

# Eureka Math™

## Grade K Module 6

### Teacher Edition

**Published by the non-profit GREAT MINDS®.**

Copyright © 2015 Great Minds. No part of this work may be reproduced, sold, or commercialized, in whole or in part, without written permission from Great Minds. Non-commercial use is licensed pursuant to a Creative Commons Attribution-NonCommercial-ShareAlike 4.0 license; for more information, go to <http://greatminds.org/maps/math/copyright>. “Great Minds” and “Eureka Math” are registered trademarks of Great Minds.

Printed in the U.S.A.

This book may be purchased from the publisher at [eureka-math.org](http://eureka-math.org)

10 9 8 7 6 5 4 3 2

GK-M6-TE-1.3.1-10.2016

## ***Eureka Math: A Story of Units Contributors***

Katrina Abdussalaam, Curriculum Writer  
Tiah Alphonso, Program Manager—Curriculum Production  
Kelly Alsup, Lead Writer / Editor, Grade 4  
Catriona Anderson, Program Manager—Implementation Support  
Debbie Andorka-Aceves, Curriculum Writer  
Eric Angel, Curriculum Writer  
Leslie Arceneaux, Lead Writer / Editor, Grade 5  
Kate McGill Austin, Lead Writer / Editor, Grades PreK–K  
Adam Baker, Lead Writer / Editor, Grade 5  
Scott Baldridge, Lead Mathematician and Lead Curriculum Writer  
Beth Barnes, Curriculum Writer  
Bonnie Bergstresser, Math Auditor  
Bill Davidson, Fluency Specialist  
Jill Diniz, Program Director  
Nancy Diorio, Curriculum Writer  
Nancy Doorey, Assessment Advisor  
Lacy Endo-Peery, Lead Writer / Editor, Grades PreK–K  
Ana Estela, Curriculum Writer  
Lessa Faltermann, Math Auditor  
Janice Fan, Curriculum Writer  
Ellen Fort, Math Auditor  
Peggy Golden, Curriculum Writer  
Maria Gomes, Pre-Kindergarten Practitioner  
Pam Goodner, Curriculum Writer  
Greg Gorman, Curriculum Writer  
Melanie Gutierrez, Curriculum Writer  
Bob Hollister, Math Auditor  
Kelley Isinger, Curriculum Writer  
Nuhad Jamal, Curriculum Writer  
Mary Jones, Lead Writer / Editor, Grade 4  
Halle Kananak, Curriculum Writer  
Susan Lee, Lead Writer / Editor, Grade 3  
Jennifer Loftin, Program Manager—Professional Development  
Soo Jin Lu, Curriculum Writer  
Nell McAnelly, Project Director

Ben McCarty, Lead Mathematician / Editor, PreK–5  
Stacie McClintock, Document Production Manager  
Cristina Metcalf, Lead Writer / Editor, Grade 3  
Susan Midlarsky, Curriculum Writer  
Pat Mohr, Curriculum Writer  
Sarah Oyler, Document Coordinator  
Victoria Peacock, Curriculum Writer  
Jenny Petrosino, Curriculum Writer  
Terrie Poehl, Math Auditor  
Robin Ramos, Lead Curriculum Writer / Editor, PreK–5  
Kristen Riedel, Math Audit Team Lead  
Cecilia Rudzitis, Curriculum Writer  
Tricia Salerno, Curriculum Writer  
Chris Sarlo, Curriculum Writer  
Ann Rose Sentoro, Curriculum Writer  
Colleen Sheeron, Lead Writer / Editor, Grade 2  
Gail Smith, Curriculum Writer  
Shelley Snow, Curriculum Writer  
Robyn Sorenson, Math Auditor  
Kelly Spinks, Curriculum Writer  
Marianne Strayton, Lead Writer / Editor, Grade 1  
Theresa Streeter, Math Auditor  
Lily Talcott, Curriculum Writer  
Kevin Tougher, Curriculum Writer  
Saffron VanGalder, Lead Writer / Editor, Grade 3  
Lisa Watts-Lawton, Lead Writer / Editor, Grade 2  
Erin Wheeler, Curriculum Writer  
MaryJo Wieland, Curriculum Writer  
Allison Witcraft, Math Auditor  
Jessa Woods, Curriculum Writer  
Hae Jung Yang, Lead Writer / Editor, Grade 1

## **Board of Trustees**

Lynne Munson, President and Executive Director of Great Minds

Nell McAnelly, Chairman, Co-Director Emeritus of the Gordon A. Cain Center for STEM Literacy at Louisiana State University

William Kelly, Treasurer, Co-Founder and CEO at ReelDx

Jason Griffiths, Secretary, Director of Programs at the National Academy of Advanced Teacher Education

Pascal Forgione, Former Executive Director of the Center on K-12 Assessment and Performance Management at ETS

Lorraine Griffith, Title I Reading Specialist at West Buncombe Elementary School in Asheville, North Carolina

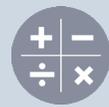
Bill Honig, President of the Consortium on Reading Excellence (CORE)

Richard Kessler, Executive Dean of Mannes College the New School for Music

Chi Kim, Former Superintendent, Ross School District

Karen LeFever, Executive Vice President and Chief Development Officer at ChanceLight Behavioral Health and Education

Maria Neira, Former Vice President, New York State United Teachers



## Table of Contents

**GRADE K • MODULE 6**

## Analyzing, Comparing, and Composing Shapes

<b>Module Overview</b> .....	2
Topic A: Building and Drawing Flat and Solid Shapes .....	7
Topic B: Composing and Decomposing Shapes .....	64
<b>End-of-Module Assessment and Rubric</b> .....	104
<b>Answer Key</b> .....	113

## Grade K • Module 6

# Analyzing, Comparing, and Composing Shapes

## OVERVIEW

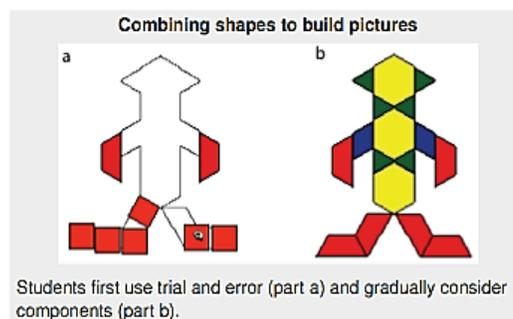
The kindergarten chapter of *A Story of Units* comes to a close with another opportunity for students to explore geometry. Throughout the year, students have built an intuitive understanding of two- and three-dimensional figures by examining exemplars, variants, and non-examples. They have used geometry as a context for exploring numerals as well as comparing attributes and quantities. To wrap up the year, students further develop their spatial reasoning skills and begin laying the groundwork for an understanding of area through composition of geometric figures.

Topic A begins with students applying their knowledge of attributes to analyze two- and three-dimensional shapes from the real world and to construct models using straws and clay (**K.G.5**). “Let’s use the straws to make the sides of the rectangle, and we’ll stick the straws together at each corner using clay!” Students use their understanding of ordination to thirds to share and communicate the systematic construction of flats and solids. “First, I cut four straws to be the same length. Second, I made a square by placing the four straws so they look like a frame. Third, I connected the sides at the corners with four little clay balls” (**K.CC.4d**).

As in Module 2, students explore the relationship between flats and solids, this time using flats to build solids. “I made my square into a cube. First, I made another square the same size. Second, I attached the two squares with four straws the same length.” They also apply their knowledge of ordinal numbers to describe the relative position of shapes within a set (**K.CC.4d**). “The yellow circle is first, and the red square is tenth.”

The lessons of Topic B focus on composition and decomposition of flat shapes (**K.G.6**). Students begin by using flats to compose geometric shapes. “I put two triangles together to make a square.” They then decompose shapes by covering part of a larger shape with a smaller shape and analyzing the remaining space. “When I cover part of my square with this triangle, I can see another triangle in the empty space.”<sup>1</sup>

As they build competence in combining and composing shapes, students build toward more complex pictures and designs. Students progress through stages as they build competence in combining shapes to form pictures, beginning with trial and error and gradually considering the systematic combination of components. “This square fits here because the corners match the puzzle.” The culminating task of this module is set up as a Math Olympics, a celebration of student learning from the whole year. Students complete tasks related to number, measurement, operations, and geometry.



<sup>1</sup>This descriptive image plus further clarification is found in the Geometry progressions document, p. 7.

Composition and decomposition of geometric figures reinforce the idea that smaller units can combine to form larger units. This concept, central to *A Story of Units*, underlies not only area concepts but also the base ten number system. Students leave this module and the kindergarten year prepared to tackle the mathematical concepts of Grade 1 and beyond.

### Notes on Pacing for Differentiation

K.CC.4d is a NY specific standard, addressing ordinal numbers and relative position. Some states or districts might opt to include, omit, or replace this standard. Using ordinal words to describe a procedure is included in Lesson 1 and parts of Lesson 5, as well as the Application Problems in Lessons 4, 5, and 6. Consider omitting pertinent lessons partly or entirely. The fluency activity “If You’re Happy and You Know It” in Lesson 1 might be omitted as well, since it prepares students to work with that content.

Another aspect of the standard asks students to use ordinal numbers to describe relative position. If pacing is a challenge and the standard is not required, consider omitting Lesson 4 and the fluency activity “Finish Line” from Lesson 5.

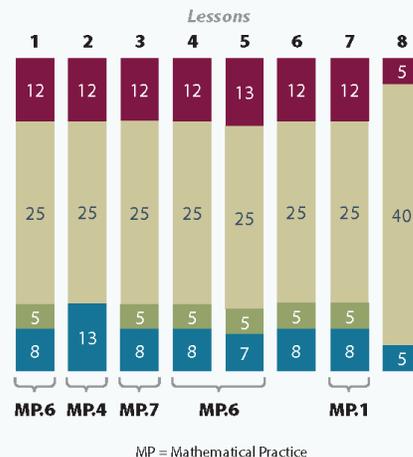
Even in schools where teaching ordinal numbers and relative position is required, there are many possibilities for embedding the concept throughout the school day in practical applications (e.g., lining up for recess, lunch, or water). The concept might also appear as part of language arts or science where students use sequence vocabulary (e.g., the steps in making a cheese sandwich or the steps in the growth of a seed).



### Distribution of Instructional Minutes

This diagram represents a suggested distribution of instructional minutes based on the emphasis of particular lesson components in different lessons throughout the module.

- Fluency Practice
- Concept Development
- Application Problems
- Student Debrief



## Focus Grade Level Standards

### Count to tell the number of objects.<sup>2</sup>

- K.CC.4** Understand the relationship between numbers and quantities; connect counting to cardinality.
- d. Develop understanding of ordinal numbers (first through tenth) to describe the relative position and magnitude of whole numbers.

### Analyze, compare, create, and compose shapes.<sup>3</sup>

- K.G.5** Model shapes in the world by building shapes from components (e.g., sticks and clay balls) and drawing shapes.
- K.G.6** Compose simple shapes to form larger shapes. *For example, “Can you join these two triangles with full sides touching to make a rectangle?”*

## Foundational Standards

- PK.CC.6** Identify “first” and “last” related to order or position.
- PK.G.3** Analyze, compare, and sort two- and three-dimensional shapes and objects, in different sizes, using informal language to describe their similarities, differences, and other attributes (e.g., color, size, and shape).
- PK.G.4** Create and build shapes from components (e.g., sticks and clay balls).

## Focus Standards for Mathematical Practice

- MP.1** **Make sense of problems and persevere in solving them.** Students persist in their use of trial and error until they begin to use the attributes of a puzzle to determine which shape fits into an open space. “The empty space has a long side like my triangle. Let’s see if my triangle fits.”
- MP.4** **Model with mathematics.** Students use shapes to create pictures of common objects and use straws and clay to create models of two- and three-dimensional objects in their environment.
- MP.6** **Attend to precision.** Ordinal numbers provide students with vocabulary to precisely describe the spatial organization of ten shapes in a straight line.
- MP.7** **Look for and make use of structure.** Students make use of their understanding of a shape’s attributes to build three-dimensional shapes from two-dimensional shapes.

---

<sup>2</sup>The balance of this cluster is addressed in Modules 1 and 5. This module addresses ordinality, part d of K.CC.4 which was added by New York State. Ordinality is introduced in the context of constructing and manipulating shapes. Check your state and local standards to determine whether ordinality is an expectation for your students.

<sup>3</sup>K.G.4 is addressed in Module 2.

## Overview of Module Topics and Lesson Objectives

Standards	Topics and Objectives	Days
K.CC.4d K.G.5 K.G.2 K.G.4	A <b>Building and Drawing Flat and Solid Shapes</b> Lesson 1: Describe the systematic construction of flat shapes using ordinal numbers. Lesson 2: Build flat shapes with varying side lengths and record with drawings. Lesson 3: Compose solids using flat shapes as a foundation. Lesson 4: Describe the relative position of shapes using ordinal numbers.	4
K.G.6 K.G.1 K.G.4	B <b>Composing and Decomposing Shapes</b> Lesson 5: Compose flat shapes using pattern blocks and drawings. Lesson 6: Decompose flat shapes into two or more shapes. Lesson 7: Compose simple shapes to form a larger shape described by an outline. Lesson 8: Culminating task—review selected topics to create a cumulative year-end project.	4
	End-of-Module Assessment: Topics A–B	2
<b>Total Number of Instructional Days</b>		<b>10</b>

## Terminology

### New or Recently Introduced Terms

- First, second, third, fourth, fifth, sixth, seventh, eighth, ninth, tenth (ordinal numbers)

### Familiar Terms and Symbols<sup>4</sup>

- Above, below, beside, in front of, next to, behind (position words)
- Circle
- Cone (three-dimensional shape)
- Cube (three-dimensional shape)
- Cylinder (three-dimensional shape)
- Face (two-dimensional side of a three-dimensional shape)
- Flat (two-dimensional shape)
- Hexagon (flat figure enclosed by six straight sides)



<sup>4</sup>These are terms and symbols students have seen previously.

- Rectangle (flat figure enclosed by four straight sides)
- Solid (three-dimensional shape)
- Sphere (three-dimensional shape)
- Square (flat figure enclosed by four straight, equal sides)
- Triangle (flat figure enclosed by three straight sides)



## Suggested Tools and Representations

- Pattern block activity cards or attribute block activity cards
- Three-dimensional shapes: cone, sphere, cylinder, and cube
- Two-dimensional shapes: circle, hexagon, rectangle, square, and triangle



## Homework

Homework at the K–1 level is not a convention in all schools. In this curriculum, homework is an opportunity for additional practice of the content from the day's lesson. The teacher is encouraged, with the support of parents, administrators, and colleagues, to discern the appropriate use of homework for his students. Fluency exercises can also be considered as an alternative homework assignment.

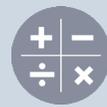
## Scaffolds<sup>5</sup>

The scaffolds integrated into *A Story of Units* give alternatives for how students access information as well as express and demonstrate their learning. Strategically placed margin notes are provided within each lesson elaborating on the use of specific scaffolds at applicable times. They address many needs presented by English language learners, students with disabilities, students performing above grade level, and students performing below grade level. Many of the suggestions are organized by Universal Design for Learning (UDL) principles and are applicable to more than one population. To read more about the approach to differentiated instruction in *A Story of Units*, please refer to “How to Implement *A Story of Units*.”

## Assessment Summary

Type	Administered	Format	Standards Addressed
End-of-Module Assessment Task	After Topic B	Constructed response with rubric	K.CC.4d K.G.5 K.G.6
Culminating Task	Lesson 8	Collaborative project: Review selected topics to create a cumulative year-end project.	K.G.6

<sup>5</sup>Students with disabilities may require Braille, large print, audio, or special digital files. Please visit the website [www.p12.nysed.gov/specialed/aim](http://www.p12.nysed.gov/specialed/aim) for specific information on how to obtain student materials that satisfy the National Instructional Materials Accessibility Standard (NIMAS) format.



## Topic A

# Building and Drawing Flat and Solid Shapes

**K.CC.4d, K.G.5, K.G.2, K.G.4**

<b>Focus Standards:</b>	K.CC.4	Understand the relationship between numbers and quantities; connect counting to cardinality. d. Develop understanding of ordinal numbers (first through tenth) to describe the relative position and magnitude of whole numbers.
	K.G.5	Model shapes in the world by building shapes from components (e.g., sticks and clay balls) and drawing shapes.
<b>Instructional Days:</b>	4	
<b>Coherence -Links from:</b>	GPK–M2	Shapes
<b>-Links to:</b>	G1–M5	Identifying, Composing, and Partitioning Shapes

In this final kindergarten module, students extend and build upon their learning about two- and three-dimensional shapes from Module 2. Students use their knowledge about common features of flats and solids to create, construct, and compose shapes by building and drawing. Throughout, they use ordinal numbers to describe the systematic construction of their flats (**K.CC.4d**).

Lesson 1 asks students to apply their knowledge of shape attributes (number and type of sides and corners) by constructing flat shapes using straws and clay (**K.G.5**). For example, when constructing a triangle, the student uses three equal, unconnected straws and connects the endpoints to form a three-sided, closed figure. This represents a departure from viewing the figure as being inclusive of the interior to now considering the shape as represented only by the outline, a perspective that eventually develops into formal definitions of triangles, quadrilaterals, and polygons (e.g., a triangle is formally defined in Grade 4 as consisting of three non-collinear points together with the three segments joining them). Students use ordination to thirds to tell the steps they take to build their flat shapes (**K.CC.4d**).

In Lesson 2, students investigate whether varied side length affects their ability to construct a shape. “What happens if I use two long straws and one short straw to build my triangle?”



3 equal straws



3 unequal straws

Lessons 3 and 4 build upon the comparisons students made between two- and three-dimensional shapes in Module 2 (**K.G.4**). In Lesson 3, students use the flats created from straws and clay in Lesson 1 as the foundation for composing solids that model real-world shapes and figures (**K.G.5**). They use these solids to count faces, edges, and corners. In Lesson 4, they relate spatial understanding (relative position) and number (magnitude) by using ordinal numbers to describe the position of flat shapes within a set of 10 (**K.CC.4d**).

### A Teaching Sequence Toward Mastery of Building and Drawing Flat and Solid Shapes

**Objective 1: Describe the systematic construction of flat shapes using ordinal numbers.**  
(Lesson 1)

**Objective 2: Build flat shapes with varying side lengths and record with drawings.**  
(Lesson 2)

**Objective 3: Compose solids using flat shapes as a foundation.**  
(Lesson 3)

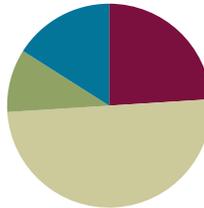
**Objective 4: Describe the relative position of shapes using ordinal numbers.**  
(Lesson 4)

## Lesson 1

**Objective:** Describe the systematic construction of flat shapes using ordinal numbers.

### Suggested Lesson Structure

■ Fluency Practice	(12 minutes)
■ Application Problem	(5 minutes)
■ Concept Development	(25 minutes)
■ Student Debrief	(8 minutes)
<b>Total Time</b>	<b>(50 minutes)</b>



### Fluency Practice (12 minutes)

- Count to 100 by Ones **K.CC.1** (3 minutes)
- If You're Happy and You Know It **K.CC.4d** (5 minutes)
- Peek-a-Boo Shapes **K.G.2** (4 minutes)

### Count to 100 by Ones (3 minutes)

Materials: (S) Rekenrek dot paper (Fluency Template 1)

Note: This activity maintains the rote counting skills acquired in Module 5 and calls attention to the structure of numbers to 100 with the use of the Rekenrek's rows of 10 and the verbal cue as they cross decades.

Students count to 100 (or as high as they can in three minutes) by touching the beads on the Rekenrek dot paper. Have them say "buzz" after the last number of each row.

### If You're Happy and You Know It (5 minutes)

Note: This fun, familiar song gives students the opportunity to practice putting events in sequence, preparing them for today's work with ordinal numbers and step-by-step procedures.

T: Raise your hand if you know the song "If You're Happy and You Know It."

S: (Raise hands.)

T: Even if you don't know all of the words, you can still do all of the moves, and that's the part that will help us in math today. We'll sing the song three times and use a different movement each time.

Then, we'll sing it a final time and put all three movements together. Ready?

Verse 1: If you're happy and you know it, clap your hands. (Clap, clap.)

Verse 2: If you're happy and you know it, stomp your feet. (Stomp, stomp.)

Verse 3: If you're happy and you know it, shout "hooray." ("Hooray!")

Verse 4 (combined): If you're happy and you know it, do all three. (Clap, clap. Stomp, stomp. "Hooray!")

Invite students to make up three new verses and actions and then to combine all three at the end.

### Peek-a-Boo Shapes (4 minutes)

Materials: (T) Shape cutouts (Fluency Template 2)

Note: This quick review of the work of Module 2 prepares students to work with flat shapes in today's lesson.

Show students each shape briefly, and then take it out of view. Remind students beforehand that they are to use the *listen, think, raise your hand, wait for the snap* procedure to name the shape in choral response. Start with easy shapes to build confidence, and then steadily increase the level of difficulty. After they have named the shapes, have students tell the number of sides.

### Application Problem (5 minutes)

Materials: (S) Markers, paper

We are going to be talking about shapes again! Draw several things you saw this past week that looked like shapes you know. What are the different shapes called?

Share your picture with your partner. Talk about each of the shapes and how you knew its name. Does your partner agree with you?

Note: Use this time to review the definitions of squares, circles, rectangles, triangles, and hexagons with students. Circulate to ensure accuracy in students' definitions and precision in their discussions. Coupled with the fluency work, the Application Problem serves as a brief review prior to construction of shapes in today's lesson.



#### NOTES ON MULTIPLE MEANS OF REPRESENTATION:

Help English language learners work with partners by giving them sentence starters, such as "This is a \_\_\_ because it has \_\_\_ sides," and "I drew a \_\_\_, which has \_\_\_ corners." Be sure to post labeled pictures of shapes on the word wall to which students can refer.

### Concept Development (25 minutes)

Materials: (S) 15 coffee stir sticks or similar material marked at the midpoint with permanent marker, scissors, small ball of clay, pencil, piece of construction paper, ruler

T: Listen to my directions. **First**, stand up. **Second**, put your hands on your shoulders. Go!

S: (Stand up, and then put hands on their shoulders.)

T: What did I ask you to do first?

S: Stand up!

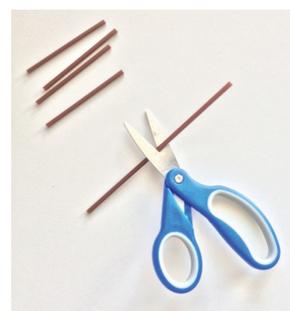
- T: What was the second thing I asked you to do?
- S: Put our hands on our shoulders.
- T: Good! Please sit down. Listen to my directions. First, stand up. Second, put your hands on your shoulders. **Third**, jump up and down 3 times! (Allow time for activity.) Please sit down. What did I ask you to do first?
- S: Stand up!
- T: What was the second thing I asked you to do?
- S: Put our hands on our shoulders.
- T: And the third thing?
- S: Jump up and down!
- T: Good listening! Let's play one more time. Listen carefully! First, clap two times. Second, stomp three times. Third, shout "Hooray!" once. (Allow time for activity.) What did you do first?
- S: Clapped two times!
- T: Second?
- S: We stomped three times!
- T: Third?
- S: We shouted "Hooray!"
- T: You are going to be builders today. We are going to make shapes. Look at the materials you have. What do you notice?
- S: We have some sticks! → There is clay, too.
- T: Pick up your sticks, and arrange them on your desk. Try to make a shape. Who has an idea?
- S: I used four sticks. I made a square.
- T: How do you know it is a square?
- S: There are four sides, and they are all the same! → It has four corners. → It is closed.
- T: Did anyone think of something else?
- S: I only used three sticks. I made a triangle.
- T: How do you know it is a triangle?
- S: There are three straight sides. → There are three corners, and they are all connected.
- T: We are going to practice more shape making. First, use your scissors to cut each of your sticks at the mark in the middle. Second, arrange your little sticks to make different flat shapes. Third, use bits of clay to connect the corners of your new shapes.

MP.6

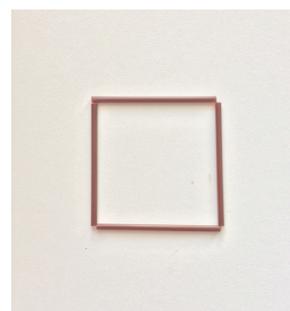


### NOTES ON MULTIPLE MEANS OF ENGAGEMENT:

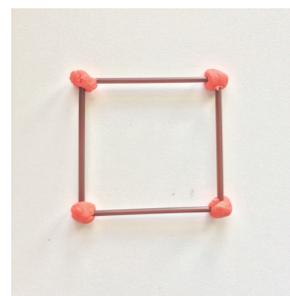
Scaffold understanding of ordinal numbers by modeling them for students working below grade level. Ask students to get up one at a time to demonstrate *first* in line, *second* in line, and *third* in line. While pointing to each corresponding student, have students practice saying who is *first*, *second*, and *third* in line.



First

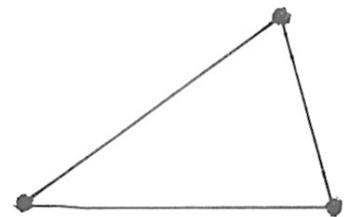
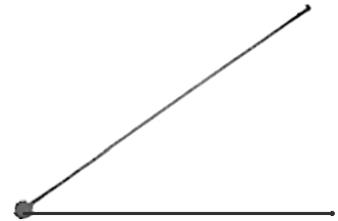


Second



Third

- T: If you haven't made a square already, please do so now. Then, you may experiment. How many different shapes can you make? We will have a shape show when you are done. (Allow ample time for experimentation and construction.)
- T: Who would like to share one of their shapes? Tell us what you did first, second, and third. Use your math words!
- S: I made a triangle! First, I cut the sticks. Second, I picked three sticks for the sides. Third, I stuck them together with clay!
- S: I made a hexagon. First, I cut the sticks. Second, I chose six and put them on my desk. Third, I used balls of clay to connect them.
- T: Listen again. Get your pencil and construction paper ready. First, put a dot on the left side of your paper. Second, draw a line that starts at that dot with your ruler. Third, draw another line that starts at the same dot with your ruler. (Model on board as directions are given.)
- S: (Work.)
- T: Show me your work.
- S: (Show their work.)
- T: Listen again. First, put a dot at the ends of both your lines. Second, draw a line with your ruler to connect those dots. Third, show your work to a friend, and tell her what shape you drew. (Allow time for sharing.)
- T: Now, share about *all* your shapes with your friends: the ones you made with straws *and* the one you made with your ruler.



Allow time for sharing and discussion. If students built shapes with five sides, or more than six sides, casually mention the name of the shape. Five sides is a pentagon. Seven sides is a heptagon. Eight sides is an octagon. Nine sides is a nonagon. Ten sides is a decagon.

- T: Listen carefully. First, put your name on your construction paper. Second, carefully lift your shapes onto your paper, and leave them on your desk. Third, stand up, and get ready to look at the shapes the rest of the class created! It's time for a shape show! (Allow students to circulate to view and discuss one another's work. Encourage mathematical discussion and precision in vocabulary. When students are done, move the papers carefully to a part of the room where they may be saved for use in Lesson 3 of this module.)

### Problem Set (10 minutes)

Students should do their personal best to complete the Problem Set within the allotted time.

### Student Debrief (8 minutes)

**Lesson Objective:** Describe the systematic construction of flat shapes using ordinal numbers.

The Student Debrief is intended to invite reflection and active processing of the total lesson experience.

