



Table of Contents

GRADE PK • MODULE 2

Shapes

Module Overview i

Family Math Newsletters.....1

Topic A: Two-Dimensional Shapes..... 2.A.1

Topic B: Constructing Two-Dimensional Shapes.....2.B.1

Topic C: Three-Dimensional Shapes.....2.C.1

Module Assessment 2.S.1

Grade PK • Module 2

Shapes

OVERVIEW

In Module 2, in the context of classroom play, children learn to identify, describe, sort, compare, and create two-dimensional (2-D) and three-dimensional (3-D) shapes and objects (**PK.G.1–4**). Children generally progress through the following levels of geometric understanding during the pre-kindergarten year to varying degrees:

- Being able to recognize and name exemplar and variant shapes (e.g., an equilateral triangle and a right triangle oriented diagonally) from among other shapes.
- Attending to shape attributes: “I counted three sides and three corners on this shape.”
- Thinking about parts: “This triangle is made of three sides and three corners!”
- Relating parts to the whole: “Any shape with three sides and three corners is a triangle!”

In this module, children develop vocabulary to describe the relative position of objects (e.g., *top*, *bottom*, *up*, *down*, *in front of*, *behind*, *over*, *under*, and *next to*), building foundational spatial reasoning abilities (**PK.G.1**). In Module 1, students developed an understanding of numbers to 5. In Module 2, students practice these counting skills in the context of geometry (counting sides, corners, a group of triangles, etc.).

In Topic A, students identify, sort, describe, and position two-dimensional shapes: circles, rectangles, squares (special rectangles), and triangles (**PK.G.2**). Through various games and activities, children uncover and discuss the attributes of each shape (e.g., number of sides and corners). After finding a particular shape, they might playfully enact its number of sides by hopping the same number of times, as pictured to the right. Students further compare (**PK.G.3**) the different attributes of two-dimensional shapes and position them using new relational terms (e.g., *up*, *down*, *in front of*, *behind*, *under*, and *next to*). By the end of Topic A, students learn to think about and describe shapes according to their attributes, rather than by relating the shape to a familiar object in the environment. For example, a student might say, “It’s a rectangle because it has four sides and four corners,” rather than “It’s a rectangle because it looks like a door.”



Topic B reinforces attention to attributes as students build two-dimensional shapes from components (**PK.G.4**). For example, students use three small balls of clay and three straws to create a triangle, which leads students to relate the parts of a triangle to the whole. Inadvertently, they also see that the whole triangle consists only of its outline, or the stick sides and clay corners; the area of the shape does not need to be filled in to be a triangle. Similar construction activities are done with rectangles and circles.

In Topic C, students identify, sort, describe, position, and build with three-dimensional shapes in their environment (**PK.G.1–3**). Focus is placed on analyzing three-dimensional shapes (real world, wooden, or

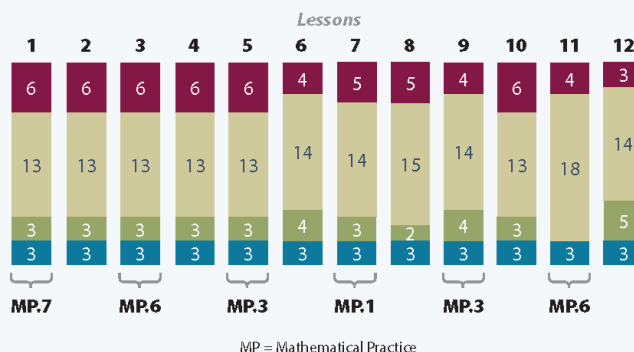
foam) by considering their two-dimensional faces and describing the functional properties of the three-dimensional shapes (e.g., sliding, stacking, or rolling). Position words (see Topic A above) are reinforced as students use three-dimensional foam or wooden blocks to create buildings, towers, bridges, and models of familiar places such as their classroom. These activities support spatial reasoning, meaning-making, and mathematical communication.



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

Identify and describe shapes (squares, circles, triangles, rectangles).

- PK.G.1** Describe objects in the environment using names of shapes, and describe the relative positions of these objects using terms such as top, bottom, up, down, in front of, behind, over, under, and next to.
- PK.G.2** Correctly name shapes regardless of size.

Analyze, compare, and sort objects.

- 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).

Foundational Standards

- PK.CC.3** Understand the relationship between numbers and quantities to 10; connect counting to cardinality.
- When counting objects, say the number names in the standard order, pairing each object with one and only one number name and each number name with one and only one object.
 - Understand that the last number name said tells the number of objects counted. The number of objects is the same regardless of their arrangement or the order in which they were counted.
- PK.CC.4** Count to answer "how many?" questions about as many as 10 things arranged in a line, a rectangular array, or a circle, or as many as 5 things in a scattered configuration; given a number from 1–10, count out that many objects).
- PK.MD.2** Sort objects into categories; count the number of objects in each category.¹

Focus Standards for Mathematical Practice

- MP.1** **Make sense of problems and persevere in solving them.** Children consider a group of triangles and put other triangles in the group based on the understanding that a triangle has three sides and three corners. They persevere in sorting as they come across variant triangles, perhaps reconsidering some of their sorting choices.
- MP.3** **Construct viable arguments and critique the reasoning of others.** Children construct viable arguments as they identify shapes based on their attributes (sides and corners).
- MP.6** **Attend to precision.** When children are able to describe a shape using its attributes, "It's a rectangle because it has four sides and four corners," instead of, "It's a rectangle because it looks like a door," their descriptions become precise.
- MP.7** **Look for and make use of structure.** Children sort shapes based on attributes.

¹ Limit category counts to be less than or equal to 5.

Overview of Module Topics and Lesson Objectives

Standards	Topics and Objectives		Days
PK.G.1 PK.G.2 PK.G.3 PK.MD.2	A	Two-Dimensional Shapes Lesson 1: Find and describe circles, rectangles, squares, and triangles using informal language without naming. Lesson 2: Identify, analyze, sort, compare, and position triangles. Lesson 3: Identify, analyze, sort, compare, and position rectangles and squares. Lesson 4: Identify, analyze, sort, compare, and position circles. Lesson 5: Identify, analyze, sort, compare, and position circles, rectangles, squares, and triangles.	5
PK.G.4 PK.G.3	B	Constructing Two-Dimensional Shapes Lesson 6: Construct a triangle. Lesson 7: Construct a rectangle and a square. Lesson 8: Construct a circle.	3
PK.G.3 PK.MD.2 PK.G.1	C	Three-Dimensional Shapes Lesson 9: Find and describe solid shapes using informal language without naming. Lesson 10: Identify, analyze, sort, compare, and match solid shapes to their two-dimensional faces. Lesson 11: Identify, analyze, sort, compare, and build with solid shapes. Lesson 12: Position solid shapes to create a model of a familiar place.	4
		End-of-Module Assessment: Topics A–C (assessment day, remediation or further applications)	3
Total Number of Instructional Days			15

Fluency

New Fluency Topics Appearing in Module 2 Instruction

- Sort shapes and count within 5
- Rote count to 7

Familiar Fluency

- Rote count to 5
- Count one-to-one within 5
- Make a group of 1 to 5 objects

Terminology

New or Recently Introduced Terms

- Above, behind, below, between, down, in, in front of, next to, off, on, under, up (position words)
- Circle (two-dimensional shape whose boundary consists of points equidistant from the center)
- Corner (where two sides meet)
- Face (flat side of a solid)
- Flat (as opposed to round)
- Model (a representation of something)
- Pointy (having a sharp point)
- Rectangle (two-dimensional shape enclosed by four straight sides)
- Roll (attribute of a shape)
- Round (circular; shaped like a circle, sphere, cylinder)
- Shape (external boundary of an object)
- Side (position or with reference to a shape)
- Slide (attribute of a shape)
- Square (two-dimensional shape enclosed by four straight, equal sides)
- Stack (attribute of a shape)
- Straight (without a curve or bend)
- Triangle (two-dimensional shape enclosed by three straight sides)

Familiar Terms and Symbols

- 1, 2, 3, 4, 5 (numerals)
- Different (characteristic used to analyze objects to match or sort)
- Group (objects sharing one or more attributes)
- Match (group items that are the same or that have the same given attribute)

- One, two, three, four, five, six, seven (number words)
- Size (generalized measurement term)
- Sort (group objects according to a particular attribute)
- The same (describing a common attribute)
- The same, but... (characteristic used to analyze objects to match or sort)

Suggested Tools and Representations

- 5-corner shape template
- Counters (e.g., beans)
- Large cutouts of shapes (for shape walk)
- Large shapes template
- Modeling clay
- Numeral cards, 1–5
- Oval and wheel templates
- Park scene template
- Pattern blocks
- Shape sort template
- Small shapes template
- Stuffed animals (for position words)
- Tree template
- Two-dimensional and three-dimensional concrete materials (e.g., linking cubes, blocks, foam or wooden shapes, centimeter cubes, tiles, etc.)
- Two-dimensional and three-dimensional natural shapes (shaped kitchen food items, play items, small balls, party hats, etc.)
- Personal white boards
- Wooden craft sticks, coffee stirrer sticks, and straws

Assessment Summary

Type	Administered	Format	Standards Addressed
End-of-Module Assessment Task	After Topic C	Constructed response with rubric	PK.G.1 PK.G.2 PK.G.3 PK.G.4

Grade PK • Module 2 • Topics A–C

Family Math Newsletter

Shapes

In Module 2, children explore two- and three-dimensional shapes and objects. They identify these shapes by first noticing the characteristics, “This shape has four straight sides and four corners!” After this analysis, they learn the names, “It’s a *rectangle*!” Position words such as *next to* help them to make statements like, “The blue rectangle is *next to* the orange square.”



Students build a circle with craft sticks and realize that all the points on a circle are the same distance from the center.

How to Help at Home

- Have a shape scavenger hunt. Look for circles, rectangles, squares, or triangles in the world around you. Use language to describe and name each shape. “Look! Our door has four *sides* and four *corners*. It looks like this rectangle!”
- Practice position vocabulary by playing Simon Says. “Simon says put your toy car *above* the table. Simon says put your hands *on* your head.”
- Build a model with 3-D objects in your home, using the Suggested Words and Key terms off to the side as much as possible in conversations with your child to practice math vocabulary and explore how shapes work together. Ask questions to analyze solid shapes. “How can we *stack* this can of soup on this box of cereal? We don’t want it to *roll off*!” “Does this ball have any *flat faces*? Do you think we could stack something on top of it?”

Key Standards

- Describe real world objects using shape names and position words.
- Correctly name shapes, regardless of size.
- Analyze, compare, and sort two-dimensional and three-dimensional shapes and objects.
- Create and build shapes.

Looking Back

In Module 1, students learned to sort and practiced touching and counting groups of up to 5 objects.

Looking Ahead

In Module 3, children will learn to touch and count groups of up to 10 objects and identify numerals to 10.

Suggested Words and Key Terms

Vocabulary

- | | |
|-------------|---------------|
| ▪ Circle | ▪ Straight |
| ▪ Corner | ▪ Triangle |
| ▪ Face | ▪ Top |
| ▪ Flat | ▪ Bottom |
| ▪ Pointy | ▪ Up |
| ▪ Rectangle | ▪ Down |
| ▪ Roll | ▪ In front of |
| ▪ Round | ▪ Next to |
| ▪ Shape | ▪ Behind |
| ▪ Side | ▪ Over |
| ▪ Slide | ▪ Under |
| ▪ Square | |
| ▪ Stack | |

Spotlight on Math Models

Constructing Shapes

Students will have hands-on experiences with characteristics like sides and corners as they construct two-dimensional shapes.

Sample Application Problem (from Module 2, Lesson 10)

Mr. McGregor's Garden

"Mr. McGregor is very angry. Someone has been walking through his garden. Let's be detectives and see if we can find the shapes that made this mess!"



Children look at a group of foam solids (e.g., a cylinder, a cube, and a sphere) and guess which shapes may have made each "footprint." They explain why they think the object they chose might be the culprit and then test to see if the face matches.

Note: This activity allows children to use their new understanding of the relationship between 2-D and 3-D shapes to guess the culprit and test their hypothesis. This requires them to carefully observe the solids and explain their reasoning.

Key mathematical models are used throughout a student's elementary years.

Children begin their exploration of shapes by sorting various examples of triangles, rectangles (including squares), and circles. They learn to name the shapes, think about their parts, or attributes (e.g., sides and corners), and relate those parts to the whole shape. "This triangle has three sides and three corners."

Children then use straws and balls of clay to construct the shapes they learned about. By using different lengths of straws and varying the orientation of their shapes, children begin to build an understanding of defining attributes. (For example, some triangles are wide and some are narrow, but *any* closed shape with three sides and three corners is a triangle.)



Children understand shapes better when they can physically create them. This activity also shows them the idea that new shapes can be created by combining parts of other shapes, which relates to the concept of addition (3 and 2 can be put together to make 5). This part-whole relationship of numbers is an important step in understanding addition.



Topic A

Two-Dimensional Shapes

PK.G.1, PK.G.2, PK.G.3, PK.MD.2

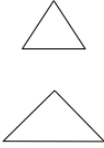
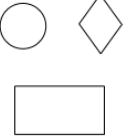
Focus Standards:	PK.G.1	Describe objects in the environment using names of shapes, and describe the relative positions of these objects using terms such as top, bottom, up, down, in front of, behind, over, under, and next to.
	PK.G.2	Correctly name shapes regardless of size.
	PK.G.3	Analyze, compare, 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).
Instructional Days:	5	
Coherence -Links to:	GK-M2	Two-Dimensional and Three-Dimensional Shapes
	GK-M6	Analyzing, Comparing, and Composing Shapes

In Topic A, children identify, analyze, sort, compare, and position two-dimensional (2-D) circles, rectangles, and triangles both in collections of objects and within their school environment. Through sorting activities, children explore and discuss the attributes of each shape (e.g., sides and corners) (**PK.G.3**).

In Lesson 1, children sort shapes based on their defining attributes, specifically, the number of straight sides and corners. Then, they go on a brief shape hunt in the classroom, using their innate ability to recognize shapes in their environment (**PK.G.1**). For example, they see a round clock and match it to its corresponding two-dimensional shape, a circle: “The clock is round, just like this shape.” Matching the two objects (e.g., clock and circle) is the first step in helping young children to describe shapes.

Students identify, sort, describe, and analyze triangles in Lesson 2, and then rectangles and squares in Lesson 3 (**PK.G.3**). As they analyze a collection of shape cutouts, they begin to notice attributes that are true of all the shapes in the sorted group: “All the triangles we put in this group have three corners and three straight sides.” This activity helps students to recognize that triangles can come in many varied forms (e.g., long, skinny, wide, up-side-down) (**PK.G.2**). Once students have successfully sorted the shapes, they play a game with shapes and relational words, such as *in*, *on*, *off*, *under*, *up*, and *down*, then position each shape on a tree work mat (**PK.G.1**). Carefully choosing shapes using the chart pictured to the right as a guide helps students to consistently identify shapes based on their attributes, regardless of size or orientation.

Triangles

Examples		Nonexamples
Exemplars (common prototypes)	Variants (other examples)	
		

Lesson 3 focuses on rectangles, again using attributes (sides and corners) to sort a collection of shapes, whereby *only* rectangles are placed on the board, with all other shapes placed in the basket. They see that a square is a special rectangle with four sides of the same length. Similarly to Lesson 2, students position their shapes *above*, *below*, and *next to* a stuffed animal (**PK.G.1**).



Next, in Lesson 4, students sort a collection of circles and other shapes, including ovals as non-circles. Students will likely describe circles as going “around and around” or having no straight sides and no corners. They position their shapes *behind*, *in front of*, and *between* a stuffed animal and a tree work mat.

The last lesson of this topic celebrates what students have learned about various two-dimensional shapes and spatial orientation. While listening to music, students go on a shape walk through the classroom, freezing when the music stops and naming the shape closest to where they are standing. Then, with partners, they use a small doll to “walk” through a park scene. Similarly, when the music stops, students describe the shape closest to their doll and use position words to tell about the shape’s location in the park. Some students may notice that some objects in the scene are composed of more than one shape. The seesaw, for example, is a rectangle on a triangle. Through these observations, students begin to relate the parts to the whole, foreshadowing the construction of shapes from parts to whole in Topic B.

In Topic A Fluency Practice, students strengthen their counting skills within 5 using both their piano mats and their “bear den” fists (i.e., the Math Way). Counting often occurs in the context of geometry, such that students sort and count the number of shapes, as in Count the Triangles, or students count the number of corners and sides on a given shape.

A Teaching Sequence Towards Mastery of Two-Dimensional Shapes

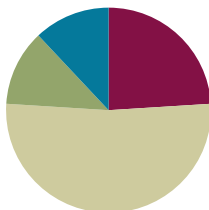
- Objective 1: Find and describe circles, rectangles, squares, and triangles using informal language without naming.**
(Lesson 1)
- Objective 2: Identify, analyze, sort, compare, and position triangles.**
(Lesson 2)
- Objective 3: Identify, analyze, sort, compare, and position rectangles and squares.**
(Lesson 3)
- Objective 4: Identify, analyze, sort, compare, and position circles.**
(Lesson 4)
- Objective 5: Identify, analyze, sort, compare, and position circles, rectangles, squares, and triangles.**
(Lesson 5)

Lesson 1

Objective: Find and describe circles, rectangles, squares, and triangles using informal language without naming.

Suggested Lesson Structure

Fluency Practice	(6 minutes)
Application Problem	(3 minutes)
Concept Development	(13 minutes)
Student Debrief	(3 minutes)
Total Time	(25 minutes)



Fluency Practice (6 minutes)

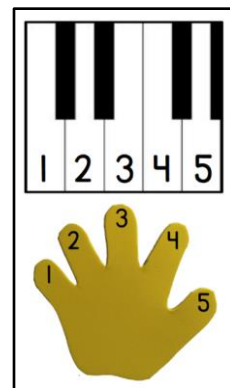
- Counting on Fingers **PK.CC.3a** (3 minutes)
- Farmer Brown **PK.CC.1** (3 minutes)

Counting on Fingers (3 minutes)

Materials: (S) Piano mat (Fluency Template)

Note: Moving back and forth between the piano mat (Fluency Template) and the “bear den” fists, helps students to use their fingers and experience counting to 5 in two different ways.

- T: Let’s count on our fingers using our piano!
- S: (Drop 1 finger from left to right, starting with the left pinky) 1, 2, 3, 4, 5.
- T: Let’s count on our fingers starting with all the bears in the den (show fist).
- S: (Lift 1 finger from left to right, starting with the left pinky) 1, 2, 3, 4, 5.
- T: Let’s go back and forth again. (Repeat the process first on the keyboard and then without.)



Farmer Brown (3 minutes)

Materials: (T) *Growing Up with Ella* by Ella Jenkins (optional CD), apple tree, 5 green paper apples

Note: As Module 2 opens, continue to strengthen students’ counting within 5 as foundational work for Module 3 wherein they count to 10.

Farmer Brown had 5 green apples hanging on the tree. (Twice.)

Then, he took 1 apple and he ate it greedily, leaving 4 green apples hanging on the tree.

Farmer Brown had 4 green apples hanging on the tree. (Twice.)

Then, he took 1 apple and he ate it greedily, leaving 3 green apples hanging on the tree.

Farmer Brown had 3 green apples hanging on the tree. (Twice.)

Then, he took 1 apple and he ate it greedily, leaving 2 green apples hanging on the tree.

Farmer Brown had 2 green apples hanging on the tree. (Twice.)

Then, he took 1 apple and he ate it greedily, leaving 1 green apple hanging on the tree.

Farmer Brown had 1 green apple hanging on the tree. (Twice.)

Then, he took 1 apple and he ate it greedily, leaving no green apples hanging on the tree.

Continue until there are no apples. Count to replace the apples on the tree, placing 2 apples on one side of the tree and 3 apples on the other. Count up to 5 apples without a break in the count: 1 apple, 2 apples, 3 apples, 4 apples, 5 apples. This allows students to see two groups while counting the total. This arrangement will open the fluency work for Lesson 2.

Application Problem (3 minutes)

Materials: (T) Bag with 5 circles, bag with 3 triangles, bag with 4 rectangles, numeral cards (Template 1)

Three teachers brought shapes to school to show their students. Each teacher brought one bag of shapes. Help me count how many shapes each teacher brought.

Hand bags to three students. Students remove the objects from bag as classmates count. After counting each set of objects, invite a volunteer to select the numeral that matches.

