them know that a regular teaspoon, like the ones at home or in the cafeteria, holds about 5 milliliters.)
- Then tell the students that each cupful you measured and poured into the 1-liter bottle was exactly 250 milliliters.
- Work with the class to determine that 4 sets of 250 added together makes 1,000, further confirming the fact that each cupful is one-fourth of a liter.



- 11 Finally, pour all the water out of the 1-liter bottle back into the pitcher, and explain that the class will collect 250 milliliters or one-fourth of a liter each day they're in school. Choose two students to update the collection for today.

- If you're conducting this activity on the second instructional day in October, have each of the two students pour 250 milliliters of water from the pitcher into the measuring cup, and then pour the water from the measuring cup into the liter bottle.
- Ask students how much water they've collected so far.

Students We put in 250 and 250—that's 500.

We have 500 milliliters in there. That's the same as half a liter because a liter is 1,000 and 500 is half of 1,000.

It doesn't look like the bottle is half full.

I think that's because it's curved.

- 12 Let the students know that the calendar helper each day will be responsible for measuring 250 milliliters of colored water and pouring it into the liter bottle on the days when the class doesn't do Calendar Collector together.

Show them where they'll find the measuring cup, the pitcher of colored water, and the liter bottle you've been working with today, and reassure them that you will supply more colored water and liter bottles as they are needed.

Day 3

Date:

Calendar Grid	Calendar Collector	Computational Fluency
<i>Update</i>	<i>Update</i>	Activity 1 – Introducing Frog Jump Multiplication
Number Line	Solving Problems	Assessment

Update

Begin Updating After Activity 1. Follow this update procedure every school day that the Calendar Grid is not one of the designated activities.

Procedure

- Have a student helper post the calendar marker and fill in the Calendar Grid Observations Chart to show the date, shape name, color, and at least one other observation about the shape. You might choose to assign one student to take this role for the entire week.
- Challenge the student helpers to be as precise as possible about the name of the shape. If it is a quadrilateral, what kind of quadrilateral? If it is a triangle, is it equilateral, isosceles, or scalene? If it is a pentagon or a hexagon, is it regular or irregular?



Key Questions

Learning to search for, describe, and extend patterns facilitates algebraic thinking. Use any of the questions below to help your students think about this month's pattern:

- When do you think we'll see the next quadrilateral (triangle, pentagon, hexagon)? How can you tell?
- What is the name of the shape on today's marker? How do you know?
- What is it that makes these shapes all triangles (quadrilaterals, pentagons, hexagons)?
- What types of angles do you see in this shape—right, obtuse, or acute?
- Is this shape regular or irregular? How do you know?
- Can you spot two shapes on the Calendar Grid that are congruent? Which ones? How do you know they're congruent?
- Describe the shape on today's marker in as much detail as you can.
- I'm thinking of one of the markers we can see on the Calendar Grid. On this marker there is a polygon with 3 sides and 1 right angle. Which marker am I thinking of?
- I'm thinking of one of the markers we can see on the Calendar Grid. On this marker there is a polygon with 4 sides and 4 right angles. Which marker am I thinking of?



Update

Begin Updating After Activity 1. Follow this procedure every school day on which the Calendar Collector is not one of the designated activities.

Procedure

The calendar helper for the day adds 250 milliliters (ml) of tinted water to the 1-liter bottle currently in use and marks the water level on the masking tape running up the side of the bottle.

Note

Remember to fill the pitcher with colored water and put out a new liter bottle every few days. (If you forget, the students will most likely remind you.)

Literature Connections

This informative and amusing book about metric measurement would be a good choice this month.

Millions to Measure by
David Schwartz



Activity 1

Introducing Frog Jump Multiplication

Day 3

- 1 Place a copy of the Whole Class Frog Jump Multiplication Game Sheet on display, and give students a few moments to examine it quietly.
- 2 Then explain that you're going to play a new game with the class today that will help students learn more about multiplication.
Let students know that they'll work together as one team, and you'll play as the other team.
- 3 Briefly explain the game to the class.
You and the students will take turns rolling a die numbered 1–6 two times. The first roll tells how many jumps you get to take along the number line; the second roll tells how long each jump will be. After you roll and mark your jumps on the number line, you write a multiplication equation to show the results. Each team takes four turns, and then they add up their products to find the total sum. The team with the greater sum wins the game.
- 4 Let students know that you'll take the first turn so they can see how the game works.
 - Explain that you'll keep track of the action for both teams on your display sheet, and they'll do the work for their team in their Number Corner Student Books today.
 - Have students locate Frog Jump Multiplication, Record Sheet 1 in their books.
- 5 Take the first turn. Begin by rolling the die to determine how many jumps you get to take, and how long each jump will be.
 - Roll the die once and record the number in the space provided at the top of your Round 1 box.
 - Roll the die again, and record that number in the space provided.
 - Read the resulting sentence to the class.

Teacher Let's see... I rolled a 4 and then a 2, and wrote the numbers here on my sheet. That means I get to take 4 jumps of 2 on my first number line.
- 6 Engage the class in predicting the number on which you'll land when you take the designated number of jumps.
 - Restate your results, and ask the students to share predictions with a neighbor about where you will land.
 - After a few moments, call on a couple of volunteers to share and explain their predictions.

Teacher Now I need to make and record a prediction about where I will land on the line if I take 4 jumps of 2. Talk to the person next to you about this. Where do you think I'll land? On which number along the line?

Jack We said 8.

Teacher OK...how were you thinking about that?

D'ante We said 8 because 4 jumps of 2 is like 2, 4, 6, 8.

Kendra We think you're going to land on 8 because it's the same as adding $2 + 2 + 2 + 2$.



Key Questions

Use questions such as these to keep student engagement high while playing Frog Jump Multiplication.

- I got a 4 on my first roll, and a 5 on my second roll. What number will I land on along the number line? How did you figure it out?
- The class just got a 3 on the first roll. Is there any number you can get on the second roll that will beat my first score of 20? Why not?
- How does your product for the second turn compare with mine? Which of the two is greater? By how much?
- Now that both teams have had 3 turns, let's figure out who's ahead. If you add my three products, what's the total? What is the total of your three products? Which team is ahead? By how much?
- What two numbers will you need to roll on your last turn to beat me? Is there more than one possibility?

7 Finish your first turn.

- Record a prediction in the space provided, and then take the designated number of jumps along your number line.
- Circle each of the numbers on which you landed along the way.
- Then read and recap the results with the class, and write a multiplication equation to represent the results.

Teacher I agree that 8 is a good prediction, so that's what I'll write. Now I'm going to take 4 jumps of 2 on my number line. Here I go—2, 4, 6, 8. The last number I landed on was 8—we were right! I'm going to circle each of the numbers I landed on—say them with me as I circle them.

Students 2, 4, 6, 8!

Teacher The last thing I'm going to do is write a multiplication equation to represent what happened on my turn. I took 4 jumps of 2, that's 4 times 2, and I landed on 8, so I'm going to write $4 \times 2 = 8$.

October | Computational Fluency Activities 1 & 2 2 copies for display

NAME _____ DATE _____

Whole Class Frog Jump Multiplication Game Sheet

Teacher Round 1

4 jumps of 2 I think I will land on 8 Equation: $4 \times 2 = 8$

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36

Students Round 1

_____ jumps of _____ We think we will land on _____ Equation: _____

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36

8 Now invite one of the students to come up and take the first turn for the class.

Have that student roll the die and do the recording on your display sheet, following the process outlined in steps 5–7 above, as classmates follow along in their books.

October | Computational Fluency Act

NAME **Sara** DATE _____

Frog Jump Multiplication, Record Sheet 1

Round 1 Students

3 jumps of 5 I think we will land on 15 Multiplication Equation: $3 \times 5 = 15$

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36

Number Corner Grade 3 Student Book

9 Take turns with the students rolling, predicting, drawing the designated number of jumps, and recording the results for a total of four rounds.

- Invite a different volunteer up to take each turn for the class, as students mark the results of their turns in their Number Corner Student Books.
- Continue to engage students in verbalizing the results of your rolls and theirs, even though they are recording only for the class while you'll be recording for both teams. Guide them begin to see the connection between skip-counting and multiplication. Here are some questions that might be helpful:
 - » Max just rolled a 4 and a 3 for the class. What does that mean for you? How many jumps do you get to take this time, and how long will each jump be?
 - » If you make 4 jumps of 3 along your number line, where do you think you will land?
 - » Can you use skip-counting to help make a prediction? How?

- » Let's go ahead and mark the number line to show your roll. How many times do you get to jump? How far do you get to jump each time?
- » Now let's go back and circle the numbers you landed on with each jump. Let's read them together as we circle them—ready? 3, 6, 9, 12.
- » Sasha says this is like adding $3 + 3 + 3 + 3$, which equals 12. Do you agree?
- » How can we write that as a multiplication equation?

10 When both teams have taken four turns, ask students to share how they would find the sum of your four products.

- Write the products separately on the board to make it easier for students to see which numbers they'll need to add.
- Have students record your four products in the space provided at the bottom of their record sheets, and give them a minute or so to find the total. Encourage them to show all their work on their sheets
- As students share their strategies for finding the total, record on the board so everyone can follow along.

11 Then give students a minute or two to find the sum of their products.

- Record the four products students got at the bottom of your display sheet as they do the same at the bottom of their record sheets.
- Give students a minute or so to find the class total. Encourage them to show all their work on their sheets
- As they finish, have them share and compare their answers with the people sitting nearest, and then have a volunteer or two share their sums with the class and explain the strategies they used for finding their answers.

12 Finally, have students compare your sum to theirs. Whose sum was greater? By how much?

The team with the greater sum wins the game of Frog Jump Multiplication.

Learning Center mathlearningcenter.org	Round 4 Students	2 jumps of 1 I think we will land on 2 Multiplication Equation: $2 \times 1 = 2$		
<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; border: none;"> Teacher's Score (add all 4 products) $8 + 20 + 8 + 12 \rightarrow 8 + 20 + 20 = 48$ </td> <td style="width: 50%; border: none;"> Students' Score (add all 4 products) $15 + 12 + 12 + 2 \rightarrow 30 + 5 + 2 + 2 + 2 = 41$ $10 + 5 \quad 10 + 2 \quad 10 + 2$ </td> </tr> </table>			Teacher's Score (add all 4 products) $8 + 20 + 8 + 12 \rightarrow 8 + 20 + 20 = 48$	Students' Score (add all 4 products) $15 + 12 + 12 + 2 \rightarrow 30 + 5 + 2 + 2 + 2 = 41$ $10 + 5 \quad 10 + 2 \quad 10 + 2$
Teacher's Score (add all 4 products) $8 + 20 + 8 + 12 \rightarrow 8 + 20 + 20 = 48$	Students' Score (add all 4 products) $15 + 12 + 12 + 2 \rightarrow 30 + 5 + 2 + 2 + 2 = 41$ $10 + 5 \quad 10 + 2 \quad 10 + 2$			

Day 4

Date:

Calendar Grid	Calendar Collector	Computational Fluency
<i>Update</i>	<i>Update</i>	
Number Line	Solving Problems	Assessment
	Activity 1 – Problem Strings: Jumping by 10s (pg. 44)	

Update

Begin Updating After Activity 1. Follow this update procedure every school day that the Calendar Grid is not one of the designated activities.

Procedure

- Have a student helper post the calendar marker and fill in the Calendar Grid Observations Chart to show the date, shape name, color, and at least one other observation about the shape. You might choose to assign one student to take this role for the entire week.
- Challenge the student helpers to be as precise as possible about the name of the shape. If it is a quadrilateral, what kind of quadrilateral? If it is a triangle, is it equilateral, isosceles, or scalene? If it is a pentagon or a hexagon, is it regular or irregular?



Key Questions

Learning to search for, describe, and extend patterns facilitates algebraic thinking. Use any of the questions below to help your students think about this month's pattern:

- When do you think we'll see the next quadrilateral (triangle, pentagon, hexagon)? How can you tell?
- What is the name of the shape on today's marker? How do you know?
- What is it that makes these shapes all triangles (quadrilaterals, pentagons, hexagons)?
- What types of angles do you see in this shape—right, obtuse, or acute?
- Is this shape regular or irregular? How do you know?
- Can you spot two shapes on the Calendar Grid that are congruent? Which ones? How do you know they're congruent?
- Describe the shape on today's marker in as much detail as you can.
- I'm thinking of one of the markers we can see on the Calendar Grid. On this marker there is a polygon with 3 sides and 1 right angle. Which marker am I thinking of?
- I'm thinking of one of the markers we can see on the Calendar Grid. On this marker there is a polygon with 4 sides and 4 right angles. Which marker am I thinking of?



Update

Begin Updating After Activity 1. Follow this procedure every school day on which the Calendar Collector is not one of the designated activities.