Invite students to review their solutions for the Problem Set. They should check work by comparing answers with a partner before going over answers as a class. Look for misconceptions or misunderstandings that can be addressed in the Student Debrief. Guide students in a conversation to debrief the Problem Set and process the lesson.

Any combination of the questions below may be used to lead the discussion.

- What words did we use to help us complete our Problem Set in order?
- Look at the triangles and squares you drew in your Problem Set. Are all the sides equal in length? Find someone who drew a shape with equal length sides; find someone who drew a shape with unequal length sides.
- How did the words *first*, *second*, and *third* help us be good builders today?
- Can you think of a time when order is important? What would happen if we put our shoes on first and our socks on second?
- Can you think of other ways that we use words like *first*, *second*, and *third*?

### Exit Ticket (3 minutes)

After the Student Debrief, instruct students to complete the Exit Ticket. A review of their work will help with assessing students' understanding of the concepts that were presented in today's lesson and planning more effectively for future lessons. The questions may be read aloud to the students.

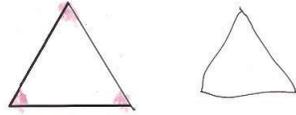
### Homework

Homework at the K–1 level is not a convention in all schools. In this curriculum, homework is an opportunity for additional practice of the content from the day's lesson. The teacher is encouraged, with the support of parents, administrators, and colleagues, to discern the appropriate use of homework for his students. Fluency exercises can also be considered as an alternative homework assignment.

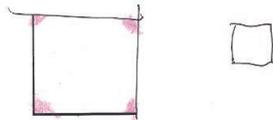
Name Robin Date 5-24-13

Listen to the directions.

First, draw the missing line to finish the triangle using a ruler. Second, color the corners red. Third, draw another triangle.



First, use your ruler to draw 2 lines to make a square. Second, color the corners red. Third, draw another square.



First, draw a triangle using your ruler. Second, draw a different triangle using your ruler. Third, show your pictures to your partner.



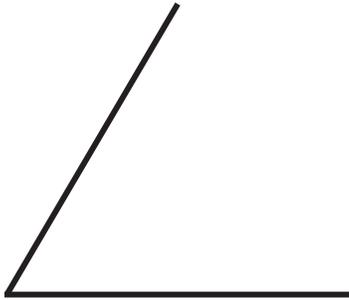
$4 + 1 = 5$ $3 = 2 + 1$ $3 + 2 = 5$ $3 + 1 = 4$ $5 = 5 + 0$	$5 - 1 = 4$ $3 = 4 - 1$ $3 - 2 = 1$ $3 - 0 = 3$ $1 = 5 - 4$
$2 - 1 = 1$ $0 = 3 - 3$ $1 - 0 = 1$ $3 - 0 = 3$ $0 = 4 - 4$	$2 + 2 = 4$ $2 = 5 - 3$ $1 + 1 = 2$ $4 - 0 = 4$ $5 = 4 + 1$

Name \_\_\_\_\_

Date \_\_\_\_\_

Listen to the directions.

**First**, draw the missing line to finish the triangle using a ruler. **Second**, color the corners red. **Third**, draw another triangle.



**First**, use your ruler to draw 2 lines to make a square. **Second**, color the corners red. **Third**, draw another square.



**First**, draw a triangle using your ruler. **Second**, draw a different triangle using your ruler. **Third**, show your pictures to your partner.

$$4 + 1 = \underline{\quad}$$

$$\underline{\quad} = 2 + 1$$

$$3 + 2 = \underline{\quad}$$

$$3 + 1 = \underline{\quad}$$

$$\underline{\quad} = 5 + 0$$

$$5 - 1 = \underline{\quad}$$

$$\underline{\quad} = 4 - 1$$

$$3 - 2 = \underline{\quad}$$

$$3 - 0 = \underline{\quad}$$

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

$$2 - 1 = \underline{\quad}$$

$$\underline{\quad} = 3 - 3$$

$$1 - 0 = \underline{\quad}$$

$$3 - 0 = \underline{\quad}$$

$$\underline{\quad} = 4 - 4$$

$$2 + 2 = \underline{\quad}$$

$$\underline{\quad} = 5 - 3$$

$$1 + 1 = \underline{\quad}$$

$$4 - 0 = \underline{\quad}$$

$$\underline{\quad} = 4 + 1$$

Name \_\_\_\_\_

Date \_\_\_\_\_

Use your ruler.

**First**, draw a straight line from the dot.

**Second**, draw a different straight line from the dot.

**Third**, draw another straight line to make a triangle.



Name \_\_\_\_\_

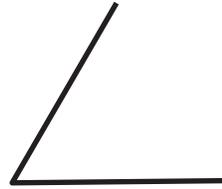
Date \_\_\_\_\_

Follow the directions.

**First**, use your ruler to draw a line finishing the triangle.

**Second**, color the triangle green.

**Third**, use your ruler to draw a bigger triangle next to the green triangle.



**First**, draw 2 lines to make a rectangle.

**Second**, circle all the corners in red.

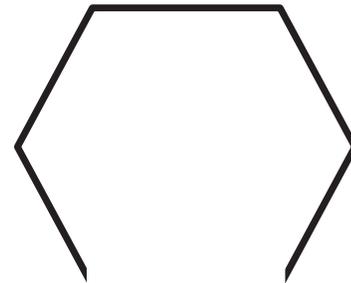
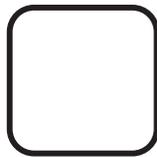
**Third**, put an X on the longer sides.



**First**, draw a line to complete the hexagon.

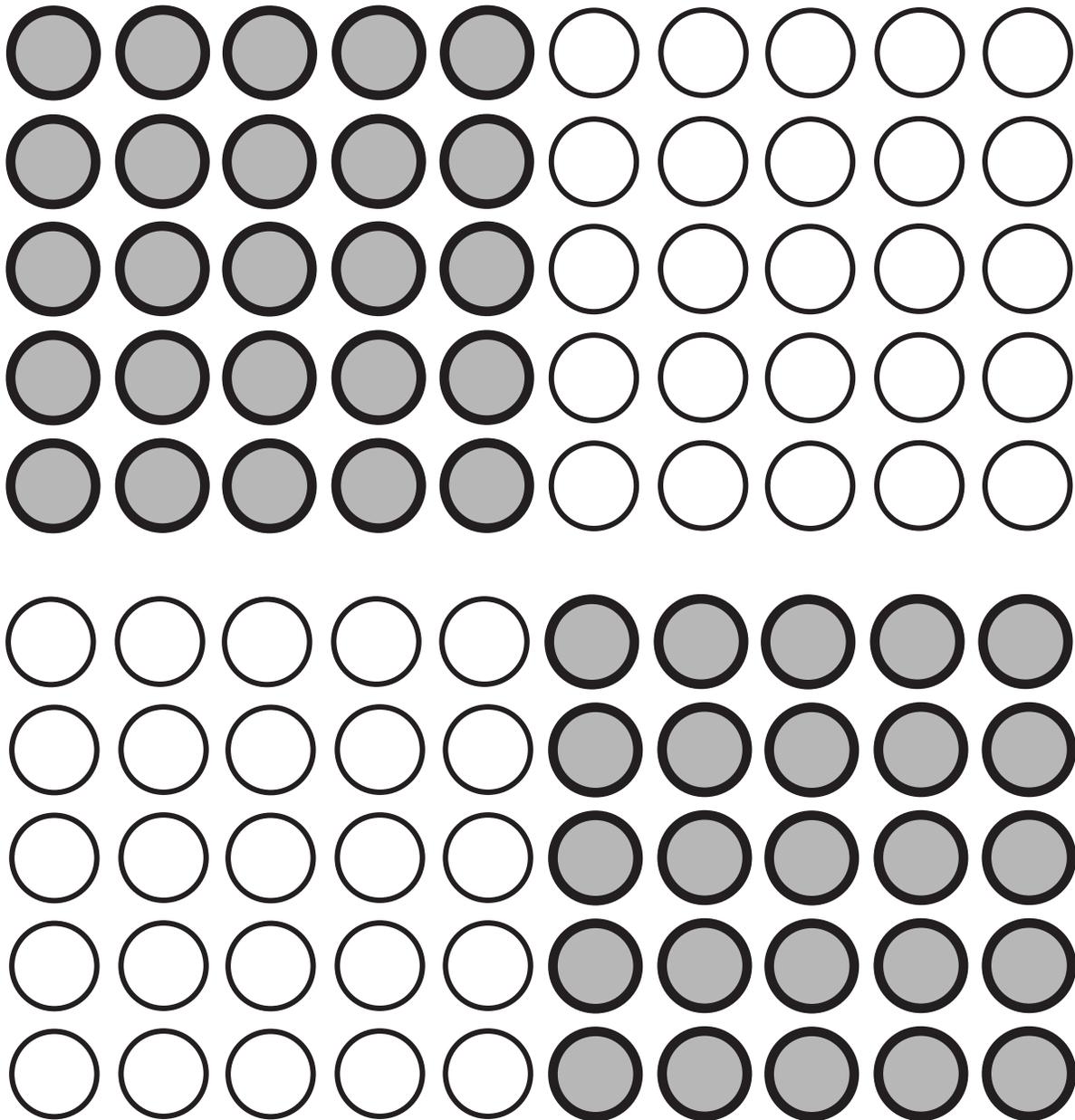
**Second**, color the hexagon blue.

**Third**, write the number of sides the hexagon has in the box below.

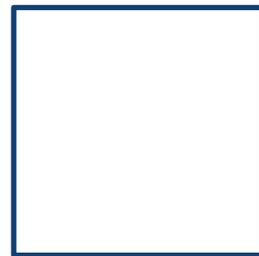
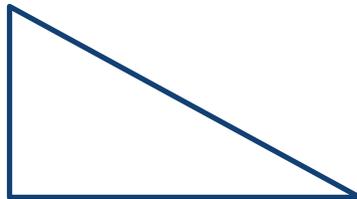
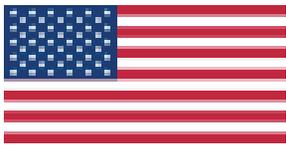
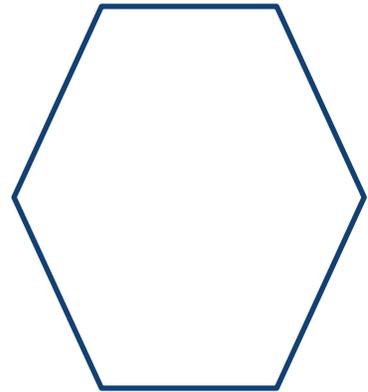
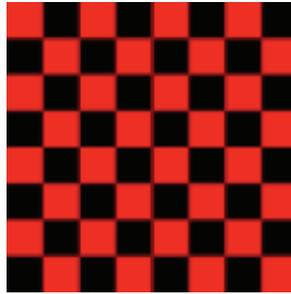
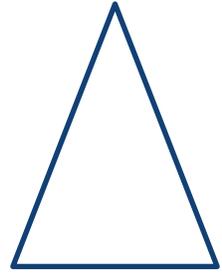
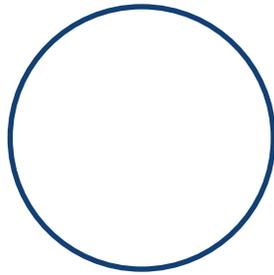


On the back of your paper, draw:

- A closed shape with 3 straight sides.
- A closed shape with 4 straight sides.
- A closed shape with 6 straight sides.



Rekenrek dot paper



---

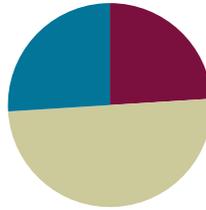
shape cutouts

## Lesson 2

**Objective:** Build flat shapes with varying side lengths and record with drawings.

### Suggested Lesson Structure

■ Fluency Practice	(12 minutes)
■ Concept Development	(25 minutes)
■ Student Debrief	(13 minutes)
<b>Total Time</b>	<b>(50 minutes)</b>



### Fluency Practice (12 minutes)

- Sprint: Core Fluency **K.OA.5** (9 minutes)
- Compose Teen Numbers **K.NBT.1** (3 minutes)

### Sprint: Core Fluency (9 minutes)

Materials: (S) Core Fluency Sprint A, B, C, or D

Note: This activity continues students' progress toward mastery of the required fluency for kindergarten.

Decide on a core fluency skill in which students would benefit from extra practice: addition, subtraction, or mixed addition with subtraction within 5. Select the Sprint that is most appropriate for the class: Core Fluency Sprint A, B, C, or D in the materials that follow. In order to correct the work as a class, all students take the same Sprint.

T: It's time for a Sprint! (Briefly recall previous Sprint preparation activities, and distribute Sprints facedown.) Take out your pencil and one crayon, any color. (Demonstrate the first problem as needed.)

Continue to follow the familiar Sprint procedure. Have students work on the same Sprint a second time. Continue to emphasize that the goal is simply to do better than the first time and celebrate improvement.

### Compose Teen Numbers (3 minutes)

Materials: (T) Large Hide Zero cards (Fluency Template) (optional)

Note: This maintenance activity ensures that students stay sharp on the work of the previous module.

T: (Show cards, or say the numbers 10 and 6.) Raise your hand when you can say the number the Say Ten way. (Wait for all hands to go up, and then signal.) Ready?

S: Ten 6.

T: Now, say it the regular way, please.

S: 16.

T: (If using Hide Zero cards, slide them together to form the number 16.)

Continue with the following sequence: 17, 18, 19, 13, 14, 15, 11, 12, 10, 20.

Variation: Students can write the number bond or write two addition sentences on their personal white boards.

### Concept Development (25 minutes)

Materials: (S) Approximately 15 coffee stir sticks, scissors, personal white board, small ball of clay, ruler

T: Who can remind us about what we did in math class yesterday? Can you use your math words to tell us, in order, the steps that we took in our lesson?

S: First, we cut our sticks. They were all the same length! → Second, we made flat shapes with them on our desks. → Third, we stuck the ends together with clay at the corners.

T: That's right. We are going to make more flat shapes today. Yesterday, we made special rectangles that had equal sides. What did we call them?

S: Squares.

T: Today, use your sticks and your clay to create another type of rectangle: one that has corners like an L but whose sides are not all the same length.

T: (Pause.) You may cut one or two of your sticks if you need to. (Allow time for students to plan and create the shape. Circulate to support students who might need it.) Hold up your rectangles! How do you know they are rectangles?

S: It's like a square, but it is stretched! → It has two long sides and two shorter sides. → I had to cut one of my sticks in half! → They have corners that look like an L. → It has four sides.

T: Take three sticks that are the same length. Now, use those sticks to make a closed shape with three straight sides. (Allow time for students to experiment.) Hold up your shapes. What do we call this shape?

S: It is a triangle!

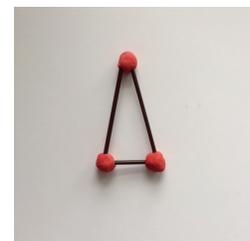
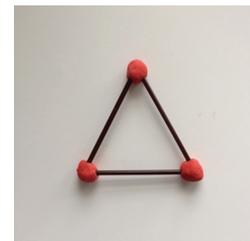
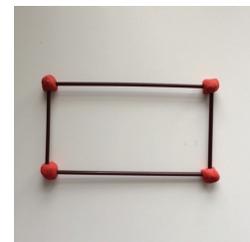
T: What if you take one of the sides of your triangle and cut it to be shorter, and then put it back into your shape? (Allow time for students to experiment.) What do you notice?

S: It is still a triangle. → It just has one side that is shorter. → It looks pointier, but it still has three sides and three corners. → Two sides are the same length!



#### NOTES ON MULTIPLE MEANS OF ACTION AND EXPRESSION:

As more shapes are introduced, be sure to put the shapes with pictures or models on the word wall. This helps English language learners study the names of the shapes and allows teachers to point to the shapes while talking about them, making a clear connection between the words and the meaning.



MP.4

- T: Great job! With your partner, use your sticks and your clay to make several different flat shapes. You may cut the sticks to be any lengths you like. Be creative! (Allow ample time for student work. Encourage students to think about not only convex but also concave figures. Hold up any interesting examples for extra inspiration. Again, if students ask, casually mention the names of created shapes they may not have studied yet.)
- T: Wow! You made a lot of different shapes! Would anyone like to show their favorite and tell the class about it? (Allow time for discussion.)
- T: With your ruler and your marker, try to copy each of your new shapes on your personal white board.

Allow time for students to replicate their shapes on paper. Circulate to offer assistance to students who may still need help in keeping their rulers straight and still during construction. If time permits, allow students to turn and talk to their partners to describe the shapes they drew.

### Problem Set (10 minutes)

Students should do their personal best to complete the Problem Set within the allotted time.

### Student Debrief (13 minutes)

**Lesson Objective:** Build flat shapes with varying side lengths and record with drawings.

The Student Debrief is intended to invite reflection and active processing of the total lesson experience.

Invite students to review their solutions for the Problem Set. They should check work by comparing answers with a partner before going over answers as a class. Look for misconceptions or misunderstandings that can be addressed in the Student Debrief. Guide students in a conversation to debrief the Problem Set and process the lesson.



#### NOTES ON MULTIPLE MEANS OF ENGAGEMENT:

Students with disabilities who might have difficulty with fine motor activities could benefit from using a geoboard and rubber bands to make different shapes or by using interactive technology such as that one found at [http://www.glencoe.com/sites/common\\_assets/mathematics/ebook\\_assets/vmf/VMF-Interface.html](http://www.glencoe.com/sites/common_assets/mathematics/ebook_assets/vmf/VMF-Interface.html).

(In the Select Grade drop-down menu, click *Kindergarten*. In the Manipulatives drop-down menu, click *Geoboard/Bands*.)

Name Ben Date 5-25-13

First, use a ruler to trace the shapes. Second, follow the directions in each box. Use your ruler to draw the shapes.

Draw 3 different triangles.

Draw 2 different rectangles.

Draw 1 hexagon.

Any combination of the questions below may be used to lead the discussion.

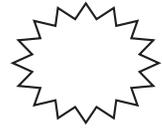
- Look at all the triangles on your Problem Set. Tell your partner what they all have in common. Choose two triangles that are different. Tell your partner how they are different.
- Does a triangle need to be closed? Can it have gaps between the sides?
- I heard you say that all of the triangles are closed and have three sides and three corners. Do they all look the same? Tell your partner how many different-looking triangles you think you could draw.
- When you made a shape with four sticks and corners like an L, what did you call it? What did you call the special shape you made where all four sticks were the same length?
- (Hold up a set of three equal stir sticks and a set of three sticks with different lengths.) If I asked you to make a triangle, which set of sticks would you choose? Why?
- Look carefully at your flat shapes and at those of your peers. What are some ways we could sort them? (Take time to allow several iterations of shape sorting with students. Encourage them to be creative in their thinking. Apart from the number of sides, also guide them to think about attributes such as concave vs. convex, regular vs. irregular, etc.)

$5 - 4 = \underline{1}$ $5 - 3 = \underline{2}$ $5 - 2 = \underline{3}$ $5 - 1 = \underline{4}$ $5 - 0 = \underline{5}$	$0 + 1 = \underline{1}$ $1 + 1 = \underline{2}$ $2 + 1 = \underline{3}$ $3 + 1 = \underline{4}$ $4 + 1 = \underline{5}$
$4 - 2 = \underline{2}$ $2 - 1 = \underline{1}$ $3 - 2 = \underline{1}$ $3 - 1 = \underline{2}$ $5 - 0 = \underline{5}$	$4 - 3 = \underline{1}$ $2 + 1 = \underline{3}$ $3 + 2 = \underline{5}$ $4 - 1 = \underline{3}$ $5 - 4 = \underline{1}$

### Exit Ticket (3 minutes)

After the Student Debrief, instruct students to complete the Exit Ticket. A review of their work will help with assessing students' understanding of the concepts that were presented in today's lesson and planning more effectively for future lessons. The questions may be read aloud to the students.

Number Correct:



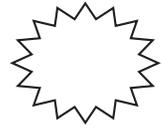
Name \_\_\_\_\_

Date \_\_\_\_\_

Write the missing number.

1.	$2 + 1 = \square$	11.	$\square = 3 + 2$
2.	$1 + 1 = \square$	12.	$1 + 3 = \square$
3.	$1 + 4 = \square$	13.	$\square = 2 + 2$
4.	$3 + 1 = \square$	14.	$\square = 1 + 2$
5.	$2 + 2 = \square$	15.	$1 + 4 = \square$
6.	$2 + 3 = \square$	16.	$\square = 2 + 3$
7.	$1 + 2 = \square$	17.	$\square = 5 - 1$
8.	$4 + 1 = \square$	18.	$5 - 2 = \square$
9.	$3 + 2 = \square$	19.	$1 + 0 = \square$
10.	$1 + 3 = \square$	20.	$5 + 0 = \square$

Number Correct:



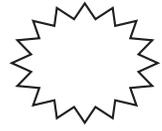
Name \_\_\_\_\_

Date \_\_\_\_\_

Write the missing number.

1.	$2 - 1 = \square$	11.	$\square = 4 - 2$
2.	$4 - 1 = \square$	12.	$5 - 3 = \square$
3.	$5 - 1 = \square$	13.	$\square = 3 - 1$
4.	$3 - 1 = \square$	14.	$\square = 5 - 2$
5.	$3 - 2 = \square$	15.	$4 - 1 = \square$
6.	$4 - 2 = \square$	16.	$\square = 5 - 4$
7.	$5 - 3 = \square$	17.	$\square = 5 - 1$
8.	$5 - 2 = \square$	18.	$5 - 1 = \square$
9.	$4 - 3 = \square$	19.	$1 - 0 = \square$
10.	$5 - 4 = \square$	20.	$5 - 5 = \square$

Number Correct:



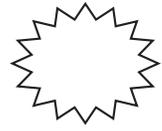
Name \_\_\_\_\_

Date \_\_\_\_\_

Write the missing number.

1.	$2 + 1 = \square$	11.	$3 + 2 = \square$
2.	$2 - 1 = \square$	12.	$3 - 2 = \square$
3.	$3 + 1 = \square$	13.	$4 + 0 = \square$
4.	$3 - 1 = \square$	14.	$4 - 0 = \square$
5.	$4 + 1 = \square$	15.	$5 + 0 = \square$
6.	$4 - 1 = \square$	16.	$5 - 0 = \square$
7.	$1 + 1 = \square$	17.	$5 - 5 = \square$
8.	$1 - 1 = \square$	18.	$4 + 1 = \square$
9.	$2 + 2 = \square$	19.	$5 - 4 = \square$
10.	$2 - 2 = \square$	20.	$5 - 1 = \square$

Number Correct:



Name \_\_\_\_\_

Date \_\_\_\_\_

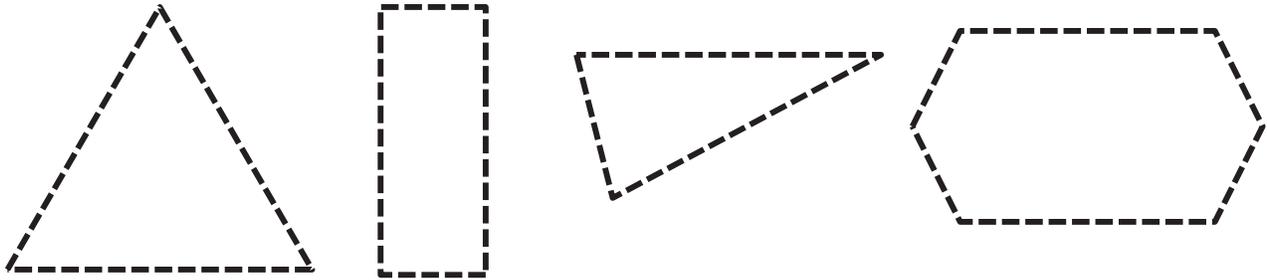
Write the missing number.

1.	$2 + 1 = \square$	11.	$\square = 1 + 2$
2.	$4 + 1 = \square$	12.	$5 + 0 = \square$
3.	$5 - 1 = \square$	13.	$\square = 3 - 1$
4.	$3 + 1 = \square$	14.	$\square = 2 + 2$
5.	$3 + 2 = \square$	15.	$4 - 1 = \square$
6.	$4 - 2 = \square$	16.	$\square = 5 - 4$
7.	$5 - 3 = \square$	17.	$\square = 5 - 1$
8.	$5 - 2 = \square$	18.	$3 + 0 = \square$
9.	$2 + 3 = \square$	19.	$1 - 0 = \square$
10.	$5 - 4 = \square$	20.	$5 - 5 = \square$

Name \_\_\_\_\_

Date \_\_\_\_\_

First, use a ruler to trace the shapes. Second, follow the directions in each box. Use your ruler to draw the shapes.



Draw 3 different triangles.

Draw 2 different rectangles.

Draw 1 hexagon.

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

$5 - 3 = \underline{\quad}$

$5 - 2 = \underline{\quad}$

$5 - 1 = \underline{\quad}$

$5 - 0 = \underline{\quad}$

$0 + 1 = \underline{\quad}$

$1 + 1 = \underline{\quad}$

$2 + 1 = \underline{\quad}$

$3 + 1 = \underline{\quad}$

$4 + 1 = \underline{\quad}$

$4 - 2 = \underline{\quad}$

$2 - 1 = \underline{\quad}$

$3 - 2 = \underline{\quad}$

$3 - 1 = \underline{\quad}$

$5 - 0 = \underline{\quad}$

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

$2 + 1 = \underline{\quad}$

$3 + 2 = \underline{\quad}$

$4 - 1 = \underline{\quad}$

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

Name \_\_\_\_\_

Date \_\_\_\_\_

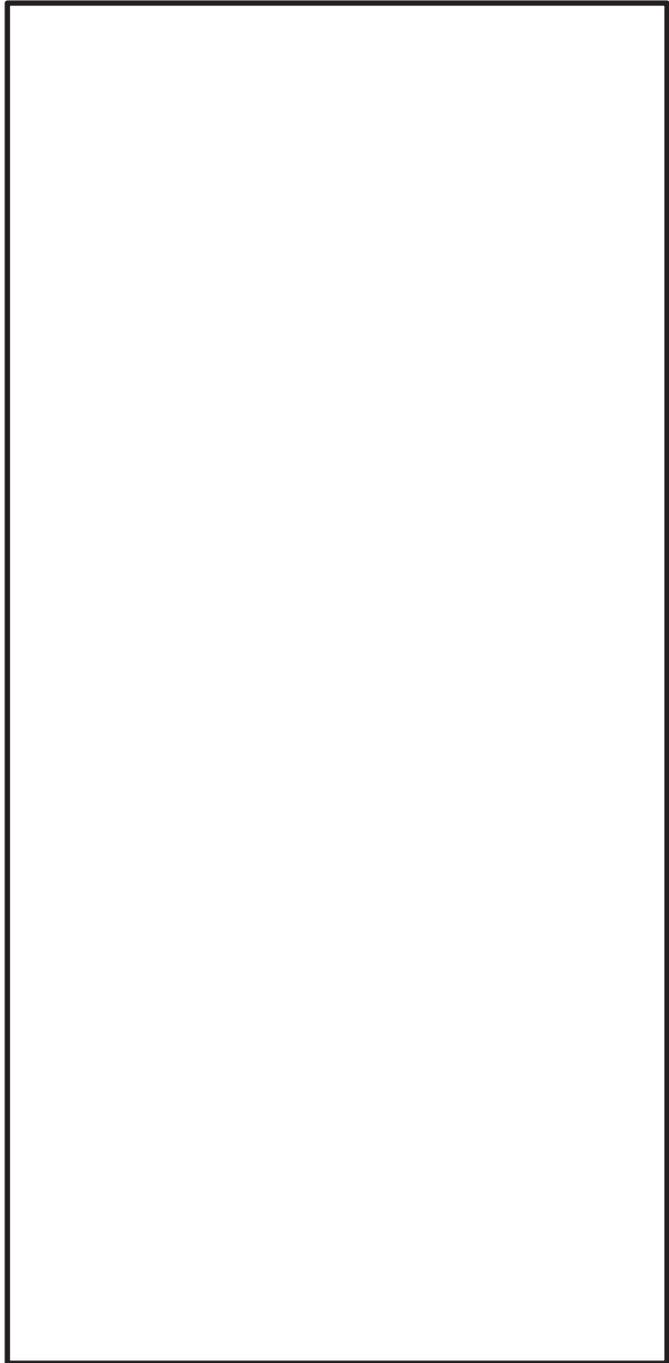
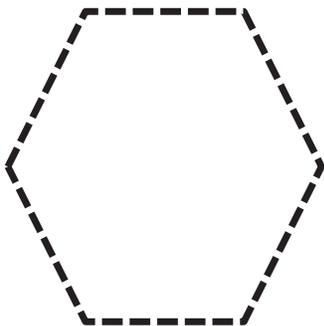
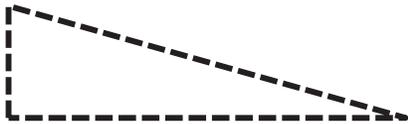
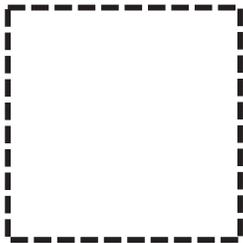
First, draw a triangle so all of the sides are different lengths.