Note: Students bridge the number work of Module 1 with the geometry work of Module 2 by counting sets of shapes. Children may provide names for the shapes in this activity. Don't discourage their use of precise language, but continue to use the term shape for all.



Concept Development (13 minutes)

Part 1: Concept Introduction

Materials: (T) Mystery bag containing large shape cutouts (Template 2, save shapes for use in later lessons), tape, chart paper divided into 3 sections

1. Tell students, "Let's see what's inside my mystery bag!" Pull out a triangle: "This is a **shape**."

2. Ask students to count the number of **straight sides** and count the number of **corners**. (If students say the names of the shape, acknowledge that the name of the shape is one way to describe it). Then, tape the triangle in one section of the chart paper.

Note: When taping rectangles, triangles, and squares into their respective sections, position them at different angles. This visual will support students as they develop the understanding that the orientation of a shape does not alter its classification—a triangle is still a triangle, regardless of its position.

3. Repeat the process with the remaining shapes, ending with the circle. (“It has no straight sides or corners!” “It is round!” “It looks like the clock.”) Sort the shapes on the chart by emphasizing the attributes of each shape. “I will put this shape in this section of the chart because it has three corners like the other shapes in this section.”
4. Tell students, “I wonder if we can find any of these shapes in our classroom? Let’s go on a shape hunt with our eyes!”
5. Allow students to look around the room and discuss shapes they find, e.g., “The clock is round just like these shapes.”



NOTES ON MULTIPLE MEANS FOR ACTION AND EXPRESSION:

Provide a variety of ways for students to participate in the discussion. Allow students who are non-verbal or are uncomfortable sharing with the group to bring an object to the rug and place the object in the correct section. Model the language for the child as they place the object. For example, “The book is the same shape as these other shapes.” Another possibility for students who are uncomfortable sharing with the large group would be to have students turn and talk to a partner.

Part 2: Practice

Materials: (T) Shape sort chart (Template 3); tape; baggie containing cutouts of circles, rectangles, and triangles or the small shapes cards (Template 4, save for later use) (S) Per pair: shape sort chart (Template 3); tape; baggie containing cutouts of circles, rectangles, and triangles or the small shape cards (Template 4, save for later use)

Prior to the activity, cut out the small shapes and assemble in baggies. Before sending children to prepared tables, gather them in a circle to model the activity.

1. Show students the shape sort template and the baggie. Tell them, “You’re going to work with a partner to sort these shapes!”
2. Model how to match the attributes of the cutout shapes to the attributes of the figures at the top of the columns.
3. Send students to their tables to work with their partners. Circulate and encourage them to talk to each other about the shapes.
4. To keep a record of student work, have children tape or glue the shapes to the page. Otherwise, keep the shapes loose for more practice.

MP.7

Student Debrief (3 minutes)

Lesson Objective: Find and describe circles, rectangles, squares, and triangles using informal language without naming.

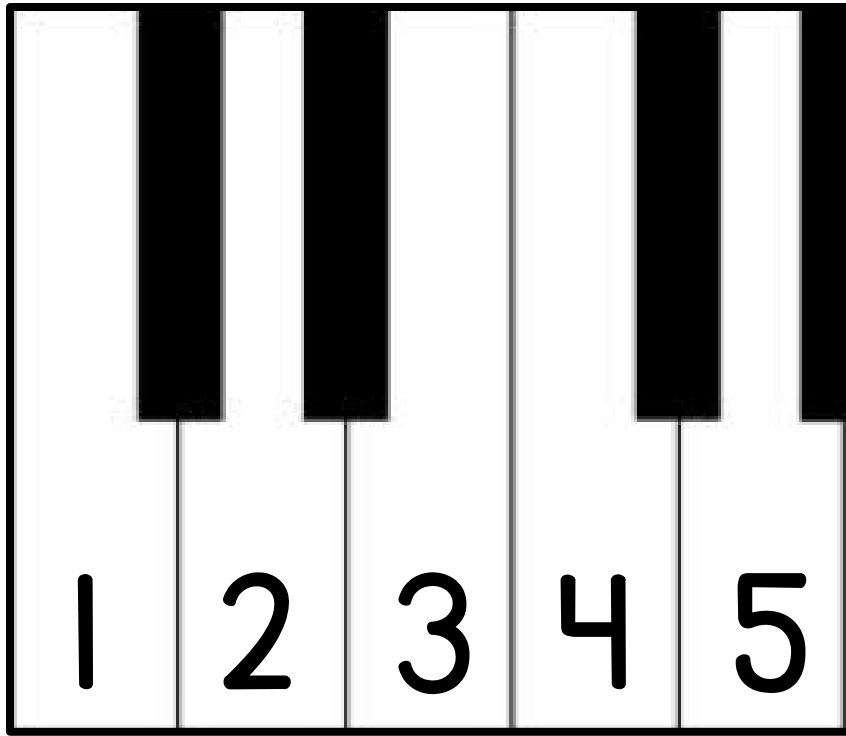
The Student Debrief is intended to invite reflection and active processing of the total lesson experience. It is also an opportunity for informal assessment. Consider taking anecdotal notes or using a simple checklist to note each child's progress towards meeting the lesson objective.

As students complete the Practice portion of the Concept Development, listen for misconceptions or misunderstandings that can be addressed in the Debrief. You may choose to use any combination of the questions below to help students express ideas, make connections, and use new vocabulary (**shape, straight, side, corner**).

- When we looked around the room on our shape hunt, what looked like this shape (hold up circle)? What looked like this shape (hold up triangle)? What looked like this shape (hold up rectangle)? Provide all students with an opportunity to share through a turn and talk.
- When we sorted our shapes, did all the shapes in this column (pointing to chart) look exactly the same?
- How did you talk about each shape today?
- Can you think of other objects at home that are shaped like these?

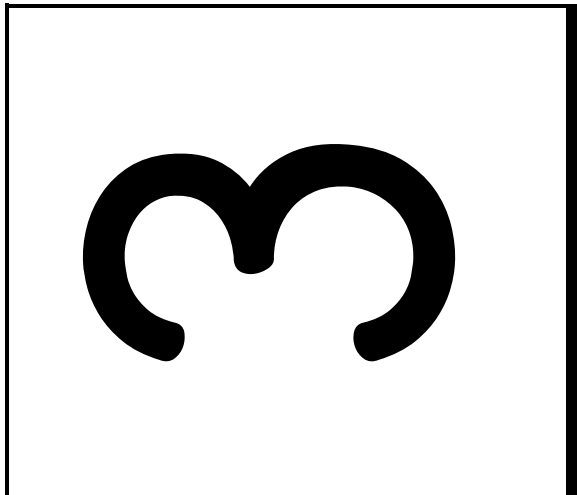
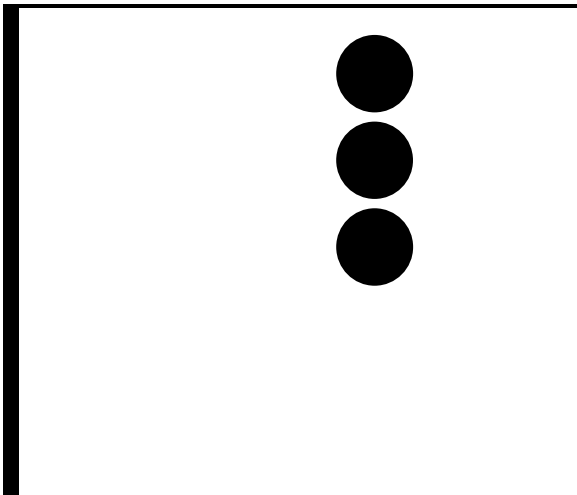
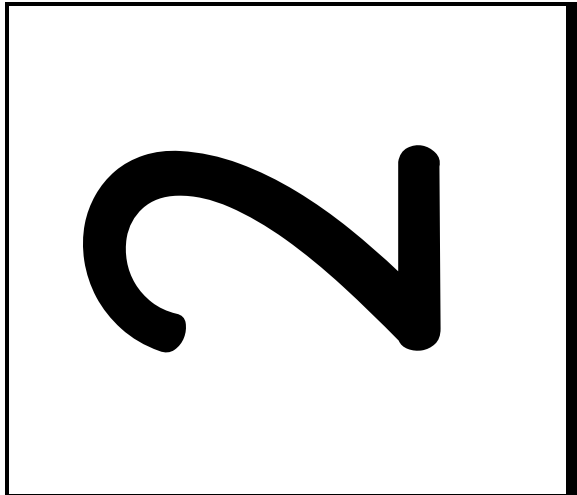
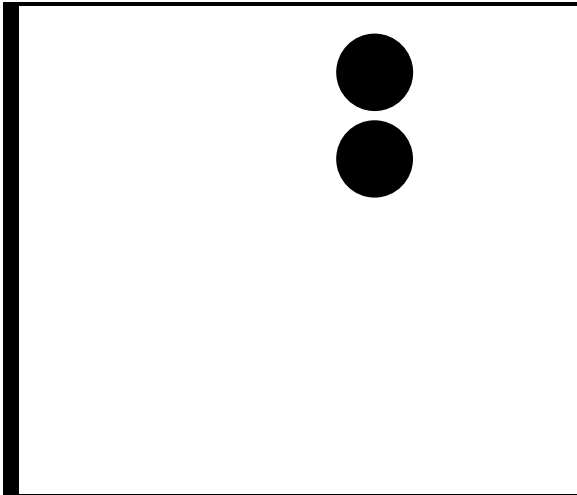
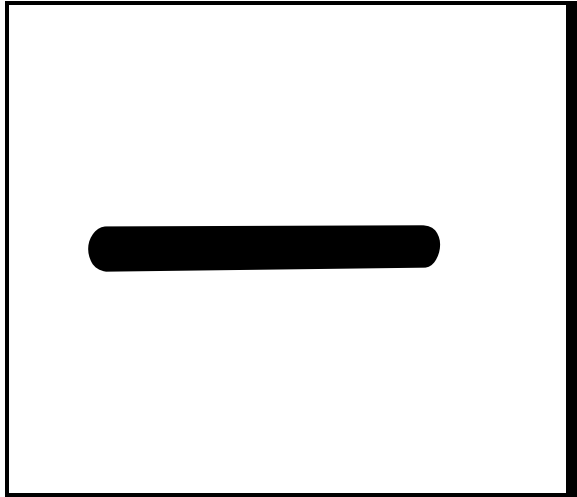
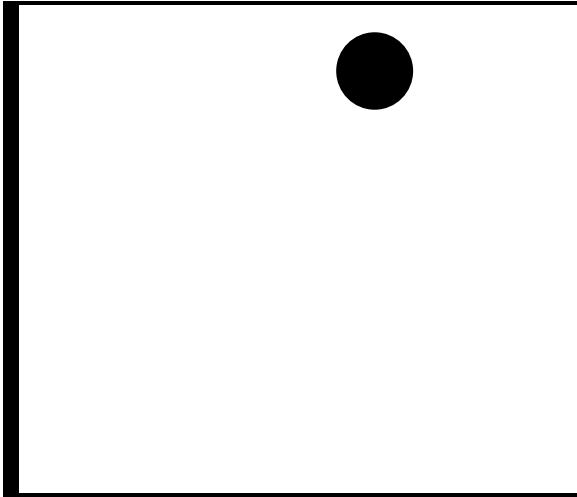
**CENTER CONNECTION:**

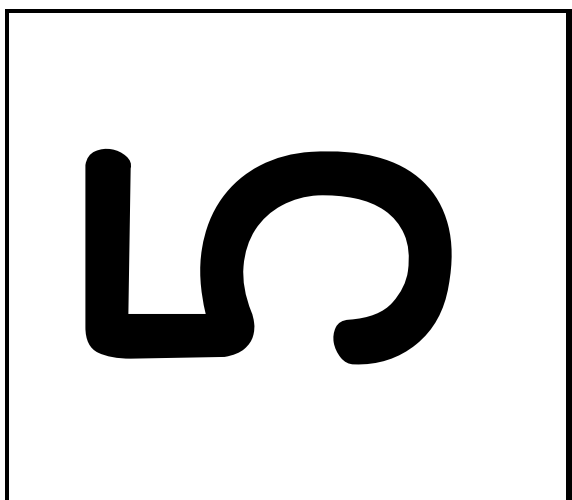
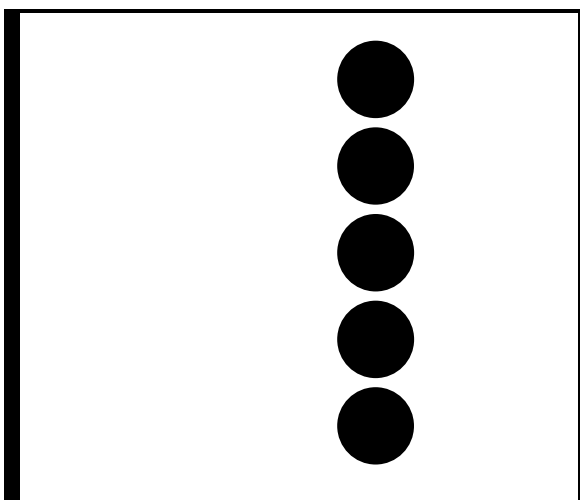
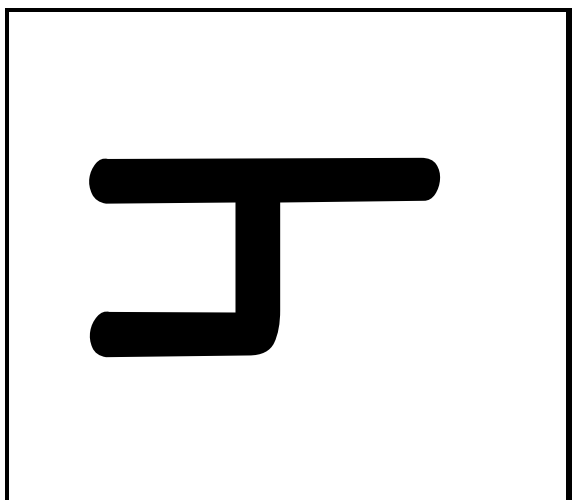
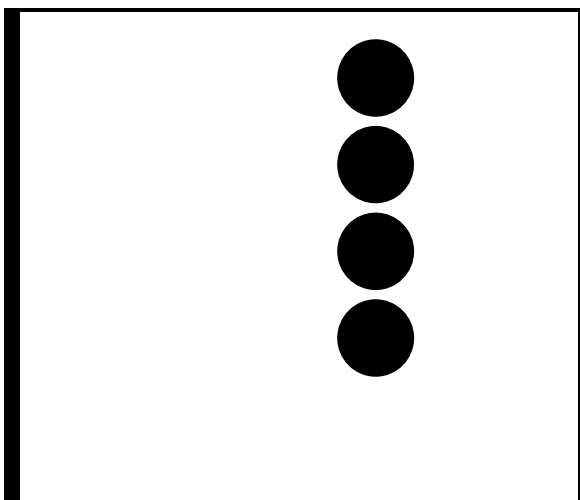
Create a center where children can use the shape sort chart (Template 3) to find and sort shapes. Children may find shapes in print materials, in small manipulatives (e.g., buttons, foam stickers), or classroom objects. Advanced students may be ready to trace the faces of classroom objects. Encourage and support their exploration, seeking ways that they can record their findings on the template.



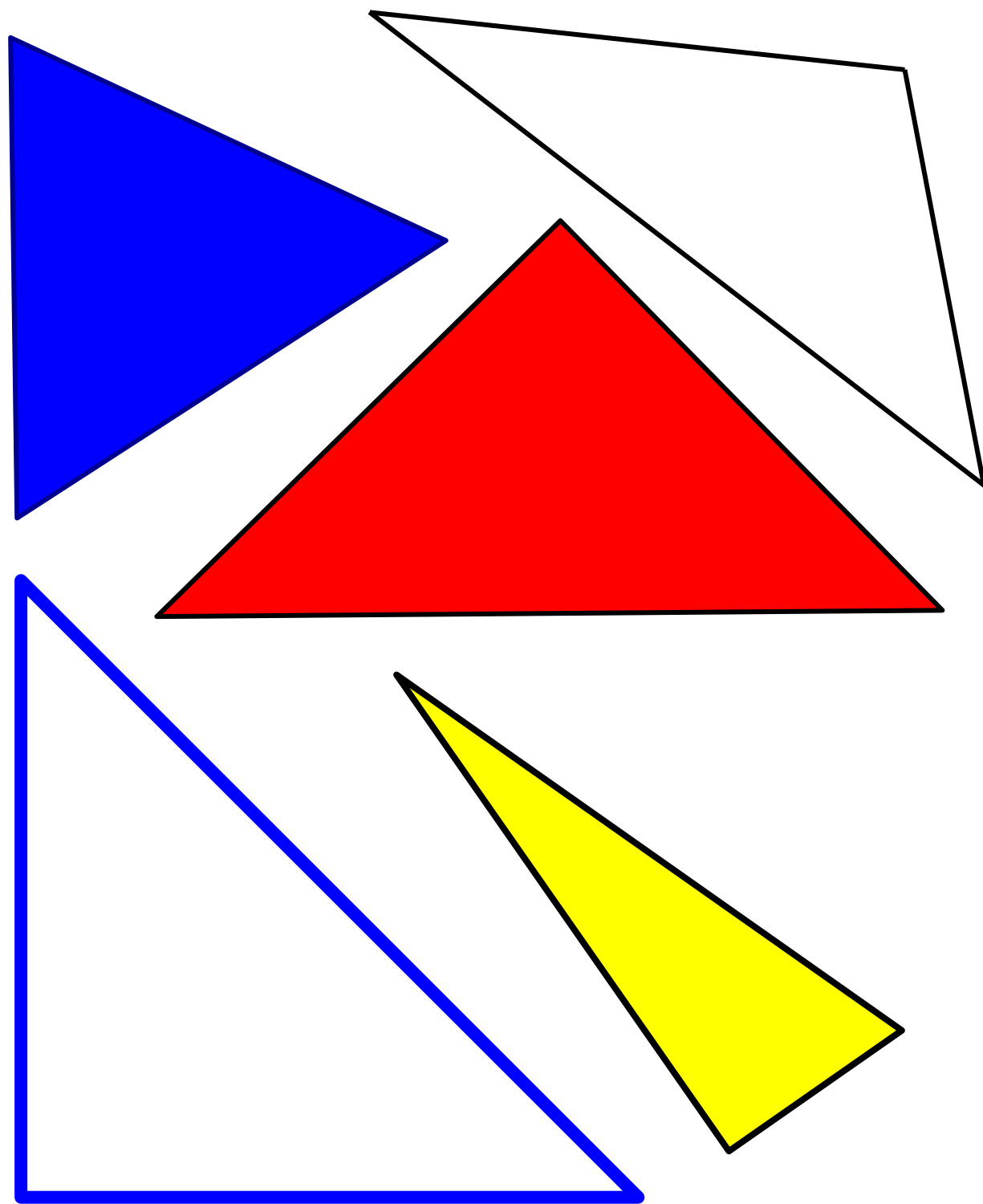
piano mat with numerals

To create numeral cards: 1) Print. 2) Fold lengthwise so the outline on the numeral side matches the outline on the dot side. 3) While the paper is folded, cut out individual cards. Do not cut along the fold! 4) Laminate with cards folded so that numeral and dots match.