Procedure

The calendar helper for the day adds 250 milliliters (ml) of tinted water to the 1-liter bottle currently in use and marks the water level on the masking tape running up the side of the bottle.

Note

Remember to fill the pitcher with colored water and put out a new liter bottle every few days. (If you forget, the students will most likely remind you.)

Literature Connections

This informative and amusing book about metric measurement would be a good choice this month.

Millions to Measure by
David Schwartz



Activity 1

Problem Strings

Days 4, 9, 17

- 1 Follow the procedure you established in September to deliver each week's problem string.
 - Ask students turn to the next blank page of the Problem String Workspace in their Number Corner Student Books and write today's date.
 - Deliver each problem in the string one at a time.
 - » Have students record and solve the problem in their Student Books.
 - » Have them put up their thumbs when they are ready to share their solutions and strategies.
 - » When you see several thumbs up, invite a few students to share the answer. Record all answers without comment or indication that any of them are correct or incorrect.
 - » Then invite two or three volunteers to explain how they got their answers.
 - » Record students' thinking on a number line model on the board (or a piece of chart paper) for everyone to see.
- 2 Conclude the activity by asking students to reflect briefly on the string.
 - Ask students to share, first in pairs and then as a group, a one-sentence statement about something they learned in today's string.
 - Invite students to write a simple statement beneath their work in the Student Book describing what they learned while doing this string.

***Students** (Referring to Problem String 4) It's easy to subtract if you just go back by tens.*

It's even faster if you can go by bigger friendly numbers, like 20 or 30.

You can just go back 10, 10, 10, however many times, and then subtract the rest of the number at the end.

***Students** (Referring to Problem String 5) I think if you're really close to a ten, you should just go back that much. After that, it's really easy to go back by 10s, and you can take away the rest when you get to the very end.*


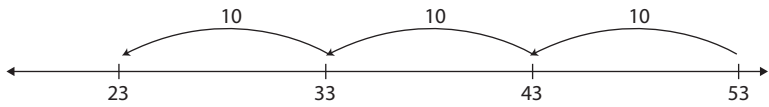
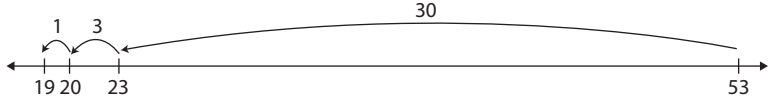
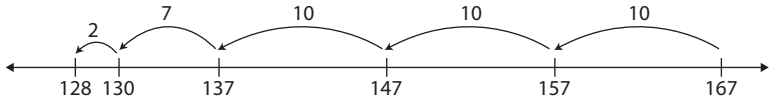
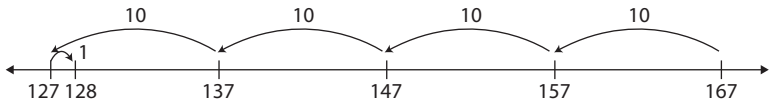
Just get to the nearest friendly number, and then keep on going.

It's really fast if you go back to the nearest ten, then just take one or two big jumps instead of going 10, 10, 10, 10. Then if there's a little more to take away at the end, it's easy because you're already on a ten.

Jumping by 10s

Day 4

Students will share a variety of strategies for these problems. Model all of their strategies on the number line. Emphasize those strategies that involve jumping back by 10 or multiples of 10 and then subtracting the remaining 1s at the end.

Problems	Sample Strategies & Recording	Connections
53 – 10	<p>53 – 10 is 43 because 43 is 10 less than 53.</p>  <p style="text-align: center;">$53 - 10 = 43$</p>	<p>By asking students to first subtract multiples of 10 (10 and 30), you are helping them see that to subtract 34, they can first subtract 30 and then subtract the 4 that are left.</p> <p>Big Idea To subtract, you can keep the larger number whole and jump back by 10s and then by 1s to subtract the smaller number.</p>
53 – 30	<p>Subtracting 30 is like taking away 10 three times.</p>  <p style="text-align: center;">$53 - 30 = 23$</p>	
53 – 34	<p>After applying the previous problem, students might remove 3 more to reach 20, then 1 more.</p>  <p style="text-align: center;"> $53 - 30 = 23$ $23 - 3 = 20$ $20 - 1 = 19$ </p>	
167 – 10 167 – 30	<p>Students will likely think about these problems in much the same way that they thought about 53 – 10 and 53 – 30 above.</p>	See above.
167 – 39	<p>From 167 the student might remove 10 three times, then 7 more to get to 130, then the last 2 to get to 128.</p>  <p style="text-align: center;">$167 - 39 = 128$</p> <p>Another approach is to remove 40 and add 1 to compensate.</p>  <p style="text-align: center;"> $167 - 40 = 127$ $127 + 1 = 128$ </p>	<p>Big Idea To subtract, you can keep the larger number whole and jump back by 10s and then by 1s to subtract the smaller number. You can also use what you know about subtracting multiples of 10 to make it easier to subtract numbers that are pretty close to a multiple of 10. For example, you can think about 167–40 to solve 167–39.</p>

Day 5

Date:

Calendar Grid	Calendar Collector	Computational Fluency
<i>Update</i>	<i>Update</i>	
Number Line	Solving Problems	Assessment
Activity 1 – Changing Endpoints (pg. 34)		

Update

Begin Updating After Activity 1. Follow this update procedure every school day that the Calendar Grid is not one of the designated activities.

Procedure

- Have a student helper post the calendar marker and fill in the Calendar Grid Observations Chart to show the date, shape name, color, and at least one other observation about the shape. You might choose to assign one student to take this role for the entire week.
- Challenge the student helpers to be as precise as possible about the name of the shape. If it is a quadrilateral, what kind of quadrilateral? If it is a triangle, is it equilateral, isosceles, or scalene? If it is a pentagon or a hexagon, is it regular or irregular?



Key Questions

Learning to search for, describe, and extend patterns facilitates algebraic thinking. Use any of the questions below to help your students think about this month's pattern:

- When do you think we'll see the next quadrilateral (triangle, pentagon, hexagon)? How can you tell?
- What is the name of the shape on today's marker? How do you know?
- What is it that makes these shapes all triangles (quadrilaterals, pentagons, hexagons)?
- What types of angles do you see in this shape—right, obtuse, or acute?
- Is this shape regular or irregular? How do you know?
- Can you spot two shapes on the Calendar Grid that are congruent? Which ones? How do you know they're congruent?
- Describe the shape on today's marker in as much detail as you can.
- I'm thinking of one of the markers we can see on the Calendar Grid. On this marker there is a polygon with 3 sides and 1 right angle. Which marker am I thinking of?
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Update

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Procedure

The calendar helper for the day adds 250 milliliters (ml) of tinted water to the 1-liter bottle currently in use and marks the water level on the masking tape running up the side of the bottle.

Note

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Millions to Measure by
David Schwartz



Activity 1



Notes About This Activity

Students will need their Number Corner Student Books and pencils for this activity. It may be easiest to conduct this activity with the students sitting at their desks or table spots instead of in the Number Corner discussion area.

Changing Endpoints

Day 5

- 1 Display your copy of the Changing Endpoints Student Book page as students find the page in their books.

Give students a few moments to examine the page quietly. Then have them briefly discuss their observations in pairs.

- 2 Ask students to share ideas, first in pairs and then as a whole class, about the numbers that belong in the boxes along the first line on the sheet.

Some students will likely believe that the boxes along the first line should be numbered from 1 to 10. Others may be open to the idea that the numbers will vary, depending on the value of the endpoint. Without a known endpoint, the possibilities are practically endless.

October | Number Line Activity 1

NAME _____ DATE _____

Changing Endpoints

A number line with arrows at both ends. Below the line are 11 boxes. The first box contains the number 0. The other 10 boxes are empty.

Teacher What numbers belong in the boxes along this line? Talk with the person sitting next to you, and then we'll have a few folks share their ideas with the class.

Lindsey That's easy—it's just the numbers 1, 2, 3, 4, 5, and keep on going until you get to 10.

Teacher How are you thinking about that, Lindsey?

Lindsey There's a 0 at the start and then 10 more boxes, so it's just the numbers that come next after 0.

Teacher Does anyone have a different idea? No? What if I told you that the number in the last box was 100?

Kala That's not fair—you can't do that!

Anton I'm not sure—I think you can put anything you want on a number line. Like when we do adding and subtracting on an open number line, we can hop around and put any numbers on the line we need.

Drew But that's with an open number line. This one is different. It has 10 boxes, and it starts with 0, so it has to be the next 10 numbers.

Laura If you put 100 in the last box on that line, the other numbers would have to go by 10s for it to work, like 10, 20, 30, 40, and keep on going.

Teacher What if I told you the number in the last box was 50? Then what?

Drew The number in the middle box would have to be 25 because it's in the middle, and 25 is half of 50.

Sam And I know what next! It would go by 5s in the boxes, like 5, 10, 15, 20, and then you'd land on 25 in the middle! Cool!

- 3 Then let students know that you're going to ask them to investigate the situation a little further.

Explain that in a few moments, you're going to write a number in the last box on the first number line. They will copy that number on their sheets. Then their job will be to figure out what the numbers in the other boxes on that same line should be.

- 4 As students watch, write the number 1,000 in the last box on the first number line on your sheet. Ask them to do the same on their sheets, and then discuss in pairs their ideas about what the numbers in the other boxes on this line should be, and why.

October | Number Line Activity 1

NAME _____ DATE _____

Changing Endpoints

0 1,000

- 5 When they've had a minute to talk it over, call on volunteers to share their thinking with the class.

Ask each of these students to come up to the display so they can point to the boxes as they describe their ideas. This way, all will be able to see what their classmates are talking about.

TJ I think it has to go by 100s, like 100 in the first box, 200 in the next box and keep going.

Teacher Thumbs up if you agree with TJ. Hmm... looks like lots of people agree. Would someone be willing to explain why they agree?

Nicola If you were counting to 10, the numbers would be 1, 2, 3, like that. But if you want to get up to 1,000, each number has to be in the hundreds, like 100, 200, 300.

David It's kind of like counting to 10, but every number is a hundreds number, like 100, 200, 300, instead of 1, 2, 3.

SUPPORT If students are at a loss for ideas, work with them to determine that the number in the middle of the line would be 500. The presence of three anchor points—0, 500, and 1,000—will scaffold students' thinking a bit more. Once the midpoint has been established, give students the opportunity to wrestle with the problem a little longer before giving any more clues.

- 6 When there is general agreement about the numbers that belong in each of the boxes, write them in as students do so on their sheets.

- 7 Now write 500 in the box at the end of the second number line. Ask students to do the same on their sheets, and then talk in pairs about what the numbers in the other boxes on this line should be, and why.

October | Number Line Activity 1

NAME _____ DATE _____

Changing Endpoints

- 8 After a minute, call on volunteers to share their thinking with the class.

David The number in the middle has to be 250, because that's half of 500.

Kala You can't go by hundreds on this one, then.

Natalie I think maybe it goes by 50s instead of 100s.

Teacher How are you thinking about that, Natalie?

Natalie Well, 500 is half of 1,000, right? And on the line that ended with 1,000, we went by 100s. Maybe everything on this next line is half.

Anton It does go by 50s! It's like counting by 5s. It goes 50, 100, 150...

Teacher Let's all try counting by 50s with Anton and see what happens. I'll point to the boxes, and we'll all count.

SUPPORT If students are at a loss for ideas, work with them to determine that the number in the middle of the line would be 250. The presence of three anchor points—0, 250, and 100—will scaffold students' thinking a bit more. Once the midpoint has been established, give students the opportunity to wrestle with the problem a little longer before giving any more clues.

- 9 When there is general agreement about the numbers that belong in each of the boxes, write them in as students do so on their sheets.
- 10 Repeat steps 7–9 with the third number line on the sheet, but this time, write 250 in the last box.

SUPPORT If students are at a loss, scaffold their thinking by helping them establish that the number in the middle box is 125. End the activity after the third line if most of your students have really struggled so far. They will have other opportunities to work with this idea later this month and in upcoming months.

CHALLENGE If the first three problems have been easy for many of your students, repeat steps 7–9 with the fourth and fifth number lines on the sheet. Write 150 at the end of the fourth line. Students will find that there aren't enough marks along the line to go by 10s, and they'll have to go by 15s instead. Write 120 at the end of the fifth line. This will present a fair challenge to some students, and you can scaffold their thinking by helping them establish that the number in the middle box is 60.

- 11 Let students know that you will return to this activity later in the month with a new version of a game they may have played in second grade.

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Day 6

Date:

Calendar Grid	Calendar Collector	Computational Fluency
Activity 2 – Identifying Right Angles (pg. 11)	<i>Update</i>	
Number Line	Solving Problems	Assessment









Activity 2

Identifying Right Angles

Day 6

- 1 Ask students to make and justify predictions about the marker you're about to post for the day.
- 2 Then post the marker and ask students to share, first in pairs, and then as a whole group, mathematical observations about the shape and any patterns that seem to be emerging in the sequence of markers.