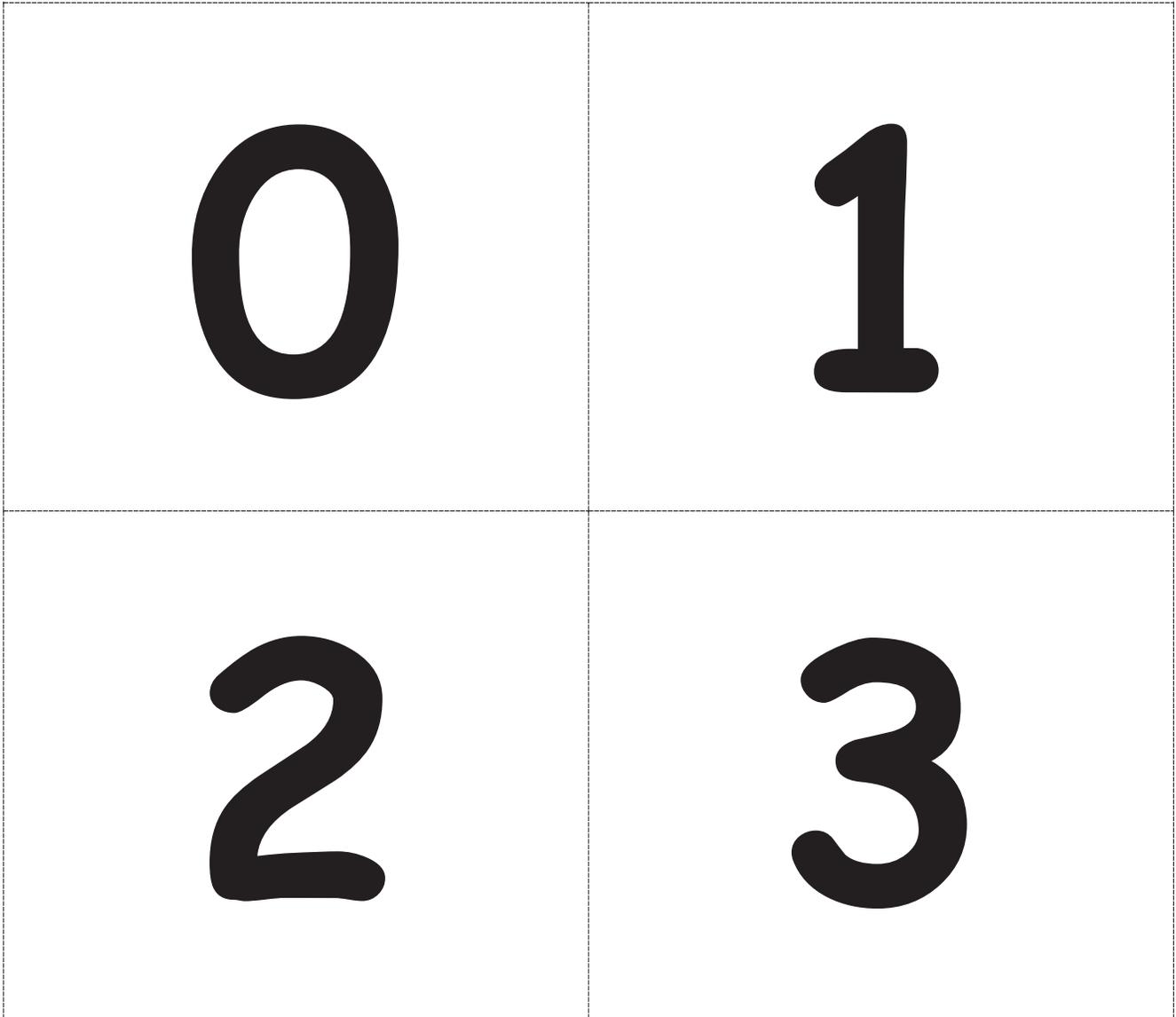
Second, draw a triangle with your ruler that has 2 sides that are about the same length.

Name \_\_\_\_\_

Date \_\_\_\_\_

Trace the shapes. Then, use a ruler to draw similar shapes, on your own, in the large rectangle. Draw more on the back of your paper if you would like!





Note: Match to corresponding 5-group side, and copy double-sided on card stock.

---

large Hide Zero cards (numeral side)

4

5

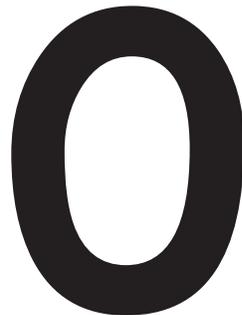
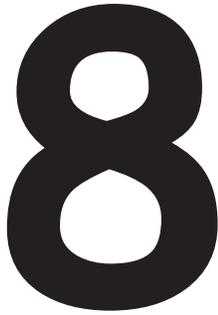
6

7

Note: Match to corresponding 5-group side, and copy double-sided on card stock.

---

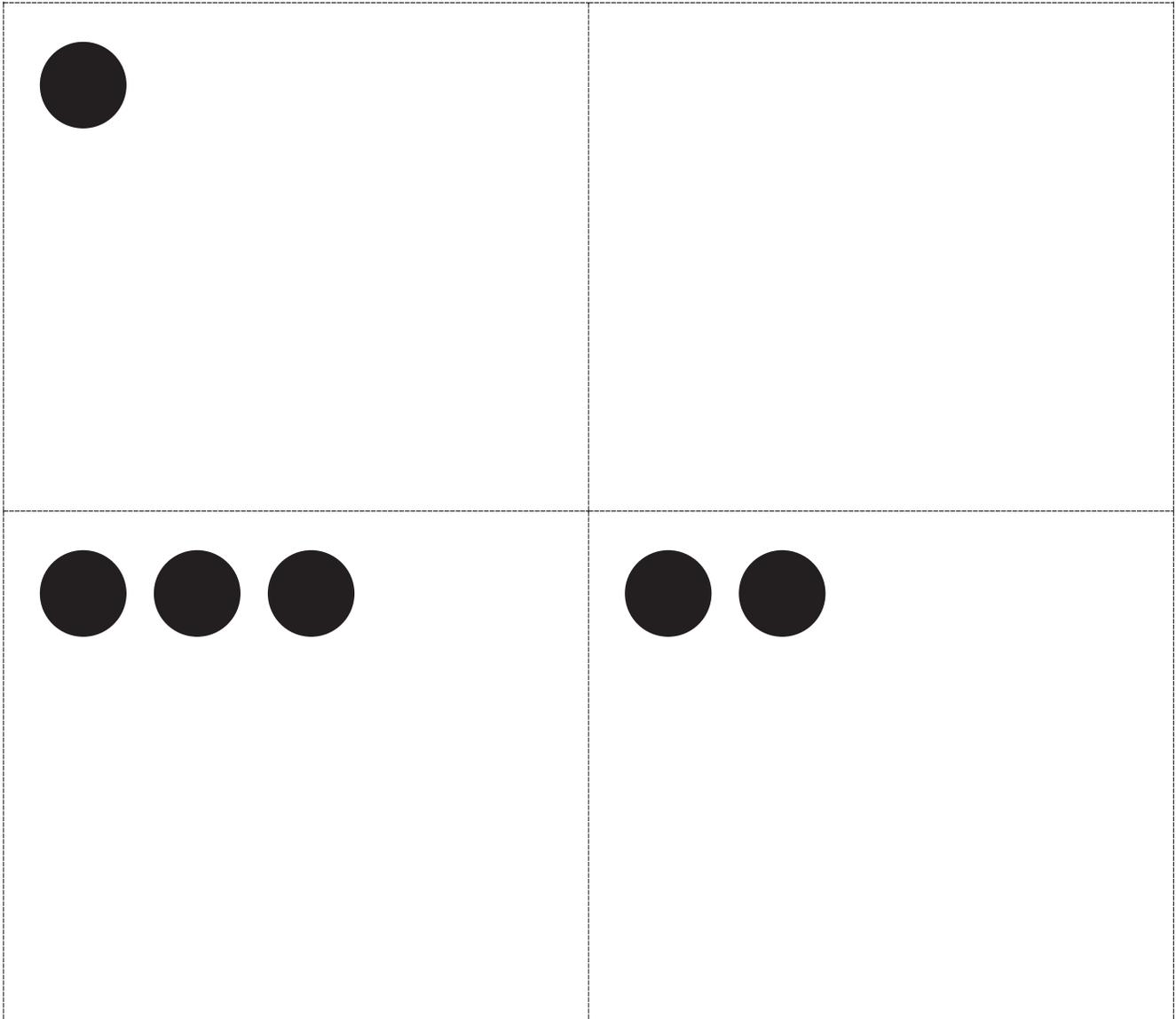
large Hide Zero cards (numeral side)



Note: Match to corresponding 5-group side, and copy double-sided on card stock.

---

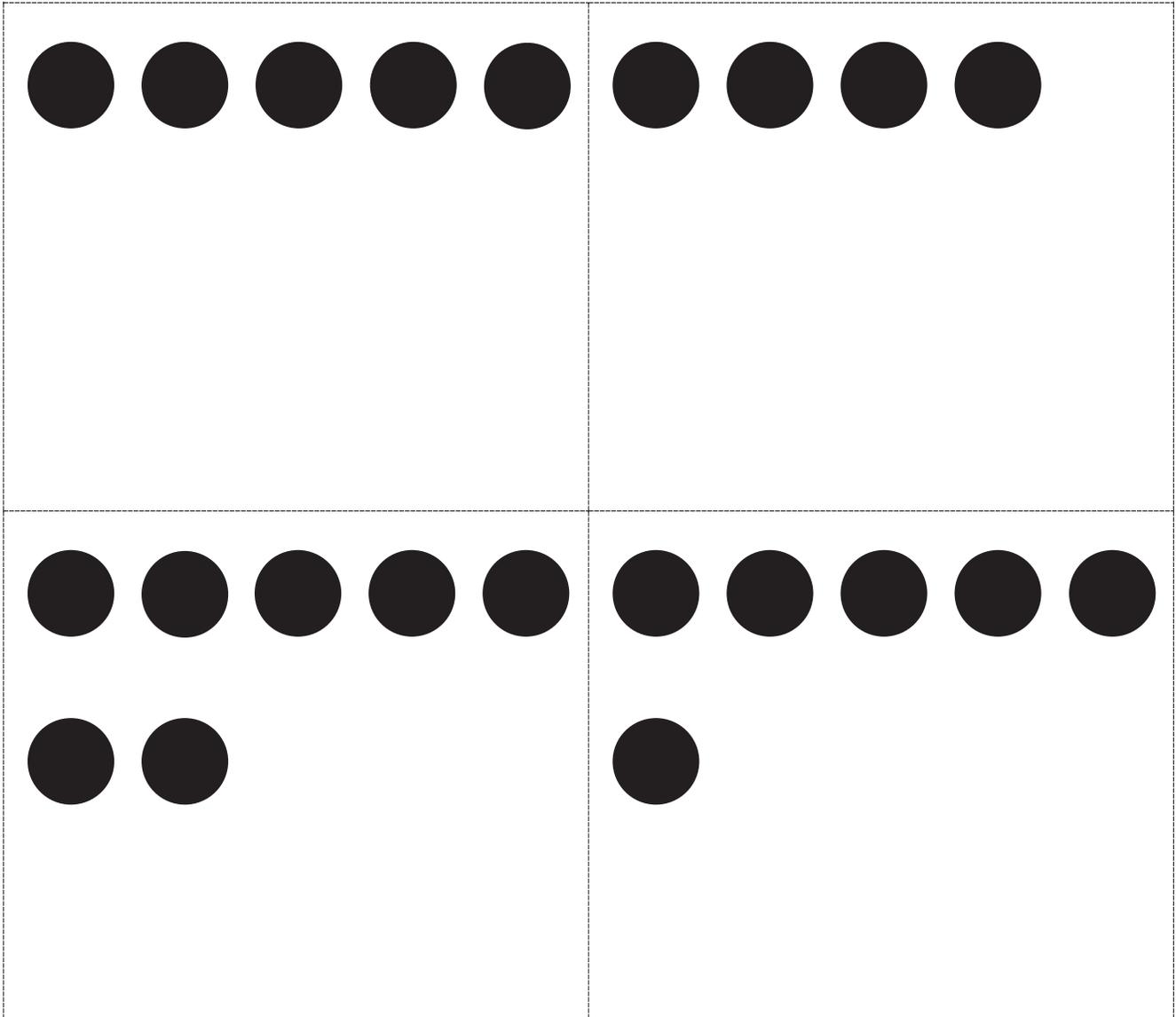
large Hide Zero cards (numeral side)



Note: Match to corresponding numeral side, and copy double-sided on card stock.

---

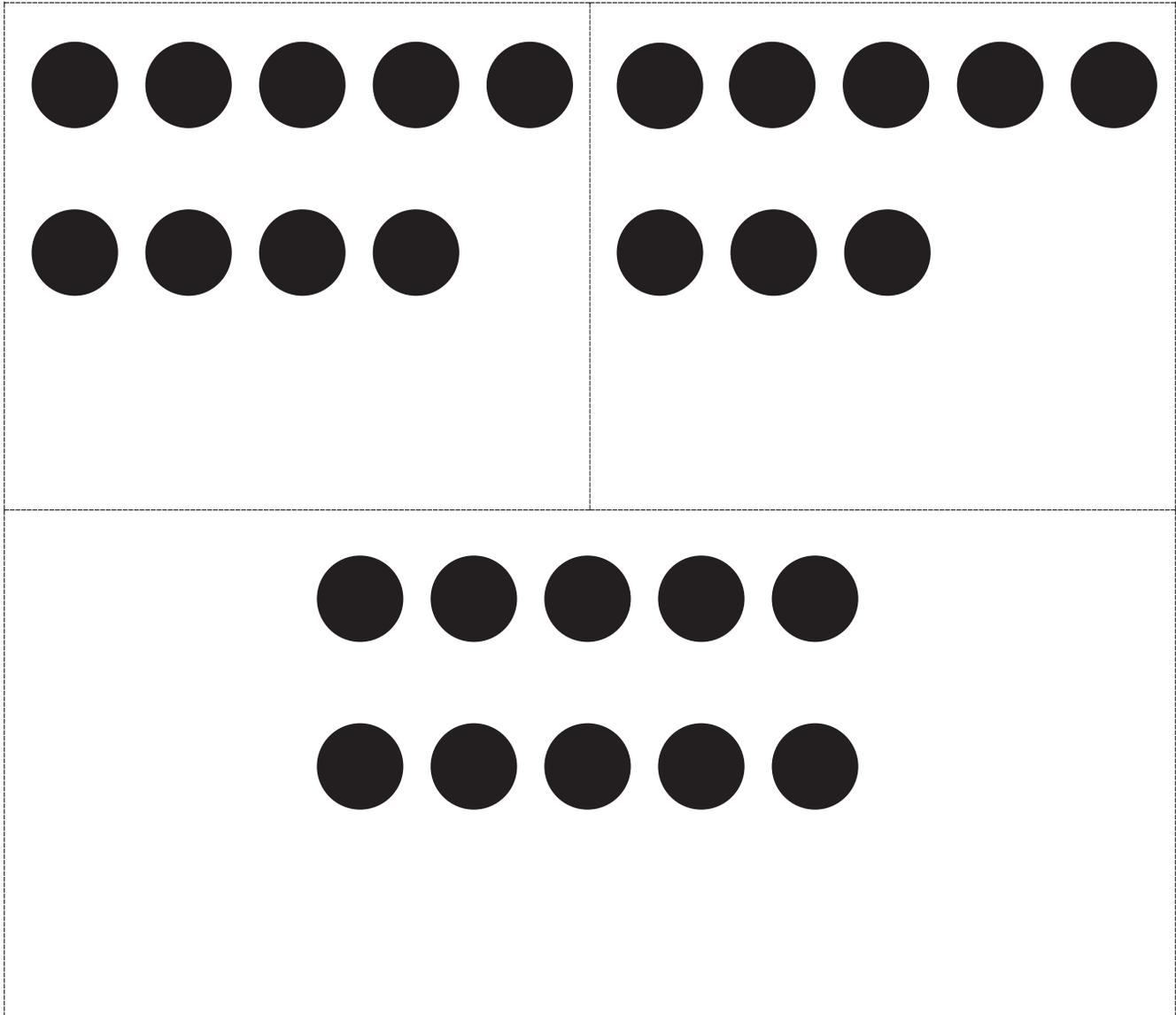
large Hide Zero cards (5-group side)



Note: Match to corresponding numeral side, and copy double-sided on card stock.

---

large Hide Zero cards (5-group side)



Note: Match to corresponding numeral side, and copy double-sided on card stock.

---

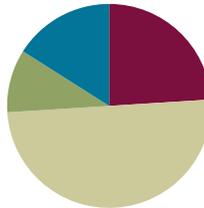
large Hide Zero cards (5-group side)

## Lesson 3

Objective: Compose solids using flat shapes as a foundation.

### Suggested Lesson Structure

■ Fluency Practice	(12 minutes)
■ Application Problem	(5 minutes)
■ Concept Development	(25 minutes)
■ Student Debrief	(8 minutes)
<b>Total Time</b>	<b>(50 minutes)</b>



### Fluency Practice (12 minutes)

- Color by Answer Addition **K.OA.5** (6 minutes)
- Color by Answer Subtraction **K.OA.5** (6 minutes)

### Color by Answer Addition (6 minutes)

Materials: (S) Color by answer addition (Fluency Template 1), crayons

Note: This activity gives students an opportunity to practice the core fluency of addition within 5 and calls students' attention to the patterns within the chart.

After giving clear instructions and demonstrating a few problems as needed, allow students time to work independently. Early finishers can analyze the patterns they see within the chart.

### Color by Answer Subtraction (6 minutes)

Materials: (S) Color by answer subtraction (Fluency Template 2), crayons

Note: This activity gives students an opportunity to practice the core fluency of subtraction within 5 and calls students' attention to the patterns within the chart.

Conduct as above.

### Application Problem (5 minutes)

Materials: (S) Geoboard and rubber bands per pair (or dot paper, markers, and ruler if geoboards are not available)

You have a challenge today! Work with your partner. On your geoboard, make a shape with three sides. Now, leave your shape on your board, and let your partner make a three-sided shape as well. Do they look the same? Name the shapes. Remove your shapes from the geoboard.

Now, make a shape with four sides. Have your partner make another four-sided shape. Do they look alike? Name the shapes. Remove your shapes from the geoboard.

Try it with five sides! Then, six! How far can you and your partner go?

Note: Reviewing the construction of a variety of flat shapes serves as the anticipatory set for extending a flat shape into a solid in today's lesson.



#### NOTES ON MULTIPLE MEANS OF ENGAGEMENT:

Students working below grade level benefit from extra practice creating a variety of three- and four-sided shapes. Give them extended time with a geoboard, or make time for using interactive technology such as that owned and provided by The Math Learning Center:  
<http://www.mathlearningcenter.org/web-apps/geoboard/>

### Concept Development (25 minutes)

Materials: (T) Set of geometric solids (S) 12 coffee stir sticks, small ball of clay

#### Part 1: Review the attributes and names of solids.

T: (Hold up each solid as a review exercise.) What do we call this solid?

S: A cone!

T: How did you know?

S: It looks like an ice cream cone. → It looks like the orange cones in the lunch area.

T: What is special about a cone? Talk to your partner.

S: It has a circle on the bottom. → It rolls funny, not in a straight line like a ball. → It kind of looks like a triangle when you look at it from the side. → It's flat on the bottom, smooth and round in the middle, and pointy on the top.



Continue reviewing the other solids, asking students to explain how they knew the name of the solid and to describe its attributes.

**Part 2: Construct a cube.**

T: In our last lesson, you made some great shapes out of your straws! I want to use some of the squares you constructed to make a new shape like one of our solids. Does anyone have any ideas?

S: Maybe we could make something like a cube! → You could use one square to be on the bottom like the floor of a room. → Some of the others could be like the faces. We need one for the top, too.

T: Look at the cube we already have. (Hold it up.) How many squares will I need to use? Let's count together.

S: 1, 2, 3, 4, 5, 6.

T: Let's use this one as the bottom of the cube. Now, I will use some of your other squares for the sides. (Demonstrate.) What does it look like now?

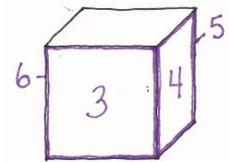
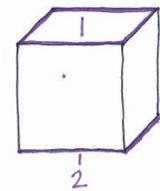
S: It looks like a box. → It is still open, though.

T: What if I trace one of the squares on my paper and cut it out? (Demonstrate.) I will attach it to one of the squares. (Cover one side of the skeleton with the paper to create a face, and hold the shape up for observation.) What do you notice?

S: It fits. → We still need more faces to close it up!

T: I will trace and cut some more. (Demonstrate with the remaining 5 faces to create a cube.)

T: Let's double-check. How many faces do we have? First, let's count the faces on the top and bottom. Say what we are counting.

**Counting Faces**

**MP.7** S: (Point and touch.) 1 face, 2 faces.

T: Second, let's count the ones around the middle. This is our third face, so start at the number...?

S: 3.

T Go.

S: 3 faces, 4 faces, 5 faces, 6 faces.

T Have we counted all of the faces? Did we miss any? How many faces are there on the cube?

S: 6 faces.

T: Now, count the edges for me. First, we'll count the ones on the bottom. I'll start with this one.

S: (Touch as they count.) 1 edge, 2 edges, 3 edges, 4 edges.

T: Second, let's count the edges in the middle. Start at the number after 4.

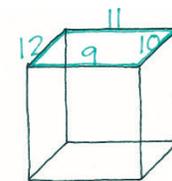
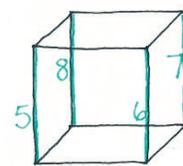
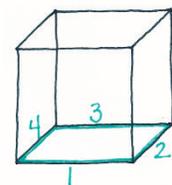
S: 5 edges, 6 edges, 7 edges, 8 edges.

T: Third, let's count the ones at the top. How many edges have we counted so far?

S: 8.

T: So, the next edge we count will be number...?

S: 9.

**Counting Edges**

T: Count when I touch.

S: 9 edges, 10 edges, 11 edges, 12 edges.

T: Are there any more edges?

S: No!

T: Tell your partner how we counted. What did we do first, second, and third?

**MP.7**

S: First, we counted the edges on the bottom. Second, we counted the ones in the middle. And third, we counted the edges on the top.

T: Let's count them once more without stopping and without saying what we are counting.

S: (Touch systematically as students count.) 1, 2, ..., 11, 12.

T: Now, count the corners. (Repeat the same process with the corners, having them count the corners on the bottom and then the top, saying what they are counting.)

T: It is time to make a shape like this on your own. Begin by making a square out of your straws for the bottom. Make another one for the top, too. (Allow time for students to work.)

T: What do we need now?

S: We need to make the edges. Let's stick straws into the corners of our bottom squares so they are poking up. → They will look like table legs. → Then, we can put on the top!

T: Please finish your shapes. (Allow time for students to construct the shape. Circulate to observe understanding, and offer support as necessary.)

T: You have made wonderful shapes! Hold them up. What do you notice about them?

S: They look like little boxes! → They are the same on every side.

T: Work with your partner to count the faces, edges, and corners of your pretend cube like we did earlier.

T: (Circulate and support the counting, which is challenging for kindergarten students.) What shapes are the invisible faces?

S: They are all squares.

T: I wonder what would happen if we put two of these shapes together. With your partner, see what you can create if you use more than one.

S: Now, ours is taller, like a building! → Ours looks like a train.

T: What are the shapes of the new invisible faces?

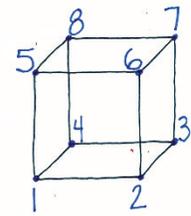
S: Squares. → Rectangles!

T: Wait for my signal. How many corners do you have now? Count them using our system. (Signal and give students sufficient time to count.)

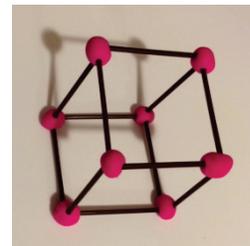
S: 8 corners.

T: How many faces? (Give students time to count.)

S: 6 faces!



Counting Corners



- T: How many edges? (Give students time to count.)  
S: 12 edges!  
T: Great work. Take a minute to compare your new shape with another pair's.  
S: (Compare shapes.)

### Problem Set (10 minutes)

Students should do their personal best to complete the Problem Set within the allotted time.

### Student Debrief (8 minutes)

**Lesson Objective:** Compose solids using flat shapes as a foundation.

The Student Debrief is intended to invite reflection and active processing of the total lesson experience.

Invite students to review their solutions for the Problem Set. They should check work by comparing answers with a partner before going over answers as a class. Look for misconceptions or misunderstandings that can be addressed in the Student Debrief. Guide students in a conversation to debrief the Problem Set and process the lesson.



Any combination of the questions below may be used to lead the discussion.

- How many squares did you trace on your Problem Set before you started cutting? What did you have to do to make a cube out of all the squares you traced?
- What two shapes did you trace to make your cylinder? (Circle and rectangle.) What happened to the rectangle when you cut and folded the paper to make the cylinder? Could we say that a rectangle is a face of a cylinder? Why or why not? (No. Faces are flat. Once we roll up the rectangle to make a cylinder, it is no longer flat.) What about the circle? Is a circle a face of the cylinder?
- When you counted the faces of your cube, how did you keep track of your count? How did you make sure that you didn't count any face twice?
- Describe a cube to me. Tell me about its faces, edges, and corners.
- Describe a cylinder to me. Tell me about its faces, edges, and corners.