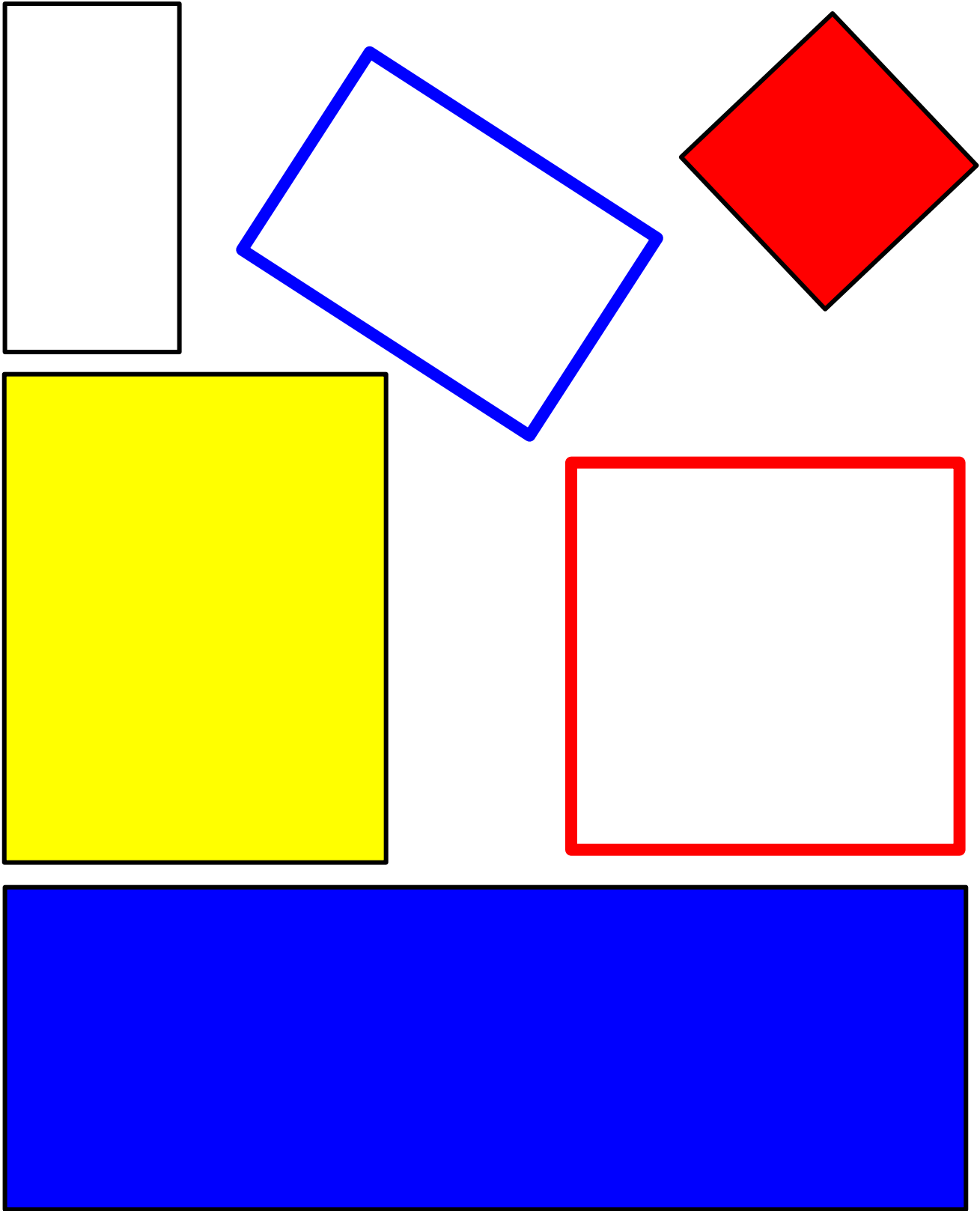




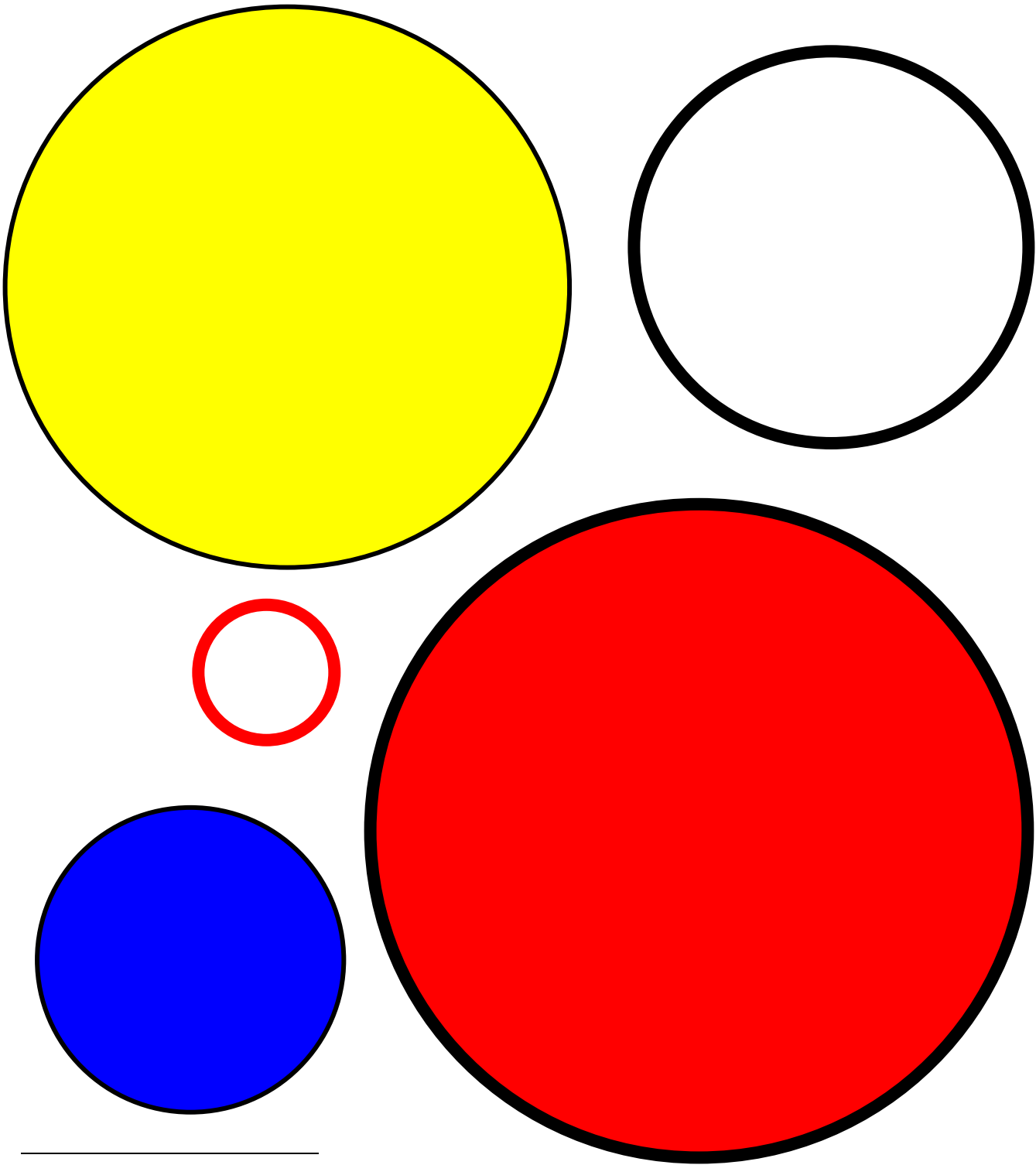
numeral cards



large triangle cutouts (exemplars and variants)



large rectangle cutouts (exemplars and variants)

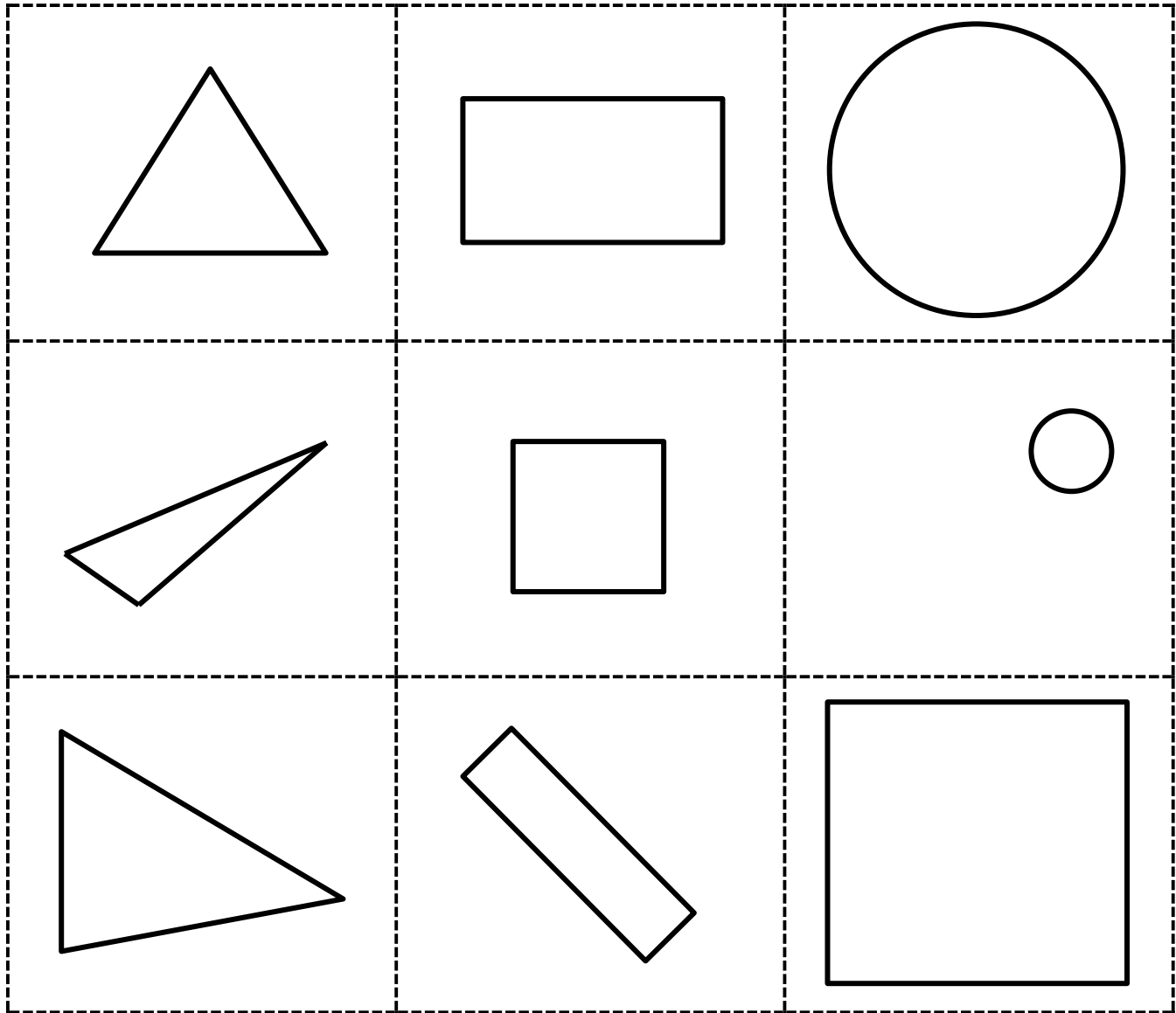


large circle cutouts (exemplars)



shape sort chart

Note: These shapes are provided as cards for easy cutting. However, students should have experience with concrete shapes, as well. Teachers may wish to use pattern blocks and cutouts of shapes from construction paper. When preparing shapes, always be sure to include exemplars (like those pictured in the top row) and variants (like the triangles and rectangles in the bottom two rows).



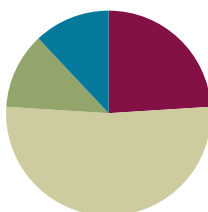
small shape cards

Lesson 2

Objective: Identify, analyze, sort, compare, and position triangles.

Suggested Lesson Structure

■ Fluency Practice	(6 minutes)
■ Application Problem	(3 minutes)
■ Concept Development	(13 minutes)
■ Student Debrief	(3 minutes)
Total Time	(25 minutes)



Fluency Practice (6 minutes)

- The Ants Go Marching **PK.CC.3c** (3 minutes)
- Count the Corners **PK.CC.3b** (3 minutes)

The Ants Go Marching (3 minutes)

Materials: (T) Song sheet for “The Ants Go Marching” with verses through the number 5 (Fluency Template)

Note: By participating in a story situation in which students join the group one by one, students again experience a growing pattern, or a pattern of 1 more in a fun way.

Sing the song “The Ants Go Marching,” and invite students to act out each verse: One student walks to show one by one, two students walk side by side to show two by two, and so on, until five students are walking side by side.

Before singing each verse, ask students to count the “ants” as they line up, i.e., “1 ant.” “1 ant, 2 ants.” Guide students to notice that the line widens as the numbers increase, asking, “Is the line wider when there are more ants?”

Repeat the activity using different children as “ants.” It is important for children to visually experience the pattern of 1 more as an observer as well as take part in the action.

Count the Corners (3 minutes)

Materials: (T) Triangle cutouts (Lesson 1 Template 2), 3 beans

Note: The three corners of a triangle are emphasized by placing a bean on each one preparing students to focus on the attributes of a triangle (three corners and three straight sides) in the lesson.

- T: Let’s put the beans on the corners of this shape. Is this a corner? (Slide finger along a straight side.)
S: No!

- T: Is this a corner? (Put your finger on a corner.)
S: Yes!
T: What is it?
S: A corner.
T: Let's mark the corners by putting one bean on each corner. Count for me.
S: (Place beans as they count.) 1 corner, 2 corners, 3 corners!

Next, remove a bean and ask, "How many corners have a bean?" and then, "How many corners do not have a bean?" Continue playfully taking beans off and putting beans on. Repeat the same process using different triangles oriented in different ways.

Application Problem (3 minutes)

Materials: (T) Illustration with many shapes (from, e.g., *Ship Shapes* by Stella Blackstone or *My Painted House*, *My Friendly Chicken*, and *Me* by Maya Angelou), protective plastic cover or sheet, dry erase marker; or a photocopy of the target illustration

Introduce the illustration and share the name of the book, author, and illustrator. Ask children to point out shapes they see in the illustration. Ask for volunteers to show straight lines and curved lines. Using the protective plastic sheet, highlight the lines they choose with the dry erase marker. As you highlight lines of different shapes, have the class hop once for each straight line highlighted in triangles and rectangles or curve their body to show highlighted curved lines in a circle.

Note: By identifying straight and curved lines in the illustration, children will be prepared to use those as distinguishing attributes in the coming shape sort. By hopping for each side of a triangle or rectangle, students will slowly start identifying the number of sides with the shape.

Concept Development (13 minutes)

Part 1: Concept Introduction

Materials: (T) Triangle cutouts (Lesson 1 Template 2), non-examples (Template 1), tape or magnets, small basket or container

Note: Prior to the lesson, cut out all shapes.

1. Show students an exemplar triangle and say, "Tell me about this shape." Guide students to notice that it has three straight sides and three corners. Say, "We call this shape a **triangle**," and affix it to the board.
2. Choose another triangle (narrow or wide) and say, "Tell me about this shape." Guide students to see that it also has three straight sides and three corners. Tell them, "This is a triangle, too. I'm going to put it **under** this other triangle."
3. Examine a few more triangles, affixing each to the board at varying angles. Describe to students what you are noticing, using self-talk: "Look! I see a pattern! This triangle has three sides and three

corners. This one also has three sides and corners.”

4. Tape a circle on the board. Say, “Tell me about this shape.” Guide students to see that it is round and has no straight sides or corners. Ask, “Is this a triangle?”
5. Tell students, “This is not a triangle, so I’m going to take it **off** the board and put it **in** this basket. My board is only for triangles!”
6. Follow Steps 4–5 with a rectangle. Ask, “Is this a triangle?” Draw students’ attention to its four sides and four corners.
7. Continue discussing and sorting shapes, putting only triangles on the board and all other shapes in the basket. Guide students to identify triangles by saying, “It is a triangle because it has three sides and three corners.”



NOTES ON MULTIPLE MEANS OF REPRESENTATION:

Highlight key vocabulary for English language learners. While students are describing the defining characteristics of each triangle, point to the sides and corners to give students a visual model of the new vocabulary. It would also be helpful for students to practice touching and counting the sides and corners.

Part 2: Practice

Materials: (T) Tree mat (Template 2), 1 triangle cutout (S) Tree mat (Template 2); 1 triangle, 1 rectangle, and 1 circle cutout

Affix a tree mat to the board. Place the three shapes and a tree mat at each student’s table before sending students to their seats.

Note: Although Simon Says is not explicitly stated in Step 2, intersperse it throughout the game for a fun twist on using position words.

1. Instruct students to stand next to their chairs. Say, “Let’s play Simon Says using a triangle!”
2. Model and say the following:
 - Find the triangle **on** your table. Put it *on* your chair, like this. Put the triangle back.
 - Put a shape that is not a triangle under your chair, like this.
 - Put the triangle **in** your hand, like this.
 - Now, put the triangle *in* your other hand, like this.
 - Sit **down**. Stand **up**. (Repeat.)
 - Hold a shape that is not a triangle *up* in the air. Now put it *down* on the table.
 - Hold it up. Put it down. (Repeat.)
3. Say, “Now, put the triangle anywhere *on* your tree mat.” Circulate and comment on the various positions, e.g., “Shawn put her triangle under the tree. Simon put his triangle on the tree.” Encourage students to continue moving their triangle to different positions on the mat, discussing each new position with a partner.

Student Debrief (3 minutes)

Lesson Objective: Identify, analyze, sort, compare, and position triangles.

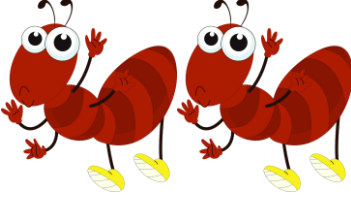
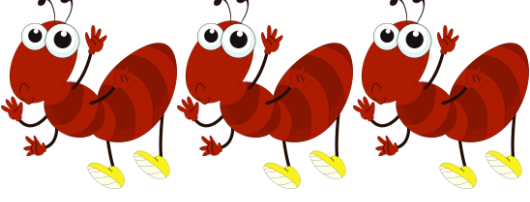
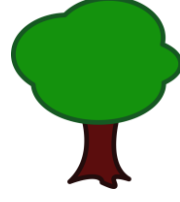
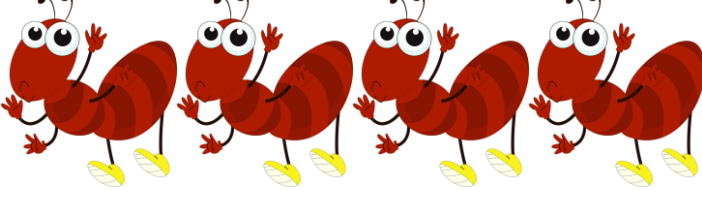
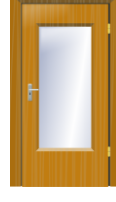
The Student Debrief is intended to invite reflection and active processing of the total lesson experience. It is also an opportunity for informal assessment. Consider taking anecdotal notes or using a simple checklist to note each child's progress towards meeting the lesson objective.

As students complete the Practice portion of the Concept Development, listen for misconceptions or misunderstandings that can be addressed in the Debrief. You may choose to use any combination of the questions below to help students express ideas, make connections, and use new vocabulary (**triangle, on, off, in, up, down, under**).