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
						
			1	2	3	4
						
5	6					

Students *It's a quadrilateral today because it has 4 sides. But it doesn't look like the ones we usually see!*

I think the colors are going in a pattern—yellow, purple, red, and then it starts over.

I still think it's a growing pattern because the shapes get one more side every day, and then they start over. Like, the triangle is 3, that first weird quadrilateral is 4, that shape that looks kind of like a crown has 5, and Saturday's shape has 6. Then Sunday it starts over with 3 sides.

Or maybe there's going to be a pattern of normal and weird shapes because the triangle is just normal. Then there's two weird shapes, and then back to a regular old hexagon.

That shape on marker 3 kind of has 2 triangles on it, but I don't know what it's called.

As students share their observations, introduce or reinforce formal geometry terms as they apply, and post the matching Word Resource Cards or record the terms near the Calendar Grid for students' reference through the month.

Teacher *How many sides does the shape on marker 3 have? Please count them and whisper to your neighbor. OK, everyone tell me.*

Students *Five!*

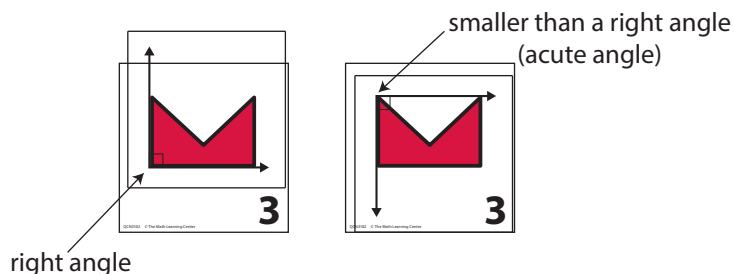
Teacher *What do we call any shape with 5 sides?*

Students *A pentagon!*

Teacher *That's right. Some people think that all pentagons look like little houses, but we know better. A pentagon is any shape at all that has 5 sides.*

- 3 Starting with marker 3 in the sequence, introduce the concept of a *right angle* and show students how to use one of the Right Angle Measures transparency you've prepared for use with this month's calendar markers.

- Starting with marker 3, some of the polygons on the markers have at least one right angle. (These appear on markers 3, 10, 12, 13, 15, 22, 24, 26, 30 and 31.)
- If students don't notice and comment on the fact that the shape on marker 3 includes 2 right angles, introduce the term and concept yourself, along with the Right Angle Measures you prepared for students' use this month.



- Show students how to use the Right Angle Measure to test the angles on the third marker. Let them know that the angles on that particular pentagon that are smaller than a right angle are called *acute angles*, and the angles that are larger than a right angle are called *obtuse angles*.
 - Encourage students to be alert to the presence of right angles on upcoming markers throughout the month.
- Point to the triangle on marker 1, and ask students if there is anything they notice about the sides and angles on this shape.
 - If students do not comment on the fact that there are no right angles, that the sides are all equal and the angles are all equal, elicit these observations by posing questions to the class.
 - Update the Observations Chart with input from the students.

Calendar Grid Observations				
Date	Shape Name	Color		Other Observations
1	Triangle	Yellow		All sides are the same length
2	Quadrilateral	Purple		All sides are different lengths
3	Pentagon	Red		It has 5 sides & 2 right angles
4	Hexagon	Yellow		There are no right angles
5	Triangle	Purple		It's skinny
6	Quadrilateral	Red		It's concave, it has no right angles



Update

Begin Updating After Activity 1. Follow this procedure every school day on which the Calendar Collector is not one of the designated activities.

Procedure

The calendar helper for the day adds 250 milliliters (ml) of tinted water to the 1-liter bottle currently in use and marks the water level on the masking tape running up the side of the bottle.

Note

Remember to fill the pitcher with colored water and put out a new liter bottle every few days. (If you forget, the students will most likely remind you.)

Literature Connections

This informative and amusing book about metric measurement would be a good choice this month.

Millions to Measure by
David Schwartz

Day 7

Date:

Calendar Grid	Calendar Collector	Computational Fluency
<i>Update</i>	Activity 2 – Charting Milliliters & Liters (pg. 23)	
Number Line	Solving Problems	Assessment

Update

Begin Updating After Activity 1. Follow this update procedure every school day that the Calendar Grid is not one of the designated activities.

Procedure

- Have a student helper post the calendar marker and fill in the Calendar Grid Observations Chart to show the date, shape name, color, and at least one other observation about the shape. You might choose to assign one student to take this role for the entire week.
- Challenge the student helpers to be as precise as possible about the name of the shape. If it is a quadrilateral, what kind of quadrilateral? If it is a triangle, is it equilateral, isosceles, or scalene? If it is a pentagon or a hexagon, is it regular or irregular?



Key Questions

Learning to search for, describe, and extend patterns facilitates algebraic thinking. Use any of the questions below to help your students think about this month's pattern:

- When do you think we'll see the next quadrilateral (triangle, pentagon, hexagon)? How can you tell?
- What is the name of the shape on today's marker? How do you know?
- What is it that makes these shapes all triangles (quadrilaterals, pentagons, hexagons)?
- What types of angles do you see in this shape—right, obtuse, or acute?
- Is this shape regular or irregular? How do you know?
- Can you spot two shapes on the Calendar Grid that are congruent? Which ones? How do you know they're congruent?
- Describe the shape on today's marker in as much detail as you can.
- I'm thinking of one of the markers we can see on the Calendar Grid. On this marker there is a polygon with 3 sides and 1 right angle. Which marker am I thinking of?
- I'm thinking of one of the markers we can see on the Calendar Grid. On this marker there is a polygon with 4 sides and 4 right angles. Which marker am I thinking of?



Activity 2

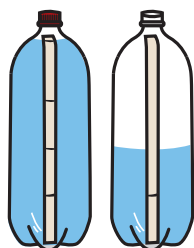
Charting Milliliters & Liters

Days 7, 10, 15

Prepare and post the Milliliters & Liters Record Sheet on your Number Corner display board before you conduct this activity the first time. You will also need a blank piece of chart paper and marking pens in several different colors, as well as the tray with the pitcher of tinted water, the small measuring cup, any liter bottles that have been filled so far, and the liter bottle that is currently being filled.

- 1 Draw students' attention to the filled and partially filled 1-liter bottles on the tray, and ask them to talk in pairs about how many liters or milliliters have been collected so far.

After a few moments, call on volunteers to share their answers with the class.



Jada We have one full bottle, and the other one looks like it's about half full.

Marco It's 1 and a half liters.

Teacher How are you thinking about that, Marco?

Marco Well, each bottle holds one liter. The first one is full, and the second one has two marks, so it must be halfway full.

Teacher Thumbs up if you agree with Marco that we've collected 1 and a half liters of water so far. Okay, I see lots of thumbs up. How many milliliters have we collected so far? Talk to the person sitting next to you about that, and then we'll have a few people share their ideas.

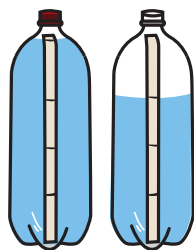
Alex It's 1,500 milliliters because there's 1,000 in the first bottle and 500 in the other bottle.

Jada I agree because I put 250 milliliters in the second bottle yesterday, and there were already 250 milliliters in there from the day before.

- 2 After there is general agreement about the amount of water collected so far, have today's student helper add another measuring cupful of water to the current bottle.

Then discuss the new total with the class.

- 3 Then introduce the Milliliters & Liters Record Sheet, and explain that it will help the class keep track of the amount of water they've collected.
 - Work with input from the students to fill in the data for each day they've been in class so far this month.
 - As you do so, take the opportunity to explain the idea of a running total; adding 250 milliliters to the total in the milliliters each day, and adding another one-fourth of a liter to the total in the liters column.



Day	Milliliters (Running Total)	Liters (Running Total)
1	250 ml	$\frac{1}{4}$ liter
2	500 ml	$\frac{2}{4}$ liter
3	750 ml	$\frac{3}{4}$ liter
4	1,000 ml	$\frac{4}{4}$ liter = 1 liter
5	1,250 ml	1 $\frac{1}{4}$ liter
6	1,500 ml	1 $\frac{2}{4}$ liter
7	1,750 ml	1 $\frac{3}{4}$ liter

- 4 After the data has been entered, ask students to share observations about the numbers on the record sheet.

Malik Every day we get another fourth of a liter, so it goes one-fourth, two-fourths, three-fourths, and four-fourths, and then it starts over.

Adrian But two-fourths is the same as one-half. I don't see why we can't just call it a half.

Teacher Thumbs up if you agree with Adrian. Do you think two-fourths is the same as one-half or not? Why?

Ava It has to be because it's 4 of the fourths in the whole thing. Two is half of 4, right?

Lily We know from last year that 2 fourths is the same as a half.

Noah I don't understand about $\frac{1}{4}$. When you get 4 fourths, it's the same as one whole thing, so why do you write $\frac{1}{4}$?

Teacher That's a good question. Can we write $\frac{1}{4}$? When the bottle is full, do we really have 4 quarter-liters in there?

Adrian Sure—why not? It's kind of like 4 quarters make a dollar. You can say you have a dollar, or you can say you have 4 quarters. It's the same thing.

Ava OK, well right now, we have 7 fourths, right? I mean, we wrote that we have 1 $\frac{3}{4}$ liters, but it's also 7 of those measuring cupfuls.

Malik I like the milliliters. We already have almost 2,000 of them. We're going to have a lot by the end of the month.

- 5 Finally, ask students to estimate how many liters they will collect by the end of the month.

- Record any and all estimates on the piece of chart paper.
- If more than one student estimates a particular amount, underline that amount on the paper.

How many liters of water do you think we will have collected by the end of the month?

10 liters

12 liters

7 liters

4 liters

15 liters

11 liters

13 liters

9 liters

- 6 Repeat the steps above each time you conduct this activity.
- Work with the class to update the chart each time.

- Record students' estimates on the same piece of chart paper each time, using a different color marking pen. Invite them to identify previous estimates that can be eliminated and to refine their current estimates based on the amount of water collected so far.

Kylie I want to change my estimate. I think I did too much last time. I think it's going to be about 6 liters.

Jamar I guessed too high last time, too. It's almost halfway through October, and we only have $2\frac{1}{2}$ liters of water. I think we'll only have about 5 liters by the end of the month.

Maya I think we should cross off 15 liters from the first time we made estimates. There's no way we're going to get 15 liters by the end of the month.

Teacher Thumbs up if you agree with Maya. OK, I see lots of thumbs up—I'll go ahead and cross off 15 liters.

How many liters of water do you think we will have collected by the end of the month?

<u>10 liters</u>	12 liters	<u>7 liters</u>	<u>4 liters</u>
15 liters	11 liters	13 liters	9 liters
4 liters	<u>5 liters</u>	$6\frac{1}{4}$ liters	<u>$5\frac{1}{2}$ liters</u>
8 liters	$6\frac{1}{2}$ liters	7 liters	$7\frac{1}{4}$ liters

The range of estimates students volunteer each time you conduct this activity will likely narrow, and you might note that with them. In general, our estimates become more accurate as we gather more information.

Day 8

Date:

Calendar Grid	Calendar Collector	Computational Fluency
<i>Update</i>	<i>Update</i>	Activity 2 – Frog Jump Multiplication Rematch (pg. 31)
Number Line	Solving Problems	Assessment

Update

Begin Updating After Activity 1. Follow this update procedure every school day that the Calendar Grid is not one of the designated activities.

Procedure

- Have a student helper post the calendar marker and fill in the Calendar Grid Observations Chart to show the date, shape name, color, and at least one other observation about the shape. You might choose to assign one student to take this role for the entire week.
- Challenge the student helpers to be as precise as possible about the name of the shape. If it is a quadrilateral, what kind of quadrilateral? If it is a triangle, is it equilateral, isosceles, or scalene? If it is a pentagon or a hexagon, is it regular or irregular?



Key Questions

Learning to search for, describe, and extend patterns facilitates algebraic thinking. Use any of the questions below to help your students think about this month's pattern:

- When do you think we'll see the next quadrilateral (triangle, pentagon, hexagon)? How can you tell?
- What is the name of the shape on today's marker? How do you know?
- What is it that makes these shapes all triangles (quadrilaterals, pentagons, hexagons)?
- What types of angles do you see in this shape—right, obtuse, or acute?
- Is this shape regular or irregular? How do you know?
- Can you spot two shapes on the Calendar Grid that are congruent? Which ones? How do you know they're congruent?
- Describe the shape on today's marker in as much detail as you can.
- I'm thinking of one of the markers we can see on the Calendar Grid. On this marker there is a polygon with 3 sides and 1 right angle. Which marker am I thinking of?
- I'm thinking of one of the markers we can see on the Calendar Grid. On this marker there is a polygon with 4 sides and 4 right angles. Which marker am I thinking of?