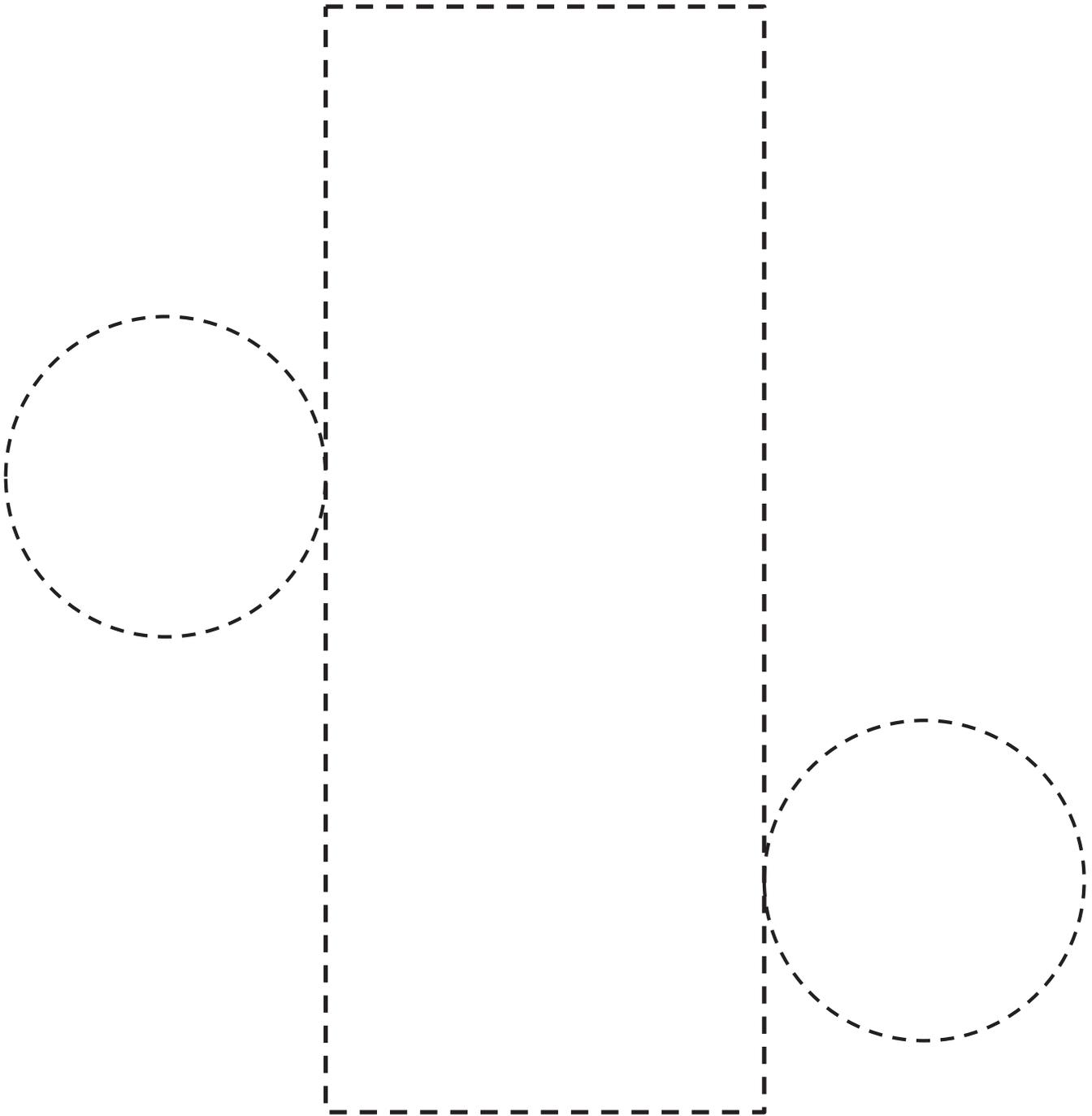
### Exit Ticket (3 minutes)

After the Student Debrief, instruct students to complete the Exit Ticket. A review of their work will help with assessing students' understanding of the concepts that were presented in today's lesson and planning more effectively for future lessons. The questions may be read aloud to the students.

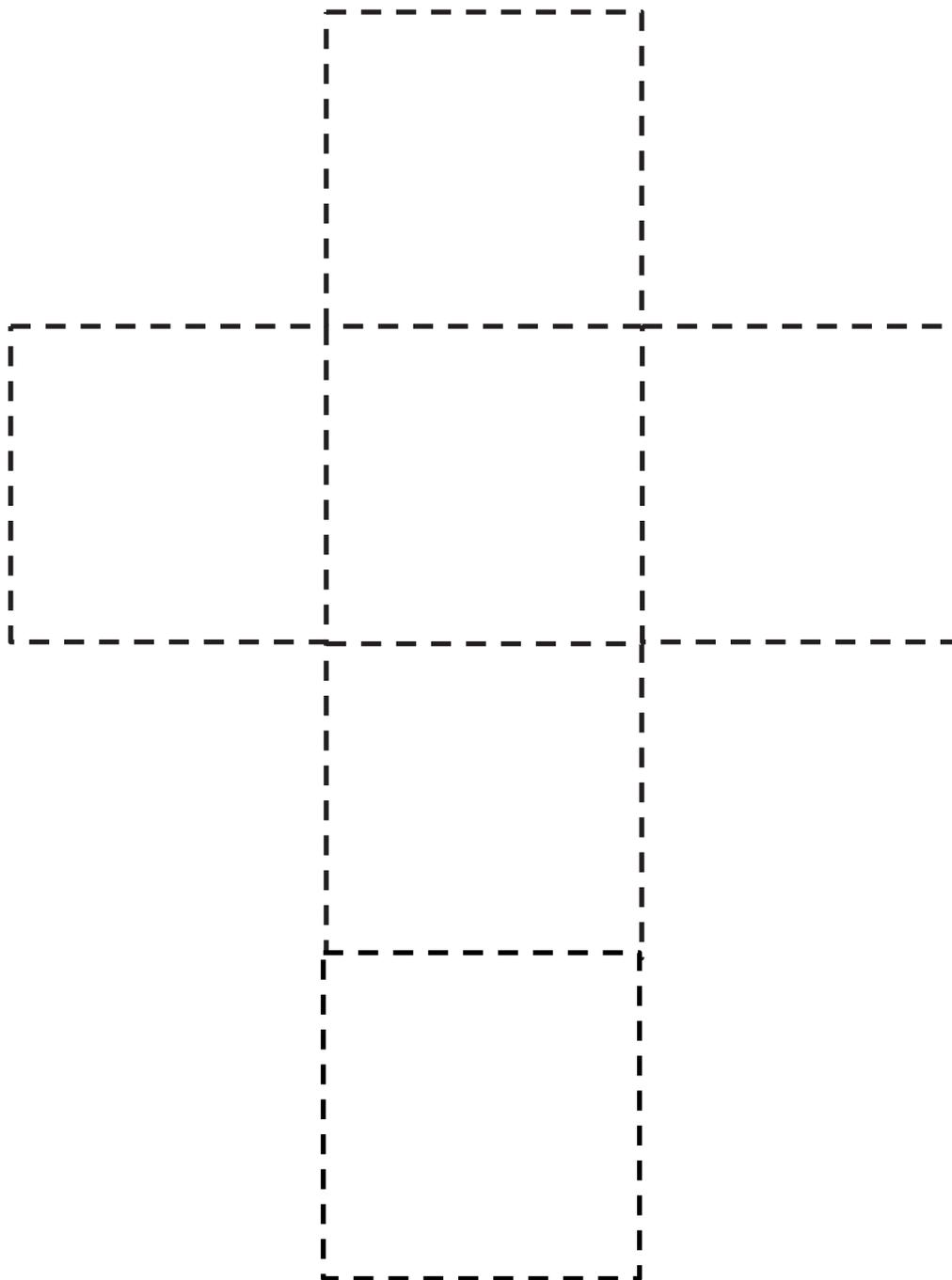
Name \_\_\_\_\_

Date \_\_\_\_\_

Trace the circles and rectangle. Cut out the shape. Fold and tape to create a cylinder.



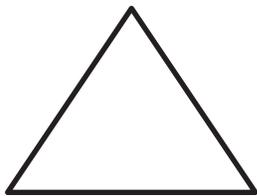
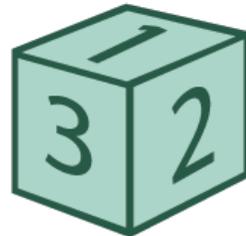
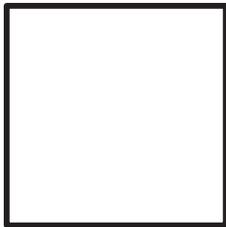
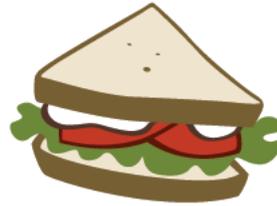
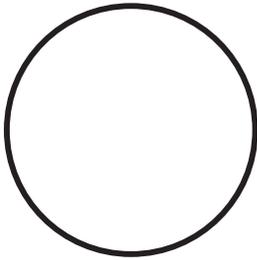
Trace the squares. Cut out the shape. Fold and tape to create a cube.



Name \_\_\_\_\_

Date \_\_\_\_\_

Draw a line from the flat shape to the object that has a face with that flat shape.



Name \_\_\_\_\_

Date \_\_\_\_\_



Draw something that is a cylinder.

Circle the flat shape you can see in a



---

Draw something that is a cube.



Circle the flat shape you can see in a





Draw something that is a cone.

Circle the flat shape you can see in a .



---

Draw a 3-dimensional solid. Draw one of your solid's faces. Tell an adult about the shapes you drew.

**Note to Family Helpers:** Your child knows how to name some 3-dimensional solids: cylinders, cones, cubes, and spheres. You can often find these 3-D shapes around the house in objects such as soup cans, ice cream cones, boxes, and balls. For the last question, it is acceptable for your student to find and draw a different type of 3-D solid. Talk about the number of edges, corners, and faces on the object.

Name \_\_\_\_\_

Date \_\_\_\_\_

Add. Color the blocks using the code for the total.

1—RED

2—ORANGE

3—YELLOW

4—GREEN

5—BLUE

$0 + 1$	$1 + 1$	$2 + 1$	$3 + 1$	$4 + 1$
$0 + 2$	$1 + 2$	$2 + 2$	$3 + 2$	
$0 + 3$	$1 + 3$	$2 + 3$		
$0 + 4$	$1 + 4$			
$0 + 5$				

---

 color by answer addition

Name \_\_\_\_\_

Date \_\_\_\_\_

Subtract. Color the blocks using the code for the difference.

0—PURPLE    1—RED    2—ORANGE    3—YELLOW  
 4—GREEN    5—BLUE

1 - 0	2 - 0	3 - 0	4 - 0	5 - 0
1 - 1	2 - 1	3 - 1	4 - 1	5 - 1
	2 - 2	3 - 2	4 - 2	5 - 2
		3 - 3	4 - 3	5 - 3
			4 - 4	5 - 4
				5 - 5

---

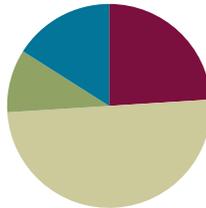
 color by answer subtraction

## Lesson 4

Objective: Describe the relative position of shapes using ordinal numbers.

### Suggested Lesson Structure

■ Fluency Practice	(12 minutes)
■ Application Problem	(5 minutes)
■ Concept Development	(25 minutes)
■ Student Debrief	(8 minutes)
<b>Total Time</b>	<b>(50 minutes)</b>



### Fluency Practice (12 minutes)

- Rekenrek Counting to 100 **K.CC.1** (4 minutes)
- Make a Shape to Find Hidden Numbers in 4 **K.OA.1, K.G.6** (4 minutes)
- Make a Shape to Find Hidden Numbers in 5 **K.OA.1, K.G.6** (4 minutes)

### Rekenrek Counting to 100 (4 minutes)

Materials: (T) 100-bead Rekenrek (preferably one that shows the color change at 50)

Note: This activity promotes proficiency in counting to 100 by tens (**K.CC.1**) and lays the foundation for understanding place value.

T: Let's count the Say Ten way. Ready?

S: (Slide the beads back and forth as students count up and down.) Ten, 2 tens, 3 tens, 2 tens, 3 tens, 4 tens, 5 tens, 6 tens, 5 tens, 6 tens, 5 tens, 6 tens, 7 tens, 8 tens, 9 tens, 8 tens, 9 tens, 10 tens.

T: 10 tens is the same as...?

S: 100.

T: Now, let's count the regular way. Ready?

Use a sequence similar to that used in counting the Say Ten way, with extra attention to the transition from 50 to 60.

T: Wow! You're getting good at counting both ways. Now, let's mix it up. Start counting the Say Ten way, but then be ready to switch to the regular way.

S: Ten, 2 tens, 3 tens.

T: Stop! 3 tens the regular way is...?

S: 30.

- T: Keep counting the regular way.  
 S: 40, 50, 60, ...  
 T: Stop! 60 the Say Ten way is...?  
 S: 6 tens!  
 T: Keep going the Say Ten way.  
 S: 7 tens, 8 tens, 9 tens, ...  
 T: Stop! 9 tens the regular way is...?  
 S: 90.  
 T: Say the next number the regular way.  
 S: 100.

Count back down to 0, alternating periodically between both ways of counting. If students are ready for a challenge, use more of a wave-style sequence.

### Make a Shape to Find Hidden Numbers in 4 (4 minutes)

Materials: (S) 4-dot puzzle cards (Fluency Template 1), plus extra 1-dot and 2-dot pieces

Note: This activity combines students' knowledge of embedded numbers and part-whole thinking and previews composition of shapes.

- T: (Distribute the 4-dot array card.) Raise your hand when you know how many dots. Ready?

S: 4.

- T: Raise your hand when you know the name of this shape. Ready?

S: Square.

- T: Very good. We're going to use puzzle pieces to make a square and, at the same time, show different ways to make 4. Here is one way you could do it.

- T: How many dots are on this puzzle piece? (Hold up one of the 2-dot rectangle pieces.)

S: 2.

- T: And on this one? (Hold up the other 2-dot rectangle.)

S: 2.

- T: On the whole puzzle? (Replace the piece, and point to indicate the entire puzzle.)

S: 4.

- T: So then, what numbers are hiding in 4?

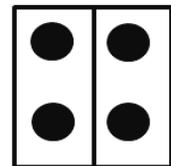
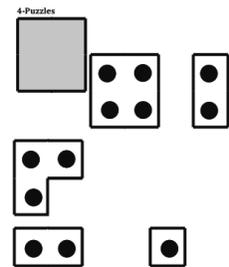
S: 2 and 2.

- T: What shapes did I use to make the square?

S: 2 rectangles.

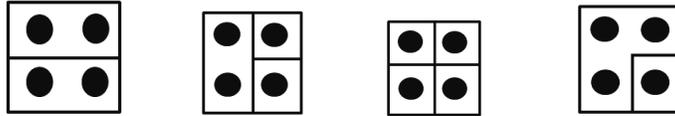
- T: Do you see other puzzle pieces I could use to make a square that has 4 dots?

S: Yes!



T: Give it a try! (Distribute additional pieces, and allow students to work for some time. Then, allow them to confer with a partner. Circulate and ask students to identify the hidden numbers in 4 and the name and quantity of the shapes they used to compose the square.)

More possibilities:

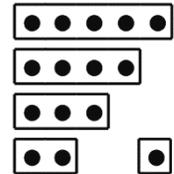


Variation: Have students work with a friend to make a rectangle that is not a square.

### Make a Shape to Find Hidden Numbers in 5 (4 minutes)

Materials: (S) 5-dot puzzle cards (Fluency Template 2), plus extra 1-dot and 2-dot pieces

Repeat the process laid out in the previous activity, but this time use the 5-dot puzzle cards. Invite students to combine puzzle pieces with up to four friends to have fun making numbers to 20.



### Application Problem (5 minutes)

Materials: (S) Personal white board

- First, draw 3 three-sided shapes on your personal white board.
- Second, draw 4 four-sided shapes on your paper.
- Third, draw a number bond, and write a number sentence to tell how many shapes you have in all.

Share your work with your partner. Do your shapes look the same? Do your number bonds look the same? How about your number sentences?

Note: Today's Application Problem serves as a link among the ordinal number discussions, shape constructions, number bonds, and number sentences. It serves as a review of some of the concepts from earlier modules as well as providing the anticipatory set for today's lesson.



#### NOTES ON MULTIPLE MEANS OF ACTION AND EXPRESSION:

Break the third step into smaller steps for students working below grade level. Ask, "How many three-sided shapes are there? How many four-sided shapes are there? How many shapes are there altogether?" They can also work directly on a number bond template.

## Concept Development (25 minutes)

Materials: (S) Shapes (Template), scissors

T: How many shapes do you see on your paper? Raise your hand when you know. Call it out at my signal! (Wait until most hands are raised, and then signal.)

S: 10.

T: Cut out each shape card by cutting on the dotted lines. (Allow students time to cut.)

T: Make a row out of your shapes. Now, rearrange your shapes so that the first shape from the left is a circle. (If necessary, review left and right.) Make your second shape the smaller triangle. Keep your row straight! Now, arrange it so that your third shape is a circle with a chunk missing. Share with your partner. What is the next shape in your row?

S: It is a heart. → Mine is a square. → Mine is a different triangle.

T: Student A, count your shapes starting from the left, stopping at the cross.

S: 1, 2, 3, 4.

T: You stopped at shape number 4. We would say that the cross is your fourth shape!

T: Tell your partner your fourth shape. Use the words, “My fourth shape is \_\_\_\_\_.”

S: (Do so.)

**MP.6** T: Student B, what is the last shape in your row?

S: Mine is the big triangle.

T: Student B, count your shapes starting from the left and stopping at the big triangle.

S: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10.

T: Tell your partner what your tenth shape is. Use the words, “My tenth shape is \_\_\_\_\_.”

S: My tenth shape is the one that looks like the outside of a can. → My tenth shape is the heart.

T: Mix up all of your shapes again.

T: This time, we are going to make a column of your shapes. Our columns will all be the same, so listen carefully.

- Make the first shape, the one at the top of your column, a square.
- Second, the large triangle.
- Third, a cross.
- Fourth, a circle.
- Fifth, a heart.
- Sixth, the hexagon.



### NOTES ON MULTIPLE MEANS OF ENGAGEMENT:

Challenge students performing above grade level by giving them an opportunity to call out an arrangement of shapes using ordinal numbers. Clearly explain what they are to do: “Call out different shapes by saying, for instance, first put your square on the table, put your triangle second in the row, etc.” Let them lead the game for the whole class or in small groups.

MP.6

- Seventh, the circle with a chunk out of it.
- Eighth, the small triangle.
- Ninth, the diamond (rhombus).
- Tenth, the one that looks like part of a can.

T: Start at the top of your column, and count down 5 shapes. What is your fifth shape? Use the words, “My fifth shape is \_\_\_\_\_.”

S: My fifth shape is a heart.

T: Count from the top, and then put your finger on the last shape in your column. How many shapes did you count?

S: 10.

T: Yes. Your finger is on your tenth shape. What is your tenth shape? Use your words.

S: My tenth shape is the one that looks like a can.



Continue practicing this way until students demonstrate an understanding of the relationship between the positions of the shapes and the resulting ordinal descriptions.

T: We are going to play Simon Says with your shapes. Simon says, make a row of shapes. Simon says, make your sixth shape a heart. Simon says, make your ninth shape a square. Simon says, make sure that your first shape is a triangle. Put your finger on the third shape.

S: You didn't say Simon Says!

Continue the game in this manner, monitoring accuracy and allowing students to gain fluency in identifying the ordinal positions in preparation for the Problem Set.

T: Turn to your partner, and tell him about your column of shapes. Use your math words to describe the position of each shape in the line.

S: My first shape is a circle. My second shape is a heart. My third shape is a circle with a chunk missing. (Continue through to the tenth shape.)

Circulate to observe the conversations and to encourage precision in the language.

### Problem Set (10 minutes)

Students should do their personal best to complete the Problem Set within the allotted time.

Name Adam Date 5-27-14

Circle the 2<sup>nd</sup> truck from the stop sign. Draw a square around the 5<sup>th</sup> truck. Draw an X on the 9<sup>th</sup> truck.

---

Draw a triangle around the 4<sup>th</sup> vehicle from the stop sign. Draw a circle around the 1<sup>st</sup> vehicle. Draw a square around the 6<sup>th</sup> vehicle.

---

Put an X on the 10<sup>th</sup> horse from the stop sign. Draw a triangle around the 7<sup>th</sup> horse. Draw a circle around the 3<sup>rd</sup> horse. Draw a square around the 8<sup>th</sup> horse.

### Student Debrief (8 minutes)

**Lesson Objective:** Describe the relative position of shapes using ordinal numbers.

The Student Debrief is intended to invite reflection and active processing of the total lesson experience.

Invite students to review their solutions for the Problem Set. They should check work by comparing answers with a partner before going over answers as a class. Look for misconceptions or misunderstandings that can be addressed in the Student Debrief. Guide students in a conversation to debrief the Problem Set and process the lesson.

Any combination of the questions below may be used to lead the discussion.

- Tell your partner how you marked the second, fifth, and ninth truck. Did you start counting from the beginning each time, or did you count on each time you were marking the next truck?
- Look at the next problem with the vehicles. Could you use the counting on strategy this time? Why or why not? (In the first problem, the students were asked to mark the trucks in sequential order; in this next problem, they are asked to mark the vehicles out of order.)
- What's different about the line of horses and the first two problems we did with the vehicles? (All the horses are exactly the same.) Did that make it easier or harder to find the one to mark?
- Before, we talked about standing up *first* and then about putting a shape *first* in the row. How are those ideas similar? How are they different? Is it fair to use *first* in both of those sentences?

### Exit Ticket (3 minutes)

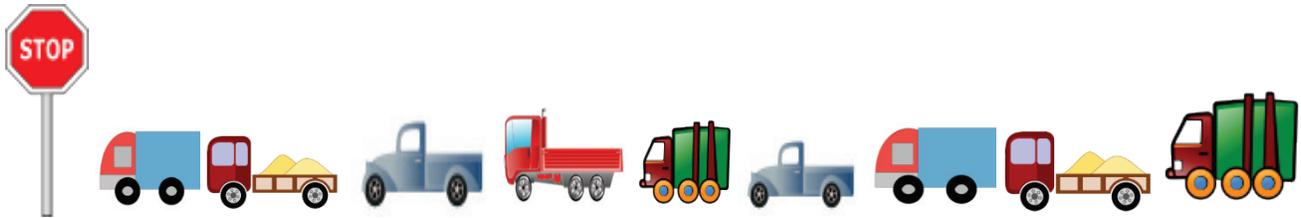
After the Student Debrief, instruct students to complete the Exit Ticket. A review of their work will help with assessing students' understanding of the concepts that were presented in today's lesson and planning more effectively for future lessons. The questions may be read aloud to the students.

Draw a line from the shape to the correct ordinal number starting at the top.

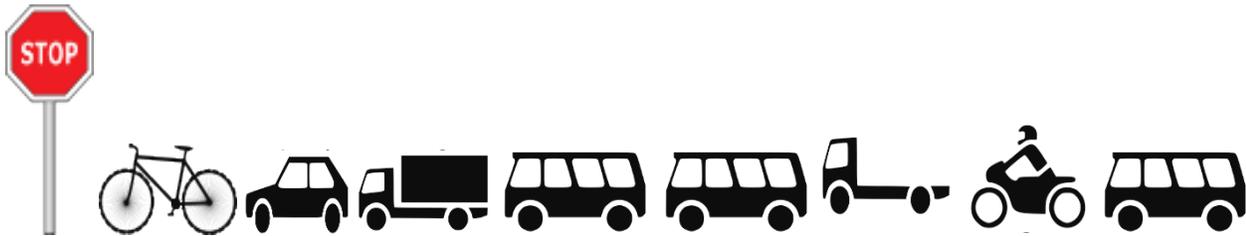
Name \_\_\_\_\_

Date \_\_\_\_\_

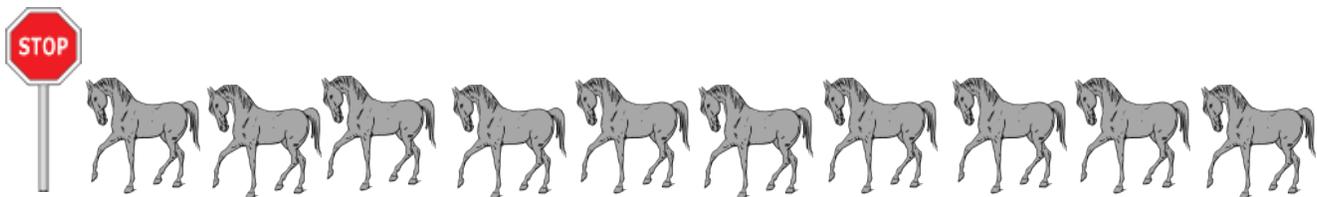
Circle the 2<sup>nd</sup> truck from the stop sign. Draw a square around the 5<sup>th</sup> truck. Draw an X on the 9<sup>th</sup> truck.



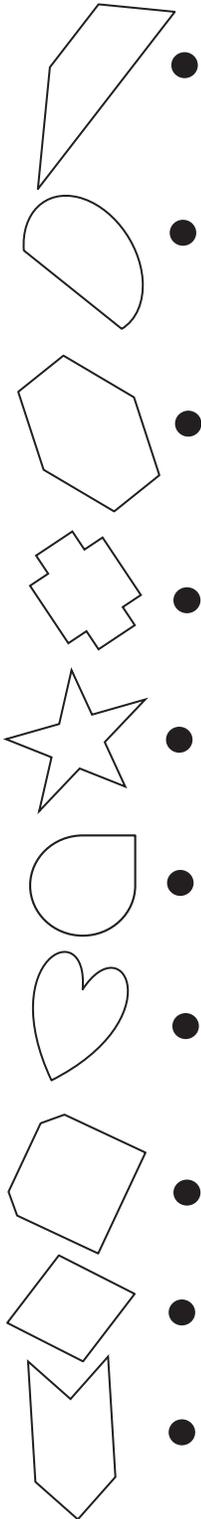
Draw a triangle around the 4<sup>th</sup> vehicle from the stop sign. Draw a circle around the 1<sup>st</sup> vehicle. Draw a square around the 6<sup>th</sup> vehicle.



Put an X on the 10<sup>th</sup> horse from the stop sign. Draw a triangle around the 7<sup>th</sup> horse. Draw a circle around the 3<sup>rd</sup> horse. Draw a square around the 8<sup>th</sup> horse.



Draw a line from the shape to the correct ordinal number, starting at the top.



- |                          |
|--------------------------|
| 9 <sup>th</sup><br>ninth |
|--------------------------|
- |                           |
|---------------------------|
| 4 <sup>th</sup><br>fourth |
|---------------------------|
- |                          |
|--------------------------|
| 6 <sup>th</sup><br>sixth |
|--------------------------|
- |                          |
|--------------------------|
| 1 <sup>st</sup><br>first |
|--------------------------|
- |                            |
|----------------------------|
| 7 <sup>th</sup><br>seventh |
|----------------------------|
- |                          |
|--------------------------|
| 3 <sup>rd</sup><br>third |
|--------------------------|
- |                           |
|---------------------------|
| 10 <sup>th</sup><br>tenth |
|---------------------------|
- |                          |
|--------------------------|
| 5 <sup>th</sup><br>fifth |
|--------------------------|
- |                           |
|---------------------------|
| 8 <sup>th</sup><br>eighth |
|---------------------------|
- |                           |
|---------------------------|
| 2 <sup>nd</sup><br>second |
|---------------------------|

Name \_\_\_\_\_

Date \_\_\_\_\_

Listen to the directions. Start at the circle when counting.