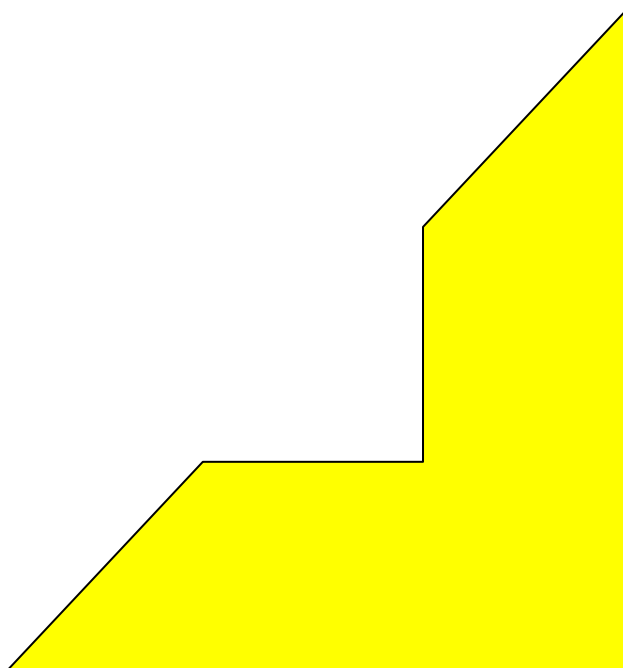
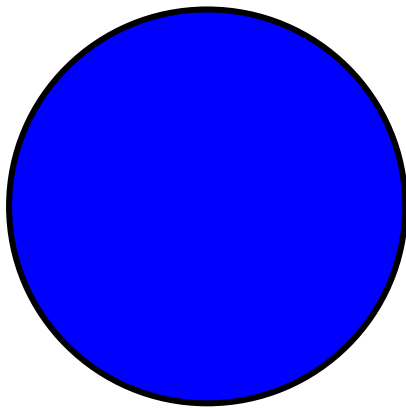
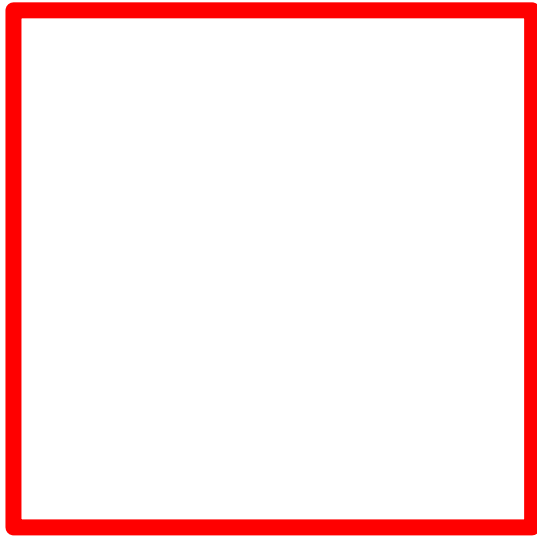
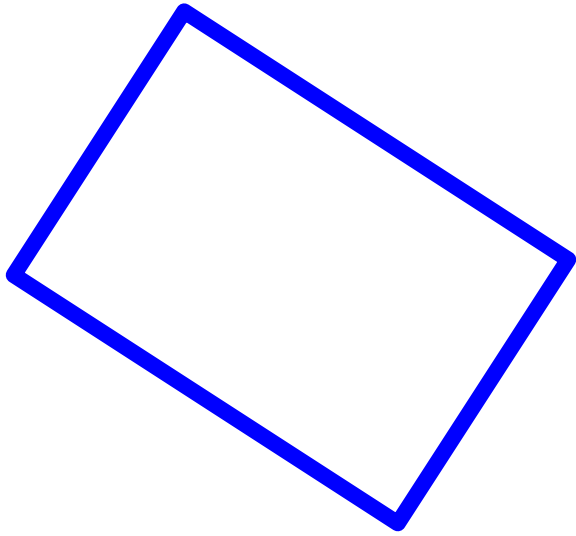
- What words did we use today to talk about triangles?
- What position words did you use to talk about where you put your triangle?
- (Show a variant of a triangle.) What shape is this? How do you know?
- (Show a circle or rectangle.) Why can't we call this a triangle?

**CENTER CONNECTION:**

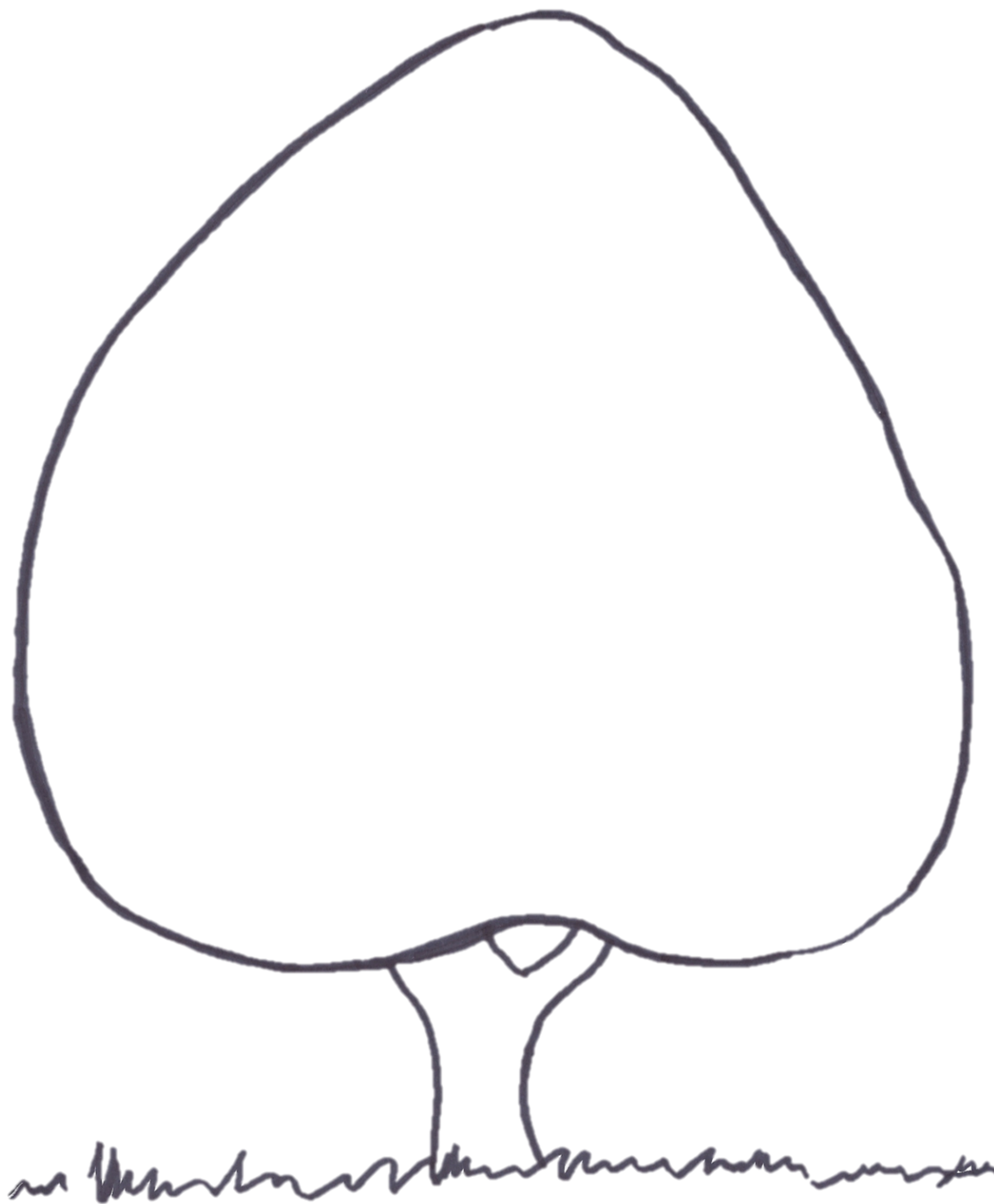
Have children search for triangles and non-triangles in the library center. Shape books offer obvious examples, but look for triangles in children's favorite books, too. For example, there are triangles hidden in *Goodnight, Goodnight, Construction Site* by Sheri Duskey Rinker and *The Family Book* by Todd Parr.

“The Ants Go Marching”



triangle non-examples



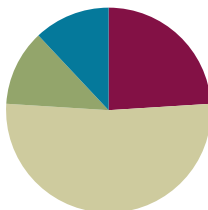
tree mat

Lesson 3

Objective: Identify, analyze, sort, compare, and position rectangles and squares.

Suggested Lesson Structure

■ Fluency Practice	(6 minutes)
■ Application Problem	(3 minutes)
■ Concept Development	(13 minutes)
■ Student Debrief	(3 minutes)
Total Time	(25 minutes)



Fluency Practice (6 minutes)

- Count the Triangles **PK.CC.3a** (3 minutes)
- Count the Corners **PK.CC.3a** (3 minutes)

Count the Triangles (3 minutes)

Materials: (S) Baggie containing shape cutouts (Lesson 1 Template 2)

Note: Observe whether students first sort to make a group of triangles or simply remove the triangles one by one from the bag and count them as they do so. Early finishers can count the number of shapes that are not triangles or that have four corners.

Have students count the number of triangles in their bag.

Count the Corners (3 minutes)

Materials: (T) Rectangle cutouts (Lesson 1 Template 2), 4 beans

Note: The four corners of a rectangle are emphasized by placing a bean on each one preparing students to focus on the attributes of a rectangle in the lesson. This activity also gives students experience with comparing corners of a triangle and a rectangle.

T: Count the corners of this shape for me as I mark them with a bean.

S: (Place beans as they count.) 1 corner, 2 corners, 3 corners, 4 corners!

T: This shape has four corners. Is this shape a triangle?

S: No!

T: You are correct, because we learned yesterday that a triangle has three corners!

Next, remove a bean and ask, “How many corners have a bean?” and then, “How many corners do not have a bean?” Playfully take beans off and put beans on. Repeat the same process using different rectangles oriented in different ways (without naming the shape as a rectangle.)

Application Problem (3 minutes)

Materials: (T) Triangle cutouts (Lesson 1 Template 2), non-examples of triangles (Lesson 2 Template 1)

Give each child a shape. Create a line in the center of the carpet or circle. Designate one side for triangles and the other side for “not triangles.” Students sort themselves based on their shapes. Ask individuals, “How did you know this was a triangle? How did you know this wasn’t a triangle?”

Note: Use this as an opportunity to help children share what they know about triangles. Some children may know because it does or does not “look like a triangle.” Others may talk about sides and corners.

Concept Development (13 minutes)

Part 1: Concept Introduction

Materials: (T) Rectangle cutouts (Lesson 1 Template 2), non-examples (Template), tape or magnets, small basket or container

Prior to the lesson, cut out all shapes.

MP.6

1. Show students a rectangle and say, “Tell me about this shape.” Guide students to notice that it has four straight sides and four corners. Say, “We call this shape a **rectangle**,” and affix it to the board.
2. Choose more rectangles (long and narrow, or short and wide), and say, “Tell me about this shape.” Guide students to see that each rectangle has four straight sides and four corners.
3. Affix each rectangle to the board at varying angles and in varying positions relative to each other, using the words **above**, **below**, and **next to**. “I’m putting the rectangle next to the other rectangles. They all have four sides and four corners.”
4. Say, “What’s on your feet?” Lead the discussion to realize that we can identify a group of objects with a word such as *shoes* but the objects in that group can also have special names such as boots, sneakers, or sandals.
5. Show a **square**. Ask, “Does this shape have four sides and four corners?” “Yes, it is a rectangle!” Then ask, “Does anyone know another special name for this shape?” Discuss that a square is a special rectangle because all sides are the same length.
6. Affix a triangle to the board, and ask, “Is this a rectangle?” Put the triangle in the basket for other shapes. Continue putting only rectangles on the board and all other shapes in the basket.



NOTES ON MULTIPLE MEANS OF REPRESENTATION:

Position words are often difficult for students. Students who are struggling would benefit from a template that models the correct position.

MP.6

7. Continue discussing and sorting shapes as rectangles and not rectangles, guiding students to identify rectangles and squares, by saying, “It is a rectangle because rectangles have four straight sides and four corners.”

Part 2: Practice

Materials: (T) 1 rectangle, small stuffed animal (S) Per pair: 1 rectangle, small stuffed animal (or puppet or doll)

Before sending students to prepared tables, gather them in a circle to model the activity.

1. Show students the stuffed animal and a rectangle. “Let’s play a game! Watch and listen carefully to what I say as I move my rectangle around the little giraffe.”
2. Use the words **above**, **below**, and **next to** as you move the rectangle around the giraffe.
 - I’m holding a rectangle above the giraffe.
 - I’m putting the rectangle below the giraffe.
 - I’m putting a rectangle next to the giraffe.
3. Send partners to their seats and say, “Now it’s your turn! Listen carefully as I tell you where to put your shapes. Lead students to repeat the statements, e.g., “I put the rectangle below the animal.”



Student Debrief (3 minutes)

Lesson Objective: Identify, analyze, sort, compare, and position rectangles and squares.

The Student Debrief is intended to invite reflection and active processing of the total lesson experience. It is also an opportunity for informal assessment. Consider taking anecdotal notes or using a simple checklist to note each child’s progress towards meeting the lesson objective.

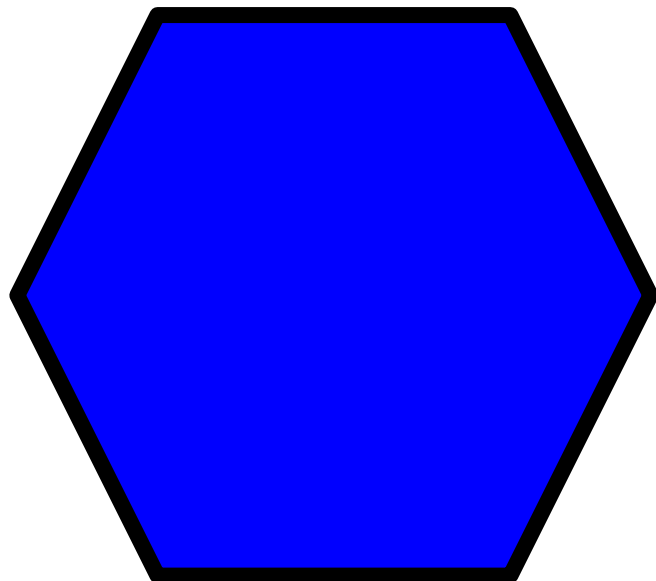
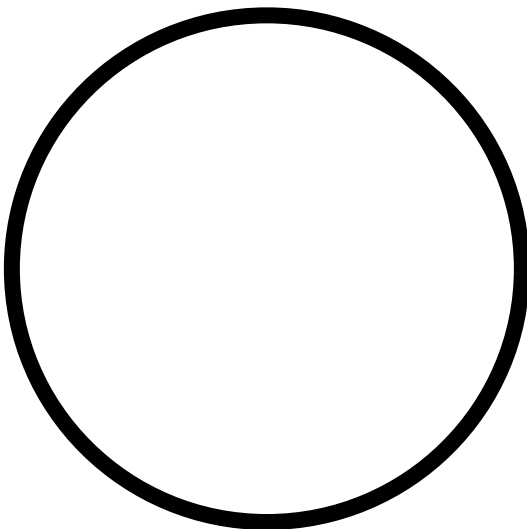
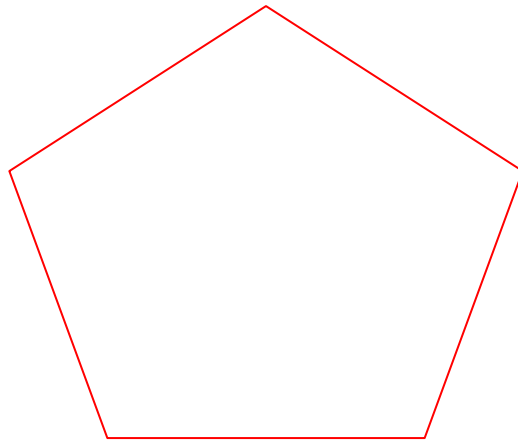
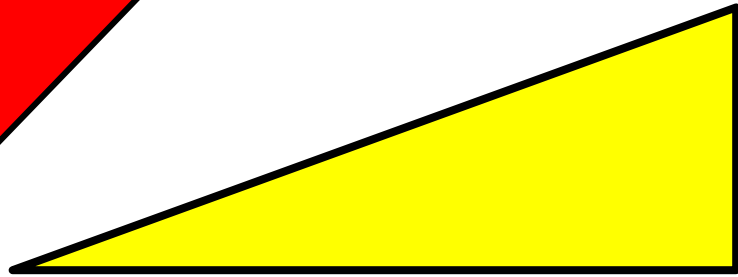
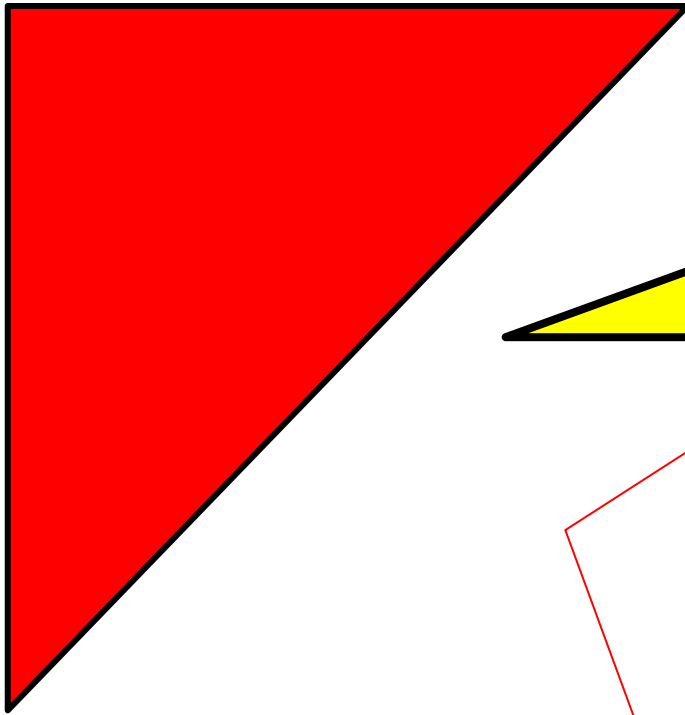
As students complete the Practice portion of the Concept Development, listen for misconceptions or misunderstandings that can be addressed in the Debrief. You may choose to use any combination of the questions below to help students express ideas, make connections, and use new vocabulary (**rectangle**, **square**, **above**, **below**, **next to**).

- What new shapes did we talk about today?
- What new position words did you use to talk about where you put your shapes around the stuffed animal?
- (Show a variant of a rectangle.) What shape is this? How many sides and corners does it have?
- (Show a square and rectangle.) Why are these both rectangles? What makes this one a square too?



CENTER CONNECTION:

Place assorted construction and tissue paper shapes in the art center. Invite children to find all of the rectangles (including the special rectangles, squares) and make a collage using those shapes.



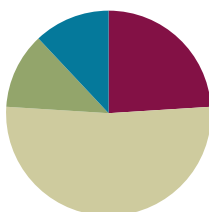
rectangle non-examples

Lesson 4

Objective: Identify, analyze, sort, compare, and position circles.

Suggested Lesson Structure

■ Fluency Practice	(6 minutes)
■ Application Problem	(3 minutes)
■ Concept Development	(13 minutes)
■ Student Debrief	(3 minutes)
Total Time	(25 minutes)



Fluency Practice (6 minutes)

- Count the Rectangles **PK.CC.3a** (3 minutes)
- Count the Corners **PK.CC.3a** (3 minutes)

Count the Rectangles (3 minutes)

Materials: (S) Baggie containing shape cutouts (Lesson 1 Template 2)

Note: Observe whether students first sort to make a group of rectangles or simply remove the rectangles one by one from the bag and count them as they do so. Early finishers can count the number of shapes that are not rectangles or that have no corners.

Have students count the number of rectangles in their bags.

Count the Corners (3 minutes)

Materials: (T) 5-corner shape (Fluency Template), 5 beans

Note: This activity reinforces rote counting to 5 while guiding students to reason quantitatively about how many corners a rectangle has.

T: Count the corners of this shape for me as I mark them with a bean.

S: (Place beans as they count.) 1 corner, 2 corners, 3 corners, 4 corners, 5 corners!

T: This shape has five corners. Is this shape a rectangle?

S: No!

T: You are correct because we learned yesterday that a rectangle has 4 corners!

Next, remove a bean and ask, “How many corners have a bean?” Pause to give time to count, and then ask, “How many corners do not have a bean?” Playfully repeat the activity, taking beans off and putting beans on.

Application Problem (3 minutes)

Materials: (T) Rectangle cutouts (Lesson 1 Template 2), non-examples of rectangles (Lesson 3 Template), including squares (1 per student)

Give each child a shape. Create a line in the center of the carpet or circle. Designate one side for rectangles and the other side for “not rectangles.” Students sort themselves based on their shapes. Ask individuals, “How did you know this was a rectangle?” or “How did you know this wasn’t a rectangle?” Once sorted, have children hop once for each corner or side of the shape they are holding.

Note: Use this as an opportunity to help children share what they know about rectangles. Some children may recognize the shape because it does or does not “look like a rectangle.” Others may talk about sides and corners. Support children to see that the square belongs on the rectangle side of the line because it has four corners and four straight sides.

Concept Development (13 minutes)**Part 1: Concept Introduction**

Materials: (T) Circle cutouts (Lesson 1 Template 2), non-examples (Lesson 4 Template), tape or magnets, small basket or container

Prior to the lesson, cut out all shapes.