Update

Begin Updating After Activity 1. Follow this procedure every school day on which the Calendar Collector is not one of the designated activities.

Procedure

The calendar helper for the day adds 250 milliliters (ml) of tinted water to the 1-liter bottle currently in use and marks the water level on the masking tape running up the side of the bottle.

Note

Remember to fill the pitcher with colored water and put out a new liter bottle every few days. (If you forget, the students will most likely remind you.)

Literature Connections

This informative and amusing book about metric measurement would be a good choice this month.

Millions to Measure by
David Schwartz



Activity 2

Frog Jump Multiplication Rematch

Day 8

- 1 Place a fresh copy of the Whole Group Frog Jump Multiplication Game Sheet Teacher Master on display, and have students find Frog Jump Multiplication, Record Sheet 2 in their Number Corner Student Books.
- 2 Explain that you're going to play another game of Frog Jump Multiplication with the class to see if the team that lost last time can win today.
 - Briefly review the rules of the game.
 - Explain that you will keep track of the results for both teams on your display sheet, just as you did last time, and the students will track of the results for their team on their own record sheets.
- 3 Play the game with the class, just as you did the first time.

Use questions such as those in the Key Questions section above to keep students engaged and thinking throughout the game.

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Day 9

Date:

Calendar Grid	Calendar Collector	Computational Fluency
<i>Update</i>	<i>Update</i>	
Number Line	Solving Problems	Assessment
	Activity 1 – Problem Strings: Friendly Tens (pg. 45)	

Update

Begin Updating After Activity 1. Follow this update procedure every school day that the Calendar Grid is not one of the designated activities.

Procedure

- Have a student helper post the calendar marker and fill in the Calendar Grid Observations Chart to show the date, shape name, color, and at least one other observation about the shape. You might choose to assign one student to take this role for the entire week.
- Challenge the student helpers to be as precise as possible about the name of the shape. If it is a quadrilateral, what kind of quadrilateral? If it is a triangle, is it equilateral, isosceles, or scalene? If it is a pentagon or a hexagon, is it regular or irregular?



Key Questions

Learning to search for, describe, and extend patterns facilitates algebraic thinking. Use any of the questions below to help your students think about this month's pattern:

- When do you think we'll see the next quadrilateral (triangle, pentagon, hexagon)? How can you tell?
- What is the name of the shape on today's marker? How do you know?
- What is it that makes these shapes all triangles (quadrilaterals, pentagons, hexagons)?
- What types of angles do you see in this shape—right, obtuse, or acute?
- Is this shape regular or irregular? How do you know?
- Can you spot two shapes on the Calendar Grid that are congruent? Which ones? How do you know they're congruent?
- Describe the shape on today's marker in as much detail as you can.
- I'm thinking of one of the markers we can see on the Calendar Grid. On this marker there is a polygon with 3 sides and 1 right angle. Which marker am I thinking of?
- I'm thinking of one of the markers we can see on the Calendar Grid. On this marker there is a polygon with 4 sides and 4 right angles. Which marker am I thinking of?



Update

Begin Updating After Activity 1. Follow this procedure every school day on which the Calendar Collector is not one of the designated activities.

Procedure

The calendar helper for the day adds 250 milliliters (ml) of tinted water to the 1-liter bottle currently in use and marks the water level on the masking tape running up the side of the bottle.

Note

Remember to fill the pitcher with colored water and put out a new liter bottle every few days. (If you forget, the students will most likely remind you.)

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Activity 1

Problem Strings

Days 4, 9, 17

- 1 Follow the procedure you established in September to deliver each week's problem string.
 - Ask students turn to the next blank page of the Problem String Workspace in their Number Corner Student Books and write today's date.
 - Deliver each problem in the string one at a time.
 - » Have students record and solve the problem in their Student Books.
 - » Have them put up their thumbs when they are ready to share their solutions and strategies.
 - » When you see several thumbs up, invite a few students to share the answer. Record all answers without comment or indication that any of them are correct or incorrect.
 - » Then invite two or three volunteers to explain how they got their answers.
 - » Record students' thinking on a number line model on the board (or a piece of chart paper) for everyone to see.
- 2 Conclude the activity by asking students to reflect briefly on the string.
 - Ask students to share, first in pairs and then as a group, a one-sentence statement about something they learned in today's string.
 - Invite students to write a simple statement beneath their work in the Student Book describing what they learned while doing this string.

Students (Referring to Problem String 4) *It's easy to subtract if you just go back by tens.*

It's even faster if you can go by bigger friendly numbers, like 20 or 30.

You can just go back 10, 10, 10, however many times, and then subtract the rest of the number at the end.

Students (Referring to Problem String 5) *I think if you're really close to a ten, you should just go back that much. After that, it's really easy to go back by 10s, and you can take away the rest when you get to the very end.*

Just get to the nearest friendly number, and then keep on going.

It's really fast if you go back to the nearest ten, then just take one or two big jumps instead of going 10, 10, 10, 10. Then if there's a little more to take away at the end, it's easy because you're already on a ten.

Friendly Tens

Day 9

Students will share a variety of strategies for these problems. Model all of their strategies on the number line. Emphasize those strategies that involve moving to the next friendly ten (multiple of 10) first, and then taking jumps of 10, or multiples of 10, backward. Encourage students to use their solutions to previous problems to solve new problems.

Problems	Sample Strategies & Recording	Connections
$254 - 4$		<p>By beginning with a problem that involves subtracting exactly enough ones to arrive at a multiple of 10 (a friendly ten), this string invites students to subtract by first removing exactly the number of ones required to land on a friendly number and then removing the rest.</p> <p>Big Idea To subtract, you can first take away enough ones to get to a friendly ten. Then jump back by tens, and finally take away any ones that are still left.</p>
$254 - 24$		
$254 - 25$		
$283 - 34$	<p>Students might remove 3 to get to 'friendly' 280, then remove 30 more to reach 250, then 1 more.</p>	<p>In all three of these problems, the number in the ones place in the subtrahend is 1 more than the number in the ones place in the minuend. This means that after they have gotten to a friendly ten and then jumped back by 10s or a multiple of 10, students must subtract the remaining 1 to arrive at a final answer.</p> <p>Big Idea To subtract, you can first take away enough ones to get to a friendly ten. Then jump back by tens, and finally take away any ones that are still left.</p>
$462 - 43$		
$494 - 55$		

Day 10

Date:

Calendar Grid	Calendar Collector	Computational Fluency
<i>Update</i>	Activity 2 – Charting Milliliters & Liters (pg. 23)	
Number Line	Solving Problems	Assessment
Activity 2 – Out It on the Line, Game 1 (pg. 37)		

Update

Begin Updating After Activity 1. Follow this update procedure every school day that the Calendar Grid is not one of the designated activities.

Procedure

- Have a student helper post the calendar marker and fill in the Calendar Grid Observations Chart to show the date, shape name, color, and at least one other observation about the shape. You might choose to assign one student to take this role for the entire week.
- Challenge the student helpers to be as precise as possible about the name of the shape. If it is a quadrilateral, what kind of quadrilateral? If it is a triangle, is it equilateral, isosceles, or scalene? If it is a pentagon or a hexagon, is it regular or irregular?



Key Questions

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- When do you think we'll see the next quadrilateral (triangle, pentagon, hexagon)? How can you tell?
- What is the name of the shape on today's marker? How do you know?
- What is it that makes these shapes all triangles (quadrilaterals, pentagons, hexagons)?
- What types of angles do you see in this shape—right, obtuse, or acute?
- Is this shape regular or irregular? How do you know?
- Can you spot two shapes on the Calendar Grid that are congruent? Which ones? How do you know they're congruent?
- Describe the shape on today's marker in as much detail as you can.
- I'm thinking of one of the markers we can see on the Calendar Grid. On this marker there is a polygon with 3 sides and 1 right angle. Which marker am I thinking of?
- I'm thinking of one of the markers we can see on the Calendar Grid. On this marker there is a polygon with 4 sides and 4 right angles. Which marker am I thinking of?



Activity 2

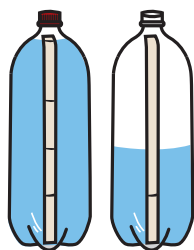
Charting Milliliters & Liters

Days 7, 10, 15

Prepare and post the Milliliters & Liters Record Sheet on your Number Corner display board before you conduct this activity the first time. You will also need a blank piece of chart paper and marking pens in several different colors, as well as the tray with the pitcher of tinted water, the small measuring cup, any liter bottles that have been filled so far, and the liter bottle that is currently being filled.

- 1 Draw students' attention to the filled and partially filled 1-liter bottles on the tray, and ask them to talk in pairs about how many liters or milliliters have been collected so far.

After a few moments, call on volunteers to share their answers with the class.



Jada We have one full bottle, and the other one looks like it's about half full.

Marco It's 1 and a half liters.

Teacher How are you thinking about that, Marco?

Marco Well, each bottle holds one liter. The first one is full, and the second one has two marks, so it must be halfway full.

Teacher Thumbs up if you agree with Marco that we've collected 1 and a half liters of water so far. Okay, I see lots of thumbs up. How many milliliters have we collected so far? Talk to the person sitting next to you about that, and then we'll have a few people share their ideas.

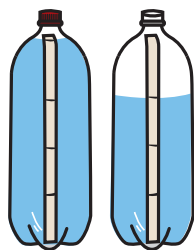
Alex It's 1,500 milliliters because there's 1,000 in the first bottle and 500 in the other bottle.

Jada I agree because I put 250 milliliters in the second bottle yesterday, and there were already 250 milliliters in there from the day before.

- 2 After there is general agreement about the amount of water collected so far, have today's student helper add another measuring cupful of water to the current bottle.

Then discuss the new total with the class.

- 3 Then introduce the Milliliters & Liters Record Sheet, and explain that it will help the class keep track of the amount of water they've collected.
 - Work with input from the students to fill in the data for each day they've been in class so far this month.
 - As you do so, take the opportunity to explain the idea of a running total; adding 250 milliliters to the total in the milliliters each day, and adding another one-fourth of a liter to the total in the liters column.



Day	Milliliters (Running Total)	Liters (Running Total)
1	250 ml	$\frac{1}{4}$ liter
2	500 ml	$\frac{2}{4}$ liter
3	750 ml	$\frac{3}{4}$ liter
4	1,000 ml	$\frac{4}{4}$ liter = 1 liter
5	1,250 ml	1 $\frac{1}{4}$ liter
6	1,500 ml	1 $\frac{2}{4}$ liter
7	1,750 ml	1 $\frac{3}{4}$ liter

- 4 After the data has been entered, ask students to share observations about the numbers on the record sheet.

Malik Every day we get another fourth of a liter, so it goes one-fourth, two-fourths, three-fourths, and four-fourths, and then it starts over.

Adrian But two-fourths is the same as one-half. I don't see why we can't just call it a half.

Teacher Thumbs up if you agree with Adrian. Do you think two-fourths is the same as one-half or not? Why?

Ava It has to be because it's 4 of the fourths in the whole thing. Two is half of 4, right?

Lily We know from last year that 2 fourths is the same as a half.

Noah I don't understand about $\frac{1}{4}$. When you get 4 fourths, it's the same as one whole thing, so why do you write $\frac{1}{4}$?

Teacher That's a good question. Can we write $\frac{1}{4}$? When the bottle is full, do we really have 4 quarter-liters in there?

Adrian Sure—why not? It's kind of like 4 quarters make a dollar. You can say you have a dollar, or you can say you have 4 quarters. It's the same thing.

Ava OK, well right now, we have 7 fourths, right? I mean, we wrote that we have 1 $\frac{3}{4}$ liters, but it's also 7 of those measuring cupfuls.

Malik I like the milliliters. We already have almost 2,000 of them. We're going to have a lot by the end of the month.

- 5 Finally, ask students to estimate how many liters they will collect by the end of the month.
- Record any and all estimates on the piece of chart paper.
 - If more than one student estimates a particular amount, underline that amount on the paper.

How many liters of water do you think we will have collected by the end of the month?

10 liters

12 liters

7 liters

4 liters

15 liters

11 liters

13 liters

9 liters

- 6 Repeat the steps above each time you conduct this activity.
- Work with the class to update the chart each time.

- Record students' estimates on the same piece of chart paper each time, using a different color marking pen. Invite them to identify previous estimates that can be eliminated and to refine their current estimates based on the amount of water collected so far.

Kylie I want to change my estimate. I think I did too much last time. I think it's going to be about 6 liters.

Jamar I guessed too high last time, too. It's almost halfway through October, and we only have $2\frac{1}{2}$ liters of water. I think we'll only have about 5 liters by the end of the month.

Maya I think we should cross off 15 liters from the first time we made estimates. There's no way we're going to get 15 liters by the end of the month.