Color the 5<sup>th</sup> shape red.

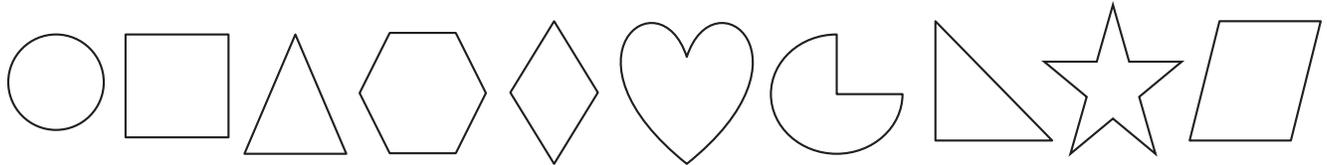
Color the 2<sup>nd</sup> shape green.

Color the 10<sup>th</sup> shape yellow.

Color the 7<sup>th</sup> shape blue.

Color the 1<sup>st</sup> shape pink.

Color the 8<sup>th</sup> shape orange.



Name \_\_\_\_\_

Date \_\_\_\_\_

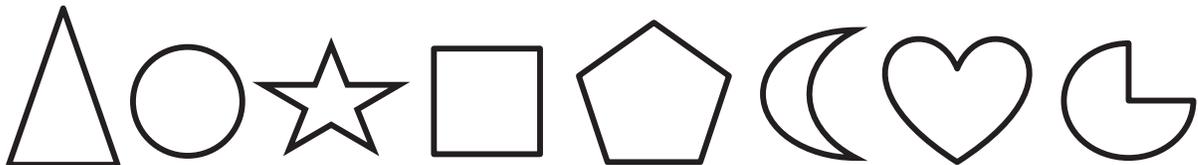
Color the 1<sup>st</sup> ☆ red.  
 Color the 3<sup>rd</sup> ☆ blue.  
 Color the 5<sup>th</sup> ☆ green.  
 Color the 8<sup>th</sup> ☆ purple.



Put an X on the 2<sup>nd</sup> shape.  
 Draw a triangle in the 4<sup>th</sup> shape.  
 Draw a circle around the 6<sup>th</sup> shape.  
 Draw a square in the 9<sup>th</sup> shape.



Draw a circle in the 7<sup>th</sup> shape.  
 Put an X on the 1<sup>st</sup> shape.  
 Draw a square in the 5<sup>th</sup> shape.  
 Draw a triangle in the 3<sup>rd</sup> shape.



Match each animal to the place where it finished the race.

4  
fourth

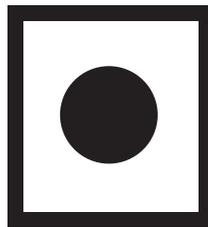
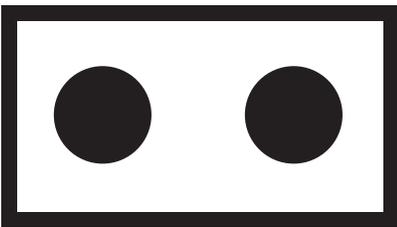
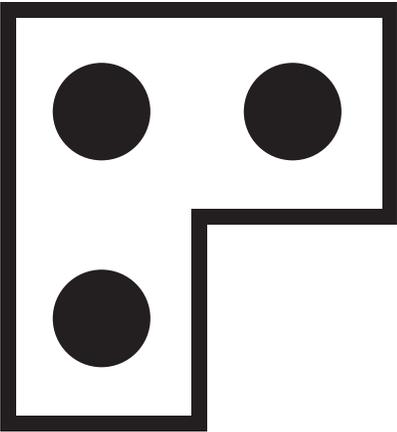
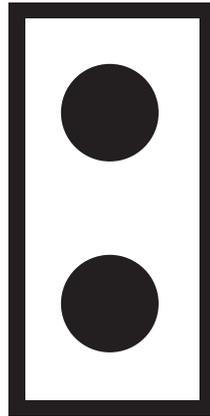
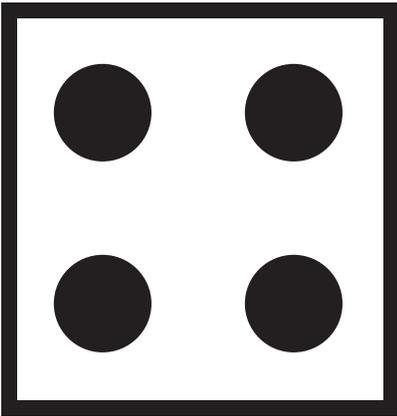
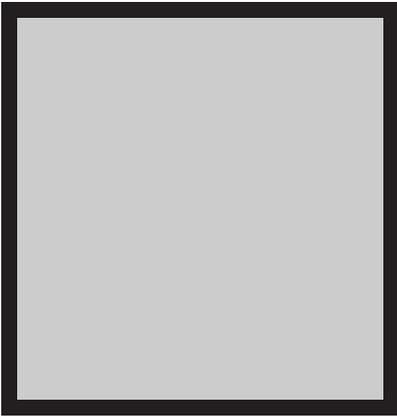
2  
second

1  
first

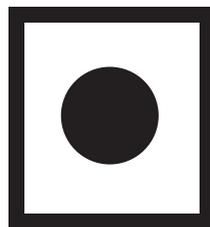
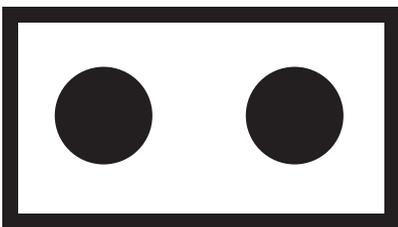
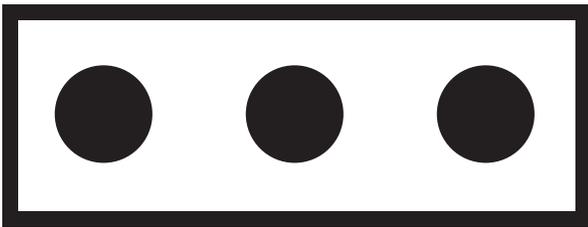
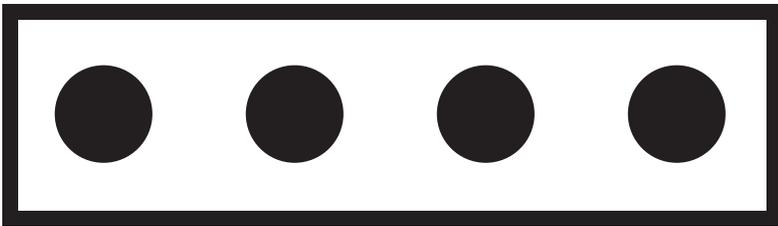
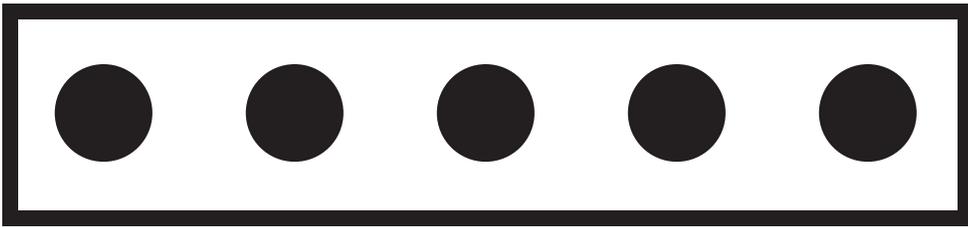
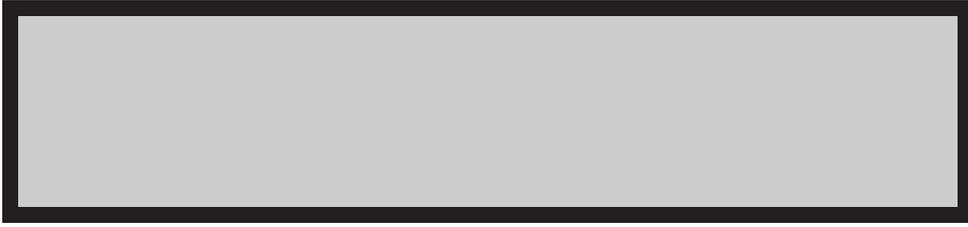
3  
third

6  
sixth

5  
fifth

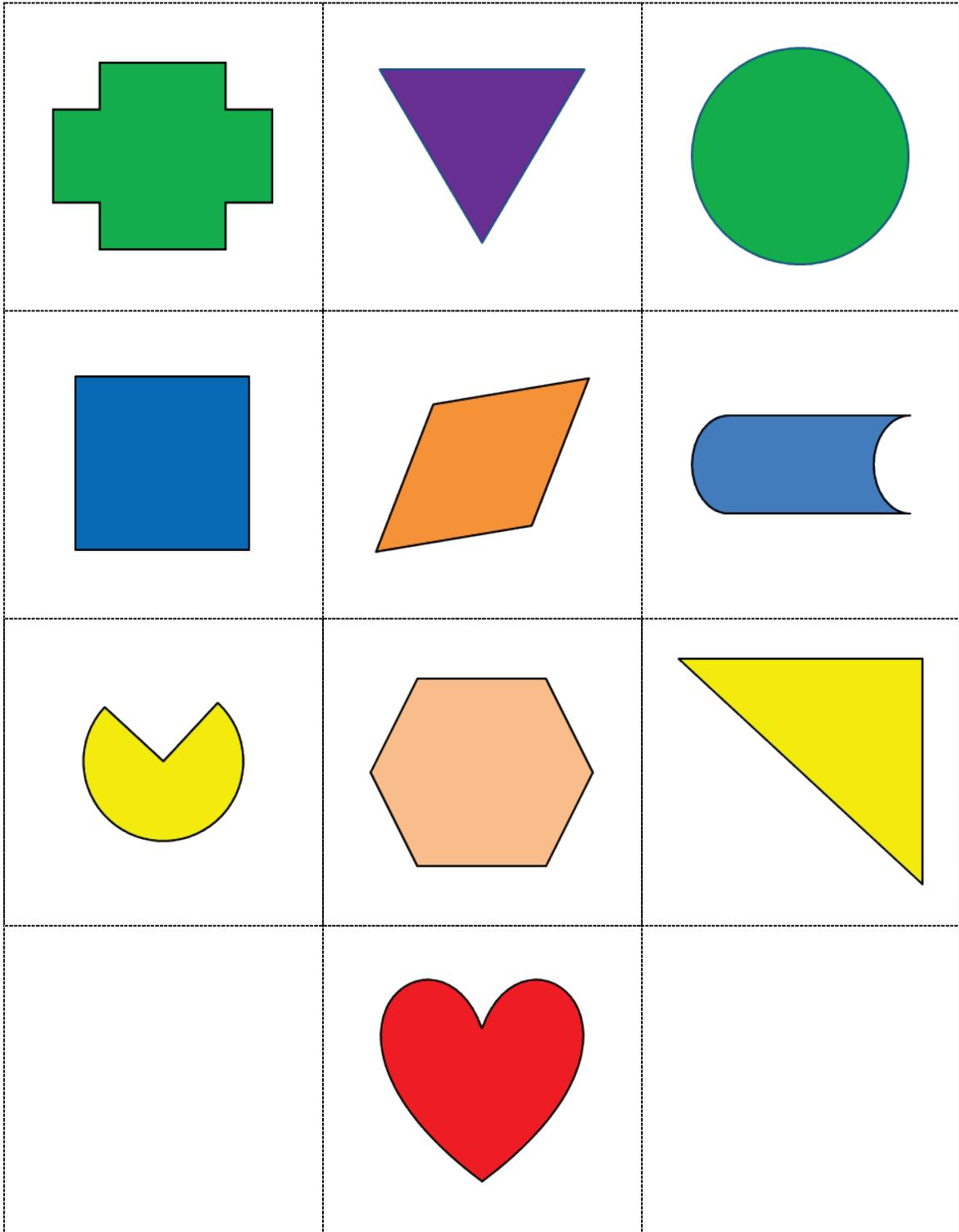


4-dot puzzle cards

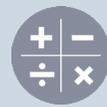


---

5-dot puzzle cards



shapes



## Topic B

## Composing and Decomposing Shapes

K.G.6, K.G.1, K.G.4

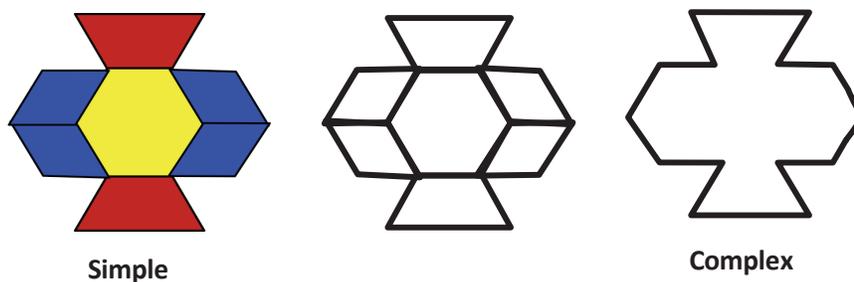
<b>Focus Standard:</b>	K.G.6	Compose simple shapes to form larger shapes. <i>For example, “Can you join these two triangles with full sides touching to make a rectangle?”</i>
<b>Instructional Days:</b>	4	
<b>Coherence -Links from:</b>	GPK–M2	Shapes
<b>-Links to:</b>	G1–M5	Identifying, Composing, and Partitioning Shapes

Thus far, students have considered shapes independently, rather than in conjunction with other shapes. Topic B expands students’ thinking about shapes by introducing the notion that simple shapes can be combined to compose larger shapes (**K.G.6**). This supports *A Story of Units’* overarching theme that smaller units can be used to make a larger unit. “These two triangles make a square! These two squares make a rectangle!”

In Lesson 5, students use pattern blocks as templates to compose other shapes and pictures. For example, they make a rectangle from two squares and use a square and a triangle to make a pentagon or *house* shape.

Lesson 6 has students explore how to decompose a flat shape into two or more flat shapes. For example, students find that their rectangle can be decomposed into two triangles, two squares, or even a square and two smaller rectangles. Students record their explorations by drawing the hidden shapes within a larger shape. The Problem Set extends puzzle work as students combine shapes to complete pattern block templates of increasing complexity (see Geometry progressions document, p. 7).

Lesson 6’s work leads into Lesson 7, where students cut a square to form simple three-piece puzzles and to intuitively use geometric motions such as flips, turns, and slides as they work to solve one another’s puzzles. Lesson 8 hosts the Math Olympics, a culminating task that celebrates student learning from the whole year. Students complete tasks related to measurement, operations, and geometry.



Simple

Complex

**A Teaching Sequence Toward Mastery of Composing and Decomposing Shapes**

**Objective 1:** Compose flat shapes using pattern blocks and drawings.  
(Lesson 5)

**Objective 2:** Decompose flat shapes into two or more shapes.  
(Lesson 6)

**Objective 3:** Compose simple shapes to form a larger shape described by an outline.  
(Lesson 7)

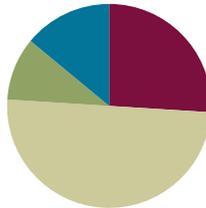
**Objective 4:** Culminating task—review selected topics to create a cumulative year-end project.  
(Lesson 8)

## Lesson 5

Objective: Compose flat shapes using pattern blocks and drawings.

### Suggested Lesson Structure

■ Fluency Practice	(13 minutes)
■ Application Problem	(5 minutes)
■ Concept Development	(25 minutes)
■ Student Debrief	(7 minutes)
<b>Total Time</b>	<b>(50 minutes)</b>



### Fluency Practice (13 minutes)

- Sprint: Core Fluency **K.OA.5** (9 minutes)
- Finish Line **K.CC.4d** (4 minutes)

### Sprint: Core Fluency (9 minutes)

Materials: (S) Core Fluency Sprint A, B, C, or D (Lesson 2 Core Fluency Sprints)

Note: This activity continues students' progress toward mastery of the required fluency for kindergarten.

Decide on a core fluency skill in which students would benefit from extra practice: addition, subtraction, or mixed addition with subtraction within 5. Select the Sprint that is most appropriate for the class from the Core Fluency Sprints in Lesson 2.

Follow the procedure outlined in Lesson 2.

### Finish Line (4 minutes)

Materials: (T/S) Personal white board (turned to landscape orientation), 10 linking cubes

Note: This activity gives students practice in using ordinal numbers to describe relative position.

- T: (Distribute linking cubes as 10-sticks.) How many cubes do you have? (Give students time to count if necessary.)
- S: 10.
- T: Pretend that your 10-stick of cubes is a little train. (Have students orient their trains the same way by giving them a point of reference in the classroom.) Put your finger on the first cube.
- S: (Touch the first cube.)
- T: Let's use our number order words as we touch each cube. Ready?
- S: First, second, third, fourth, fifth, sixth, seventh, eighth, ninth, tenth.

- T: Good. Now, break apart your cubes so none are connected. (Give students a moment to do this.) This time, I want you to pretend that they are little people running in a race! The start line is the edge of your personal white board. The finish line is the opposite side of your board. Watch me make my people run. (Demonstrate how to make cubes run.)
- T: On your mark, get set, go! (Allow about 10–30 seconds for students to participate.)
- S: (Move the cubes around as if running.)
- T: Stop! The race is over. (Do not allow students to change the position of the cubes at this point.) Get out your marker. Listen carefully to what I want you to do. Circle the first runner.
- S: (Circle the cube that is closest to the finish line or the runner that passed the finish line.)
- T: Make an X next to the tenth runner.
- S: (Make an X next to the cube that is farthest from the finish line.)
- T: Underline the fifth runner.
- S: (Underline the fifth cube.)
- T: Now, point and show your partner who is first, second, and so on.

Have students clear their boards and play again alone or with a partner. Give instructions to mark different ordinal positions each time.

Have students change the location of the finish line so that they can describe the position of the runners relative to it.

### Application Problem (5 minutes)

Materials: (S) Personal white board

Listen carefully to my instructions. You are going to draw a house!

- First, draw a square to make the big part of your house.
- Second, use a triangle to make a roof.
- Third, use a shape of your choice for a door.
- Fourth, find somewhere in your picture where you can use two more squares or rectangles.
- Fifth, use a circle somewhere in your scene.
- Sixth, find a place where you could draw a hexagon in your scene.

Take another minute to finish your scene with more shapes and details. Don't forget to draw yourself!

Now, show your picture to your partner. Tell her about each of your shapes. Do your houses look alike? How did you use shapes differently in your pictures?

Note: The activity of creating a scene using a number of assigned shapes is an opportunity for students to practice drawing the shapes. It also serves as an anticipatory set for composition with shapes in today's lesson. Circulate during the activity to see if there are students who still need help drawing any of the basic shapes.



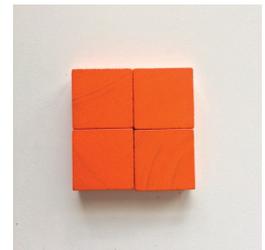
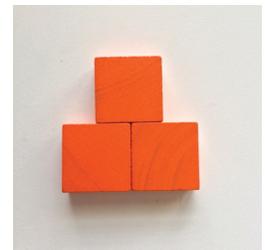
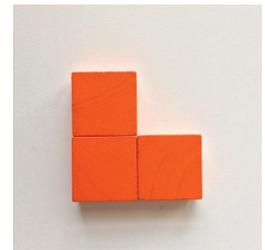
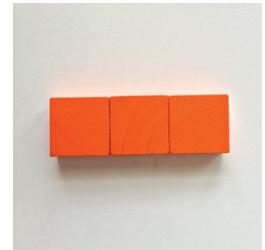
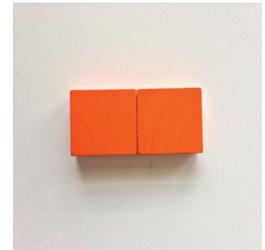
#### NOTES ON MULTIPLE MEANS OF ACTION AND EXPRESSION:

Because drawing might present a further challenge, students working below grade level and those with disabilities may benefit from using manipulatives to create a house. Provide attribute blocks or pattern blocks to make the house as the first step toward drawing the shapes on personal white boards.

### Concept Development (25 minutes)

Materials: (S) Pattern blocks (a variety including 4 squares and 1 triangle), personal white board, I can make new shapes recording sheet (Template)

- T: Find two squares in your pattern block box. How do you know they are squares?
- S: They each have four sides. → The sides are all the same length. → They have corners like an L. → They look like the face of a cube!
- T: Place the squares on your personal white board. See if you can make a different rectangle from your squares. (Pause.) Tell me about your work.
- S: I put them right next to each other. → Now, two of the sides are long!  
→ It is a different rectangle now.
- T: I like how you put your squares together so that the edges are fully touching. While you hold your pattern blocks down, trace your new shape with your marker. Hold up your boards to show me your work! (Pause.)
- T: Put your squares back inside your new shape outline. I wonder what would happen if we added another square?
- S: I think it would just get longer. → I think it might be another rectangle.  
→ I have a different idea!
- T: Try it and see! Trace your new shape. (Pause.)
- S: I have a longer rectangle now. → I decided to put my square on top!  
→ I don't have a rectangle anymore. I have an L. → Now it looks like a building!
- T: Turn and talk to your partner about your drawings. (Pause.)
- T: Take out one more square. Can you use the four small squares to make a larger square?
- S: Yes. I put two next to each other and two on top. → All of my squares are touching in the corners.
- T: How do you know that you built a square?
- S: It looks like a carpet square. → Four sides and four corners. → All the sides are the same. The corners are like an L.
- T: Let's try another one. Take a square and a triangle out of your pattern block box. On your board, find a way to put their sides together to make a new shape. (Pause.) Tell me about your work.
- S: I made a house shape! → It looks like the one we made in our drawing before! → I think mine looks like a rocket ship.
- T: Trace your pattern blocks to show your new shape. (Pause.) Hold up your boards to show me your work! (Briefly observe to ensure understanding and to see which students might need additional support with the tracing activity.)



T: Now, you are going to get a chance to make up your own new shapes! Work with your partner, taking turns to be the shape artist.

- First, choose two shapes from your pattern block box.
- Second, put them together to make a new shape.
- Third, trace your shape on your recording sheet.
- Fourth, tell your partner about your new shape. How many sides does it have? How many corners? What would you name your new shape?

MP.6

Allow time for exploration and composition of new shapes. Listen to the conversations to observe precision in the descriptive language such as *sides*, *corners*, *straight lines*, and so on. If time permits and students demonstrate ability, they may choose to use three shapes at a time.

T: Would anyone like to hold up their recording sheet and share one of their new shapes?

S: Mine looks like a bird! → I made a snowman shape. → I made a person!

Note: Save student recording sheets for additional work in Lesson 6.

### Problem Set (10 minutes)

Students should do their personal best to complete the Problem Set within the allotted time.

### Student Debrief (7 minutes)

**Lesson Objective:** Compose flat shapes using pattern blocks and drawings.

The Student Debrief is intended to invite reflection and active processing of the total lesson experience.

Invite students to review their solutions for the Problem Set. They should check work by comparing answers with a partner before going over answers as a class. Look for misconceptions or misunderstandings that can be addressed in the Student Debrief. Guide students in a conversation to debrief the Problem Set and process the lesson.



#### NOTES ON MULTIPLE MEANS OF REPRESENTATION:

In order to facilitate the partner share after students create their own new shapes, give English language learners a review of key vocabulary needed to tell about their new shapes: *sides*, *corners*, *straight lines*, etc.

Name Shelley Date 5-31-14

Choose 4 shapes to create a new shape in Box 1. Give the same 4 shapes to your partner. Have your partner create a different shape in Box 2.

1

2

Any combination of the questions below may be used to lead the discussion.

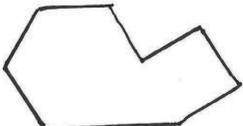
- In your Problem Set, what did you think about when you were arranging your pattern blocks to make new shapes?
- What if you had left spaces in between the blocks?
- Look around the classroom. Can you see anything that is made out of different shapes?
- How did you choose names for the shapes you created? (Many students name shapes after a real-world object they resemble, but look for some students to start naming based on attributes.)
- How does our work with the pattern blocks remind you of when you drew your house at the beginning of the lesson?

### Exit Ticket (3 minutes)

After the Student Debrief, instruct students to complete the Exit Ticket. A review of their work will help with assessing students' understanding of the concepts that were presented in today's lesson and planning more effectively for future lessons. The questions may be read aloud to the students.

Choose 5 shapes to create a new shape in Box 3. Give the same 5 shapes to your partner. Have your partner create a different shape in Box 4.

3



4



Subtract:

5 - 1 = 4    5 - 2 = 3    5 - 3 = 2    5 - 4 = 1

Name \_\_\_\_\_

Date \_\_\_\_\_

Choose 4 shapes to create a new shape in Box 1. Give the same 4 shapes to your partner. Have your partner create a different shape in Box 2.

1

2

Choose 5 shapes to create a new shape in Box 3. Give the same 5 shapes to your partner. Have your partner create a different shape in Box 4.

3

4

Subtract.

$$5 - 1 = \square \quad 5 - 2 = \square \quad 5 - 3 = \square \quad 5 - 4 = \square$$

Name \_\_\_\_\_ Date \_\_\_\_\_

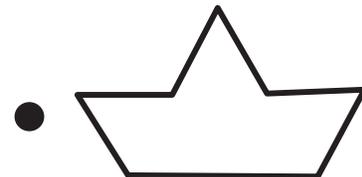
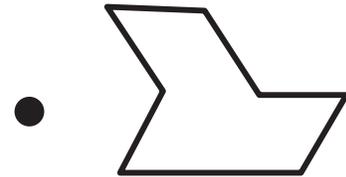
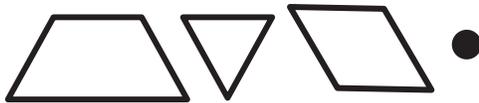
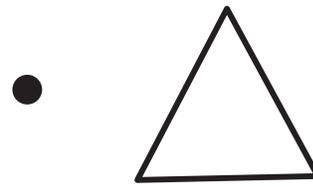
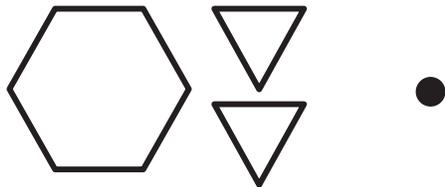
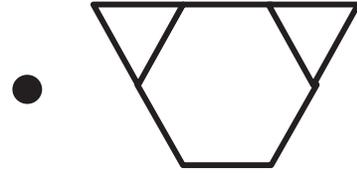
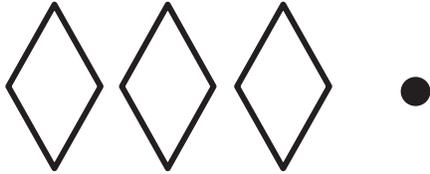
Use your pattern blocks to help you solve the problem.

Use 2 blocks to make a rectangle. Trace your blocks to show your rectangle.

Name \_\_\_\_\_

Date \_\_\_\_\_

Match each group of shapes on the left with the new shape they make when they are put together.



## *I Can Make New Shapes!*



---

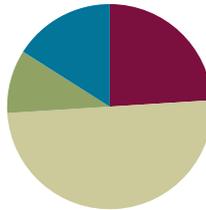
I can make new shapes recording sheet

## Lesson 6

Objective: Decompose flat shapes into two or more shapes.