1. Say, “Today, we’re going to explore another shape!” Show students a circle to guide them as they discover a circle’s defining characteristics.
2. Say, “Tell me about this shape.” Encourage students to talk about circles: “They go around and around.” “They are not straight.”
3. Guide students to notice that a circle has no straight sides and no corners. Say, “We call this shape a **circle**. I’m going to put the circle on the board.”
4. Examine more circles (big and small), and affix each circle to the board at varying positions relative to each other. Notice that the size and position do not matter.
5. Model the position words **behind**, **in front of**, and **between** with the help of students. Ask one student to hold a circle *behind* his back. Have another student hold a shape that is not a circle *in front of* her body. Ask two students to come up so that a circle can be held *between* them.
6. Hold up an oval: “Tell me about this shape.” Guide students to see that there are no straight sides or corners. “This is like a circle, but it is squished. A circle rolls like a wheel, but this wouldn’t roll very well.” Put the oval in the basket for all other shapes.
7. Continue discussing and sorting shapes as circles and not circles.

Part 2: Practice

Materials: (T) Tree mat (Lesson 2 Template 2); small stuffed animal; 1 circle, 1 rectangle, and 1 triangle cutout (S) Per pair: tree mat (Lesson 2 Template 2); small stuffed animal, puppet, or doll; 1 circle, 1 rectangle, and 1 triangle cutout (Lesson 1 Template 2)

Prepare tables with student materials listed above, and then gather students in a circle to model the activity.

1. Show students the tree mat, the stuffed animal (e.g., a little giraffe), and a circle. Say, “Let’s play our game! Watch and listen carefully to what I say as I move my circle on the mat with the little giraffe.”
2. Use the words *behind*, *in front of*, and *between* as you move the circle.
 - I’m putting a circle behind the giraffe.
 - I’m putting a shape that is not a circle between the tree and the giraffe.
 - I’m putting a shape that is not a circle in front of the tree.
3. Send partners to their seats and say, “Now it’s your turn! Listen carefully as I tell you and your partner where to move your shapes. Lead students to repeat the statements, e.g., “I put the circle between the tree and the giraffe.”



NOTES ON MULTIPLE MEANS OF ENGAGEMENT:

Students who struggle with position words benefit from practice with concrete manipulatives or their own bodies throughout the day. For example, ask students to get in line *behind*, *in front of*, or *between* another student, or suggest that students put objects *behind*, *in front of*, or *between* other materials when cleaning up.

Student Debrief (3 minutes)

Lesson Objective: Identify, analyze, sort, compare, and position circles.

The Student Debrief is intended to invite reflection and active processing of the total lesson experience. It is also an opportunity for informal assessment. Consider taking anecdotal notes or using a simple checklist to note each child’s progress towards meeting the lesson objective.

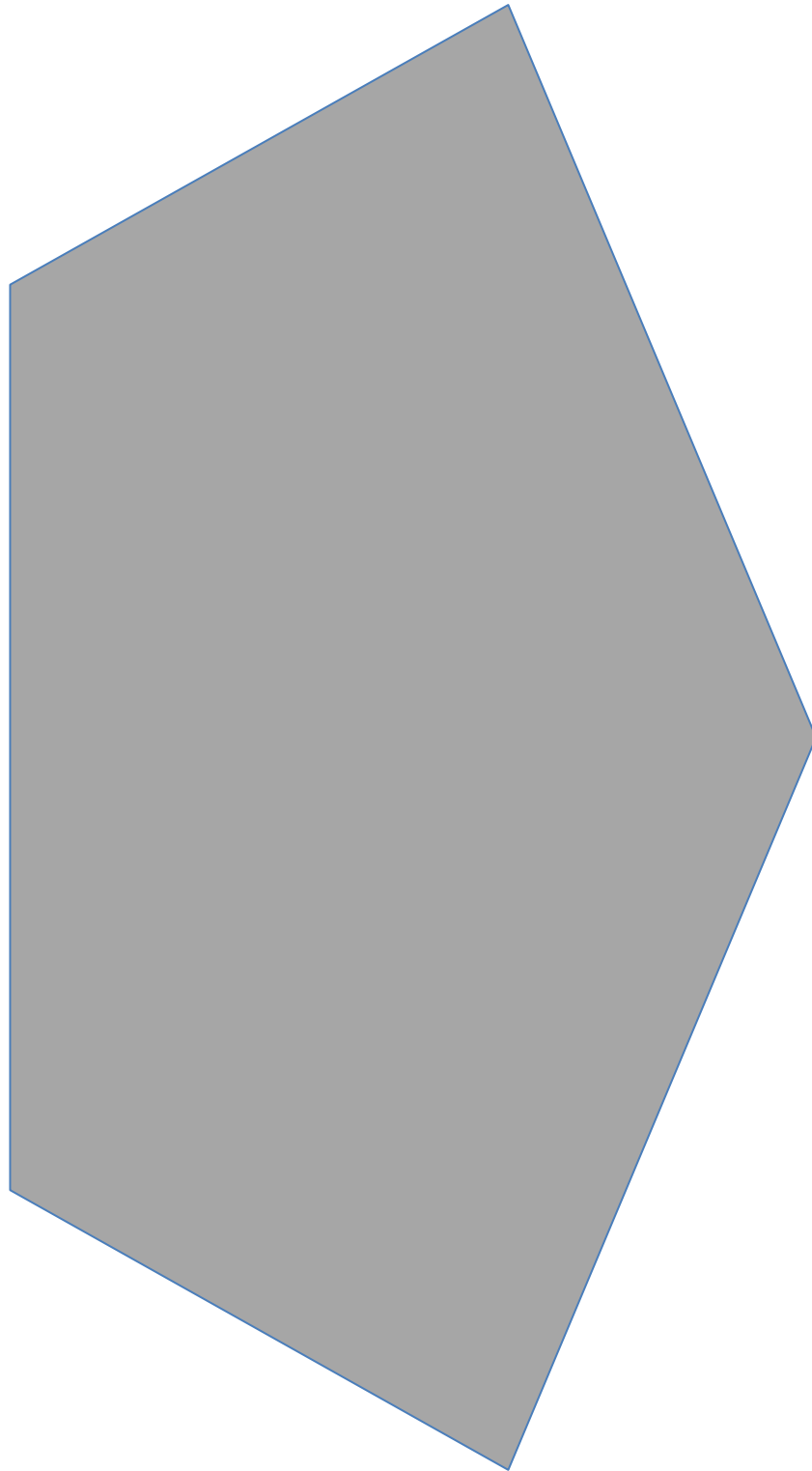
As students complete the Practice portion of the Concept Development, listen for misconceptions or misunderstandings that can be addressed in the Debrief. You may choose to use any combination of the questions below to help students express ideas, make connections, and use new vocabulary (**circle, behind, in front of, between**).

- What new shape did we talk about today?
- How is a circle different from a rectangle?
- (Show an oval.) How is this the same as and different from a circle?
- What new position words did we use to talk about where we put our circle today?

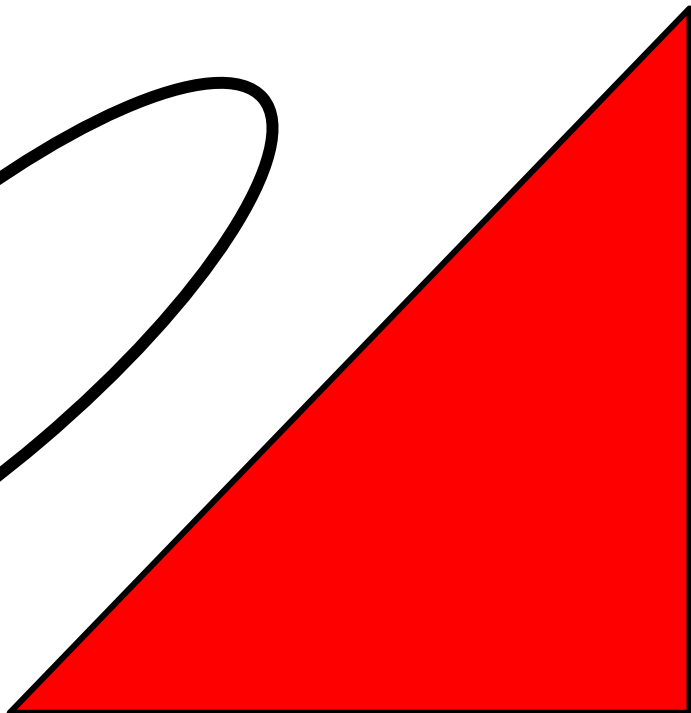
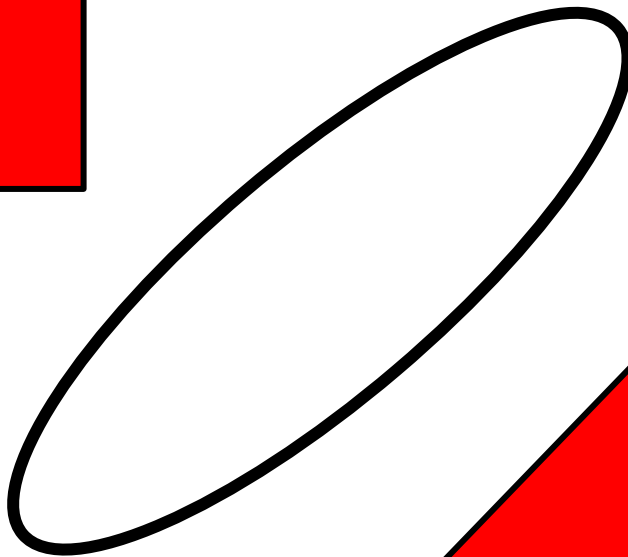
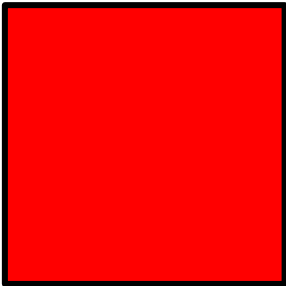
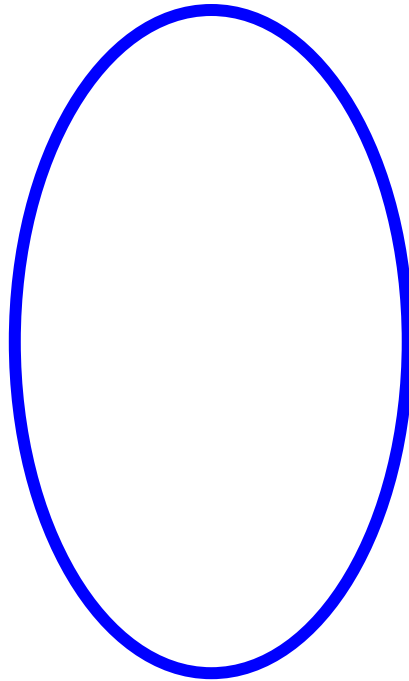
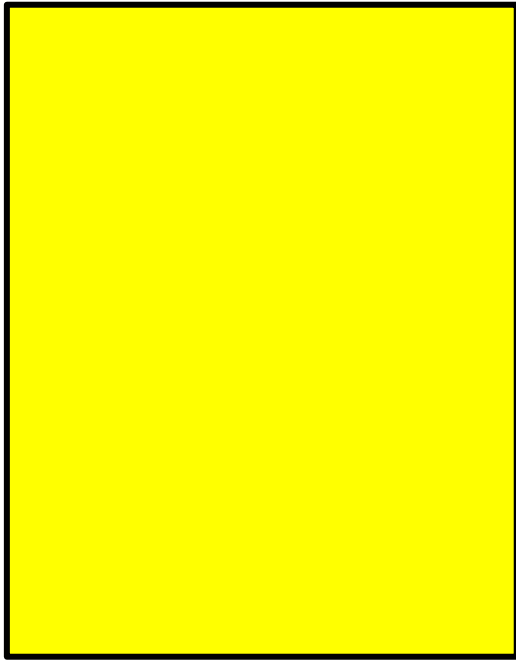


CENTER CONNECTION:

In the sensory center, have children stamp circles into sand or clay using buttons, plastic bowls, container tops, and other round items from around the classroom. As a challenge, use an item to stamp and then see if children can figure out which item made the circle.



5-corner shape



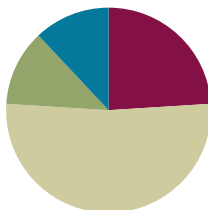
circle non-examples

Lesson 5

Objective: Identify, analyze, sort, compare, and position circles, rectangles, squares, and triangles.

Suggested Lesson Structure

■ Fluency Practice	(6 minutes)
■ Application Problem	(3 minutes)
■ Concept Development	(13 minutes)
■ Student Debrief	(3 minutes)
Total Time	(25 minutes)



Fluency Practice (6 minutes)

- Pop Up Fingers **PK.CC.3a** (2 minutes)
- Count the Corners **PK.CC.3a** (4 minutes)

Pop Up Fingers (2 minutes)

Note: Notice if students are able to pop up 1, 2, and 3 fingers without counting or if they release them one at a time. This is an informal assessment. Model popping up but accept the action of moving one finger up at a time. Keep it playful.

T: Let's count on our fingers the Math Way.

S: (Lift a finger from left to right starting with the left pinky and count.) 1, 2, 3, 4, 5.

T: Put your fingers back into their starting position with no fingers up. Pop up 1.

S: (Pop up the left pinky.)

T: Put 1 finger down again.

S: (Do so.)

T: Pop up 2 fingers.

S: (Pop up the left pinky and left ring finger.)

S: Put 2 fingers down again.

Repeat with 3 fingers.

Count the Corners (4 minutes)

Materials: (S) Rectangle and triangle (Fluency Template), bag with 7 beans

Note: This is an informal assessment to see if students can distinguish between the rectangle and the triangle.

T: Mark the corners of the triangle with beans.

S: (Mark the corners with beans.)

T: How many beans did you put?

S: Three.

T: How many corners does a triangle have?

S: Three!

Leave the beans on the triangle. Repeat the process with the rectangle. Next, direct the students to remove one or more beans from the rectangle and ask them how many corners have a bean on them, how many do not. Have them replace all the beans and repeat the same process with the triangle. If students are doing very well, move fluidly between the rectangle and triangle, at times removing a bean from the rectangle, at other times from the triangle.

Application Problem (3 minutes)

Materials: (S) Per pair: 1 paper bag with a triangle cutout inside (Lesson 1 Template 2), 1 paper bag with a circle cutout inside (Lesson 1 Template 2)

Pair students and give each child a bag (ensure that each pair has a triangle and circle). Invite one student in each pair to open the bag and feel the shape without looking. Encourage children to describe what they feel and to guess the shape before pulling it out of the bag. Repeat, giving the other child in each pair a chance to try.

Note: This activity requires children to think about the parts of a shape and use the sense of touch to name the shape. By describing what they feel to a partner, children have a chance to use new vocabulary in context.

Concept Development (13 minutes)**Part 1: Concept Introduction**

Materials: (T) Large cutouts of circles, rectangles, triangles, and squares (Lesson 1 Template 2); music

Prior to the lesson, place shapes on the floor throughout the room. There should be a few more shapes than students.

1. Tell students, “Let’s play a game called Shape Walk!” Explain that they will walk around the classroom

**NOTES ON
MULTIPLE MEANS
OF REPRESENTATION:**

Provide a visual signal for the stop of the music so deaf and hard of hearing students can participate in the game.

between all the shapes on the floor as music plays.

2. Say, “When the music stops, touch the closest shape with your foot and freeze! Then, everyone will chant, ‘Circle, rectangle, triangle, square. You can find shapes everywhere!’” Tell students to whisper-say the name of the shape their foot is on.
3. Still frozen, students listen carefully to a direction. “If you’re *next to* a circle, sit down on it.” “If you have a square, hold it *up*.” Any students who are not touching the named shape, remain frozen.
4. Alternate naming the shape and describing the shape, e.g., “This shape has three sides and three corners.” Then, as before, give directions using position words.
5. Continue playing until all shapes have been named several times.

Part 2: Practice

Materials: (S) Per pair: park scene (Template), 2 small animals or dolls, music

Before sending children to prepared tables, gather them in a circle to model the activity.

- MP.3**
1. Show students the park scene and a small doll or animal. Say, “You and your partner are going to take your little friends for a walk in the park.”
 2. Tell students they will move their doll on the paper, and when the music stops they will identify the shape their doll is *on* or *next to* and talk about it with their partner.
 3. Encourage students to share all they know about each shape and to use position words to tell where each shape is, e.g., “Part of the sun is a circle. It is round. It has no straight sides and no corners. It is up in the sky.”
 4. Circulate as students talk about the shapes. Comment and describe what you hear, using parallel talk, e.g., “Jason says the seesaw is a rectangle on a triangle. The rectangle has four sides and four corners. It is *under* the kite.”
 5. Invite partners to the Student Debrief with their park scene templates.

Student Debrief (3 minutes)

Lesson Objective: Identify, analyze, sort, compare, and position circles, rectangles, squares, and triangles.

The Student Debrief is intended to invite reflection and active processing of the total lesson experience. It is also an opportunity for informal assessment. Consider taking anecdotal notes or using a simple checklist to note each child’s progress towards meeting the lesson objective.

As students complete the Practice portion of the Concept Development, listen for misconceptions or misunderstandings that can be addressed in the Debrief.