Teacher Thumbs up if you agree with Maya. OK, I see lots of thumbs up—I'll go ahead and cross off 15 liters.

How many liters of water do you think we will have collected by the end of the month?

<u>10 liters</u>	12 liters	<u>7 liters</u>	<u>4 liters</u>
15 liters	11 liters	13 liters	9 liters
4 liters	<u>5 liters</u>	$6\frac{1}{4}$ liters	<u>$5\frac{1}{2}$ liters</u>
8 liters	$6\frac{1}{2}$ liters	7 liters	$7\frac{1}{4}$ liters

The range of estimates students volunteer each time you conduct this activity will likely narrow, and you might note that with them. In general, our estimates become more accurate as we gather more information.



Activity 2



Notes About This Activity

You will need the Put It on the Line Game 1 Teacher Master prepared as described in the Preparation section, along with a red and a blue marker. The students will need their Number Corner Student Books, as well as regular, red, and blue pencils. It may be easiest to conduct this activity with the students sitting at their desks or table spots instead of in the Number Corner discussion area.

Put It on the Line, Game 1

Day 10

- 1 Display the copy of the Put It on the Line Game 1 Teacher Master you have prepared for this activity. As students watch, write 1,000 at the end of the line above the last box.

- Give students a few moments to examine the sheet quietly. Then have them talk in pairs about the numbers that belong in the boxes, given that the line starts with 0 and ends with 1,000 today.
- When they have had about half a minute to talk in pairs, invite volunteers to share their ideas with the class.

SUPPORT If students are at a loss, write the number 500 above the box in the middle of the line and ask again.

- 2 Then explain that this is a record sheet for a game that might be familiar to some of the students. This version of Put It on the Line has new twist, however.

Briefly describe the game by telling the students that you will take turns with the class to remove one sticky note at a time from the collection at the bottom of the sheet. There is a problem under 10 of the notes, and a picture under the other two. When a team removes one of the notes, they will solve the problem and write the answer in the box where it belongs on the number line. If a team finds a picture under a note they remove, they can write a number in any one of the boxes along the number line if any are still available. In order to do so, however, they have to come up with an equation or story problem that has that number as the answer. At the end of the game each team will add up the numbers they have placed on the line. The team with the highest total wins.

Note If a team finds that the number they get by solving the problem under the note they choose is already taken, they lose that turn. The game is over when all the boxes along the line are filled.

- 3 Let students know that to keep track of their winnings, each team will use a different color to record the numbers they place on the line.

Decide which team will play for blue, and which for red. Then color in the boxes on the game sheet accordingly.

Number Corner Grade 3 Teacher Masters

Put It on the Line, Game 1

0 1,000

Teacher Students

October | Number Line Activity 2 (copy for display)

- 4 Have students find the Put It on the Line Record Sheet in their Number Corner Student Books, and explain that they will use the top half of the sheet today. They'll save the bottom half for another game of Put It on the Line later in the month.

- Have them get out three pencils to use during the game—a regular pencil and two colored pencils, one red and the other blue.
- Have helpers give each student a half-sheet of scratch paper they can use to do their figuring on.

- 5 Take the first turn so students understand how to play the game.

- Remove one of the sticky notes from your sheet at random.
- Read the problem with the class. Then solve it, explaining your reasoning.
- Record the answer in the appropriate box along the number line, using a pen in your color.
- Have the students record the number you just placed, using a colored pencil in your color on the number line at the top of their record sheet.

Teacher *Let's see ... I think I'll take the note off this problem in the middle row. It says $(2 \times 150) - 100$. Hmm ... 2 times 150 is the same as 2 groups of 150, or $150 + 150$, and that's 300. Then, 300 minus 100 is 200. I'll use my red pen to write the answer, but which box does it go in? Can you help me out?*

Students *It goes 0, 100, 200 on that line.*

You should put it in the box after the one for the 100.

Put it in the second box after the 0.

Put It on the Line, Game 1

Number Corner Grade 3 Teacher Masters

October | Number Line Activity 2 (copy for display)

1,000

0

200

Teacher

Students

	$(2 \times 150) - 100$		

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- 6 Have the students take their first turn.

- Call one of the students up to remove a sticky note for the class.
- Read the problem with the class. Give them a little time to solve the problem, working in pairs or individually if they prefer.
- Have all the students report the answer aloud, and then invite two or three students to explain their strategies.

- Finally, ask one of the students to come and record the number in the box along the line where it belongs on the teacher master, using the class's color, as students do so in their books.

- 7 Take turns back and forth with the class until all the boxes along the number line are filled. If any of the sticky notes remain, due to numbers filled in when a picture is uncovered, decide with the class how to handle the situation.

The class may decide to leave the box covered, or remove the note out of curiosity to see what's under it. Some classes decide to add the amount under the note to the score of the losing team, or subtract it from the score of the winning team, but they have to make the decision before they lift the note. Your students may have additional ideas.

Put It on the Line, Game 1

Number Corner Grade 3 Teacher Masters

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October | Number Line Activity 2 (copy for display)

■ Teacher

■ Students

$(10 \times 10) + 300$	Tim and his friends collect baseball cards. Tim has 75 cards. Sara has the same number of cards as Tim. Jeff has twice as many cards as Tim. How many cards in all?	<p><i>I had 1 liter of water. I drank 300 mL. How many do I have left?</i></p>	$(2 \times n) - 100 = 900$ $n = \underline{\hspace{2cm}}$
Maya had a half a liter of water left in her water bottle. She drank 300 milliliters and accidentally spilled another 100 milliliters. How many milliliters does she have left?	$(2 \times 150) - 100$	How many milliliters are in one liter?	$1,200$ $- 300$ <hr style="width: 50px; margin: 0 auto;"/>
$700 - n = 100$ $n = \underline{\hspace{2cm}}$	<p>$2 \times 500 = 1,000$</p>	<div style="height: 100px; width: 100%;"></div>	DJ has a penny collection. He had 300 pennies. He got \$5.00 for his birthday, and he traded it in for pennies at the bank. How many pennies does he have now?

- 8 Remind the students that each team will add up the numbers they placed along the line to see who got the highest score. Before you do, however, ask them to predict which team will win, based on the numbers each has placed.

Students I think Mrs. O is going to win because she got most of the high numbers.

Yeah, she got the 600, the 800, and the 900. She's probably going to win this time.

But we got the 700 and the 1,000.

We also got the 300, 400, and 500. I think when we add everything together, we'll get more points.

- 9 List on the board in column formation all the numbers you placed along the line, as students do so in the designated box on their record sheet. Work with input from the class to find your total, as the students work along with you on their own sheets.

Encourage students to search for combinations that result in friendly numbers, rather than adding the numbers in order from top to bottom, and model doing so yourself.

Teacher OK, I got 100, 200, 600, 800, and 900. Does anyone see any pairs of numbers that add up to something really nice, like 1,000?

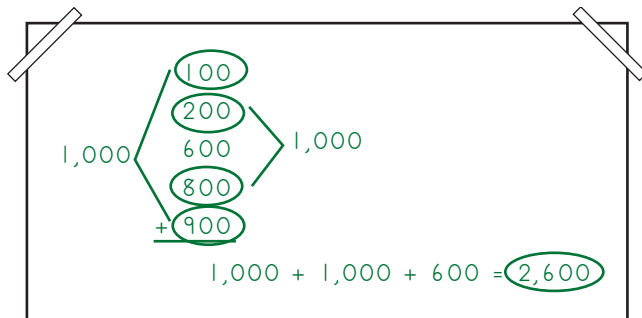
Ana You can add the numbers at the top and the bottom. A hundred plus 900 is 1,000.

Teacher OK... anyone see anything else?

Jorge The second one down, 200, plus 800, is 1,000.

Nick So that's 2,600, because you add the 2 thousands and the 600.

Teacher Not bad! Let's see what your team's score is.



- 10 List on the board in column formation all the numbers the students placed along the line, as they do so in the other box on their record sheet.
- 11 Give students a minute to add their numbers. Encourage them to work in pairs or share and compare their solutions and strategies as they finish.
 - Solicit all responses and record them on the board.
 - Then have two or three students share and explain their strategies.
- 12 When students have found their total, compare the scores to determine the winner. Let the class know you'll return to this game later this month.

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Day 11

Date:

Calendar Grid	Calendar Collector	Computational Fluency
Activity 3 – Identifying Lines of Symmetry (pg. 12)	<i>Update</i>	
Number Line	Solving Problems	Assessment

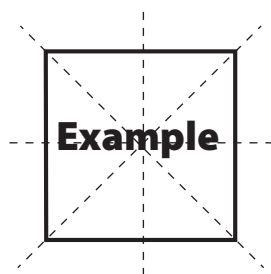


Activity 3

Identifying Lines of Symmetry

Day 11

- After students make predictions about the marker for today, post it on the Calendar Grid pocket chart, and have them share observations about the shape. Work with their input to update the Observations Chart.
Encourage students to use some of the geometry terms you've posted so far this month by challenging them to describe the shape as precisely as possible.
 - What is the name of the new shape? What does the name tell people about the number of sides?
 - What kinds of angles do they see on today's shape? Are any of them right angles?
 - Is today's shape regular or not?
- Introduce the terms *line of symmetry* and *symmetrical*, and work with students to investigate the symmetry of each of the shapes posted so far.
 - Explain that a line of symmetry is a line that divides a shape into two identical mirror images, and if a shape has at least one line of symmetry, it is said to be symmetrical.
 - Demonstrate the concept using the square labeled "Example" that you've cut from the Jumbo Shapes Teacher Master. Ask students where the shape could be folded so that one half of the shape would match exactly the other half.
 - Fold the shape or draw a line with a straight edge to show the line of symmetry suggested by the students.
 - Ask if the square has any other lines of symmetry. After students have a few moments to share ideas with a neighbor, call on volunteers to mark or fold other lines of symmetry. The class should discover four lines of symmetry, as shown here.



- Give each pair of students one of the other jumbo shapes you've cut. Each of these is the same as one of the shapes on the first 10 markers. Have them take a minute or two to determine whether or not their shape is symmetrical, and if it is, how many lines of symmetry there are.

Have students fold or mark their shapes to test for and find any lines of symmetry.

Those students working with Shapes 2, 6, and 9 will find that there are no lines of symmetry, no matter how they fold, twist, turn, or mark those shapes. Those students working with Shapes 1, 3, 5, 6, 7, 8, and 10 should discover at least one line of symmetry.

- 4 Have each pair of students share their discoveries with at least one other pair. Then have each pair report how many lines of symmetry they were able to find as you record the information on the Observations Chart.
- If there are errors that go unnoticed, let them pass for now. Post the jumbo shapes near the Calendar Grid pocket chart so students can revisit them during the month to check and confirm (or not) their original reports.
 - Encourage students to include observations about the symmetry of shapes as they are posted during the rest of the month, including shapes that have no lines of symmetry at all.

<div>*LS = Lines of Symmetry</div> Calendar Grid Observations				
Date	Shape Name	Color	LS*	Other Observations
1	Triangle	Yellow	3	All sides are the same length
2	Quadrilateral	Purple	0	All sides are different lengths
3	Pentagon	Red	1	It has 5 sides & 2 right angles
4	Hexagon	Yellow	6	There are no right angles
5	Triangle	Purple	1	It's skinny
6	Quadrilateral	Red	0	It's concave, it has no right angles
7	Pentagon	Yellow	5	Not concave, all 5 sides same length
8	Hexagon	Purple	2	6 sides, 4 obtuse angles, 2 acute
9	Triangle	Red	0	No equal sides, no right angles



Update

Begin Updating After Activity 1. Follow this procedure every school day on which the Calendar Collector is not one of the designated activities.

Procedure

The calendar helper for the day adds 250 milliliters (ml) of tinted water to the 1-liter bottle currently in use and marks the water level on the masking tape running up the side of the bottle.

Note

Remember to fill the pitcher with colored water and put out a new liter bottle every few days. (If you forget, the students will most likely remind you.)

Literature Connections

This informative and amusing book about metric measurement would be a good choice this month.

Millions to Measure by
David Schwartz

Day 12

Date:

Calendar Grid	Calendar Collector	Computational Fluency
<i>Update</i>	Activity 3 – Hands-On Measuring (pg. 25)	
Number Line	Solving Problems	Assessment

Update

Begin Updating After Activity 1. Follow this update procedure every school day that the Calendar Grid is not one of the designated activities.

Procedure

- Have a student helper post the calendar marker and fill in the Calendar Grid Observations Chart to show the date, shape name, color, and at least one other observation about the shape. You might choose to assign one student to take this role for the entire week.
- Challenge the student helpers to be as precise as possible about the name of the shape. If it is a quadrilateral, what kind of quadrilateral? If it is a triangle, is it equilateral, isosceles, or scalene? If it is a pentagon or a hexagon, is it regular or irregular?