### Suggested Lesson Structure

■ Fluency Practice	(12 minutes)
■ Application Problem	(5 minutes)
■ Concept Development	(25 minutes)
■ Student Debrief	(8 minutes)
<b>Total Time</b>	<b>(50 minutes)</b>



### Fluency Practice (12 minutes)

- Sprint: Make 10 **K.OA.4** (12 minutes)

#### Sprint: Make 10 (12 minutes)

Materials: (S) 2 copies of the Make 10 Sprint

Note: This Sprint maintains students' knowledge of making 10 from Module 4.

T: It's time for a Sprint!

Briefly recall previous Sprint preparation activities, and distribute Sprints facedown.

T: Take out your pencil and one crayon of any color. For this Sprint, you are going to write the missing number needed to make 10. (Demonstrate one example if needed.)

Continue to follow the Sprint procedure as outlined in Module 4 Lesson 3. Have students work on the Sprint for a second time. Continue to emphasize that the goal is simply to do better than the first time and celebrate improvement.

### Application Problem (5 minutes)

Materials: (S) Personal white board

You are going to be a detective today!

- First, look around the classroom to see if you can find things made of more than one shape, like we did yesterday.
- Second, draw one thing on your personal white board.
- Third, use your marker to draw the shapes inside.

If necessary, give hints about items such as tiles, bricks, windowpanes, and so on. Encourage students to look for and highlight the shapes within shapes on their boards.

T: Turn and talk to your partner about the hidden shapes that you found!

Note: Careful observation of shapes in the environment serves as the basis for today's decomposition lesson.



#### NOTES ON MULTIPLE MEANS OF ACTION AND EXPRESSION:

Encourage English language learners to use the words in their native language to name the shapes they find in the classroom. For instance, a native Spanish speaker can say *triángulo* and *rectángulo* instead of *triangle* and *rectangle*. Ask the student to share with the class, and then ask everyone else to say the English word as well.

### Concept Development (25 minutes)

Materials: (S) Scissors, shape sheet (Template), pattern blocks, I can make new shapes recording sheet (Lesson 5 Template)

T: What do you see on your paper?

S: We have different shapes! → I see squares, rectangles, and triangles.

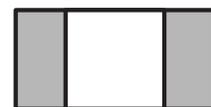
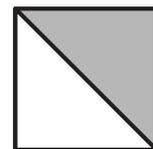
T: Cut out your shapes, and talk about them with your friends. Do not cut on the dotted line. (Allow time for activity and discussion.)

T: Hold up your gray square. Hold up your white triangle. Put your white triangle on your gray square, making two of the sides match. What do you notice?

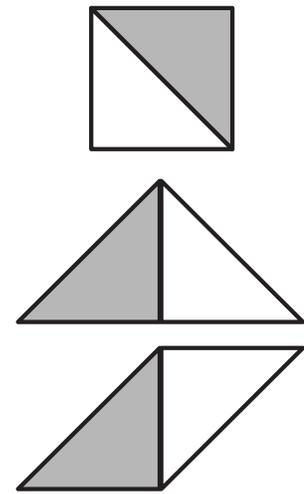
S: When I put the white triangle on, it leaves an empty space like another triangle! → There are two triangles now!

T: Yes! You made your square into two triangles. Find your gray rectangle and your white square. What happens if we cover as much as we can of the gray rectangle with the square?

S: I have two squares now! → I have a square in the middle and two little rectangles on the ends.



- T: You found more shapes inside your rectangle, didn't you? Hold up your white and gray triangles. Put them together. What shapes can you make with them?
- S: A square that is the same as the big square with the dotted line!  
→ A bigger triangle. → This one that looks like a diamond (rhombus).
- T: Fold your gray triangle on the dotted line. What do you notice?
- S: It's still a triangle, but now it is smaller. → When I unfold it, I see two little triangles inside.
- T: Now, look at your white rectangle with the dotted line. Fold it on the dotted line.
- S: Now, I have two rectangles! → They are smaller, but when I unfold it, I see the big rectangle again.
- T: Is there another way you could fold it?
- S: Yes! When I fold it the other way and then unfold it again, I have four rectangles in all! → I left mine folded and folded again. Now, I have a square.
- T: Now, take your large gray square, and fold it on the dotted line. What shapes do you see?
- S: Two triangles! → And they are the same size and shape as the white and gray triangle!
- T: You found a lot of little shapes inside other ones. What does this make you think of?
- S: It's like inside one thing is another that is smaller.  
→ It's like folding napkins for dinner. They start square and then make a rectangle. → Or triangle. → It's like our numbers! → We found number pairs hiding inside big numbers. These are shapes hiding in bigger shapes.
- T: Excellent thinking. Just like we can break our numbers into smaller parts, we can make smaller shapes out of bigger shapes, too.
- T: Yesterday, you made some wonderful new shapes on your recording sheet. Today, you are going to trade sheets with your partner to see if you can use pattern blocks to fill in the new shapes that she made. If you need help, ask your partner! You can take turns being the teacher! (Allow time for partner work and discussion.)



#### NOTES ON MULTIPLE MEANS OF ENGAGEMENT:

Give students working above grade level pattern blocks to use in creating different shapes. Challenge them by asking them to be sure to use at least one of each of the pattern blocks (including the orange square and the tan rhombus) and to make sure not to leave any gaps in their design. Have them describe their designs with a partner.

### Problem Set (10 minutes)

Students should do their personal best to complete the Problem Set within the allotted time. Provide pattern blocks for each student to use while completing the Problem Set.

Note: Look for additional pattern block activity cards at education stores or online to challenge students who finish the Problem Set quickly. These make great center activities during assessments.

### Student Debrief (8 minutes)

**Lesson Objective:** Decompose flat shapes into two or more shapes.

The Student Debrief is intended to invite reflection and active processing of the total lesson experience.

Invite students to review their solutions for the Problem Set. They should check work by comparing answers with a partner before going over answers as a class. Look for misconceptions or misunderstandings that can be addressed in the Student Debrief. Guide students in a conversation to debrief the Problem Set and process the lesson.

Any combination of the questions below may be used to lead the discussion.

- How did you decide which pattern blocks you needed to fill in the shapes in the Problem Set?
- Did you and your neighbor use the same blocks?
- Do you think there are shapes hiding inside your pattern blocks, too? Give me an example. How can you use this to help you find more than one way to fill in the big shapes?
- How is finding hidden shapes inside other shapes like what we did yesterday? (In the previous lesson, students put shapes together to make new shapes.)
- How is finding hidden shapes inside a bigger shape like finding hidden numbers inside a bigger number?
- Can you think of something at home that is made out of more than one shape and tell us about it?

### Exit Ticket (3 minutes)

After the Student Debrief, instruct students to complete the Exit Ticket. A review of their work will help with assessing students' understanding of the concepts that were presented in today's lesson and planning more effectively for future lessons. The questions may be read aloud to the students. Allow students to use pattern blocks to solve.

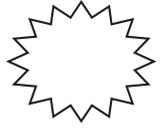
Name NUHAD Date 6-1-14  
Trace to show 2 ways to make each shape. How many shapes did you use?

I used 3 shapes. I used 2 shapes.  
I used 4 shapes. I used 5 shapes.  
I used 1 shapes. I used 3 shapes.

Fill in each shape with pattern blocks. Trace to show the shapes you used.

How many different ways can you cover the sun picture with pattern blocks?  
Answer: 3 ways  
(2 triangles), (6 triangles/1 hexagon), (1 large triangle/3 small triangles)

Number Correct:



Name \_\_\_\_\_

Date \_\_\_\_\_

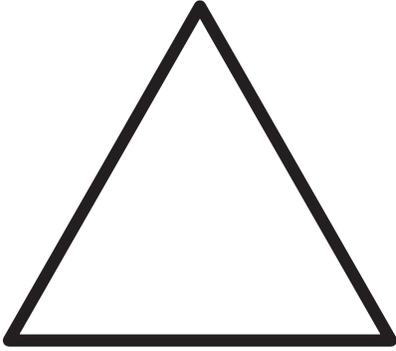
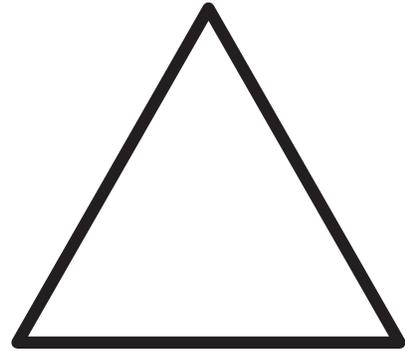
Write the number of dots needed to make 10 dots.

1.		9.	
2.		10.	
3.		11.	
4.		12.	
5.		13.	
6.		14.	
7.		15.	
8.		16.	

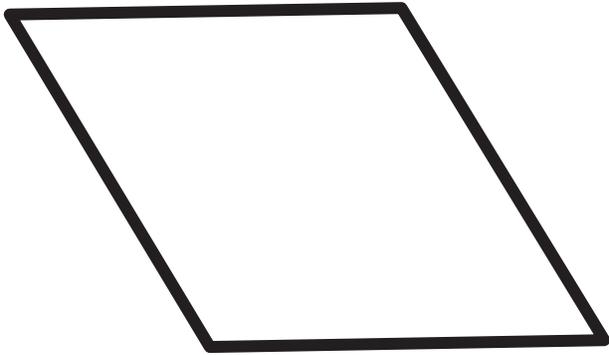
Name \_\_\_\_\_

Date \_\_\_\_\_

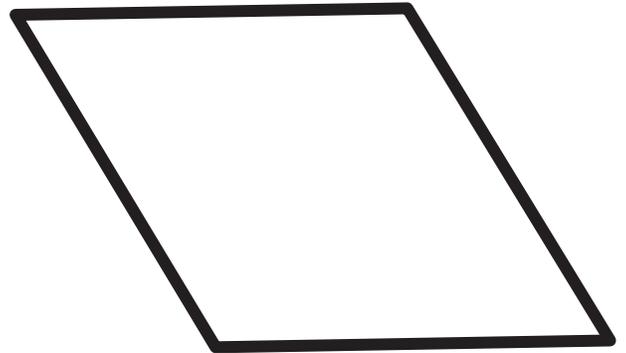
Trace to show 2 ways to make each shape. How many shapes did you use?

I used 3 shapes.

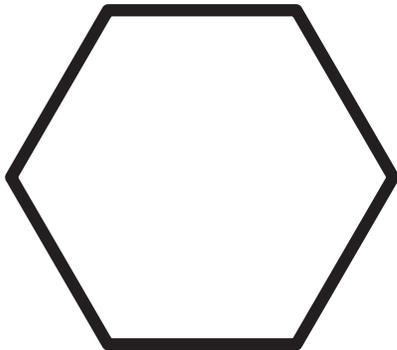
I used \_\_\_\_\_ shapes.



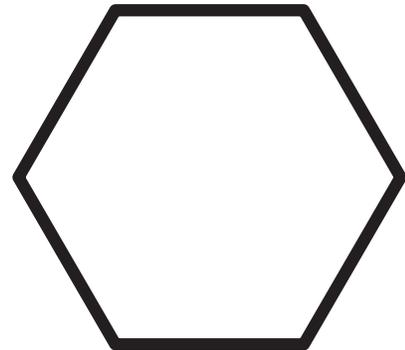
I used \_\_\_\_\_ shapes.



I used \_\_\_\_\_ shapes.

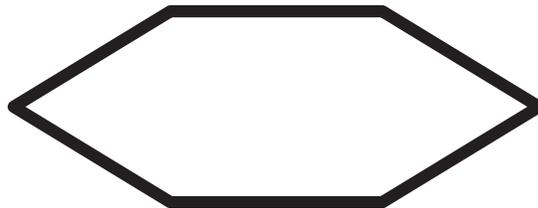
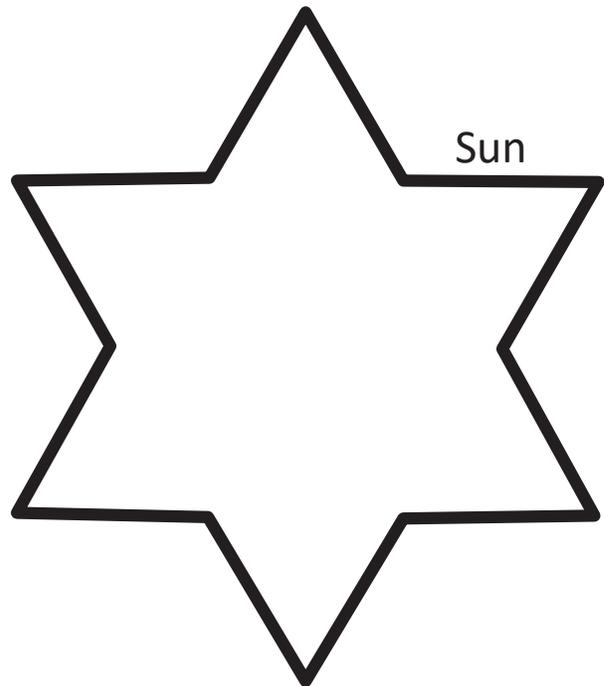
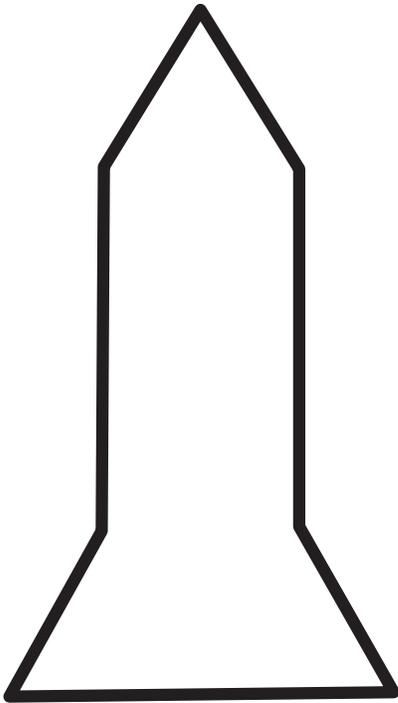
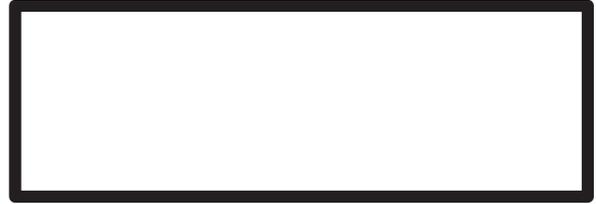


I used \_\_\_\_\_ shapes.



I used \_\_\_\_\_ shapes.

Fill in each shape with pattern blocks. Trace to show the shapes you used.



How many different ways can you cover the sun picture with pattern blocks?

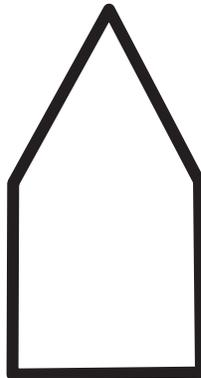
Name \_\_\_\_\_

Date \_\_\_\_\_

Draw 2 shapes that can be used to build the rectangle.



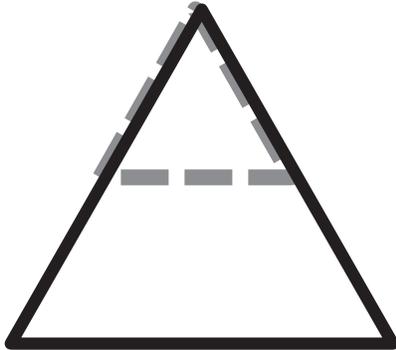
Draw 2 shapes that can be used to build the house.



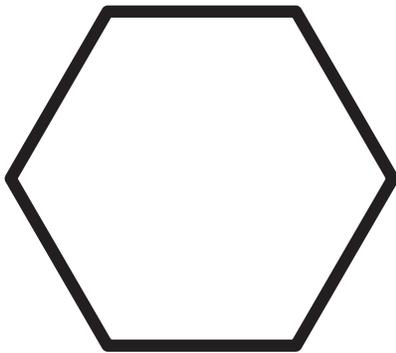
Name \_\_\_\_\_

Date \_\_\_\_\_

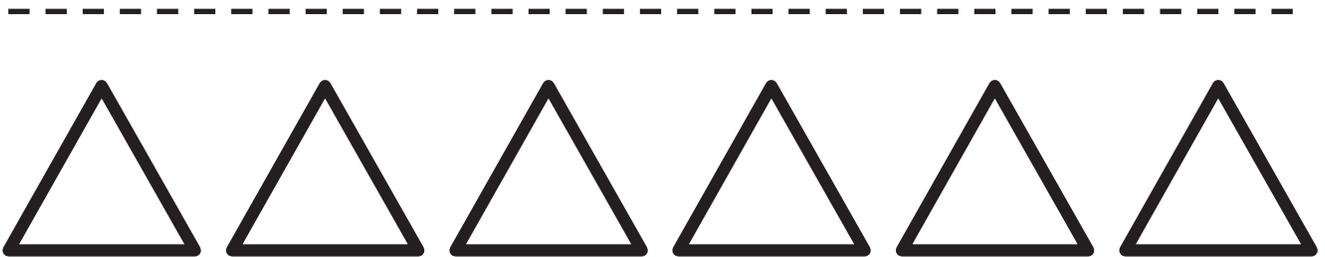
Cut out the triangles at the bottom of the paper. Use the small triangles to make the big shapes. Draw lines to show where the triangles fit. Count how many small triangles you used to make the big shapes.

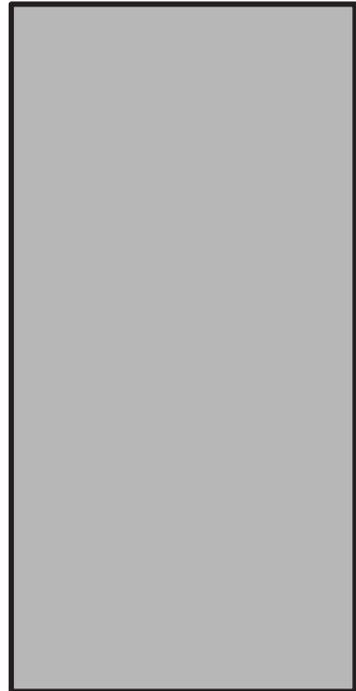
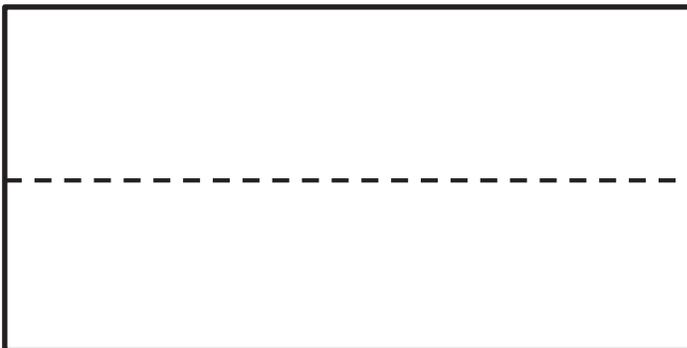
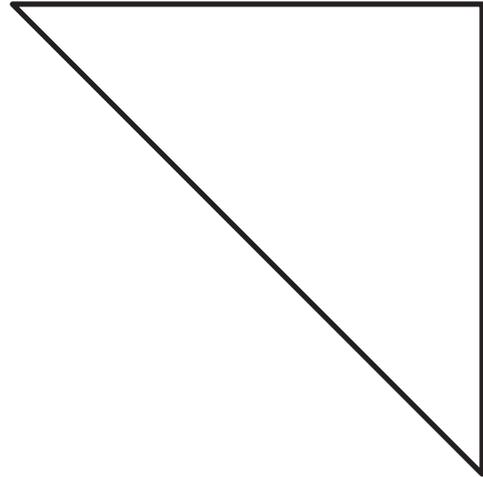
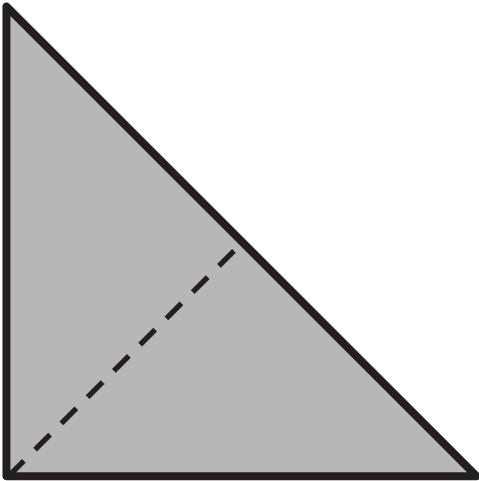
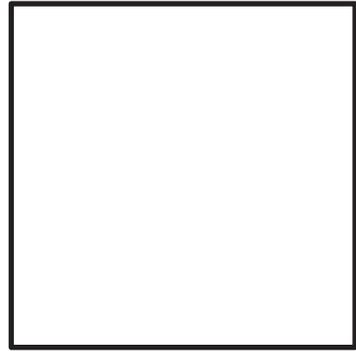
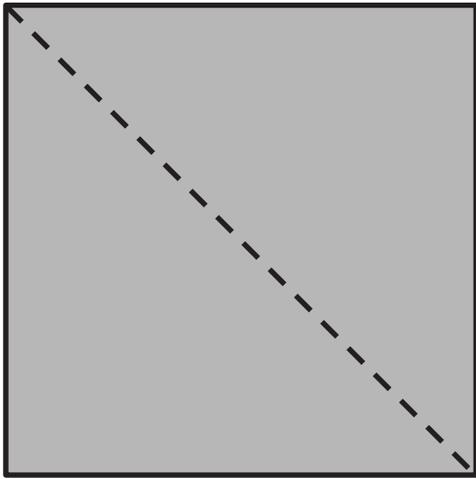


This big triangle is made with \_\_\_\_\_ small triangles.



This hexagon is made with \_\_\_\_\_ small triangles.





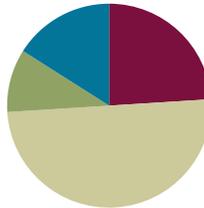
shape sheet

## Lesson 7

**Objective:** Compose simple shapes to form a larger shape described by an outline.

### Suggested Lesson Structure

■ Fluency Practice	(12 minutes)
■ Application Problem	(5 minutes)
■ Concept Development	(25 minutes)
■ Student Debrief	(8 minutes)
<b>Total Time</b>	<b>(50 minutes)</b>



### Fluency Practice (12 minutes)

- Getting Ready for First Grade! (12 minutes)

### Getting Ready for First Grade! (12 minutes)

**Materials:** (S) Folders, resealable plastic bags, personal white board, copies of Sprints, personal Rekenreks (made in Module 5), fluency kit (Fluency Template), and other consumable fluency materials

Generate a conversation about the necessity of practicing math over the summer to maintain skills students have learned in kindergarten. Emphasize the importance of getting ready for first grade, and tell students that they will get some things today to take home and use over the summer. Tell students that they will receive a letter telling parents and families how they can help.

Select materials in advance based on individual students' needs. Take into consideration the amount of support students can be expected to receive at home, and choose activities that can be done somewhat independently. Distribute copies of Sprints and Fluency Activity Sheets. Demonstrate how to use them in a personal white board so that they can be used multiple times over the summer.

Consider enlisting the help of parents or older students to assemble students' materials into packets. Hold students' packets until Lesson 8 so that they can share them with guests at the culminating activity!

### Application Problem (5 minutes)

**Materials:** (S) Personal white board, ruler

- T: Pretend you are having a party. Draw a big rectangle on your personal white board to show a delicious pretend chocolate cake.

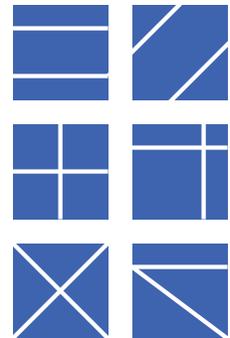
- T: Now, use your ruler, and draw lines to show how you would slice it to share the cake with the party guests. Where would you draw the lines? How many pieces did you make?
- T: Compare your cake to your partner's. Did you both do it the same way? Who has more pieces?

Note: Thinking about decomposing the rectangle in the problem leads the way to the creation of square puzzles in today's lesson.

### Concept Development (25 minutes)

Materials: (S) Ruler, shape puzzle (Template), scissors, pattern blocks, personal white board, envelope to contain student puzzle pieces (optional)

- T: What do you see on your paper?
- S: I see four shapes! → Two are colored (or gray), and two are white. → There are two squares and two rectangles.
- T: Yes! Today, you are going to be puzzle makers! Your first job is to cut the paper down the dotted line. Then, cut out your colored (or gray) shapes. Leave the white ones because you are going to use those for puzzle frames. (Allow time for cutting.)
- T: Use your ruler to draw two lines through your square, just like you did in the cake problem. Make sure that your lines go from edge to edge. (Pause.) Do you see some new shapes inside your square now?
- S: I have three shapes! → I made rectangles. → I made four new shapes. → I have little squares. → I have four triangles!
- T: Use your pencil to put your initials inside each of your new shapes. Now, cut the new shapes apart with your scissors. You are making a puzzle! (Allow time for cutting.)
- T: Mix up your puzzle pieces! Now, trade your puzzle pieces with your partner. Try to put his square back together. Use the frame on your paper to help you. (Allow time for practice and experimentation. Circulate to listen to the mathematical language being used. Encourage students to describe unfamiliar shapes by focusing on the number of sides and corners.) Tell me about your work.



#### NOTES ON MULTIPLE MEANS OF REPRESENTATION:

Help English language learners discuss their work with a partner by providing them with sentence starters, such as, "I have more pieces because..." The sentence starters not only help them communicate but also hold students accountable for staying on topic.

MP.1

- S1: I can't figure this one out. → The triangle won't fit inside the square.
- T: Could you move the triangle to make it fit?
- S1: I can turn it around. That doesn't work.
- T: Think about another way to move it.
- S1: I can turn it over. That works!

T: You needed to flip it! I like how you kept trying until you found a way to solve the puzzle.

S: I got the square back together! → I had to flip this piece over to make it fit. → I had to turn this one around!

T: Great job! Trade with another partner, and try again! (Allow time for more experimentation.)

T: Let's make another puzzle! This time, use your ruler to draw two lines through your rectangle. Make sure that your lines go from side to side. Remember to put your initials in each of the new shapes before you cut them apart.

**MP.1**

Repeat the activity with the rectangle, again circulating to observe precision in the language during the discussion of the shapes. Allow students to try solving a few different puzzles. In the spirit of MP.1, allow students to struggle and persevere, to experience the joy of the accomplishment without interference.



**NOTES ON  
MULTIPLE MEANS  
OF ACTION AND  
EXPRESSION:**

Challenge students working above grade level by offering them tangram puzzles to solve. Give them tangram manipulatives and outlines to solve the simpler puzzles, or download and give students printable tangrams. Students who finish their work early can form teams to solve the more challenging puzzles together.

### Problem Set (10 minutes)

Students should do their personal best to complete the Problem Set within the allotted time.

### Student Debrief (8 minutes)

**Lesson Objective:** Compose simple shapes to form a larger shape described by an outline.

The Student Debrief is intended to invite reflection and active processing of the total lesson experience.

Invite students to review their solutions for the Problem Set. They should check work by comparing answers with a partner before going over answers as a class. Look for misconceptions or misunderstandings that can be addressed in the Student Debrief. Guide students in a conversation to debrief the Problem Set and process the lesson.