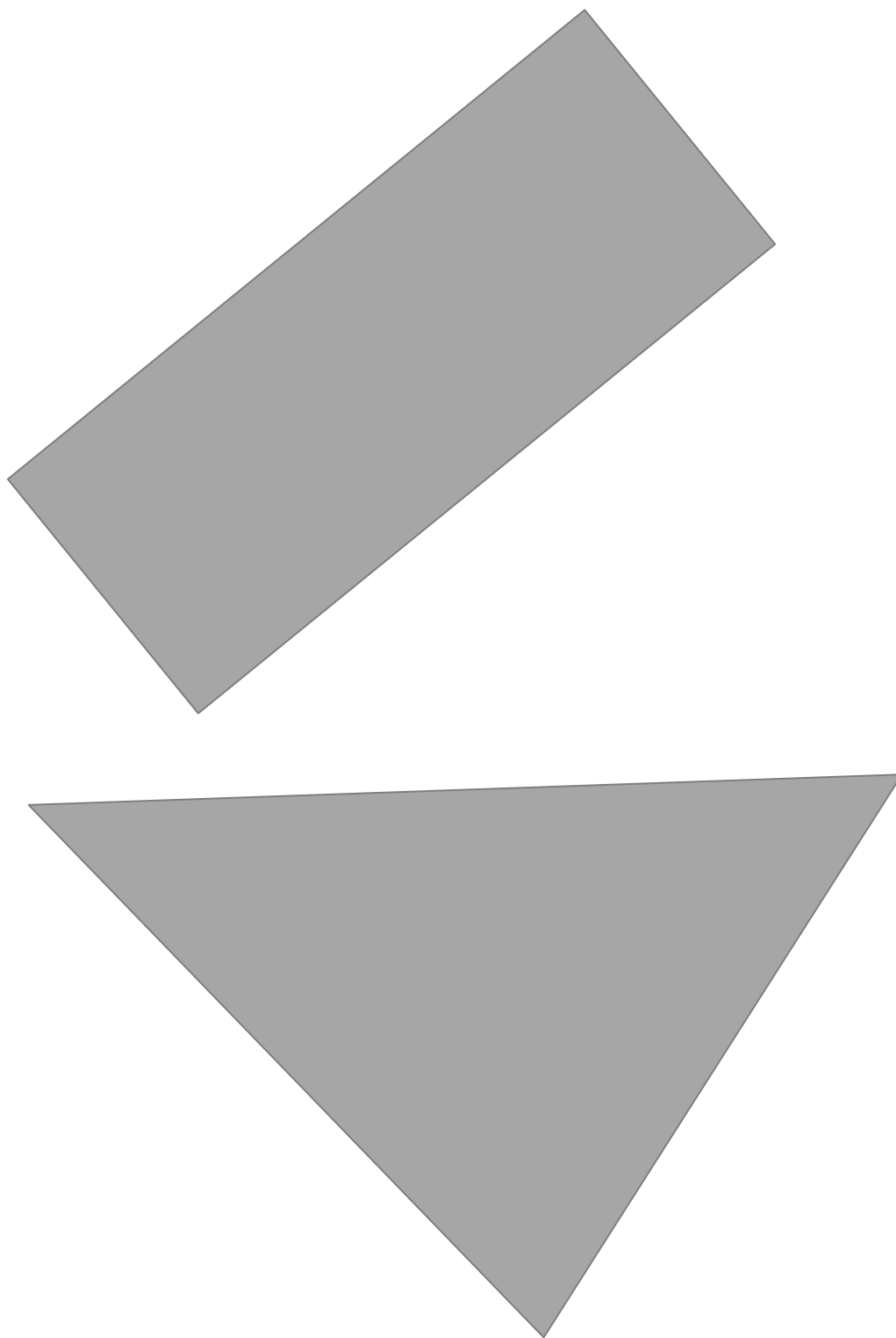


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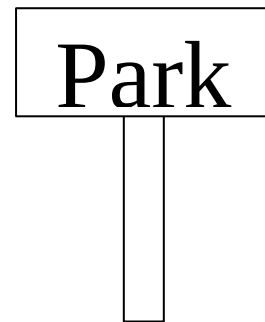
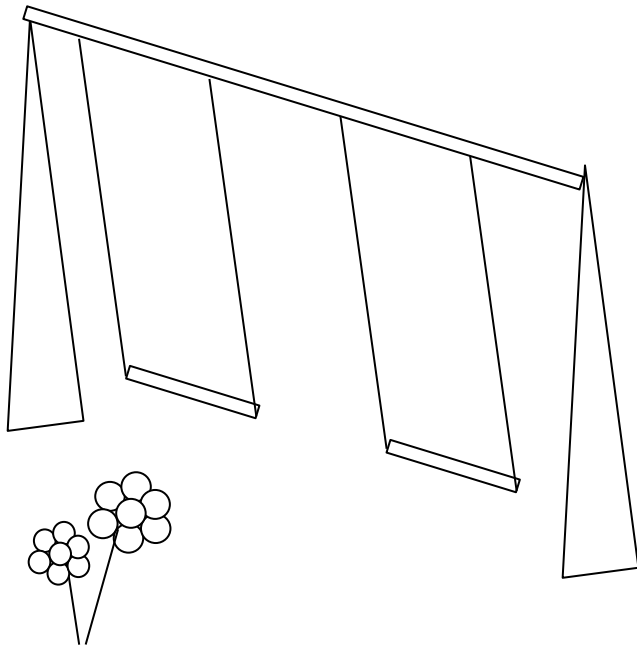
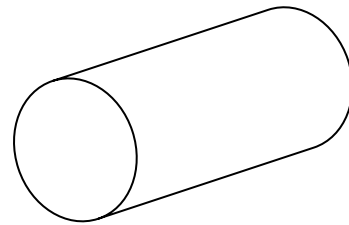
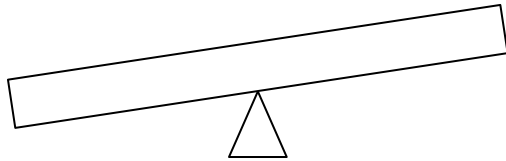
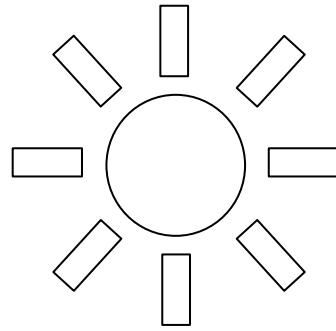
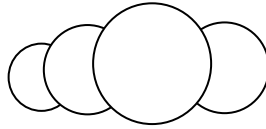
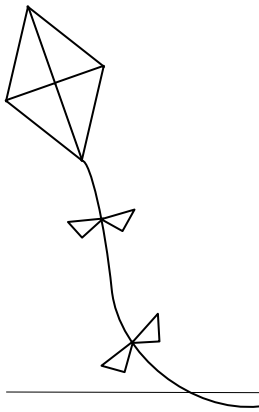
Place paper shapes in the art center. Students can use the shapes to create a picture or design like the park scene. Ask them to describe their work using position words, e.g., “The circle is the sun. I made a house under the sun. The house is a rectangle.”

You may choose to use any combination of the questions below to help students express ideas, make connections, and use new vocabulary.

- Where do you see circles in the park scene? Triangles?
- Look at the park scene with your partner. What is the same about the seesaw and the swing set? What is different?
- Ask me a question about the park scene using a position word (e.g., *above*, *next to*, *in front of*), such as, “What is next to the park sign?”



rectangle and triangle



park scene

Topic B

Constructing Two-Dimensional Shapes

PK.G.4, PK.G.3

Focus Standards:	PK.G.4	Create and build shapes from components (e.g., sticks and clay balls).
Instructional Days:	3	
Coherence -Links to:	GK–M2	Two-Dimensional and Three-Dimensional Shapes
	GK–M6	Analyzing, Comparing, and Composing Shapes

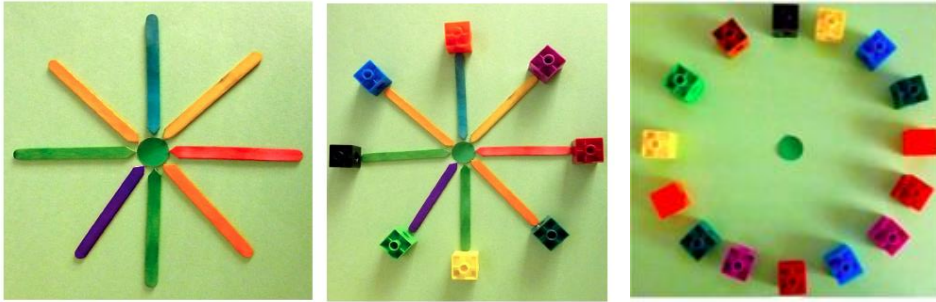
In Topic A, children identified and sorted two-dimensional shapes and described their attributes (**PK.G.3**). As they progress to Topic B, students are able to think about the parts of shapes (e.g., sides, corners) and relate those parts to the whole (e.g., a triangle has three sides and three corners).

Students construct from their component parts first a triangle in Lesson 6, and then a rectangle and a square in Lesson 7 (**PK.G.4**). Using straws of various lengths, students build the three sides of a triangle and place balls of clay on the corners where the straws meet. Students count the number of sides (straws) and corners (balls of clay), connecting these attributes to the triangle, rectangle, or square.



When constructing rectangles in Lesson 7, students are encouraged to keep their construction anchored to the paper shape template so the rectangles hold their “square corners.” In the construction of the rectangles, some children will have equal length straws and other children will have two pairs of different length straws. The Debrief will focus on all the rectangles the students constructed and then highlight that some children constructed a rectangle with all the sides having the same length: “Let’s call these special rectangles *square* because all the sides are the same length.”

In Lesson 8, students build a circle, using equal length craft sticks and linking cubes, as shown on the next page. Through this activity, students are able to see and demonstrate that all the outer points of a circle are equidistant from the center: “The cubes are on a circle!” Once students define a circle using informal language—“All the cubes are 1 stick away from the dot in the middle!”—they can differentiate the circle from other rounded shapes. The discussion might lead to an examination of wheels and why an oval-shaped wheel would not roll as well.



In Topic B Fluency Practice, students make small balls of clay in preparation for shape construction activities in the Concept Development. Students are asked to use 1 ball of clay to make 2, 3, 4, or 5 balls that are about the same size. They may notice that as they decompose 1 ball of clay into 3 balls of clay, each ball becomes smaller.

A Teaching Sequence Towards Mastery of Constructing Two-Dimensional Shapes

Objective 1: Construct a triangle.
(Lesson 6)

Objective 2: Construct a rectangle and a square.
(Lesson 7)

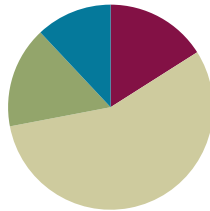
Objective 3: Construct a circle.
(Lesson 8)

Lesson 6

Objective: Construct a triangle.

Suggested Lesson Structure

■ Fluency Practice	(4 minutes)
■ Application Problem	(4 minutes)
■ Concept Development	(14 minutes)
■ Student Debrief	(3 minutes)
Total Time	(25 minutes)



Fluency Practice (4 minutes)

- Make Three Small Balls **PK.CC.3a** (4 minutes)

Make Three Small Balls (4 minutes)

Materials: (S) Small ball of clay

Note: This fluency activity prepares the materials for today's lesson. It also demonstrates, though not explicitly, that as you make more units, the units become smaller!

- T: Show me your ball of clay! How many balls of clay do you have?
- S: 1!
- T: Use the whole piece of clay to make two smaller balls of clay that are about the same size.
- S: (Do so.)
- T: How many balls of clay do you have now?
- S: 2!
- T: Put your two balls of clay back together to make one bigger ball of clay.
- S: (Do so.)
- T: Now, make your one ball of clay into three balls of clay that are about the same size.
- S: (Do so.)
- T: How many balls of clay do you have now?
- S: 3!
- T: Great! We are going to use these balls of clay for our lesson today, so keep them on your table.

Application Problem (4 minutes)

Materials: (T) Cutouts of different shapes (Lesson 1 Template 2, including 1 triangle for each child in the group), music (optional)

Spread out the shapes in the middle of the circle so children can easily access them from all points.

Say, “Jose is having a party! He wants everyone to bring a shape with three sides. Can you find a shape with exactly three sides?”

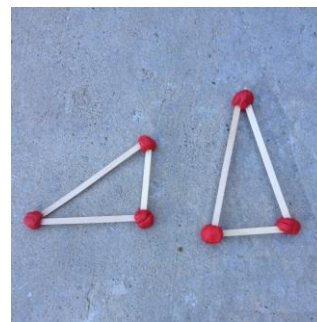
When children have found their triangles, have them share the name of the shape with a partner. Consider playing music and having children dance to celebrate the triangle party. Repeat the process.

Note: This activity focuses children’s attention on the fact that triangles have three sides, a fact they will use to construct triangles in the Concept Development.

Concept Development (14 minutes)**Part 1: Concept Introduction**

Materials: (T) 10 straws or stirrer sticks of various lengths, 3 small balls of clay (from the fluency activity)

1. Draw three triangles on the board (of different sizes and orientations). Ask, “What shape do you see?” Listen for the descriptions to include attributes: “It’s a triangle because I see three sides!”
2. Hold up 10 straws. Count out the three straws together, clapping once for each straw counted, “1, 2, 3.”
3. Ask, “How can we use these three straws to build a triangle?” Guide students to build the three sides of the triangle. Notice how the lengths of the sides do not have to be the same.
4. Ask, “What can we do to hold the three sides of the triangle together?” Guide students to see the three corners where the straws meet and remind them of the three balls of clay from the fluency activity.
5. Count the three balls of clay together, clapping once for each clay ball counted, “1, 2, 3.” Show students how to use the clay balls to hold the straws together at the three corners, making a triangle.
6. Say, “We can make triangles with three straws and three balls of clay! All triangles have three sides and three corners!”

**Part 2: Practice**

Materials: (S) 3 small balls of clay (from the fluency activity), per table: caddy with straws (or stirrer sticks) of different lengths

1. Send students to prepared tables and tell them, “It’s your turn to build a triangle!”

2. Say, "Count the number of straws you need to make a triangle from the materials on the table."
3. Say, "Let's check to see if we have everything we need. If you have three sides, clap three times. If you have three corners, clap three times."
4. Guide students to build triangles with straws and clay balls. Circulate and provide assistance to those who are struggling.
5. As they complete their triangles, encourage students to count the sides and corners, "1, 2, 3."
6. If time permits, lead a gallery walk through the classroom, and point out the different sizes, orientations, and shapes of the triangles.

**NOTES ON
MULTIPLE MEANS
OF ENGAGEMENT:**

Students who are ready for a challenge could be given three straws to cut and manipulate on their own to create a variant triangle.

Student Debrief (3 minutes)

Lesson Objective: Construct a triangle.

The Student Debrief is intended to invite reflection and active processing of the total lesson experience. It is also an opportunity for informal assessment. Consider taking anecdotal notes or using a simple checklist to note each child's progress towards meeting the lesson objective.

As students complete the Practice portion of the Concept Development, listen for misconceptions or misunderstandings that can be addressed in the Debrief. You may choose to use any combination of the questions below to help students express ideas, make connections, and use new vocabulary.

- What tools did we use today to make a triangle? How many straws did we need? How many clay balls?
- (Hold up one of the triangles built by the students.) Is this a triangle even though there is no inside part? (A shape is made up of its sides and corners.)
- (Turn any triangle so the point is not on top.) Is it still a triangle if I turn it like this?
- Do you think it is possible to make a rectangle with straws? How about a circle?

**CENTER CONNECTION:**

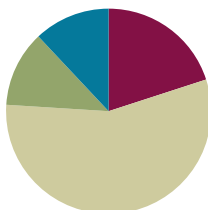
Set up the art center with clay and straws or stirrers of different lengths. Invite children to build lots of different triangles. Provide triangle stencils or attribute blocks for children to trace.

Lesson 7

Objective: Construct a rectangle and a square.

Suggested Lesson Structure

■ Fluency Practice	(5 minutes)
■ Application Problem	(3 minutes)
■ Concept Development	(14 minutes)
■ Student Debrief	(3 minutes)
Total Time	(25 minutes)



Fluency Practice (5 minutes)

- Make 4 Small Balls **PK.CC.3a** (5 minutes)

Make 4 Small Balls (5 minutes)

Materials: (S) Small ball of clay

Note: This fluency activity prepares materials for today's lesson to make rectangles with straws. An extra minute has been added to the time so that the entire sequence can be worked through, from two balls to three to four. An interesting question is, "Which balls are bigger, when we made two balls or when we made four balls?"

T: Show me your ball of clay!

S: (Do so.)

T: How many balls of clay do you have?

S: 1!

T: Use the whole piece of clay to make two smaller balls of clay that are about the same size.

S: (Do so.)

Repeat, making three and four balls. Have students put their four balls at the top of their desk to use during the lesson.

Application Problem (3 minutes)

Materials: (T) Cutouts of different shapes (including 1 rectangle or square for each child in the group; do not include any four-cornered shapes that are not rectangles, e.g., parallelogram or rhombus), music (optional)

Spread out the shapes in the middle of the circle so children can easily access them from all points.

Say, “Jose is having another party! Today, he wants everyone to bring a shape with four corners. Can you find a shape with exactly four corners?”

When children have found their rectangles, have them share the name of the shape with a partner. Consider playing music and having children dance to celebrate the rectangle party. Repeat more than once.

Note: This activity focuses children’s attention on the fact that rectangles have four corners, a fact they will use to construct rectangles in the Concept Development.

Concept Development (14 minutes)

Part 1: Concept Introduction

Materials: (T) Rectangle and square template on paper, 4 straws or stirrer sticks matching each template, 4 small balls of clay (from the fluency activity)

Note: This lesson involves making a rectangle with two pairs of same length sticks for the sides (exemplar rectangle) and a square, using four equal length sticks for the sides. A template for each will need to be created by the teacher to match the materials used.

1. Display rectangle template (two short sides, two long sides) on a flat surface. Ask students to identify the shape. Listen for the descriptions to include attributes: “It’s a rectangle because I see four corners!” “I see four sides!”
2. Hold up four straws that match the template. Count the four straws together, jumping once for each straw counted, “1, 2, 3, 4.”
3. Ask, “How can we use these four straws to build a rectangle?” Match each straw to the corresponding sides on the rectangle template.
4. Ask, “What can we do to hold the four sides of the rectangle together?” Guide students to see the four corners where the straws meet. Ask, “How many clay balls did we make today?”
5. Count the four clay balls, jumping once for each one counted. Guide students to say that the four clay balls can hold the four straws together at the four corners, making a rectangle.
6. Hold up the square template. “Rectangles have four sides and four corners. Is this a rectangle?” Count the sides and corners together, jumping once for each side and corner counted.
7. Say, “Yes! It’s a rectangle. It has four straight sides and four corners, but we can also call it a square because all sides are the same!”

Part 2: Practice

Materials: (S) Rectangle and square template on paper, 4 straws or stirrer sticks matching each template, 4 small balls of clay (from the fluency activity)

Note: Prepare student materials so that *half* the students have two pairs of the same length sides and *half* have equal length sides to build their rectangle or square.

MP.1

1. Send students to tables prepared with sides that match their template and clay balls. "It's your turn to build a rectangle."
2. "Let's check to see if we have everything we need. If you have four sides, jump four times. If you have four corners, jump four times."
3. Guide students to build rectangles on top of their templates. Circulate and provide assistance to those who are struggling. Encourage students to keep their constructions on the paper (not to lift them) so the corners stay square.
4. As they complete their rectangles, encourage students to count the sides and corners, "1, 2, 3, 4."
5. When all the students are done building their rectangles, lead a gallery walk around the room to look at all the rectangles. "We made wonderful rectangles today! Some have sides that are different lengths and some have four sides that are all the same. We named these *squares*."



NOTES ON MULTIPLE MEANS OF ENGAGEMENT:

For students are ready for a challenge, give them all eight straws and both of the templates. Providing challenging extensions sustains effort and interest.

Student Debrief (3 minutes)

Lesson Objective: Construct a rectangle and a square.

The Student Debrief is intended to invite reflection and active processing of the total lesson experience. It is also an opportunity for informal assessment. Consider taking anecdotal notes or using a simple checklist to note each child's progress towards meeting the lesson objective.

As students complete the Practice portion of the Concept Development, listen for misconceptions or misunderstandings that can be addressed in the Debrief. You may choose to use any combination of the questions below to help students express ideas, make connections, and use new vocabulary.

- What tools did you use today to make rectangles? How many straws and clay balls did we need? (The number of straws and clay balls were the same!)
- Hold up an exemplar rectangle and a square. What is the same about these rectangles? What is different about these rectangles?
- What was the same about the triangle and the rectangle you made? (They both had straight sides and corners.)
- What was different about the triangle and the rectangle you made? (The rectangle had one more corner and side than a triangle.)
- (Arrange two long straws and one short straw without the template.) How many straws do I need to finish my rectangle?



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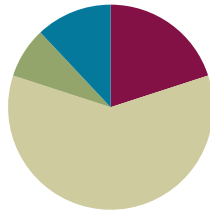
Help students build shapes using their bodies in the block center (e.g., by lying on the floor or by holding hands and using arms as sides). After they have built the shapes with their bodies, challenge them to build the shapes with blocks. Children can make larger shapes by using more than one block to create a side.

Lesson 8

Objective: Construct a circle.

Suggested Lesson Structure

■ Fluency Practice	(5 minutes)
■ Concept Development	(15 minutes)
■ Application Problem	(2 minutes)
■ Student Debrief	(3 minutes)
Total Time	(25 minutes)



Fluency Practice (5 minutes)

- Make Five Small Balls **PK.CC.3a** (5 minutes)

Make Five Small Balls (5 minutes)

Materials: (S) Small ball of clay

Note: Students will improve at partitioning their clay over the three days. Call that to their attention, “Look how much better you are at making balls that are about the same!” If certain students were less successful yesterday making four balls, suggest they can make two, three, four, or five balls the same size. This will make comparing the size of the balls in the final question easier.

T: Show me your ball of clay!

S: (Do so.)

T: How many balls of clay do you have?

S: 1!

T: Use the whole piece of clay to make two smaller balls of clay that are about the same size.

S: (Do so.)

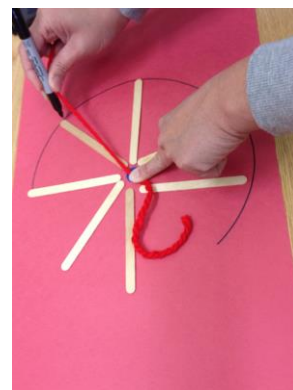
Repeat, making five balls. Ask, “Which balls were bigger, when we made two balls or five balls?”

Concept Development (15 minutes)

Part 1: Concept Introduction

Materials: (T) 1 large piece of construction paper, circle template (teacher created), 8 craft sticks, 16 linking cubes, dot stickers, wheel (Template 1), oval (Template 2)

Note: The circle template will need to be made by teachers on a paper large enough for a 4.5" craft stick radius for this lesson. Once measured, use a string and pen to make the template. Oval template provided.



- Put a dot sticker in the middle of the large piece of construction paper. Say, "We are going to make another shape today by putting these pretend lollipops around this dot." Demonstrate placing a stick with one end touching the dot sticker and a linking cube at the other end.
- Invite students forward to repeat putting "lollipops" around the dot sticker eight times. Help students space sticks and linking cubes evenly around the dot.
- Ask, "What shape did we make?" Acknowledge and discuss responses.
- Say, "We made a lollipop circle!" Remove the sticks and fill in the gaps with eight more linking cubes. "We made a linking cube circle!"
- Hold up the circle and wheel template. Say, "I want to put a dot sticker in the middle of this circle like the wheel. Can I use the sticks to help me place my dot sticker?" Guide the students to place the sticks with one end touching the edge of the circle leaving a space in the middle that fits the dot sticker.
- Lead a short discussion on how wheels are circles and how they roll. Discuss all the things that use wheels.
- Display the paper oval. Point to the center. Ask the students why this would not make a good wheel and why it is not a circle. Use craft sticks to demonstrate that the edges of the oval are not all the same distance from the center.