Key Questions

Learning to search for, describe, and extend patterns facilitates algebraic thinking. Use any of the questions below to help your students think about this month's pattern:

- When do you think we'll see the next quadrilateral (triangle, pentagon, hexagon)? How can you tell?
- What is the name of the shape on today's marker? How do you know?
- What is it that makes these shapes all triangles (quadrilaterals, pentagons, hexagons)?
- What types of angles do you see in this shape—right, obtuse, or acute?
- Is this shape regular or irregular? How do you know?
- Can you spot two shapes on the Calendar Grid that are congruent? Which ones? How do you know they're congruent?
- Describe the shape on today's marker in as much detail as you can.
- I'm thinking of one of the markers we can see on the Calendar Grid. On this marker there is a polygon with 3 sides and 1 right angle. Which marker am I thinking of?
- I'm thinking of one of the markers we can see on the Calendar Grid. On this marker there is a polygon with 4 sides and 4 right angles. Which marker am I thinking of?



Activity 3

Hands-On Measuring

Day 12

Prior to conducting this activity, set up a work station for measuring liquid volume as described in the Preparation section. You will introduce the work station today, and students will visit it in pairs over the next couple of weeks as time permits. You may want to pre-assign student pairs and post a list near the work station. You will also need to run a class set of the Investigating Liters & Milliliters Teacher Master. Keep these at your desk or in another convenient location, rather than at the work station itself, where there are likely to be a few spills from time to time.

- 1 Let students know that one of the best ways to learn about measuring is to measure things yourself. For that reason, you have set up a measuring work station, which they'll all have a chance to visit in pairs over the next couple of weeks.

- 2 Show students the work station area, and explain the system you'll use to have them work there.

Once students know how to take their turn at the work station, you may want to carry the tray of materials over to the Number Corner discussion area so they can all see the tools they'll have to work with.

- 3 Display a copy of the Investigating Liters & Milliliters Teacher Master.

- Review the instructions and clarify as needed.
- Show students the tools they'll have to work with.
- Establish any rules or procedures necessary to helping things run smoothly, including how to cope with spilled water.
- Let students know where and how to access copies of the teacher master. Explain that they'll work together, but they'll each need to complete their own copy of the sheet and turn it in when they're finished.

- 4 When students understand what to do, let the first pair visit the work station while you continue with your Number Corner instruction for the day.

Allow the rest of the students to work at the measuring station during other times of the day that fit into your schedule. It will take each pair 10 to 15 minutes to complete the worksheet.

Day 13

Date:

Calendar Grid	Calendar Collector	Computational Fluency
<i>Update</i>	<i>Update</i>	Activity 3 – Frog Jump Multiplication with a Partner (pg. 31)
Number Line	Solving Problems	Assessment

Update

Begin Updating After Activity 1. Follow this update procedure every school day that the Calendar Grid is not one of the designated activities.

Procedure

- Have a student helper post the calendar marker and fill in the Calendar Grid Observations Chart to show the date, shape name, color, and at least one other observation about the shape. You might choose to assign one student to take this role for the entire week.
- Challenge the student helpers to be as precise as possible about the name of the shape. If it is a quadrilateral, what kind of quadrilateral? If it is a triangle, is it equilateral, isosceles, or scalene? If it is a pentagon or a hexagon, is it regular or irregular?



Key Questions

Learning to search for, describe, and extend patterns facilitates algebraic thinking. Use any of the questions below to help your students think about this month's pattern:

- When do you think we'll see the next quadrilateral (triangle, pentagon, hexagon)? How can you tell?
- What is the name of the shape on today's marker? How do you know?
- What is it that makes these shapes all triangles (quadrilaterals, pentagons, hexagons)?
- What types of angles do you see in this shape—right, obtuse, or acute?
- Is this shape regular or irregular? How do you know?
- Can you spot two shapes on the Calendar Grid that are congruent? Which ones? How do you know they're congruent?
- Describe the shape on today's marker in as much detail as you can.
- I'm thinking of one of the markers we can see on the Calendar Grid. On this marker there is a polygon with 3 sides and 1 right angle. Which marker am I thinking of?
- I'm thinking of one of the markers we can see on the Calendar Grid. On this marker there is a polygon with 4 sides and 4 right angles. Which marker am I thinking of?



Update

Begin Updating After Activity 1. Follow this procedure every school day on which the Calendar Collector is not one of the designated activities.

Procedure

The calendar helper for the day adds 250 milliliters (ml) of tinted water to the 1-liter bottle currently in use and marks the water level on the masking tape running up the side of the bottle.

Note

Remember to fill the pitcher with colored water and put out a new liter bottle every few days. (If you forget, the students will most likely remind you.)

Literature Connections

This informative and amusing book about metric measurement would be a good choice this month.

Millions to Measure by
David Schwartz



Activity 3

Frog Jump Multiplication with a Partner

Day 13

- 1 Display your copy of Frog Jump Multiplication, Record Sheet 3, and have students find the page in their Number Corner Student Books.
- 2 Explain that the students are going to play the game again today, this time in pairs.
- 3 Briefly review the rules of the game. Then have students pair up, and give each pair one die numbered 1–6 to share.
- 4 When students understand what to do, give them the remainder of the period to play the game.

Circulate as students are working to observe and assist as needed.

SUPPORT If you know that some of the students are likely to struggle playing the game on their own, you might invite a small group to play the game with you in a corner of the room while the rest of the class is engaged in pairs.

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Day 14

Date:

Calendar Grid	Calendar Collector	Computational Fluency
Activity 4 – Sorting Quadrilaterals (pg. 14)	Update	
Number Line	Solving Problems	Assessment



Activity 4

Sorting Quadrilaterals

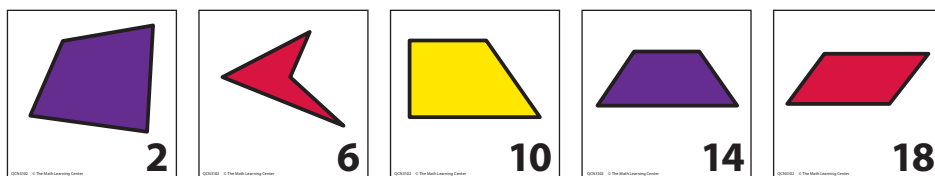
Day 14

- 1 After students make predictions about the marker for today, post it on the Calendar Grid pocket chart, and have them share observations about the shape. Work with their input to update the Observations Chart.

Encourage them to use some of the geometry terms you've posted so far this month by challenging them to describe the shape as precisely as possible. By now, they should be able to identify the shape by counting the number of sides, tell whether or not the shape has one or more right angles, point out the acute and obtuse angles, talk about which side lengths and angles are equal, identify any lines of symmetry, and describe whether the shape is regular or irregular. This might also be a good opportunity to expand the list of attributes they can identify to include whether a shape is concave or not. You might choose to add columns for these attributes to your Observations Chart.

- 2 Then, ask students to talk with a neighbor about how many quadrilaterals have been posted so far, and on which markers they appear.

Choose a student to come up to the Calendar Grid pocket chart, pull out the markers that feature quadrilaterals, and set them on a nearby chalk ledge.



- 3 Have students share, first in pairs, and then with the whole group some of the ways in which these quadrilaterals are alike and some of the ways in which they're different.

Choose several students to share ideas with the class.

Students They all have 4 sides.

That's because they're all quadrilaterals. My dad told me that quad means 4.

The purple one on marker 14 is a trapezoid, but I don't know what the others are called.

That one on marker 6 looks like an arrowhead. It has that dent in it. I wonder if there's a name for that?

- 4 Now explain that there are many different types of quadrilaterals, and they are grouped into three main families depending on how many pairs of parallel sides they have.

Take a moment to share the front and the back of the Word Resource Card for *parallel*.

- 5 Ask students to look closely at the quadrilaterals on display. Do any of them have parallel sides? After a few moments, invite volunteers to share their thinking with the group.

Andrea It looks like the shape on marker 18 has parallel lines on the top and bottom, and the sides are parallel too.

Vincent I think the top and bottom sides of the one on marker 14 are parallel.

Teacher What's the name of that quadrilateral, boys and girls?

Students Trapezoid!

It's a trapezoid like the ones in the pattern blocks.

Whitney The top and bottom of the shape on marker 10 are parallel too, but I don't know what that shape is called. It looks kind of like a robot's foot or something.

George We said that there aren't any parallel lines on those other shapes.

Teacher But they're still quadrilaterals?

George Well, I think they have to be because they have 4 sides, right?

- 6 Display a copy of the Quadrilateral Sorting Tree Poster Teacher Master where everyone can see it. Briefly review some of the highlights, and then work with students to name each of the quadrilaterals on display.

The shapes on markers 10 and 14 are both trapezoids.

The shape on marker 18 is a parallelogram.

The shapes on markers 2 and 6 are called irregular quadrilaterals because they have no equal sides or angles, just as any polygon that has no equal sides or angles is an irregular polygon). A less common definition for irregular quadrilateral requires that the quadrilateral have no sides parallel, and these shapes also meet this condition.

The shape on marker 6 is also a concave quadrilateral, while the shape on marker 2 is a convex quadrilateral. Third graders are not expected to consider this classification, but you may want to discuss it with them, especially if they question the differences in the two shapes' angles.

- 7 Let students know that you'll leave the poster on display for the rest of the month so they can record the exact name of each quadrilateral as it appears in the sequence of calendar markers when it's their turn to update the Calendar Grid and Observations Chart.



Update

Begin Updating After Activity 1. Follow this procedure every school day on which the Calendar Collector is not one of the designated activities.

Procedure

The calendar helper for the day adds 250 milliliters (ml) of tinted water to the 1-liter bottle currently in use and marks the water level on the masking tape running up the side of the bottle.

Note

Remember to fill the pitcher with colored water and put out a new liter bottle every few days. (If you forget, the students will most likely remind you.)

Literature Connections

This informative and amusing book about metric measurement would be a good choice this month.

Millions to Measure by
David Schwartz

Day 15

Date:

Calendar Grid	Calendar Collector	Computational Fluency
<i>Update</i>	Activity 2 – Charting Milliliters & Liters (pg. 23)	
Number Line	Solving Problems	Assessment
Activity 3 – Put It on the Line, Game 2 (pg. 3)		

Update

Begin Updating After Activity 1. Follow this update procedure every school day that the Calendar Grid is not one of the designated activities.

Procedure

- Have a student helper post the calendar marker and fill in the Calendar Grid Observations Chart to show the date, shape name, color, and at least one other observation about the shape. You might choose to assign one student to take this role for the entire week.
- Challenge the student helpers to be as precise as possible about the name of the shape. If it is a quadrilateral, what kind of quadrilateral? If it is a triangle, is it equilateral, isosceles, or scalene? If it is a pentagon or a hexagon, is it regular or irregular?



Key Questions

Learning to search for, describe, and extend patterns facilitates algebraic thinking. Use any of the questions below to help your students think about this month's pattern:

- When do you think we'll see the next quadrilateral (triangle, pentagon, hexagon)? How can you tell?
- What is the name of the shape on today's marker? How do you know?
- What is it that makes these shapes all triangles (quadrilaterals, pentagons, hexagons)?
- What types of angles do you see in this shape—right, obtuse, or acute?
- Is this shape regular or irregular? How do you know?
- Can you spot two shapes on the Calendar Grid that are congruent? Which ones? How do you know they're congruent?
- Describe the shape on today's marker in as much detail as you can.
- I'm thinking of one of the markers we can see on the Calendar Grid. On this marker there is a polygon with 3 sides and 1 right angle. Which marker am I thinking of?
- I'm thinking of one of the markers we can see on the Calendar Grid. On this marker there is a polygon with 4 sides and 4 right angles. Which marker am I thinking of?



Activity 2

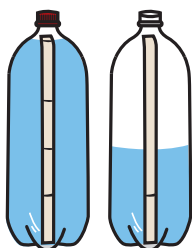
Charting Milliliters & Liters

Days 7, 10, 15

Prepare and post the Milliliters & Liters Record Sheet on your Number Corner display board before you conduct this activity the first time. You will also need a blank piece of chart paper and marking pens in several different colors, as well as the tray with the pitcher of tinted water, the small measuring cup, any liter bottles that have been filled so far, and the liter bottle that is currently being filled.

- 1 Draw students' attention to the filled and partially filled 1-liter bottles on the tray, and ask them to talk in pairs about how many liters or milliliters have been collected so far.

After a few moments, call on volunteers to share their answers with the class.



Jada We have one full bottle, and the other one looks like it's about half full.

Marco It's 1 and a half liters.

Teacher How are you thinking about that, Marco?

Marco Well, each bottle holds one liter. The first one is full, and the second one has two marks, so it must be halfway full.