Any combination of the questions below may be used to lead the discussion.

- How many shapes did Carlos have after he cut? How did you know which shapes to circle?
- How many shapes did India have after she cut? How did you know which shapes to circle?

Name Ananya Date 6-2-14  
Glue your puzzles into the frames.

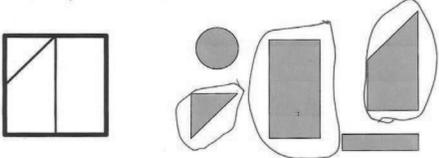
Draw some of the shapes that you had after you cut your rectangles.

- We all started with the same square, but all of your puzzles were different. Why is that? Everyone drew two lines, but some people ended up with three pieces, and some people had four pieces. Why?
- How did you know how to put your partner's puzzle together?
- Did you have to do anything to the shapes to make them fit into your puzzle? (Look for students to describe turns, flips, and slides.)
- How is the cake drawing like the rectangle puzzle that you made?

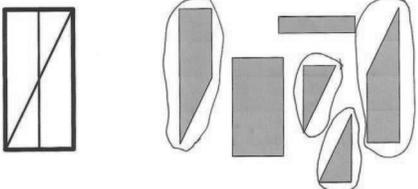
### Exit Ticket (3 minutes)

After the Student Debrief, instruct students to complete the Exit Ticket. A review of their work will help with assessing students' understanding of the concepts that were presented in today's lesson and planning more effectively for future lessons. The questions may be read aloud to the students.

Carlos drew 2 lines on his square. You can see his square before he cut it. Circle the shapes Carlos had after he cut.



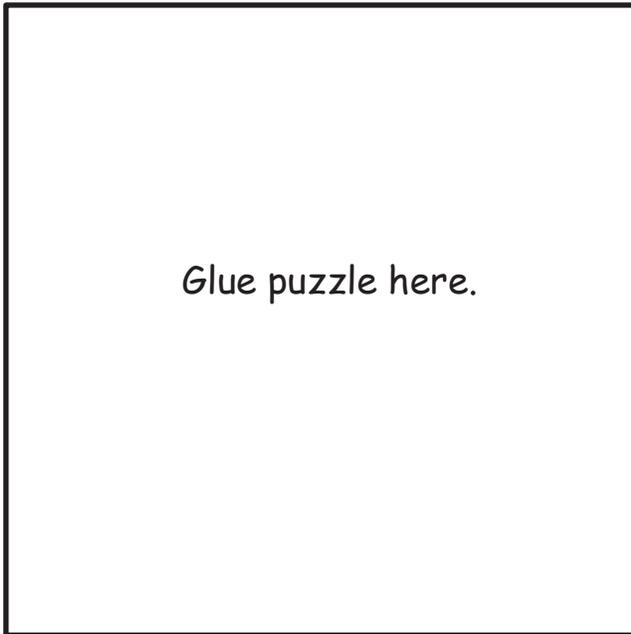
India drew 2 lines on her rectangle. You can see her rectangle before she cut it. Circle the shapes India had after she cut.



Name \_\_\_\_\_

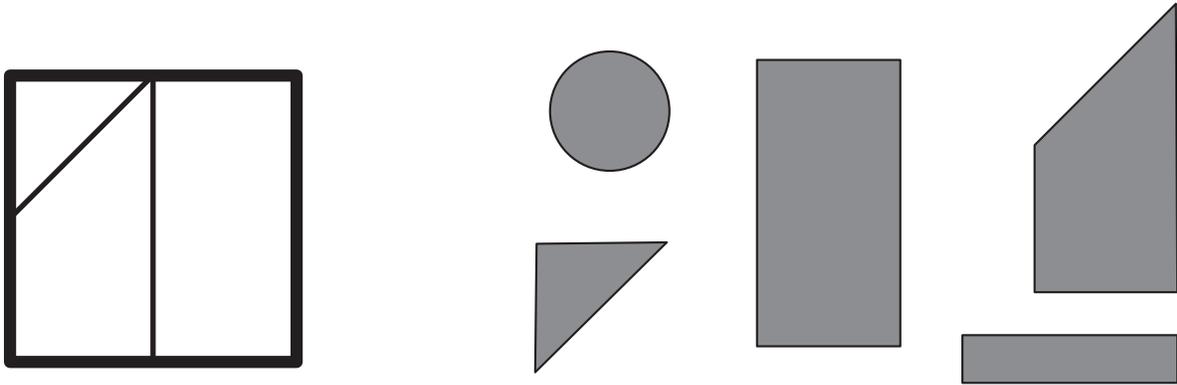
Date \_\_\_\_\_

Glue your puzzles into the frames.

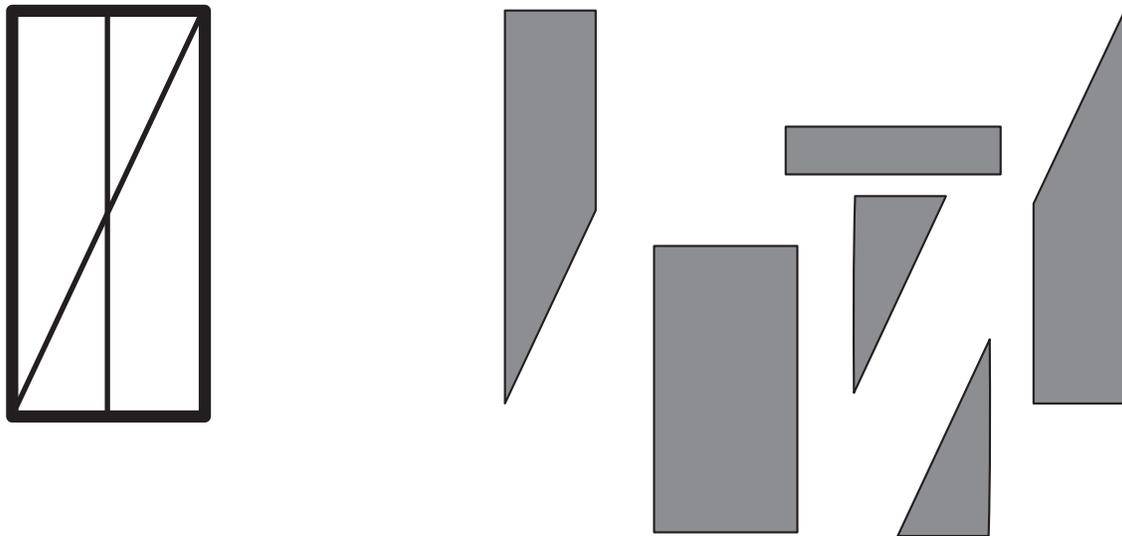


Draw some of the shapes that you had after you cut your rectangles.

Carlos drew 2 lines on his square. You can see his square before he cut it. Circle the shapes Carlos had after he cut.



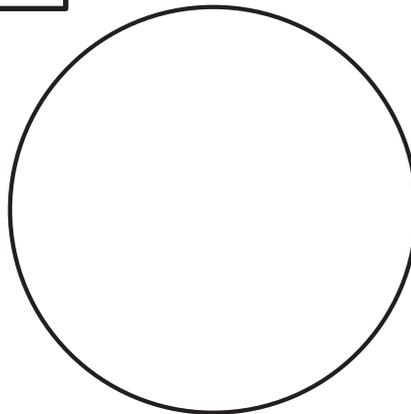
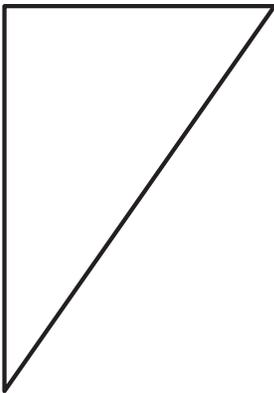
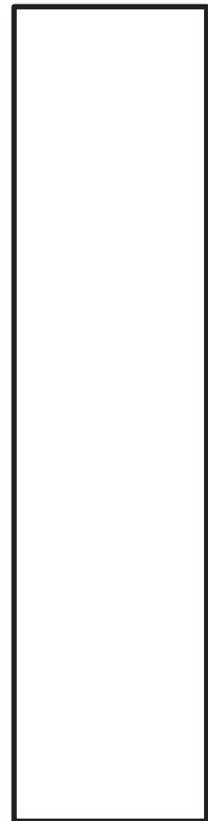
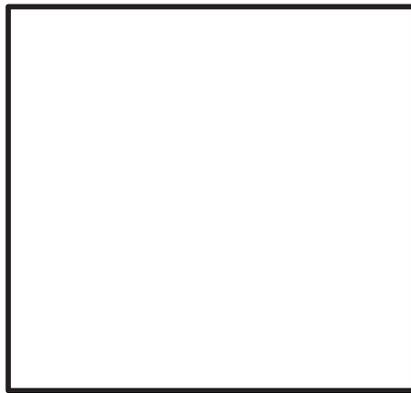
India drew 2 lines on her rectangle. You can see her rectangle before she cut it. Circle the shapes India had after she cut.



Name \_\_\_\_\_

Date \_\_\_\_\_

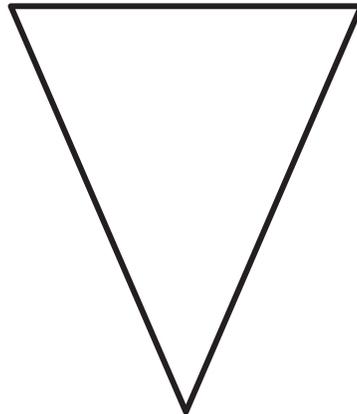
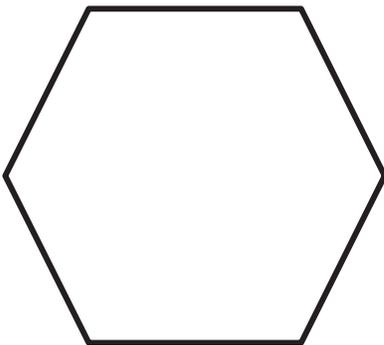
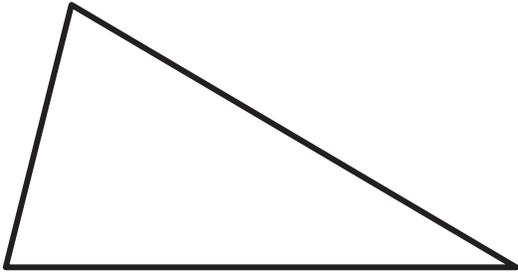
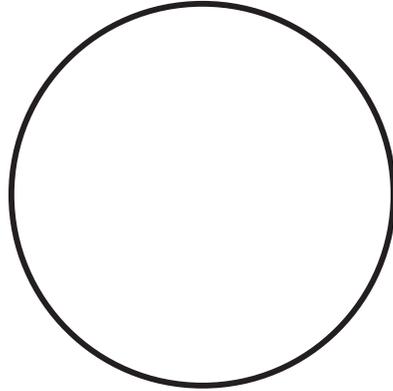
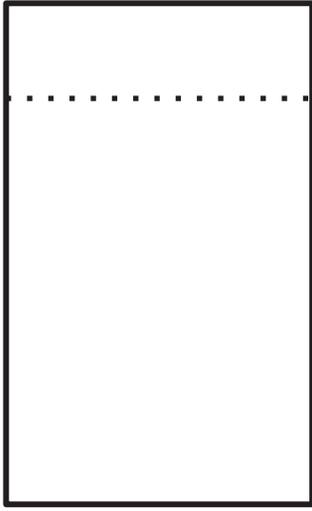
If you drew 2 straight lines inside the gray rectangle, what shapes might you find? Circle them.

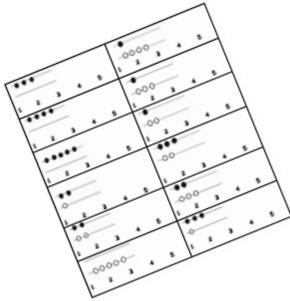
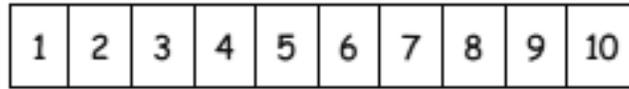
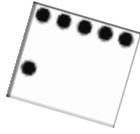


Name \_\_\_\_\_

Date \_\_\_\_\_

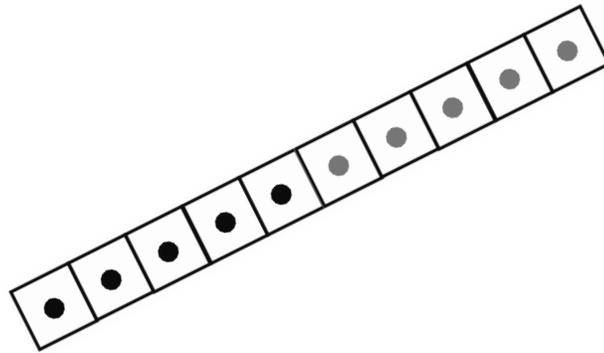
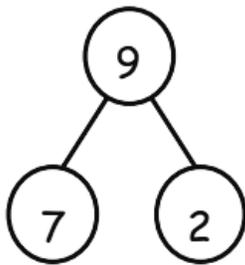
Using your ruler, draw 2 straight lines from side to side through each shape. The first one has been started for you. Describe to an adult the new shapes you made.





# I'm Getting Ready for First Grade!

## My Math Fluency Kit



Name \_\_\_\_\_

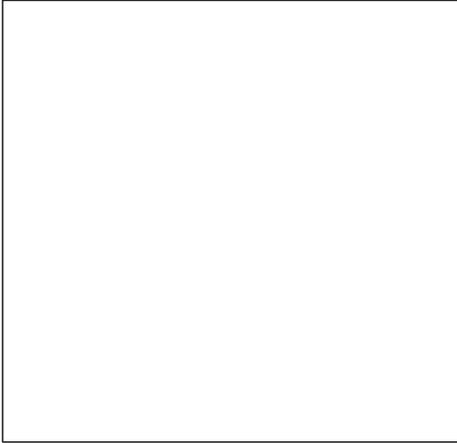
fluency kit

Name \_\_\_\_\_

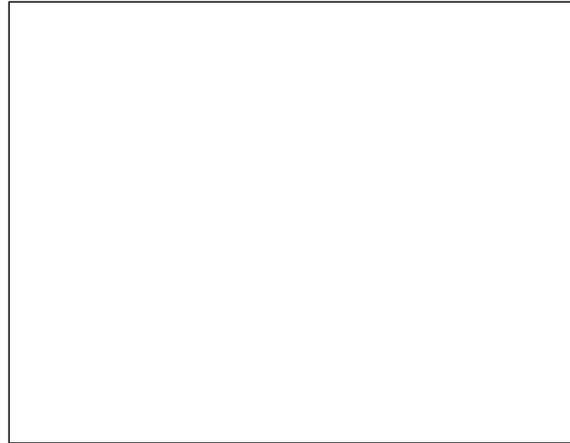
Date \_\_\_\_\_

### My Plan to Get Ready for First Grade Math

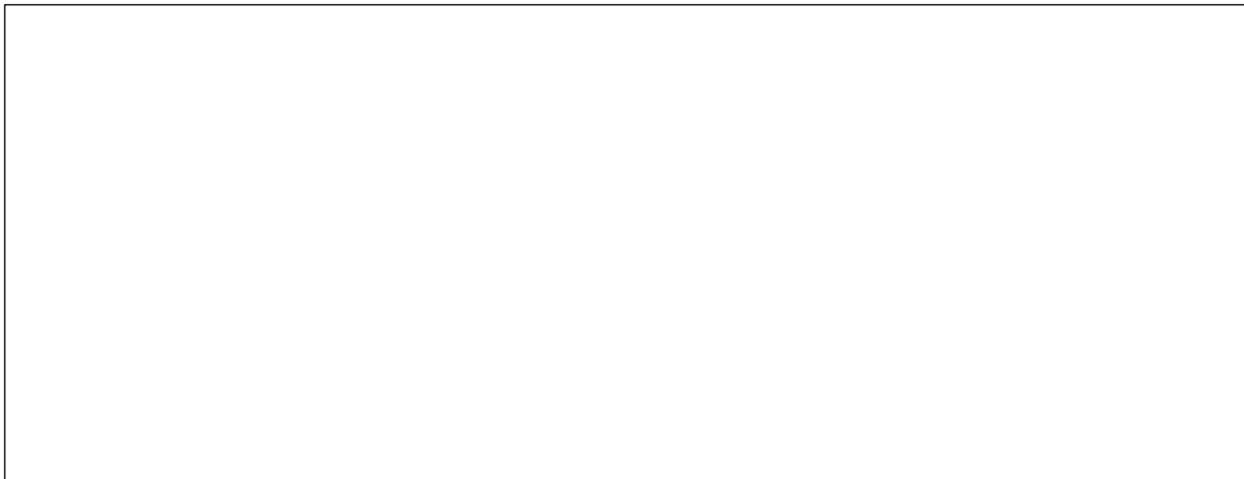
This is a picture of someone  
who can help me practice.



This is a picture of where I will  
practice.



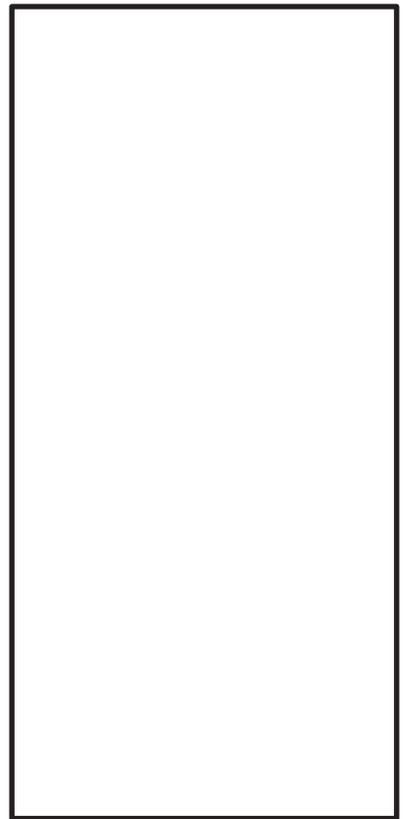
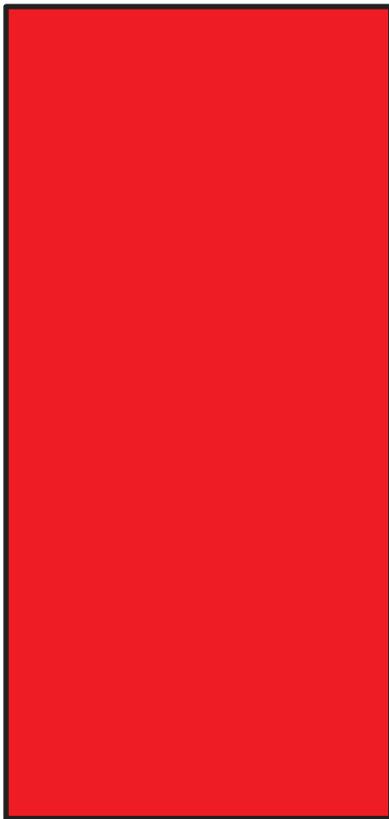
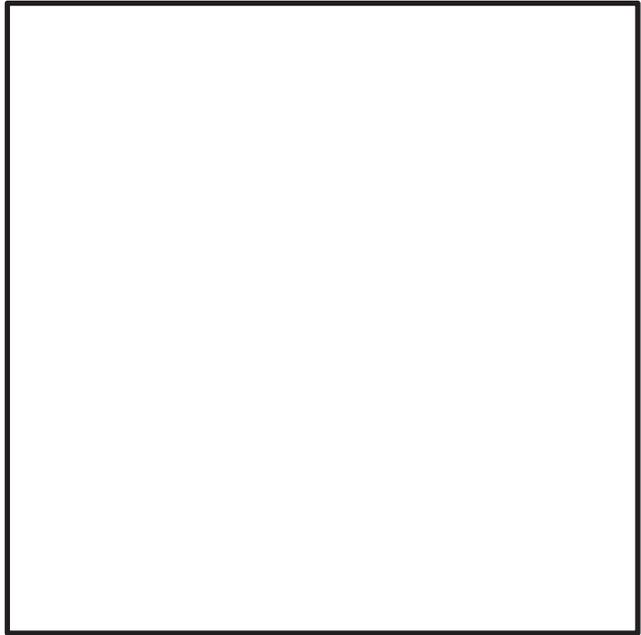
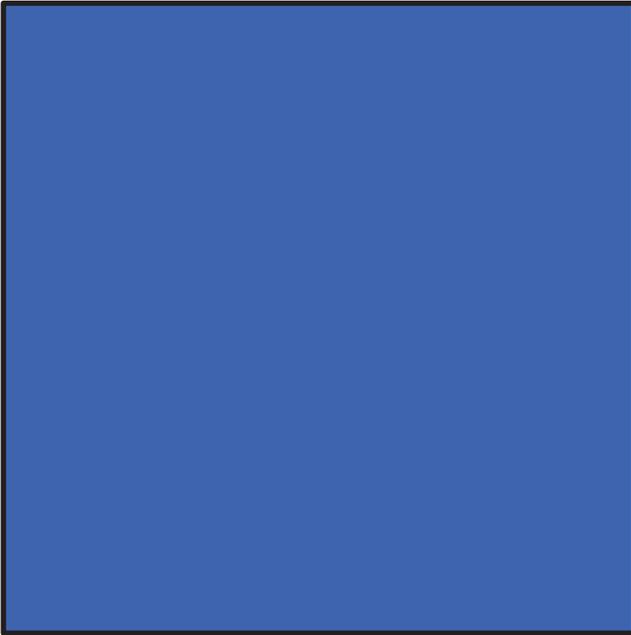
This is ME getting ready for first grade!



---

fluency kit





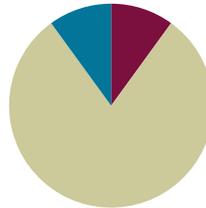
shape puzzle

## Lesson 8

**Objective:** Culminating task—review selected topics to create a cumulative year-end project.

### Suggested Lesson Structure

■ Fluency Practice	(5 minutes)
■ Concept Development	(40 minutes)
■ Student Debrief	(5 minutes)
<b>Total Time</b>	<b>(50 minutes)</b>



### Fluency Practice (5 minutes)

- My Favorite Fluency (5 minutes)

### My Favorite Fluency (5 minutes)

Materials: (S) Summer packets (built in Lesson 7 with Fluency Template)

Note: Today's activity is a fluency celebration.

Using their Getting Ready for First Grade packets, students practice their favorite fluency activity or teach it to a guest attending the Math Olympics. If available, invite Pre-K students to learn a fluency activity from their older kindergarten buddies.

### Application Problem

There is no Application Problem today in order to allow more time for the cumulative project.

### Concept Development (40 minutes)

Materials and Note: Today's lesson is a celebratory Math Olympics. There are activities set up in five different *events* or stations around the classroom, through which small groups of students rotate for seven minutes each. At each station, students have paper, pencils, and markers in addition to many copies of the half-page recording sheets. (Some students may be able to complete more than one at each station in the time allotted.) Teachers might wish to supply popcorn, ribbons, or small prizes for the participants during the end of the lesson Student Debrief celebration. Students use the materials they create at the stations to make a book reviewing some of the main concepts that they learned this year.

In addition to the recording sheets and writing tools, individual station materials are as follows:

- Make-10 Mania: Linking cube 10-sticks
- Five-Group Frenzy: Digit cards 1–20
- Shape Shifters: Pattern blocks and markers
- The Weigh Station: 2 pan balances, bags of pennies, mystery bag of small objects to weigh
- Awesome Authors: Large foam die, linking cubes to serve as addition support, if necessary

Fun signs for the individual stations may be made up in advance, if desired. It is suggested that, if possible, older students, parents, administrators, or community volunteers be enlisted to help oversee the individual events in the Math Olympics. That way, the following lengthy explanation can be omitted, and students can instead receive the directions for a particular station upon arrival.

- T: We are going to have a special **Math Olympics** celebration today! You are going to use many of the things that you learned to make your own math book to take home for the summer. We have several special stations set up today. (Demonstrate.)
- T: (Station A, Make-10 Mania.) Here, you break apart 10-sticks and create number bonds and number sentences showing different ways to make 10. Find as many different pairs as you can, and write them on the recording sheets.
- T: (Station B, Five-Group Frenzy.) Here, you choose digit cards, write the numbers in your best penmanship, and show them on recording sheets the 5-group way. In the last box, show your number in another way, too!
- T: (Station C, Shape Shifters.) Here, you choose up to 5 pattern blocks, make a shape with them on your paper, and trace the outline. If you have time, you trade with a friend and see if you can fill in his outline with the blocks!
- T: (Station D, The Weigh Station.) Here, you choose an object from the mystery bag. After you've held it and tested its weight with your hands, guess how many pennies are the same weight as your object. Then, check your guess, and record your work! If you have time, you can weigh more objects.

Name Naydelin Date \_\_\_\_\_

A. Make 10 Mania: Show how you made 10.

$10 = 10 + 0$      $10 = 3 + 7$   
 $10 = 9 + 1$      $10 = 2 + 8$   
 $10 = 8 + 2$      $10 = 1 + 9$   
 $10 = 7 + 3$      $10 = 0 + 10$   
 $10 = 6 + 4$   
 $10 = 5 + 5$   
 $10 = 4 + 6$

Name Melania Date 6-3-14

B. Five-Group Frenzy: Write the number, draw the number in the 5-group way, draw the number in any other configuration

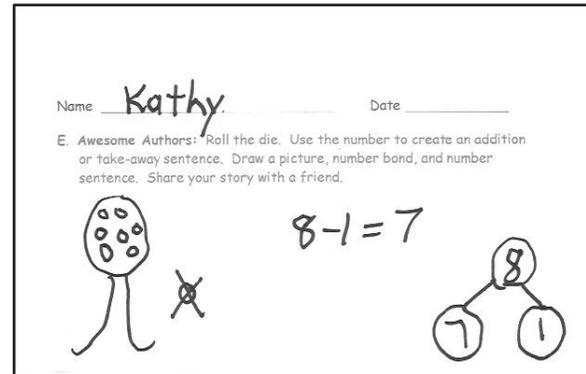
Name Kate Date 6-3-14

C. Shape Shifters: Choose 5 pattern blocks and create a shape. Trace your shape, and then trade with a partner.

Name Nancy Date 6-3-14

D. The Weigh Station: Choose an object. Guess how many pennies are the same weight as the object. Then, see if you guessed correctly! Draw a picture of the object and write how many pennies it weighs.

- T: (Station E, Awesome Authors.) At the last station, you are a math author! You roll the die to get a number. You use this number as part of an addition or a subtraction sentence. Think of a story that includes your number. Draw your picture and your number bond, and then write the number sentence. Make sure that you will be able to share your story with a friend or someone at home!
- T: You have seven minutes at each of the stations, and then, when you hear this sound (flute, bell, whistle, clap, or other signal), you will switch. When you have finished all of the stations, make sure your name is on all of your recording sheets, and give them to me. I will make them into a math book of your very own! We will gather together at the end for a special celebration.



### Student Popcorn Celebration Debrief (5 minutes)

**Lesson Objective:** Culminating task—review selected topics to create a cumulative year-end project.

- Which station did you find to be the most challenging? Why?
- Which station did you like best today? Why?
- What was the best thing about math this year?
- What are you looking forward to learning about next year?
- Let's have some popcorn!