Part 2: Practice

Materials: (S) Circle template (teacher created), 8 craft sticks, 16 linking cubes, dot stickers

Note: To prepare the paper circle template use the template made for Concept Introduction to cut several circle templates at once.

- Send students to prepared circles with dot stickers already in place and tell them, "It's your turn to build a



NOTES ON MULTIPLE MEANS OF REPRESENTATION:

Circulate and check for understanding while giving directions for building circles. Students having difficulty following verbal directions would benefit from a model of each step. This could be a concrete model provided by the teacher, or a buddy who will model each step of the building process.

circle!”

2. Say, “First, make a wheel by putting your sticks around the circle from the dot to the edge.”
3. Say, “Now, put one cube on the outer end of each stick to make a wheel.”
4. Guide students to fill in the spaces with the rest of their cubes and remove the sticks to see their circle. “The cubes are on the circle!”
5. Encourage students to say informally that they made circles that will roll like wheels because all the cubes are one stick from the dot.
6. When all the students are finished building their circles, lead a gallery walk around the room to look at all the circles. Record creations with digital pictures.

Application Problem (2 minutes)

Materials: (T) 2 circles, 2 squares, 2 ovals

Claude is building a new bicycle. He needs to choose two tires for his bike. Which tires would you tell him to use? Why?

Note: This question asks children to consider the attributes of a shape and apply that knowledge to a real world scenario. For children who have experience with bicycles, it may be easy to select the circle because it is shaped like a wheel. Support students as they search for language to explain their choice.

Student Debrief (3 minutes)

Lesson Objective: Construct a circle.

The Student Debrief is intended to invite reflection and active processing of the total lesson experience. It is also an opportunity for informal assessment. Consider taking anecdotal notes or using a simple checklist to note each child’s progress towards meeting the lesson objective.

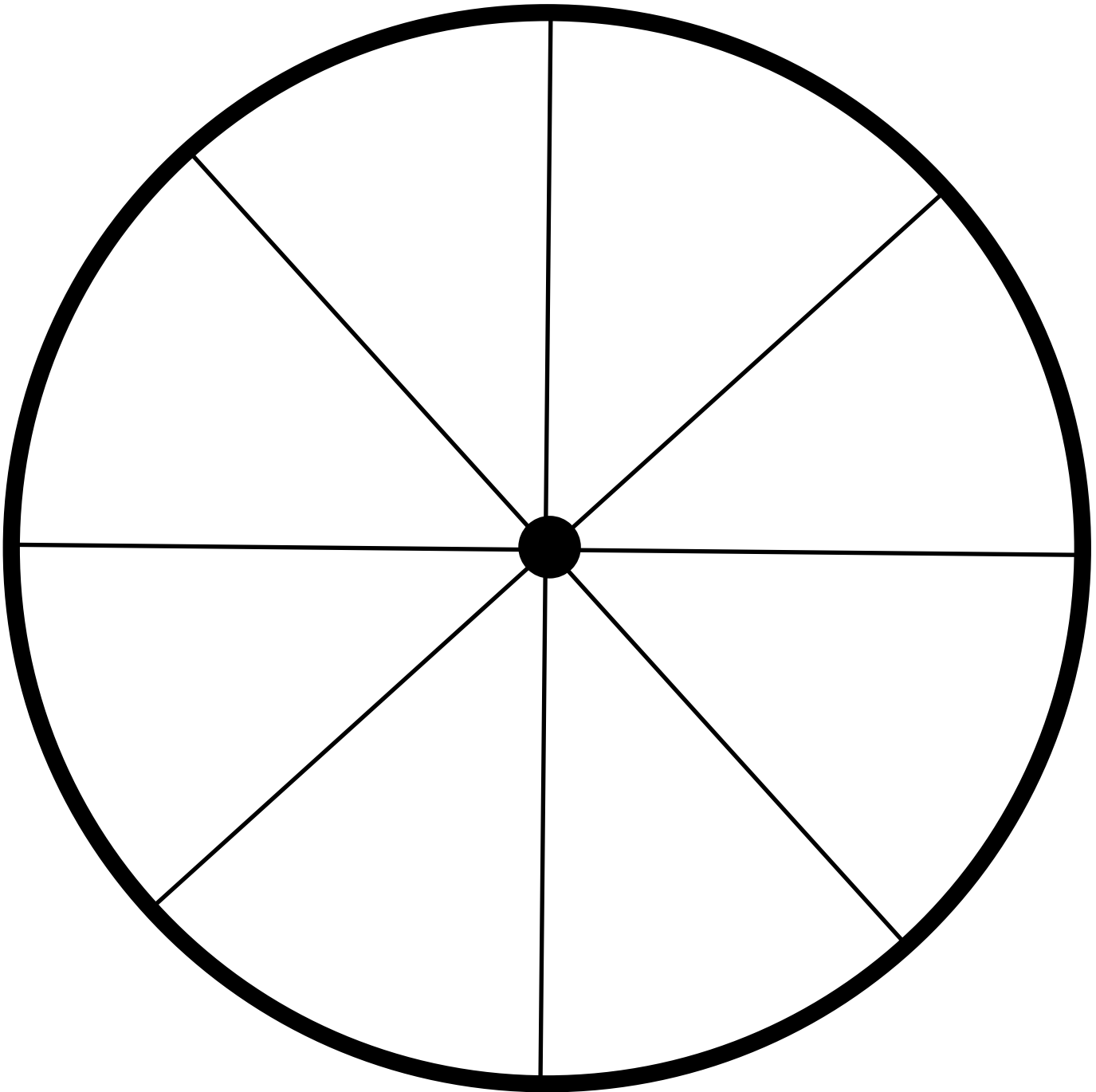
As students complete the Practice portion of the Concept Development, listen for misconceptions or misunderstandings that can be addressed in the Debrief. You may choose to use any combination of the questions below to help students express ideas, make connections, and use new vocabulary.

- What tools did you use today to make circles? Why did you use craft sticks that were exactly the same?
- Why do circles roll? Why don’t ovals roll as well as circles?
- Why is it best for Claude to choose circles for his tires?
- Why is an oval not a circle?

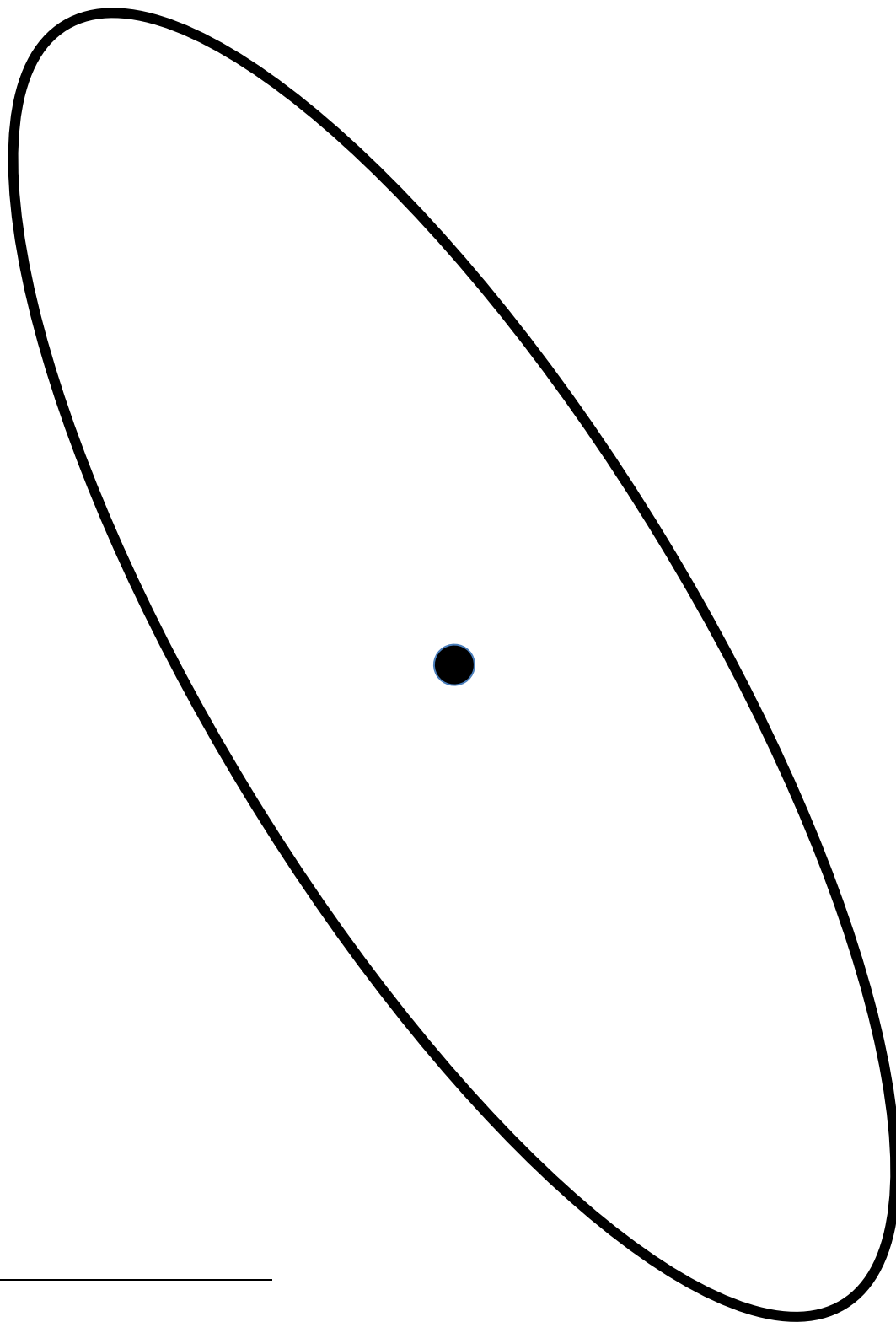


CENTER CONNECTION:

Add pattern blocks and pattern block templates to the block center. Children will enjoy using shapes to build (compose) familiar objects. Many students will begin to see the relationships between the shapes and how larger shapes can be broken down into smaller shapes (decomposition).



wheel



oval



Topic C

Three-Dimensional Shapes

PK.G.3, PK.MD.2, PK.G.1

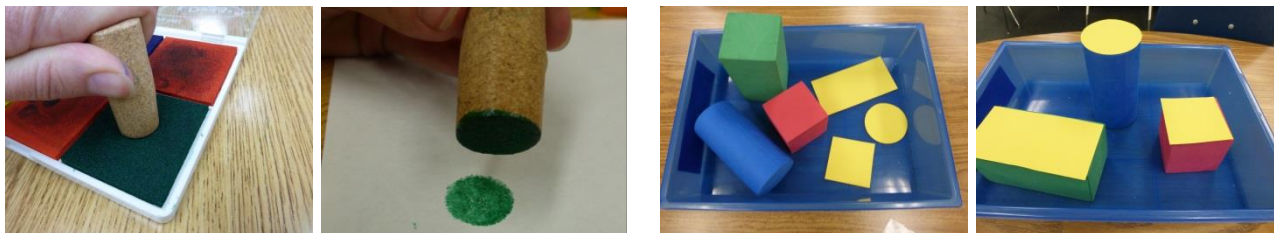
Focus Standards:	PK.G.3	Analyze, compare, and sort two- and three-dimensional shapes and objects, in different sizes, using informal language to describe their similarities, differences, and other attributes (e.g., color, size, and shape).
Instructional Days:	4	
Coherence -Links to:	GK–M2	Two-Dimensional and Three-Dimensional Shapes
	GK–M6	Analyzing, Comparing, and Composing Shapes

In Topic C, children identify, analyze, sort, compare, and position three-dimensional (3-D) shapes (**PK.G.1–3**). This topic focuses on analyzing three-dimensional shapes (real world, wooden, or foam) by considering their two-dimensional faces and describing their functional properties (e.g., stacking or rolling) in order to build with them.

Lesson 9 follows the same format as Lesson 1 as students explore and sort solid shapes (sphere, rectangular block, cylinder, cone, cube, triangular block or pyramid) pulled from a mystery bag. Then, students act as shape detectives with a partner and hunt for shapes throughout the classroom, matching each three-dimensional shape to its wooden or foam block counterpart (e.g., soup can to a wooden cylinder). While teachers may use mathematical names to identify shapes (e.g., cube), students might informally identify three-dimensional shapes, calling a sphere a ball or a cylinder a can. When comparing shapes informally, students notice that some three-dimensional shapes have “a lot of flat parts and some don’t have any,” or “some have pointy parts and some are round.”

In Lesson 10, students consider and compare the parts of three-dimensional shapes. They analyze the happy faces of two-dimensional paper shapes in different sizes and orientations (**PK.G.2**), and match them to their solid counterparts: “Look! The circle happy face fits this shape!” Then, using three-dimensional foam shapes as stamps, students identify the “footprint” that their shape is making as it marches along a path. Such activities build geometric reasoning skills and understanding of shape and structure.





In Lesson 11, students develop spatial visualization skills as they examine and describe the functionality of different solid shapes in order to build with them (blocks). Students experiment with how each shape moves, and based on these experiments, create buildings, rooms, towers, or bridges. In the context of play, the attention to attributes becomes inherently important as students notice, for example, that while a cone could be used at the top of their structure, it is difficult to use this solid as a support for other shapes. Hence, students see that solids with multiple faces are the most versatile building block. As students articulate their thinking, they begin to see how the parts relate to the whole construction. For example, a student might say, “I can stack boxes because they are flat on the top and bottom.” The teacher is encouraged to photograph and celebrate the children’s unique creations.



Lesson 12 again highlights spatial visualization skills as students synthesize their understanding of position words and the structure of three-dimensional shapes to construct a simple model of a familiar place, such as the classroom or their bedroom. Using a rectangular block for a bed and a cube to represent a desk gives the child a foundational experience with abstraction—something crucial to their mathematical development.

In Topic C Fluency Practice, anticipating the work in Module 3 wherein students explore numbers through 10, students practice rote counting to 6 and 7 through fun, energizing activities such as playing the drums and marching.

A Teaching Sequence Towards Mastery of Three-Dimensional Shapes

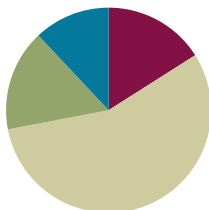
- Objective 1: Find and describe solid shapes using informal language without naming.**
(Lesson 9)
- Objective 2: Identify, analyze, sort, compare, and match solid shapes to their two-dimensional faces.**
(Lesson 10)
- Objective 3: Identify, analyze, sort, compare, and build with solid shapes.**
(Lesson 11)
- Objective 4: Position solid shapes to create a model of a familiar place.**
(Lesson 12)

Lesson 9

Objective: Find and describe solid shapes using informal language without naming.

Suggested Lesson Structure

■ Fluency Practice	(4 minutes)
■ Application Problem	(4 minutes)
■ Concept Development	(14 minutes)
■ Student Debrief	(3 minutes)
Total Time	(25 minutes)



Fluency Practice (4 minutes)

- Drum and Count to 6! **PK.CC.1** (4 minutes)

Drum and Count to 6! (4 minutes)

Materials: (S) Plastic or metal lid

Note: This fluency activity anticipates the work of Module 3 wherein students work with numbers through 10, preparing them with knowledge of the number word sequence.

- T: Let's play the drums! Here are my drumsticks and drum (hold up your 2 index fingers and show how to hit them on the lid). Show me your drumsticks.
- S: (Show index fingers.)
- T: Let's count to 4 and hit the drum with our sticks each time we say a number!
- T: (Demonstrate playing the drum and counting. Pause slightly between each set.) Join in when you are ready! 1, 2, 3, 4. 1, 2, 3, 4. 1, 2, 3, 4. 1, 2, 3, 4. (Continue until all are playing.)
- T: Now, let's play and count to 5. Join in when you are ready. 1, 2, 3, 4, 5. 1, 2, 3, 4, 5. 1, 2, 3, 4, 5. 1, 2, 3, 4, 5. (Continue until all are playing.)
- T: Now, let's play and count to 6. Join in when you are ready. 1, 2, 3, 4, 5, 6. 1, 2, 3, 4, 5, 6. 1, 2, 3, 4, 5, 6. 1, 2, 3, 4, 5, 6. (Continue until all are playing.)

Application Problem (4 minutes)

Materials: (T) Rectangle, square, triangle (Lesson 1 Template 2) (S) 5 straws or craft sticks

Show the rectangle. Say, “Sophia wants to build a rectangle and use one stick to make each side. Show me the sticks she needs to build a rectangle. How many sticks does she need?”

Repeat with the square and triangle.

Note: This activity focuses children on the parts of a shape and asks them to connect number to geometry.

Concept Development (14 minutes)

Part 1: Concept Introduction

Materials: (T) Mystery bag containing foam or wooden 3-D shapes (cylinders, spheres, cubes, rectangular blocks, and cones, a few of each in different sizes if available), 4 shallow lids for sorting (e.g., shoe box lids, plastic container lids, shallow boxes), a variety of real world 3-D objects (soup cans, small balls, unsharpened pencils, party hats, etc.) placed strategically around the room to be found on the shape hunt

Note: If the mathematical names of the solid shapes come out during the lesson, acknowledge them and use them as one type of descriptor. Pre-kindergarten students will not be expected to use or master the names of three-dimensional shapes.

1. Say, “Let’s see what’s inside the mystery bag!” Pull out a 3-D shape.
2. Ask students to discuss what they see and what they know about the shape. (If students say the name of the shape, remind them that it is just one way to describe the shape.)
3. Invite students to pull shapes from the bag, sorting them by placing the shapes into the various lids. Accept all informal reasons as to why each shape belongs in a group: “I’m putting this shape (cube) here, because it has lots of pointy parts, which is the same as these other shapes. But all the sides are the same, and they’re flat.” Repeat for all shapes in the mystery bag.
4. Say, “You and your partner are going to be shape detectives and go on a shape hunt in our classroom! When you see a shape that looks like one of the shapes in our boxes, tell your partner about it.”
5. Allow students to explore, and then discuss and compare some of the shapes they found. “The balls look like this **round** shape (sphere).” “The soup can and this shape (cylinder) both have flat sides on the top and bottom!”



NOTES ON MULTIPLE MEANS FOR ACTION AND EXPRESSION:

Use parallel talk to model the vocabulary needed to describe the shapes for students who struggle with vocabulary and expressive language.

MP.3

Part 2: Practice

Materials: (T) 4 foam or wooden 3-D shapes (cylinder, sphere, cube, and cone) in the mystery bag
(S) 4 foam or wooden 3-D shapes (cylinder, sphere, cube, and cone)

Give each student a set of 3-D shapes. Have students work in pairs if needed.

1. To play the mystery bag game, put your hand in the bag and feel a shape. “I’m holding a shape that is round and smooth. I don’t feel anything flat or pointy.”
2. Say, “When you know what shape I am holding, hold it in the air (repeat clue). It’s one of the shapes in front of you.”
3. Provide wait time. Then, reveal the sphere.
4. Repeat with the other three shapes in the bag using the clue sentences below.
 - I’m holding a shape that has a flat circle on the bottom. It has a point on the top.
 - I’m holding a shape that has lots of flat squares. There are lots of pointy corners. It feels like a box.
 - I’m holding a shape that has two flat circles on the top and the bottom. It is round in the middle.

Student Debrief (3 minutes)

Lesson Objective: Find and describe solid shapes using informal language without naming.

The Student Debrief is intended to invite reflection and active processing of the total lesson experience. It is also an opportunity for informal assessment. Consider taking anecdotal notes or using a simple checklist to note each child’s progress towards meeting the lesson objective.

As students complete the Practice portion of the Concept Development, listen for misconceptions or misunderstandings that can be addressed in the Debrief. You may choose to use any combination of the questions below to help students express ideas, make connections, and use new vocabulary (**round**).

- When you went on the shape hunt, what looked like this shape (hold up sphere)? What looked like this shape (hold up cylinder)? (Continue with other shapes.)
- When we sorted our shapes, did all the shapes in this box look exactly the same? How were they different? How were they the same?
- What words did you use to talk about our shapes today?