Teacher Thumbs up if you agree with Marco that we've collected 1 and a half liters of water so far. Okay, I see lots of thumbs up. How many milliliters have we collected so far? Talk to the person sitting next to you about that, and then we'll have a few people share their ideas.

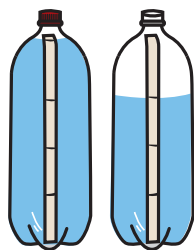
Alex It's 1,500 milliliters because there's 1,000 in the first bottle and 500 in the other bottle.

Jada I agree because I put 250 milliliters in the second bottle yesterday, and there were already 250 milliliters in there from the day before.

- 2 After there is general agreement about the amount of water collected so far, have today's student helper add another measuring cupful of water to the current bottle.

Then discuss the new total with the class.

- 3 Then introduce the Milliliters & Liters Record Sheet, and explain that it will help the class keep track of the amount of water they've collected.
 - Work with input from the students to fill in the data for each day they've been in class so far this month.
 - As you do so, take the opportunity to explain the idea of a running total; adding 250 milliliters to the total in the milliliters each day, and adding another one-fourth of a liter to the total in the liters column.



Day	Milliliters (Running Total)	Liters (Running Total)
1	250 ml	$\frac{1}{4}$ liter
2	500 ml	$\frac{2}{4}$ liter
3	750 ml	$\frac{3}{4}$ liter
4	1,000 ml	$\frac{4}{4}$ liter = 1 liter
5	1,250 ml	1 $\frac{1}{4}$ liter
6	1,500 ml	1 $\frac{2}{4}$ liter
7	1,750 ml	1 $\frac{3}{4}$ liter

- 4 After the data has been entered, ask students to share observations about the numbers on the record sheet.

Malik Every day we get another fourth of a liter, so it goes one-fourth, two-fourths, three-fourths, and four-fourths, and then it starts over.

Adrian But two-fourths is the same as one-half. I don't see why we can't just call it a half.

Teacher Thumbs up if you agree with Adrian. Do you think two-fourths is the same as one-half or not? Why?

Ava It has to be because it's 4 of the fourths in the whole thing. Two is half of 4, right?

Lily We know from last year that 2 fourths is the same as a half.

Noah I don't understand about $\frac{1}{4}$. When you get 4 fourths, it's the same as one whole thing, so why do you write $\frac{1}{4}$?

Teacher That's a good question. Can we write $\frac{1}{4}$? When the bottle is full, do we really have 4 quarter-liters in there?

Adrian Sure—why not? It's kind of like 4 quarters make a dollar. You can say you have a dollar, or you can say you have 4 quarters. It's the same thing.

Ava OK, well right now, we have 7 fourths, right? I mean, we wrote that we have 1 $\frac{3}{4}$ liters, but it's also 7 of those measuring cupfuls.

Malik I like the milliliters. We already have almost 2,000 of them. We're going to have a lot by the end of the month.

- 5 Finally, ask students to estimate how many liters they will collect by the end of the month.
- Record any and all estimates on the piece of chart paper.
 - If more than one student estimates a particular amount, underline that amount on the paper.

How many liters of water do you think we will have collected by the end of the month?

10 liters

12 liters

7 liters

4 liters

15 liters

11 liters

13 liters

9 liters

- 6 Repeat the steps above each time you conduct this activity.
- Work with the class to update the chart each time.

- Record students' estimates on the same piece of chart paper each time, using a different color marking pen. Invite them to identify previous estimates that can be eliminated and to refine their current estimates based on the amount of water collected so far.

Kylie I want to change my estimate. I think I did too much last time. I think it's going to be about 6 liters.

Jamar I guessed too high last time, too. It's almost halfway through October, and we only have $2\frac{1}{2}$ liters of water. I think we'll only have about 5 liters by the end of the month.

Maya I think we should cross off 15 liters from the first time we made estimates. There's no way we're going to get 15 liters by the end of the month.

Teacher Thumbs up if you agree with Maya. OK, I see lots of thumbs up—I'll go ahead and cross off 15 liters.

How many liters of water do you think we will have collected by the end of the month?

<u>10 liters</u>	12 liters	<u>7 liters</u>	<u>4 liters</u>
15 liters	11 liters	13 liters	9 liters
4 liters	<u>5 liters</u>	$6\frac{1}{4}$ liters	<u>$5\frac{1}{2}$ liters</u>
8 liters	$6\frac{1}{2}$ liters	7 liters	$7\frac{1}{4}$ liters

The range of estimates students volunteer each time you conduct this activity will likely narrow, and you might note that with them. In general, our estimates become more accurate as we gather more information.



Activity 3

Put It on the Line, Game 2

Day 15

- 1 Display the copy of the Put It on the Line Game 2 Teacher Master you have prepared for this activity. As students watch, write 500 at the end of the line above the last box.
 - Give students a few moments to examine the sheet quietly. Then have them talk in pairs about the numbers that belong in the boxes, given that the line starts with 0 and ends with 500 today.
 - When they have had about half a minute to talk in pairs, invite volunteers to share their ideas with the class.

SUPPORT If students are at a loss, write the number 250 above the box in the middle of the line and ask again.
- 2 Have students find the Put It on the Line Record Sheet in their Number Corner Student Books. Explain that they'll use the bottom half of the page for today's game.
- 3 Briefly review the rules if necessary. Then play the game with the class following the same steps and rules as you did for the first game.



Notes About This Activity

You will need the Put It on the Line Game 2 Teacher Master prepared as described in the Preparation section, along with a red and a blue marker. The students will need their Number Corner Student Books, as well as regular, red, and blue pencils.

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Day 16

Date:

Calendar Grid	Calendar Collector	Computational Fluency
Activity 5 – Congruent Shapes (pg. 15)	<i>Update</i>	
Number Line	Solving Problems	Assessment



Activity 5

Congruent Shapes

Day 16

- 1 After students make predictions about the marker for today, post it on the Calendar Grid pocket chart, and have them share observations about the shape. Work with their input to update the Observations Chart.

Encourage them to use some of the geometry terms you've posted so far this month by challenging them to describe the shape as precisely as possible. By now, they should be able to identify the shape by counting the number of sides, tell whether or not the shape has one or more right angles, point out the acute and obtuse angles, tell whether or not the shape is concave, regular or irregular, identify any lines of symmetry, identify parallel lines, and provide the exact name of any quadrilateral.

- 2 Tell students that when all the markers are posted at the end of the month, there will be three pairs of congruent shapes in the set. Post the Word Resource Card for *congruent*, and ask students if they can figure out what the term means by looking at the pictures on the card.

Students Maybe it's something about triangles, because all the shapes on there are triangles.

I think those are all right triangles. Can I use the Right Angle Measure to find out?

I agree. Every one of those triangles has a square corner.

They're all the same, just turned different directions, I think.

- 3 After a minute or two of discussion, explain that if two figures are *congruent*, they are exactly the same shape and the same size. Then ask students if they can spot one pair of congruent shapes on the Calendar Grid and demonstrate to their classmates how they know for sure the two are the same shape and size.
 - Give them a minute to examine the Calendar Grid markers carefully and talk with one another to see if they can discover the congruent pair, and then choose three students to share their answers.
 - If no one has identified the congruent pair after three tries, tell students that the congruent shapes are pentagons.
 - At least a few students will likely discover that markers 7 and 11 are congruent, especially given your clue. If not, leave the question dangling for now, with an open invitation to students to solve the problem.
 - Let students know that by the end of the month, they'll be able to spot two more pairs of congruent shapes, and encourage them to be on the lookout as each new marker through the 31st is posted. (Markers 8 and 28, and markers 5 and 29 are those two pairs.)
- 4 Have the students locate the Polygon Concepts Review page in their Number Corner Student Books as you display your copy.
 - Explain that this is a very brief review of some of the things they've learned about geometry over the past few weeks.
 - Read and review with the class the tasks on the sheet, and clarify as necessary.
 - When students understand what to do, give them the remaining time to complete the assignment.

SUPPORT If some students aren't able to complete the page within the allotted time, allow them to finish it during a designated seatwork time, or take it home and return it to you the next day.



Update

Begin Updating After Activity 1. Follow this procedure every school day on which the Calendar Collector is not one of the designated activities.

Procedure

The calendar helper for the day adds 250 milliliters (ml) of tinted water to the 1-liter bottle currently in use and marks the water level on the masking tape running up the side of the bottle.

Note

Remember to fill the pitcher with colored water and put out a new liter bottle every few days. (If you forget, the students will most likely remind you.)

Literature Connections

This informative and amusing book about metric measurement would be a good choice this month.

Millions to Measure by
David Schwartz

Day 17

Date:

Calendar Grid	Calendar Collector	Computational Fluency
<i>Update</i>	<i>Update</i>	
Number Line	Solving Problems	Assessment
	Activity 1 – Problem Strings: Removing vs. Adding On (pg. 46)	

Update

Begin Updating After Activity 1. Follow this update procedure every school day that the Calendar Grid is not one of the designated activities.

Procedure

- Have a student helper post the calendar marker and fill in the Calendar Grid Observations Chart to show the date, shape name, color, and at least one other observation about the shape. You might choose to assign one student to take this role for the entire week.
- Challenge the student helpers to be as precise as possible about the name of the shape. If it is a quadrilateral, what kind of quadrilateral? If it is a triangle, is it equilateral, isosceles, or scalene? If it is a pentagon or a hexagon, is it regular or irregular?



Key Questions

Learning to search for, describe, and extend patterns facilitates algebraic thinking. Use any of the questions below to help your students think about this month's pattern:

- When do you think we'll see the next quadrilateral (triangle, pentagon, hexagon)? How can you tell?
- What is the name of the shape on today's marker? How do you know?
- What is it that makes these shapes all triangles (quadrilaterals, pentagons, hexagons)?
- What types of angles do you see in this shape—right, obtuse, or acute?
- Is this shape regular or irregular? How do you know?
- Can you spot two shapes on the Calendar Grid that are congruent? Which ones? How do you know they're congruent?
- Describe the shape on today's marker in as much detail as you can.
- I'm thinking of one of the markers we can see on the Calendar Grid. On this marker there is a polygon with 3 sides and 1 right angle. Which marker am I thinking of?
- I'm thinking of one of the markers we can see on the Calendar Grid. On this marker there is a polygon with 4 sides and 4 right angles. Which marker am I thinking of?



Update

Begin Updating After Activity 1. Follow this procedure every school day on which the Calendar Collector is not one of the designated activities.

Procedure

The calendar helper for the day adds 250 milliliters (ml) of tinted water to the 1-liter bottle currently in use and marks the water level on the masking tape running up the side of the bottle.

Note

Remember to fill the pitcher with colored water and put out a new liter bottle every few days. (If you forget, the students will most likely remind you.)

Literature Connections

This informative and amusing book about metric measurement would be a good choice this month.

Millions to Measure by
David Schwartz



Activity 1

Problem Strings

Days 4, 9, 17

- 1 Follow the procedure you established in September to deliver each week's problem string.
 - Ask students turn to the next blank page of the Problem String Workspace in their Number Corner Student Books and write today's date.
 - Deliver each problem in the string one at a time.
 - » Have students record and solve the problem in their Student Books.
 - » Have them put up their thumbs when they are ready to share their solutions and strategies.
 - » When you see several thumbs up, invite a few students to share the answer. Record all answers without comment or indication that any of them are correct or incorrect.
 - » Then invite two or three volunteers to explain how they got their answers.
 - » Record students' thinking on a number line model on the board (or a piece of chart paper) for everyone to see.
- 2 Conclude the activity by asking students to reflect briefly on the string.
 - Ask students to share, first in pairs and then as a group, a one-sentence statement about something they learned in today's string.
 - Invite students to write a simple statement beneath their work in the Student Book describing what they learned while doing this string.

***Students** (Referring to Problem String 4) It's easy to subtract if you just go back by tens.*

It's even faster if you can go by bigger friendly numbers, like 20 or 30.

You can just go back 10, 10, 10, however many times, and then subtract the rest of the number at the end.

***Students** (Referring to Problem String 5) I think if you're really close to a ten, you should just go back that much. After that, it's really easy to go back by 10s, and you can take away the rest when you get to the very end.*

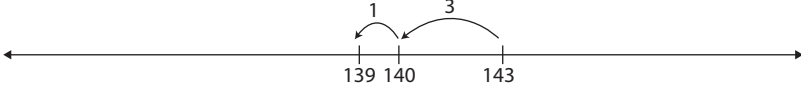

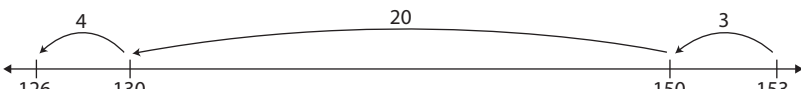
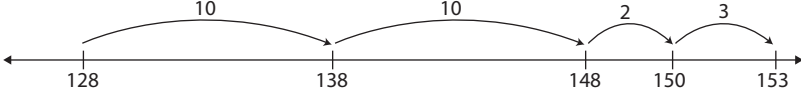
Just get to the nearest friendly number, and then keep on going.

It's really fast if you go back to the nearest ten, then just take one or two big jumps instead of going 10, 10, 10, 10. Then if there's a little more to take away at the end, it's easy because you're already on a ten.

Removing vs. Adding On

Day 17

Students will share a variety of strategies for these problems. Model all of their strategies on the number line. This string is designed to elicit a discussion about removing versus adding on to solve subtraction problems. Many students are likely to make backward hops using one of the strategies already explored this month to solve the first three combinations. The fourth combination, $153 - 128$, might inspire a few students to add on rather than going through the very tedious process of making backward jumps to take 128 away from 153. If not, you can share the strategy yourself, and use the last two combinations in the string to revisit and discuss the advantages of adding on rather than removing to solve combinations in which the minuend and subtrahend are close together.

Problems	Sample Strategies & Recording	Connections
$143 - 4$	 $143 - 3 = 140$ $140 - 1 = 139$	In all three of these problems, the subtrahend is quite small compared to the minuend, which makes jumping back by the subtrahend sensible and efficient.
$143 - 7$	 $143 - 3 = 140$ $140 - 4 = 136$	Big Idea When the subtrahend is much smaller than the minuend, it can be efficient to take the subtrahend away from the minuend or to make backward jumps equal to the subtrahend from the minuend to find the difference.
$153 - 27$	 $153 - 3 = 150$ $150 - 20 = 130$ $130 - 4 = 126$	
$153 - 128$	<p>Students are likely to find it easier to start at the subtrahend instead of the minuend, then add in easy-to-calculate increments.</p>  $128 + 10 = 138$ $138 + 10 = 148$ $148 + 2 = 150$ $150 + 3 = 153$ $10 + 10 + 2 + 3 = 25$ <p>which means $128 + 25 = 153$ so $153 - 128 = 25$</p>	
$265 - 19$	See the jumping back strategies for the first three problems.	We want students to have the opportunity to think about which strategy makes the best sense: adding up or jumping back/removing. You'll revisit the adding on strategy for finding the difference in future Problem String workouts.
$265 - 229$	See the adding on strategy for $153 - 128$.	

Day 18

Date:

Calendar Grid	Calendar Collector	Computational Fluency
<i>Update</i>	<i>Update</i>	
Number Line	Solving Problems	Assessment
		Number Corner Checkup 1 – Part 1 (pg. 48)

Update

Begin Updating After Activity 1. Follow this update procedure every school day that the Calendar Grid is not one of the designated activities.

Procedure

- Have a student helper post the calendar marker and fill in the Calendar Grid Observations Chart to show the date, shape name, color, and at least one other observation about the shape. You might choose to assign one student to take this role for the entire week.
- Challenge the student helpers to be as precise as possible about the name of the shape. If it is a quadrilateral, what kind of quadrilateral? If it is a triangle, is it equilateral, isosceles, or scalene? If it is a pentagon or a hexagon, is it regular or irregular?



Key Questions

Learning to search for, describe, and extend patterns facilitates algebraic thinking. Use any of the questions below to help your students think about this month's pattern:

- When do you think we'll see the next quadrilateral (triangle, pentagon, hexagon)? How can you tell?
- What is the name of the shape on today's marker? How do you know?
- What is it that makes these shapes all triangles (quadrilaterals, pentagons, hexagons)?
- What types of angles do you see in this shape—right, obtuse, or acute?
- Is this shape regular or irregular? How do you know?
- Can you spot two shapes on the Calendar Grid that are congruent? Which ones? How do you know they're congruent?
- Describe the shape on today's marker in as much detail as you can.
- I'm thinking of one of the markers we can see on the Calendar Grid. On this marker there is a polygon with 3 sides and 1 right angle. Which marker am I thinking of?
- I'm thinking of one of the markers we can see on the Calendar Grid. On this marker there is a polygon with 4 sides and 4 right angles. Which marker am I thinking of?



Update

Begin Updating After Activity 1. Follow this procedure every school day on which the Calendar Collector is not one of the designated activities.

Procedure

The calendar helper for the day adds 250 milliliters (ml) of tinted water to the 1-liter bottle currently in use and marks the water level on the masking tape running up the side of the bottle.

Note

Remember to fill the pitcher with colored water and put out a new liter bottle every few days. (If you forget, the students will most likely remind you.)

Literature Connections

This informative and amusing book about metric measurement would be a good choice this month.

Millions to Measure by
David Schwartz



Number Corner Checkup 1, Part 1

Completing Pages 1 & 2

Day 18

- 1 Open the session by explaining 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 in the next day or so.
 Explain that 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 Number Corner Checkup 1, pages 1 and 2, and give each student a copy of both sheets.
 - Give students a few moments to examine the sheets quietly, and have them get out their pencils and red crayons for today's problems.
 - Using your copy of the first sheet, show students how to write their name and date at the top on the lines provided.
 - Have a helper place a small stack of scratch paper at each table or near each cluster of desks. Let students know they can use these materials to help with problems as needed.
- 3 Read the instructions at the top of page 1 and explain that the first problem is timed, but the rest of the problems on today's part of the checkup are not.
 - Let students know that you are going to give them 1 minute to complete as many of the multiplication combinations as they can.
 - Give them a few moments to examine the combinations carefully, looking for those that seem easiest. Let them know that they can skip over combinations that seem difficult and come back to them when they're finished if they still have time.
 - Note with students that the combinations involve multiplication facts through 6×6 but not beyond. By asking them to complete 20 combinations in a minute or less, you're offering them the opportunity to show how fluent they are with these types of facts.
 - Show them the clock or timer you plan to use. Explain that they'll start when you give the signal, work for a minute, and then stop when you give the signal. Then you'll ask them to draw a line with red crayon right after the last combination they completed so you can see how far they got.
- 4 When students understand how the timing will work, administer problem 1 as described in step 3 above.

Assessment Guide

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

- 5 Use the display copy of the checkup to review the rest of the items on the first and second pages with the class.
 - Read each problem out loud, and clarify as needed.
 - Remind students that they can do some of their figuring on the scratch paper, but they need to show all their work very clearly on the assessment itself.
- 6 When students understand what to do, give them time to complete the assessment.
 - While students work independently, circulate to observe how they work and to answer questions as needed.
 - Ask students who finish before their classmates to double-check their work, and then read or draw quietly until everyone else is done.

SUPPORT None of the items except the first one on this assessment need to be timed. If there are students who are unable to complete the assessment in the given amount of time, have them do later, perhaps during math stations or a seatwork period.

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Day 19

Date:

Calendar Grid	Calendar Collector	Computational Fluency
<i>Update</i>	<i>Update</i>	
Number Line	Solving Problems	Assessment
		Number Corner Checkup 1 – Part 2 (pg. 49)

Update

Begin Updating After Activity 1. Follow this update procedure every school day that the Calendar Grid is not one of the designated activities.

Procedure

- Have a student helper post the calendar marker and fill in the Calendar Grid Observations Chart to show the date, shape name, color, and at least one other observation about the shape. You might choose to assign one student to take this role for the entire week.
- Challenge the student helpers to be as precise as possible about the name of the shape. If it is a quadrilateral, what kind of quadrilateral? If it is a triangle, is it equilateral, isosceles, or scalene? If it is a pentagon or a hexagon, is it regular or irregular?



Key Questions

Learning to search for, describe, and extend patterns facilitates algebraic thinking. Use any of the questions below to help your students think about this month's pattern:

- When do you think we'll see the next quadrilateral (triangle, pentagon, hexagon)? How can you tell?
- What is the name of the shape on today's marker? How do you know?
- What is it that makes these shapes all triangles (quadrilaterals, pentagons, hexagons)?
- What types of angles do you see in this shape—right, obtuse, or acute?
- Is this shape regular or irregular? How do you know?
- Can you spot two shapes on the Calendar Grid that are congruent? Which ones? How do you know they're congruent?
- Describe the shape on today's marker in as much detail as you can.
- I'm thinking of one of the markers we can see on the Calendar Grid. On this marker there is a polygon with 3 sides and 1 right angle. Which marker am I thinking of?
- I'm thinking of one of the markers we can see on the Calendar Grid. On this marker there is a polygon with 4 sides and 4 right angles. Which marker am I thinking of?



Update

Begin Updating After Activity 1. Follow this procedure every school day on which the Calendar Collector is not one of the designated activities.

Procedure

The calendar helper for the day adds 250 milliliters (ml) of tinted water to the 1-liter bottle currently in use and marks the water level on the masking tape running up the side of the bottle.

Note

Remember to fill the pitcher with colored water and put out a new liter bottle every few days. (If you forget, the students will most likely remind you.)

Literature Connections

This informative and amusing book about metric measurement would be a good choice this month.

Millions to Measure by
David Schwartz



Number Corner Checkup 1, Part 2

Completing Pages 3–5

Day 19

- 1 Let students know that they are going to do the second part of the first Number Corner Checkup today.
Have them get out their pencils and crayons (including a yellow crayon) for today's problems.
- 2 Display your copy of Number Corner Checkup 1, pages 3–5, and give each student a copy.
 - Give students a few moments to examine the three sheets quietly.
 - Have a helper place a small stack of scratch paper at each table or near each cluster of desks. Let students know they can use these materials to help with problems as needed.
- 3 Use the display copy of the checkup to review the items on the three pages with the class.
 - Read each problem out loud, and clarify as needed.
 - Remind students that they can do some of their figuring on the scratch paper, but they need to show all their work very clearly on the assessment itself.
 - Let students know that this is not a reading test. They can raise their hand and ask for help to read a problem during the assessment if they need it.
- 4 When students understand what to do, give them time to complete the assessment.
 - While students work independently, circulate to observe how they work and to answer questions as needed.
 - Ask students who finish before their classmates to double-check their work, and then read or draw quietly until everyone else is done.

SUPPORT None of the items on this part of the assessment need to be timed. If there are students who are unable to complete the assessment in the given amount of time, have them do later, perhaps during math stations or a seatwork period.

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Day 20

Date:

Calendar Grid	Calendar Collector	Computational Fluency
<i>Update</i>	Activity 4 – Total Volume of the Collection (pg. 26)	
Number Line	Solving Problems	Assessment

Update

Begin Updating After Activity 1. Follow this update procedure every school day that the Calendar Grid is not one of the designated activities.

Procedure

- Have a student helper post the calendar marker and fill in the Calendar Grid Observations Chart to show the date, shape name, color, and at least one other observation about the shape. You might choose to assign one student to take this role for the entire week.
- Challenge the student helpers to be as precise as possible about the name of the shape. If it is a quadrilateral, what kind of quadrilateral? If it is a triangle, is it equilateral, isosceles, or scalene? If it is a pentagon or a hexagon, is it regular or irregular?



Key Questions

Learning to search for, describe, and extend patterns facilitates algebraic thinking. Use any of the questions below to help your students think about this month's pattern:

- When do you think we'll see the next quadrilateral (triangle, pentagon, hexagon)? How can you tell?
- What is the name of the shape on today's marker? How do you know?
- What is it that makes these shapes all triangles (quadrilaterals, pentagons, hexagons)?
- What types of angles do you see in this shape—right, obtuse, or acute?
- Is this shape regular or irregular? How do you know?
- Can you spot two shapes on the Calendar Grid that are congruent? Which ones? How do you know they're congruent?
- Describe the shape on today's marker in as much detail as you can.
- I'm thinking of one of the markers we can see on the Calendar Grid. On this marker there is a polygon with 3 sides and 1 right angle. Which marker am I thinking of?
- I'm thinking of one of the markers we can see on the Calendar Grid. On this marker there is a polygon with 4 sides and 4 right angles. Which marker am I thinking of?



Activity 4

Total Volume of the Collection

Day 20

- 1 Work with the class to update the collection and the record sheet one last time.
 - When you're finished, take a minute or two to compare the final volume with the estimates students have made.
 - » Are they surprised at the amount?
 - » Does it seem like more or less than they thought it would be?
 - If the tinted water were their favorite kind of juice, how many servings would it provide? Why?
- 2 Display your copy of the Solving Liquid Volume Story Problems as students find the page in their Number Corner Student Books.

Review the instructions and the problems with the class, and clarify as needed.

CHALLENGE You can assign the challenge problem at the bottom of the page to some or all students, or give students the option of whether or not they want to tackle it.
- 3 When students understand what to do, give them the remainder of the Number Corner period to complete the assignment.
 - Circulate as students are working to observe and assist as needed.
 - As they finish, have students share and compare their strategies and solutions with at least one classmate. If they have different answers to one or more of the problems, encourage them to work together to find the actual solution.

SUPPORT If some of the students aren't able to complete the assignment in the allotted time, allow them to finish their work later.

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