Name \_\_\_\_\_

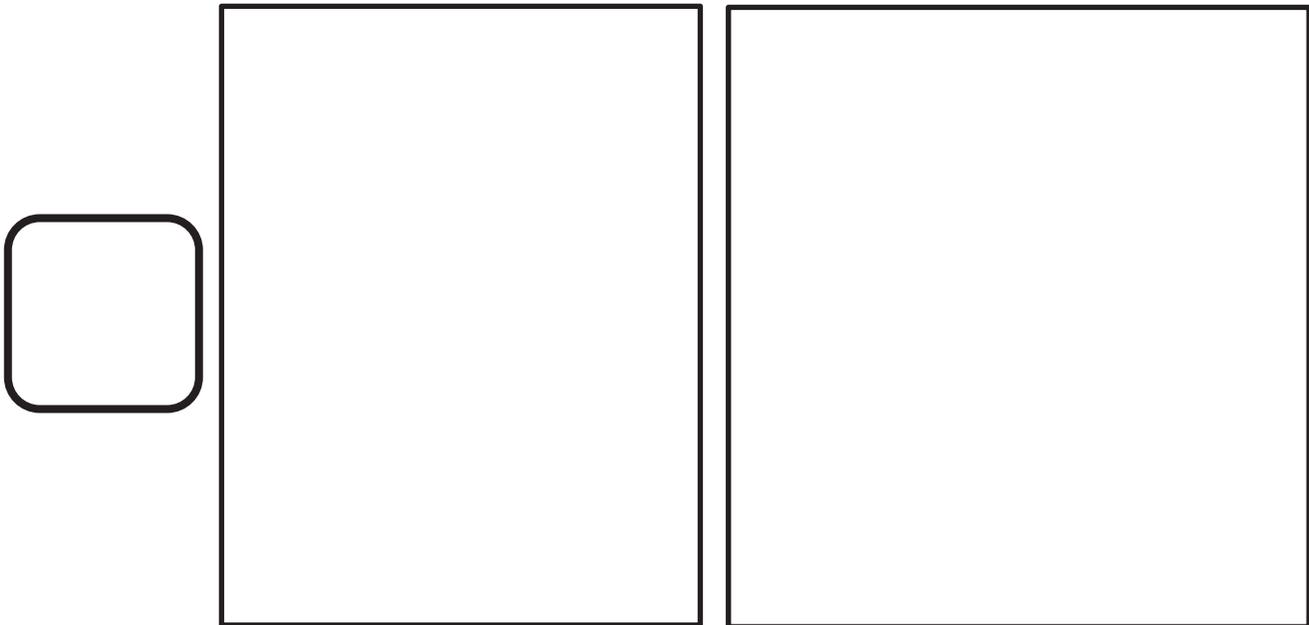
Date \_\_\_\_\_

**A. Make-10 Mania:** Show how you made 10.

---

Name \_\_\_\_\_ Date \_\_\_\_\_

**B. Five-Group Frenzy:** Write the number, draw the number in the 5-group way, and draw the number in any other configuration.



Name \_\_\_\_\_

Date \_\_\_\_\_

**C. Shape Shifters:** Choose 5 pattern blocks, and create a shape. Trace your shape, and then trade with a partner.

-----

Name \_\_\_\_\_

Date \_\_\_\_\_

**D. The Weigh Station:** Choose an object. Guess how many pennies are the same weight as the object. Then, see if you guessed correctly! Draw a picture of the object, and write how many pennies it weighs.



Student Name \_\_\_\_\_

	Date 1	Date 2	Date 3
Topic A			
Topic B			

**Topic A: Building and Drawing Flat and Solid Shapes**

Rubric Score: \_\_\_\_\_ Time Elapsed: \_\_\_\_\_

Materials: (S) 1 set of four 3" straws, 1 set of four 5" straws (separated by length for the student), small clay balls for connectors, 5 real-world items with familiar shapes (e.g., book, clock, including a square and rectangle), pattern block shapes (Template 1)

- (Place all straws and formed clay connecting balls in front of the student.) Build a square.
- (Place solid shapes in front of the student.) Choose one object that has the shape you just built.
- (Place pattern blocks template in front of the student horizontally.) The star is the beginning. Point to the third shape. Point to the seventh shape.
- (Turn the template vertically.) The star is the beginning. Point to the first shape. Point to the ninth shape.

What did the student do?	What did the student say?
1.	
2.	
3.	
4.	

**Topic B: Composing and Decomposing Shapes**

Rubric Score: \_\_\_\_\_ Time Elapsed: \_\_\_\_\_

Materials: (S) Pattern blocks, 2 right triangles (Template 2), 3-piece square puzzle (Template 3, cut into 3 pieces), puzzle template (Template 4)

1. (Give the student two right triangles.) Use these triangles to make a rectangle.
2. (Give the student the 3-piece paper square puzzle disassembled.) This was a square. Then, I cut it into three pieces. Can you put it together so it makes a square again?
3. (Place the pattern blocks and puzzle template in front of the student.) Use your pattern blocks to complete the puzzle.

What did the student do?	What did the student say?
1.	
2.	
3.	

**End-of-Module Assessment Task  
Standards Addressed**

Topics A–B

**Count to tell the number of objects.**

- K.CC.4** Understand the relationship between numbers and quantities; connect counting to cardinality.
- d. Develop understanding of ordinal numbers (first through tenth) to describe the relative position and magnitude of whole numbers.

**Analyze, compare, create, and compose shapes.**

- K.G.5** Model shapes in the world by building shapes from components (e.g., sticks and clay balls) and drawing shapes.
- K.G.6** Compose simple shapes to form larger shapes. *For example, “Can you join these two triangles with full sides touching to make a rectangle?”*

**Evaluating Student Learning Outcomes**

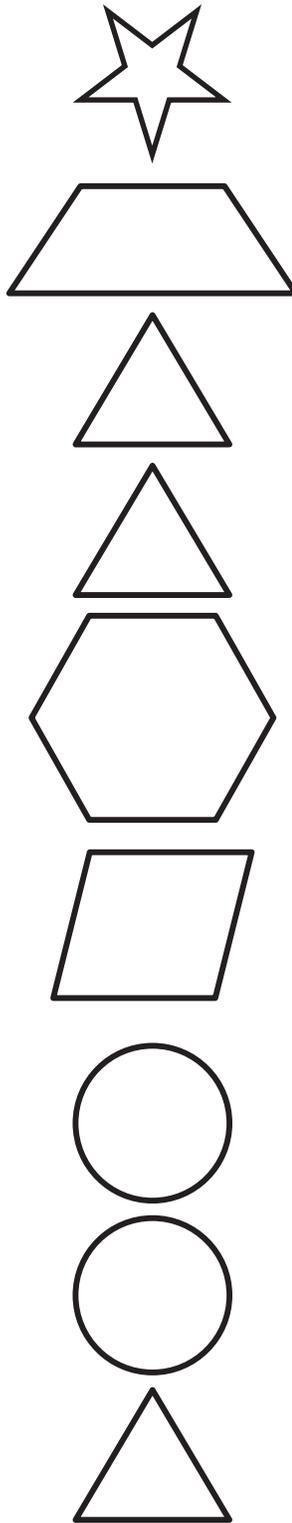
A Progression Toward Mastery is provided to describe steps that illuminate the gradually increasing understandings that students develop on their way to proficiency. In this chart, this progress is presented from left (Step 1) to right (Step 4). The learning goal for students is to achieve Step 4 mastery. These steps are meant to help teachers and students identify and celebrate what the students CAN do now and what they need to work on next.

## A Progression Toward Mastery

Assessment Task Item and Standards Assessed	STEP 1 Little evidence of reasoning without a correct answer.  (1 point)	STEP 2 Evidence of some reasoning without a correct answer.  (2 points)	STEP 3 Evidence of some reasoning with a correct answer or evidence of solid reasoning with an incorrect answer.  (3 points)	STEP 4 Evidence of solid reasoning with a correct answer.  (4 points)
<p><b>Topic A</b></p> <p><b>K.CC.4d</b> <b>K.G.5</b></p>	<p>The student:</p> <ul style="list-style-type: none"> <li>▪ Does not build a closed figure.</li> <li>▪ Struggles to select a real-world object that matches the shape he built or does not choose any object.</li> <li>▪ Is unable to identify the position of the third, seventh, first, and ninth shape in any orientation of the pattern block template.</li> </ul>	<p>The student:</p> <ul style="list-style-type: none"> <li>▪ Builds a rectangle or some other shape.</li> <li>▪ Struggles to select a real-world object that matches the shape he built or chooses an object with no matching shape.</li> <li>▪ Correctly identifies the position of some of the shapes but is clearly confused when the template is turned or requires teacher support on where to start.</li> </ul>	<p>The student:</p> <ul style="list-style-type: none"> <li>▪ Builds a square but considers the two different length straws before building with four equal length straws.</li> <li>▪ Selects a real-world object that matches the square with some hesitation.</li> <li>▪ Correctly identifies the position of at least two shapes: third, seventh, first, and ninth shapes.</li> </ul>	<p>The student correctly:</p> <ul style="list-style-type: none"> <li>▪ Builds a square using four equal straws.</li> <li>▪ Selects a real-world object that matches the square built.</li> <li>▪ Identifies the third and seventh shape from the beginning of the horizontal line.</li> <li>▪ Identifies the first and ninth shape from the beginning of the vertical line.</li> </ul>
<p><b>Topic B</b></p> <p><b>K.G.6</b></p>	<p>The student:</p> <ul style="list-style-type: none"> <li>▪ Does not join the triangles and does not make a rectangle.</li> <li>▪ Does not attempt to put the pieces together, may not know what a square is, and may just line up the pieces.</li> <li>▪ Places random pattern blocks on the puzzle with no understanding of spatial relationships between the pattern blocks and the puzzle.</li> </ul>	<p>The student:</p> <ul style="list-style-type: none"> <li>▪ Puts the triangles together so that two sides are touching but does not make a rectangle.</li> <li>▪ Keeps moving the pieces around but is unable to make the square.</li> <li>▪ Places some correct pattern block pieces on the puzzle, but several pieces are incorrect and sticking out of the puzzle border.</li> </ul>	<p>The student:</p> <ul style="list-style-type: none"> <li>▪ Makes a rectangle after several trial-and-error attempts.</li> <li>▪ Makes the square with more time elapsed and more trial and error.</li> <li>▪ Completes the puzzle after trying several different pieces with more time elapsed due to the trial and error of choosing different shapes to fit in the puzzle.</li> </ul>	<p>The student correctly:</p> <ul style="list-style-type: none"> <li>▪ Makes a rectangle without much hesitation.</li> <li>▪ Makes the square with very little trial and error.</li> <li>▪ Completes the puzzle using the correct pattern blocks so that nothing extends past the puzzle border.</li> </ul>

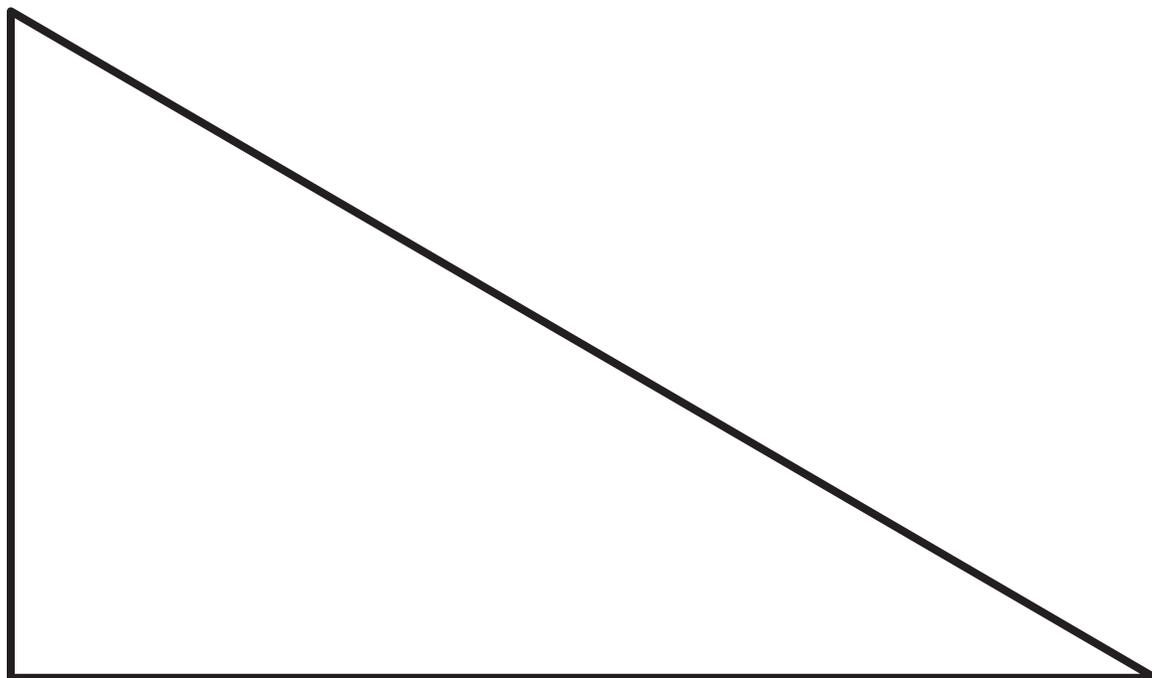
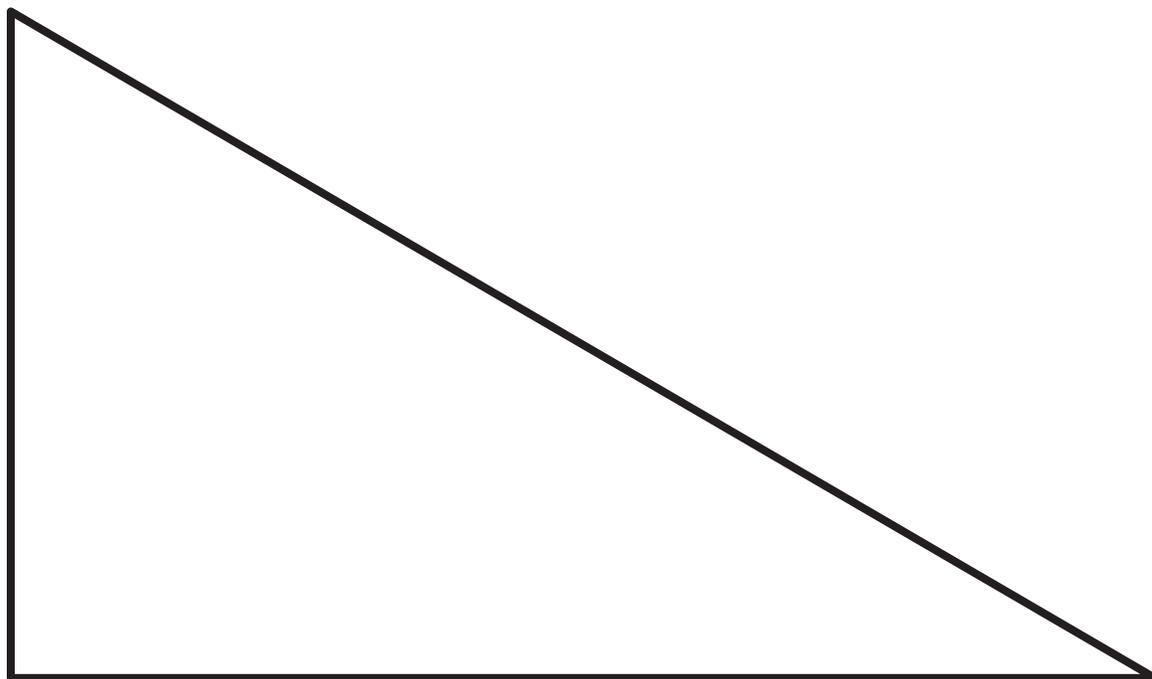
## Class Record Sheet of Rubric Scores: Module 6

Student Names:	Topic A: Building and Drawing Flat and Solid Shapes	Topic B: Composing and Decomposing Shapes	Next Steps:



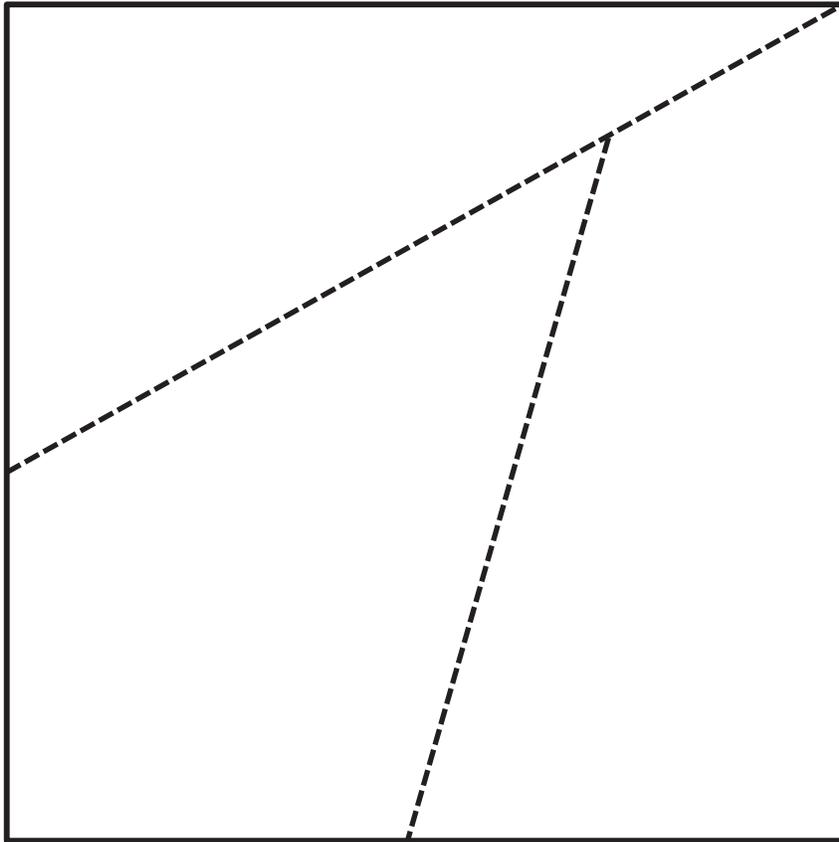
---

pattern block shapes

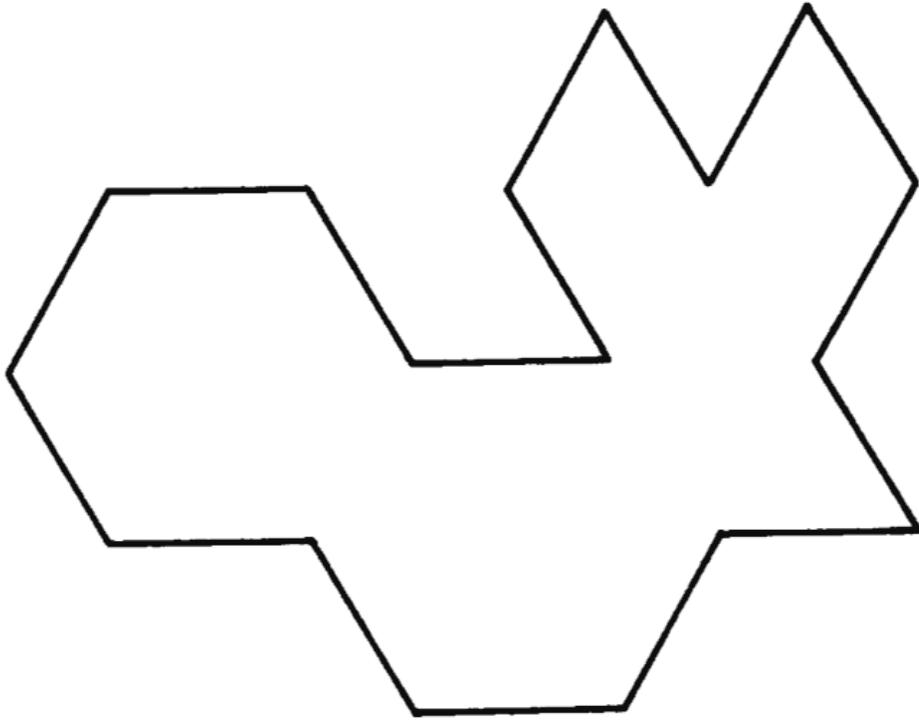


---

2 right triangles

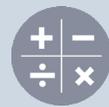


3-piece square puzzle



---

puzzle template



Answer Key

## **GRADE K • MODULE 6**

Analyzing, Comparing, and Composing Shapes

## Lesson 1

### Problem Set

Line drawn to finish triangle; corners colored red; another triangle drawn

2 lines drawn to finish square; corners colored red; another square drawn

Triangle drawn; different triangle drawn

5; 3; 5; 4; 5

4; 3; 1; 3; 1

1; 0; 1; 3; 0

4; 2; 2; 4; 5

### Exit Ticket

Answers will vary.

### Homework

Line drawn to finish triangle; triangle colored green; bigger triangle drawn

2 lines drawn to finish rectangle; corners circled in red; X's placed on longer sides

Line drawn to finish hexagon; hexagon colored blue; 6

3 shapes drawn on back of paper: 1 with 3 straight sides; 1 with 4 straight sides; 1 with 6 straight sides

## Lesson 2

### Core Fluency Sprint A

- |       |       |
|-------|-------|
| 1. 3  | 11. 5 |
| 2. 2  | 12. 4 |
| 3. 5  | 13. 4 |
| 4. 4  | 14. 3 |
| 5. 4  | 15. 5 |
| 6. 5  | 16. 5 |
| 7. 3  | 17. 4 |
| 8. 5  | 18. 3 |
| 9. 5  | 19. 1 |
| 10. 4 | 20. 5 |

### Core Fluency Sprint B

- |       |       |
|-------|-------|
| 1. 1  | 11. 2 |
| 2. 3  | 12. 2 |
| 3. 4  | 13. 2 |
| 4. 2  | 14. 3 |
| 5. 1  | 15. 3 |
| 6. 2  | 16. 1 |
| 7. 2  | 17. 4 |
| 8. 3  | 18. 4 |
| 9. 1  | 19. 1 |
| 10. 1 | 20. 0 |

### Core Fluency Sprint C

- |       |       |
|-------|-------|
| 1. 3  | 11. 5 |
| 2. 1  | 12. 1 |
| 3. 4  | 13. 4 |
| 4. 2  | 14. 4 |
| 5. 5  | 15. 5 |
| 6. 3  | 16. 5 |
| 7. 2  | 17. 0 |
| 8. 0  | 18. 5 |
| 9. 4  | 19. 1 |
| 10. 0 | 20. 4 |

### Core Fluency Sprint D

- |       |       |
|-------|-------|
| 1. 3  | 11. 3 |
| 2. 5  | 12. 5 |
| 3. 4  | 13. 2 |
| 4. 4  | 14. 4 |
| 5. 5  | 15. 3 |
| 6. 2  | 16. 1 |
| 7. 2  | 17. 4 |
| 8. 3  | 18. 3 |
| 9. 5  | 19. 1 |
| 10. 1 | 20. 0 |

**Problem Set**

Triangle, rectangle, triangle, and hexagon traced

3 different triangles drawn in the box

2 different rectangles drawn in the box

1 hexagon drawn in the box

1; 2; 3; 4; 5

1; 2; 3; 4; 5

2; 1; 1; 2; 5

1; 3; 5; 3; 1

**Exit Ticket**

Triangle drawn with all sides of different length

Triangle drawn with 2 sides about the same length

**Homework**

Triangle, rectangle, square, triangle, and hexagon traced; related shapes drawn in the box

## Lesson 3

### Fluency Activity Sheet

#### Add

RED	ORANGE	YELLOW	GREEN	BLUE
ORANGE	YELLOW	GREEN	BLUE	
YELLOW	GREEN	BLUE		
GREEN	BLUE			
BLUE				

#### Subtract

RED	ORANGE	YELLOW	GREEN	BLUE
PURPLE	RED	ORANGE	YELLOW	GREEN
	PURPLE	RED	ORANGE	YELLOW
		PURPLE	RED	ORANGE
			PURPLE	RED
				PURPLE

### Problem Set

Cylinder constructed correctly

Cube constructed correctly

### Exit Ticket

Line drawn from circle to soup can

Line drawn from square to die

Line drawn from triangle to sandwich

**Homework**

Object shaped like cylinder drawn; circle

Object shaped like cube drawn; square

Object shaped like cone drawn; circle

Answers will vary.

## Lesson 4

### Problem Set

Circle drawn around 2<sup>nd</sup> truck; square drawn around 5<sup>th</sup> truck; X placed on 9<sup>th</sup> truck

Triangle drawn around 4<sup>th</sup> vehicle; circle drawn around 1<sup>st</sup> vehicle; square drawn around 6<sup>th</sup> vehicle

X placed on the 10<sup>th</sup> horse; triangle drawn around 7<sup>th</sup> horse; circle drawn around 3<sup>rd</sup> horse; square drawn around 8<sup>th</sup> horse;

Lines drawn from shapes to correct ordinal numbers

### Exit Ticket

1<sup>st</sup> shape colored pink; 2<sup>nd</sup> shape colored green; 5<sup>th</sup> shape colored red; 7<sup>th</sup> shape colored blue; 8<sup>th</sup> shape colored orange; 10<sup>th</sup> shape colored yellow

### Homework

1<sup>st</sup> star colored red; 3<sup>rd</sup> star colored blue; 5<sup>th</sup> star colored green; 8<sup>th</sup> star colored purple

X placed on 2<sup>nd</sup> shape; triangle drawn in 4<sup>th</sup> shape; circle drawn around 6<sup>th</sup> shape; square drawn in 9<sup>th</sup> shape

Circle drawn in 7<sup>th</sup> shape; X placed on 1<sup>st</sup> shape; square drawn in 5<sup>th</sup> shape; triangle drawn in 3<sup>rd</sup> shape

Line drawn from the lion to “first”; line drawn from the grey-striped cat to “second”; line drawn from the zebra to “third”; line drawn from the yellow-striped cat to “fourth”; line drawn from the snake to “fifth”; line drawn from the snail to “sixth”

## Lesson 5

### Sprint

Answer keys for all Core Fluency Sprints can be found in Grade Kindergarten Module 6 Lesson 2.

### Problem Set

Answers will vary.

Answers will vary.

Answers will vary.

Answers will vary.

4; 3; 2; 1

### Exit Ticket

Answers will vary.

### Homework

First bullet in the left column matched to the third bullet in the right column

Second bullet in the left column matched to the first bullet in the right column

Third bullet in the left column matched to the fourth bullet in the right column

Fourth bullet in the left column matched to the second bullet in the right column

## Lesson 6

### Sprint

- |      |       |
|------|-------|
| 1. 1 | 9. 9  |
| 2. 2 | 10. 1 |
| 3. 3 | 11. 2 |
| 4. 4 | 12. 8 |
| 5. 5 | 13. 3 |
| 6. 6 | 14. 7 |
| 7. 7 | 15. 4 |
| 8. 8 | 16. 6 |

### Problem Set

Answers will vary.

### Exit Ticket

Answers will vary.

Answers will vary.

### Homework

Drawing shows how 4 small triangles can be used to compose a large triangle; 4

Drawing shows how 6 triangles can be used to compose a hexagon; 6

## Lesson 7

### Problem Set

Answers will vary.

All shapes except the circle and the narrow rectangle circled

All shapes except the 2 rectangles circled

### Exit Ticket

Answers will vary.

### Homework

Answers will vary.

## Lesson 8

### Culminating Activities

Answers will vary.