**CENTER CONNECTION:**

Put each 3-D shape on a lid in a central location in the classroom. At the beginning or end of centers, invite each child to bring a shape from their center and place it on the appropriate lid. There are many possibilities throughout the centers:

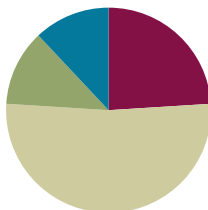
- Cone party hats from the dramatic play center.
- Cans from the home center.
- Cylindrical paint jars from the art center.

Lesson 10

Objective: Identify, analyze, sort, compare, and match solid shapes to their two-dimensional faces.

Suggested Lesson Structure

■ Fluency Practice	(6 minutes)
■ Concept Development	(13 minutes)
■ Application Problem	(3 minutes)
■ Student Debrief	(3 minutes)
Total Time	(25 minutes)



Fluency Practice (6 minutes)

- Drum and Count to 6! **PK.CC.1** (2 minutes)
- March and Count to 6! **PK.CC.1** (4 minutes)

Drum and Count to 6! (2 minutes)

Materials: (S) Plastic or metal lid, 2 craft sticks

Note: This fluency activity anticipates the work of Module 3 wherein students work with numbers through 10, preparing them with rote counting.

T: Let's play the drums! Here are my drum sticks and drum (hold up two craft sticks and show how to hit them on the lid like a drum). Show me your drum sticks.

S: (Show the craft sticks.)

T: Let's count to 6 and hit the drum with our sticks each time we say a number!

T: Join in when you are ready. 1, 2, 3, 4, 5, 6. 1, 2, 3, 4, 5, 6. 1, 2, 3, 4, 5, 6. 1, 2, 3, 4, 5, 6. (Continue until all are playing.)

March and Count to 6! (4 minutes)

Note: This fluency activity supports rote counting through 6.

T: Let's march! (Demonstrate marching while counting to 6. Call the students up one by one.) Join in and follow me when I call your name! Margie. 1, 2, 3, 4, 5, 6. Brad. 1, 2, 3, 4, 5, 6. Pedro. 1, 2, 3, 4, 5, 6. Laura! 1, 2, 3, 4, 5, 6. (Continue until all are marching. Go outside the classroom for extra fun. Speed up or slow down the rhythm of the marching steps in an effort to keep it engaging while encouraging one step for one count.)

Concept Development (13 minutes)

Part 1: Concept Introduction

Materials: (T) Foam or wooden cone, cube, cylinder, and rectangular block; several paper circles, squares, and rectangles with happy faces drawn on them; tape

Note: When preparing the paper shapes, have several extra choices in different sizes and place them in skewed orientations to build students' reasoning skills with shapes.

1. Place a cone, cube, cylinder, and rectangular block in a line so all the students can see them. Say, "Let's make happy shapes today!"
2. Place several paper circles, squares, and rectangles with happy faces drawn on them in front of the students.
3. Pick up the cone, "Which **face** fits on this shape to make it happy?" Invite a student forward to analyze the paper shapes and pick a happy face for the shape.
4. Comment, "Delia found that the circle happy face fits this shape!" Tape the circle onto the cone.
5. Repeat until all the shapes have found their happy face. Encourage students to use the names of learned shapes (circle, square, and rectangle) as they identify the happy faces that fit each solid.



Part 2: Practice

Materials: (S) Stamp pad or paint, foam shapes or corks, cut sponges, construction paper

1. Say, "All of our happy shapes are going on a march!"
2. Invite each student to pick one shape to stamp for the march along the path from the mailbox to the house.
3. "Watch as your shape marches from the mailbox to the house. What kind of footprint is your shape making?" Circulate to help as needed.
4. Encourage students to tell their partner about the "footprints" they are making. "My shape is making a circle footprint!"



NOTES ON MULTIPLE MEANS OF ENGAGEMENT:

After students complete their walking path, display in the classroom to celebrate student success.

Application Problem (3 minutes)

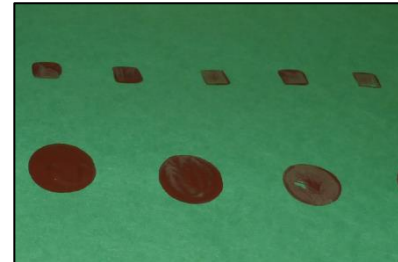
Materials: (T) Green construction paper, foam or wooden cone, cube, cylinder, rectangular block

Before the activity, stamp the faces of two different solids on the green construction paper.

Display the foam solids in a line and show children the “garden.” Say, “Mr. McGregor is very angry. Someone has been marching through his garden. Let’s be detectives and see if we can find the shapes that made this mess!”

Allow children to guess which shapes may have made each “footprint,” then test to see if the face matches. Before they test, ask them to explain why they think the shape might be the culprit.

Note: Children use their new understanding of the relationship between 2-D and 3-D shapes to guess the culprit and test their hypothesis. This requires them to carefully observe the solids and explain their reasoning.



Student Debrief (3 minutes)

Lesson Objective: Identify, analyze, sort, compare, and match solid shapes to their two-dimensional faces.

The Student Debrief is intended to invite reflection and active processing of the total lesson experience. It is also an opportunity for informal assessment. Consider taking anecdotal notes or using a simple checklist to note each child’s progress towards meeting the lesson objective.

As students complete the Practice portion of the Concept Development, listen for misconceptions or misunderstandings that can be addressed in the Debrief. You may choose to use any combination of the questions below to help students express ideas, make connections, and use new vocabulary (**face**).

- How did we make our shapes happy today? How did you match them?
- (Hold up a rectangular block.) What footprint can this shape make? Can this same shape make a different footprint?
- (Hold up a sphere.) What type of footprint do you think this shape will make? (Reveal the dot footprint prepared earlier). Can any of our happy faces make this shape happy? Why or why not?



CENTER CONNECTION:

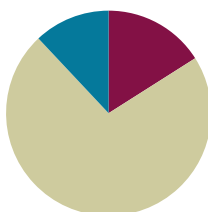
Place a set of solids in the sensory center. Children can create their own mysteries by stamping one face of the solid into sand, shaving cream, or play dough. Friends can guess which shape has been walking through the area.

Lesson 11

Objective: Identify, analyze, sort, compare, and build with solid shapes.

Suggested Lesson Structure

■ Fluency Practice	(4 minutes)
■ Concept Development	(18 minutes)
■ Student Debrief	(3 minutes)
Total Time	(25 minutes)



Fluency Practice (4 minutes)

- Drum and Count to 7! **PK.CC.1** (4 minutes)

Drum and Count to 7! (4 minutes)

Materials: (S) Plastic or metal lid, 2 craft sticks

Note: This fluency activity anticipates the work of Module 3 by preparing students to count to 7 by rote so they are ready for the conceptual work of the first lessons in that module. By drawing out the “fiiiive” the students start to see the relationship of 6 and 7 to 5.

- T: Let’s play and count to 6. Join in when you are ready. 1, 2, 3, 4, fiiiive, 6. 1, 2, 3, 4, fiiiive, 6. 1, 2, 3, 4, fiiiive, 6. 1, 2, 3, 4, fiiiive, 6. (Continue until all are playing.)
- T: Now, let’s play and count to 7. Join in when you are ready. 1, 2, 3, 4, fiiiive, 6, 7. 1, 2, 3, 4, fiiiive, 6, 7. 1, 2, 3, 4, fiiiive, 6, 7. 1, 2, 3, 4, fiiiive, 6, 7. (Continue until all are playing.)

Concept Development (18 minutes)

Part 1: Concept Introduction

Materials: (T) Several foam or wooden 3-D shapes (cylinder, cone, cube, rectangular block, and sphere), box lid and can (ramp), piece of butcher paper large enough for a student to sit on

1. Demonstrate rolling with students. Call on a student to lie flat on the ground and **roll**. “Look at Sammy roll! His face is up, then down, then up again, and down again. Sammy is rolling!”
2. Demonstrate sliding with students. “Watch Mary **slide**.” Use a piece of butcher paper large enough for a student to sit on and drag to slide her a few feet.



3. Repeat rolling and sliding with as many students as time permits.
4. Say, “Let’s see if shapes can roll and slide.” Display 3-D shapes (cylinder, cone, cube, rectangular block, and sphere), several of each kind, in different sizes if available. Roll or slide each shape down the ramp. Test to see if each shape can be stacked.
5. After each shape is tested, lead a short discussion about the shape’s function. “This shape (cone) rolls AND slides!” “I can **stack** lots of these shapes (cubes) on top of each other.”



NOTES ON MULTIPLE MEANS OF REPRESENTATION:

Highlight key vocabulary for English language learners when students roll and slide shapes and when they build a simple structure. This will help students feel more comfortable using math vocabulary in discussions.

Part 2: Practice

Materials: (S) 3-D shapes

Gather all the students in the block area.

1. Say, “It’s time for you to use shapes to be builders.” Allow students to work with partners or independently.
2. Model the activity by building a simple structure. Reinforce position words and describe what you are doing, using self-talk: “I am putting this shape with lots of flat sides on the **bottom**. Then I will put this red box **above** the green one.”
3. Say, “Use the blocks and shapes to create a building, a room, a tower, or a bridge. When you are done, I will take a picture of your structure.”
4. As students begin building, encourage them to talk about their shapes’ characteristics. Ask questions such as, “Why did you put the cone at the **top** of your building?” “Which shapes are good for making tall things? Why?” “Did you use any shapes that roll?” “What is *in front* of your tower?”

MP.6



Student Debrief (3 minutes)

Lesson Objective: Identify, analyze, sort, compare, and build with solid shapes.

The Student Debrief is intended to invite reflection and active processing of the total lesson experience. It is also an opportunity for informal assessment. Consider taking anecdotal notes or using a simple checklist to note each child’s progress towards meeting the lesson objective.



CENTER CONNECTION:

Continue to explore 3-D shapes in the block center. As children build independently, ask them to tell why they chose particular blocks for specific functions. For example, “Why did you use the rectangular block at the bottom of your castle? Why didn’t you use the cone?”

As students complete the Practice portion of the Concept Development, listen for misconceptions or misunderstandings that can be addressed in the Debrief. You may choose to use any combination of the questions below to help students express ideas, make connections, and use new vocabulary (**roll, slide, stack**).

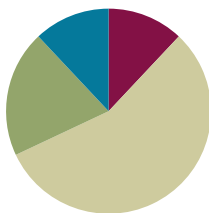
- What test did we give our shapes today?
- If you were going to build a tall tower, which shape(s) would be best to make the tallest tower?
- Which shapes can you roll *and* stack?
- I saw a lot of you use this shape (cylinder) in your buildings. Why did you build with it standing up instead of laying it down?

Lesson 12

Objective: Position solid shapes to create a model of a familiar place.

Suggested Lesson Structure

■ Fluency Practice	(3 minutes)
■ Application Problem	(5 minutes)
■ Concept Development	(14 minutes)
■ Student Debrief	(3 minutes)
Total Time	(25 minutes)



Fluency Practice (3 minutes)

- March and Count to 7! **PK.CC.1** (3 minutes)

March and Count to 7! (3 minutes)

Note: This fluency activity supports rote counting through 7 in preparation for GPK–Module 3.

T: Let's march! Count with me. (Demonstrate marching while counting to 7. Start calling up the students one by one to march as their counting gets stronger.) Join in and follow me when I call your name! Armen. 1, 2, 3, 4, fiiive, 6, 7. Paula. 1, 2, 3, 4, fiiive, 6, 7. Ester. 1, 2, 3, 4, fiiive, 6, 7. Bobby! 1, 2, 3, 4, fiiive, 6, 7.

Application Problem (5 minutes)

Materials: (T) *The Secret Birthday Message* by Eric Carle

Read the book to the children. On the rock page, ask children what the oval stands for, or models. Repeat for the triangle, circle, and rectangle pages.

Note: This book depicts a boy using landmarks to find his birthday present. The landmarks are represented by shapes, preparing children to use shapes to represent objects in their classroom.

Concept Development (14 minutes)

Part 1: Concept Introduction

Materials: (T) Foam or wooden 3-D shapes (including small centimeter cubes), large blank piece of construction paper, 1 small doll or animal counter

1. Say, “Let’s use our shapes to make a **model** of our classroom.” Lead a walk around the classroom, carrying the box of 3-D shapes.
2. As you walk, stop when you get to a prominent piece of furniture or “landmark.” For example, say, “Is there a shape in this box that we could use to model this bookcase?” Invite a student to choose an appropriate shape and hold onto it.
3. Say, “Let’s sit down with the shapes we are going to use to make a model of our classroom.”
4. Place a large, blank piece of construction paper (representing the classroom) in the center of the floor. Ask, “Who has the shape that looks like our bookcase, the one we chose to model our bookcase?”
5. Invite the student with the bookcase shape to position it on the construction paper. Lead a discussion about placement, and help the student orient the shape to match the room layout. Reinforce position words as more students place their shapes, e.g., “You put the bookcase *next to* the door.”
6. Repeat until all the shapes are positioned on the paper.
7. Use a small doll or animal counter to walk through the model. Encourage students to call out what the doll is walking by in the model. “The doll is walking to the art table. The doll is in the reading center.”



Part 2: Practice

Materials: (S) Various solid shapes

1. What are some other places we could use the shapes to model or build? (The cafeteria, the gym, their bedrooms, the playground.)
2. Send students to their prepared tables to make a model using the solid shapes.
3. Circulate as students share with a partner what the solid shapes represent in their model. “This sphere is a ball on the playground.” “The block next to the ball is the slide.”



NOTES ON MULTIPLE MEANS OF ENGAGEMENT:

After sharing their classroom models with their families, encourage students to make a model of a room from their home or a place in the community with their families. This will strengthen the home–school connection and cultivate excitement.

Student Debrief (3 minutes)

Lesson Objective: Position solid shapes to create a model of a familiar place.

The Student Debrief is intended to invite reflection and active processing of the total lesson experience. It is also an opportunity for informal assessment. Consider taking anecdotal notes or using a simple checklist to note each child’s progress towards meeting the lesson objective.

As students complete the Practice portion of the Concept Development, listen for misconceptions or misunderstandings that can be addressed in the Debrief. You may choose to use any combination of the questions below to help students express ideas, make connections, and use new vocabulary (**model**).

- What did we make today?
- What important words would you use to describe our model?
- Think about the playground. (Hold up a rectangular box.) Finish my sentence: This shape could be a model of.... (Continue with other 3-D shapes.)

**CENTER CONNECTION:**

Use the dramatic play center as a place to make additional maps. Invite children to make 3-D and 2-D models of the current scene in the dramatic play area (e.g., doctor's office, restaurant, zoo). Provide support as they choose materials and encourage them to use position words to describe their models.

Pre-Kindergarten End-of-Module 2 Assessment (Administer after Topic C)

Student Name _____

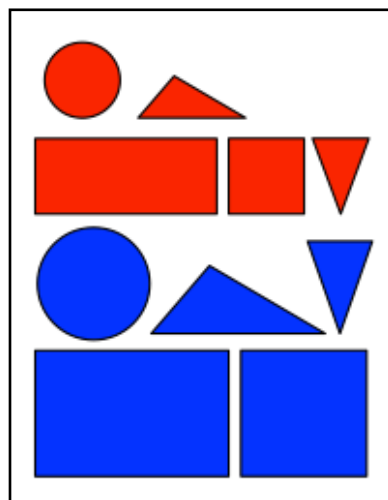
Topic A: Two-Dimensional Shapes

Rubric Score: _____ Time Elapsed: _____

	Date 1	Date 2	Date 3
Topic A			
Topic B			
Topic C			

Materials: (S) 10 pre-cut sturdy two-dimensional shapes, including rectangles, squares, circles, and triangles (End-of-Module Assessment Template); blank mat

- (Place all 10 two-dimensional shapes on the table. Place the 5 red shapes on the mat.)
 - Point to a triangle. (Record which triangle each student chooses. If the majority of the class chooses the same type of triangle, a review lesson might include experience with more variant triangles.)
 - Point to a circle.
 - Point to a rectangle.
 - Do you see another rectangle on the mat? (If yes, have student point to it.)
- Clear the mat. Put a blue triangle in the middle of the mat.
 - Put a circle next to the triangle.
 - Put a rectangle under the triangle.
- (Clear the mat and refer to all the shapes on the table.)
 - Put all the triangles on the mat. Tell me one thing that is the same about *all* the triangles.



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

Topic B: Construct Two-Dimensional Shapes

Rubric Score: _____ Time Elapsed: _____

Materials: (S) 8 straws cut in half: 4 long, 4 short (cut in half); blank mat

1. (Place 8 straws on the table next to the mat.) Use some straws to make a rectangle on your mat.
How many straws did you use?

What did the student do?	What did the student say?

Topic C: Three-Dimensional Shapes

Rubric Score: _____ Time Elapsed: _____

Materials: (S) Collection of three-dimensional objects: spheres, rectangular blocks, cylinders, cones, cubes, triangular block or pyramids; 2 blank mats, each a different color

1. Look in the box. Put the objects with only one flat side or no flat sides on the red mat. Put the objects with more than one flat side on the blue mat.
2. What's different about the objects on the red mat from the objects on the blue mat? (This question is not evaluated by the rubric. Record and use this data to inform instruction and review.)



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

End-of-Module Assessment Task Standards Addressed

Topics A–C

Identify and describe shapes (squares, circles, triangles, rectangles).

- PK.G.1** Describe objects in the environment using names of shapes, and describe the relative positions of these objects using terms such as top, bottom, up, down, in front of, behind, over, under, and next to.
- PK.G.2** Correctly name shapes regardless of size.

Analyze, compare, and sort objects.

- 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).

Evaluating Student Learning Outcomes

A Progression Toward Mastery is provided to describe and quantify 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 each student is to achieve Step 4 mastery. These steps are meant to help teachers and students identify and celebrate what the student CAN do now, and what they need to work on next.

A Progression Toward Mastery				
Assessment Task Item	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)
Topic A PK.G.1 PK.G.2 PK.G.3	The student: - Shows little evidence of identifying a 2-D shape. - Shows little evidence of being able to position or describe the relative position of shapes and is almost non-responsive. - Shows little evidence of understanding how to sort 2-D shapes and is unable to describe one attribute of triangles.	The student: - Shows evidence of beginning to identify a 2-D shape like a rectangle, circle, or triangle, but is unable to do so accurately and consistently. - Completes one of the two tasks presented. - Shows evidence of beginning to sort 2-D shapes, but is unable to describe a triangle's mathematical attributes.	The student: - Correctly identifies a triangle, circle, and rectangle, but is confused when asked to identify another rectangle on the mat. - Places the circle <i>next</i> to the triangle and the rectangle <i>under</i> the triangle (below or literally under). - Places most of the triangles on the mat (with one omission) and/or cannot describe one similar attribute of all the triangles.	The student correctly: - Identifies a triangle, circle, and rectangle, and replies that yes, there is another rectangle on the mat, pointing to the special rectangle. - Places the circle <i>next</i> to the triangle and the rectangle <i>under</i> the triangle (below or literally under). - Sorts all the triangles onto the mat and describes one similar attribute (corners or sides).
Topic B PK.G.4	The student shows little evidence of building a rectangle or how many straws it takes to construct one.	The student shows evidence of beginning to build a rectangle from straws but is unable to do so accurately. The student incorrectly states how many straws were used in the construction.	The student correctly uses the straws to build a rectangle but struggles with choosing which straws to use. The student incorrectly states how many straws were used in the construction.	The student correctly uses two long and two short straws to build a rectangle with four sides. OR The student uses four straws of the same length to build a rectangle with four sides that are the same, calling the shape a <i>special rectangle</i> or <i>square</i> . OR

A Progression Toward Mastery

				The student uses all eight straws to make a rectangle. AND The student correctly states how many straws were used in each construction.
Topic C PK.G.3	The student: - Shows little evidence of being able to sort 3-D objects according to a shared attribute. - Puts objects randomly on the mats.	The student: - Shows evidence of beginning to sort 3-D objects according to their sides. - Is unable to do so systematically or consistently.	The student: - Correctly sorts most of the 3-D objects according to their sides. - Leaves some objects in the box, confused about their placement. - Considers each object for several seconds.	The student correctly sorts <i>all</i> the 3-D objects according to their sides.

Class Record Sheet of Rubric Scores: End-of-Module 2 Assessment

Student Names	Topic A: Two-Dimensional Shapes	Topic B: Constructing Two- Dimensional Shapes	Topic C: Three-Dimensional Shapes	Next Steps:

