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GRADE PK • MODULE 5

Addition and Subtraction Stories and Counting to 20

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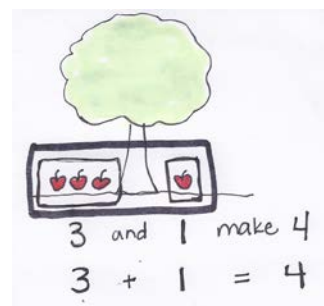
Note: The student sheets were created using the KG Primary Penmanship font—a clear and simple font for Pre-Kindergarteners. Please download this font to ensure accurate depiction of numerals in the Word documents.

Grade PK • Module 5

Addition and Subtraction Stories and Counting to 20

OVERVIEW

Module 5 is the culmination of children's work with numbers in the Pre-K year. Throughout Modules 1 and 3, they had extensive counting experiences with numbers 0–10. In Module 4, they examined the relationships between numbers 1–5 through comparison. In Module 5, children transition from the comparative concept of *more* (4 apples is more than 1 apple) to the concept of addition (3 apples and 1 more apple make 4 apples, as shown to the right). They are ready to begin work with operations, focusing on addition and subtraction stories with numbers 1 to 5.



In Pre-K, addition and subtraction stories are limited to numbers 0–5. Children use Level 1 problem solving strategies to solve, meaning that stories can always be acted out, modeled with objects or fingers, drawn, or solved from pictorial representations. For example, a student might solve a problem such as "Two fish were splashing in the river. One more fish came to splash. How many fish are splashing now?" by demonstrating the story using picture cards, and then counting all three fish to find the total. At first, the teacher needs to provide the correct number of objects up front, but with practice, students learn to count out the number of objects needed to solve story problems. Throughout Module 5, children learn to represent addition and subtraction stories with abstract representations including fingers, cubes, and drawings.

Topic A starts the module with children learning to write numerals 0–5 (**PK.CC.2**). Students have been working with recognizing and matching these numerals to a quantity since Module 1. Now, their fine motor skills have developed to a point where they are ready to write the numerals with paper and pencil and tactile materials like dough and sand.

In Topic B, children begin work with addition stories by first acting them out, then manipulating objects, and finally drawing to model the problem (**PK.OA.1**). They work with two types of addition word problems, *add to with result unknown*, and *put together with total unknown* ($A + B = \underline{\quad}$). Though similar, there is a key distinction between these two problem types. *Add to with result unknown problems* involve adding to an existing set: "Two children are reading at the library. Two more children come to read. How many children are reading all together?" *Put together with total unknown problems*, conversely, involve a single whole decomposed into parts, as shown below: "There are 3 copies of *Chicka Chicka Boom Boom*. There are 2 copies of *The Very Hungry Caterpillar*. How many books are there in all?" Building language skills is a key part of this topic; students practice putting the story problem into their own words with careful focus on the question.



In Topic C, students shift focus to subtraction stories, again using actions, objects, and drawings to model the problem (**PK.OA.1**). Here, they focus on one subtraction word problem type, *take from with result unknown* ($C - B = \underline{\quad}$). Something is removed in *take from with result unknown* problems: "Five bears are eating dinner. Three bears leave to sleep in a cave. How many bears are eating now?" Children subtract by either hiding a part or crossing out. The Mid-Module Assessment should be administered after this topic.

Topics D and E enhance the work of Topics B and C, providing opportunities for children to solve addition and subtraction story problems with increasingly abstract representations (**MP.4**). In Topics B and C, children use actions, pictures, and drawings to demonstrate an understanding of addition and subtraction stories. In Topics D and E, students use fingers, cubes (shown to the right), or more abstract drawings to represent the objects in the story. Students decontextualize the story to represent it with fingers, cubes, or circles, and then recontextualize it to give an answer. For example, students might say "3 alligators were left" rather than "Three".



$$1 + 2 = 3$$

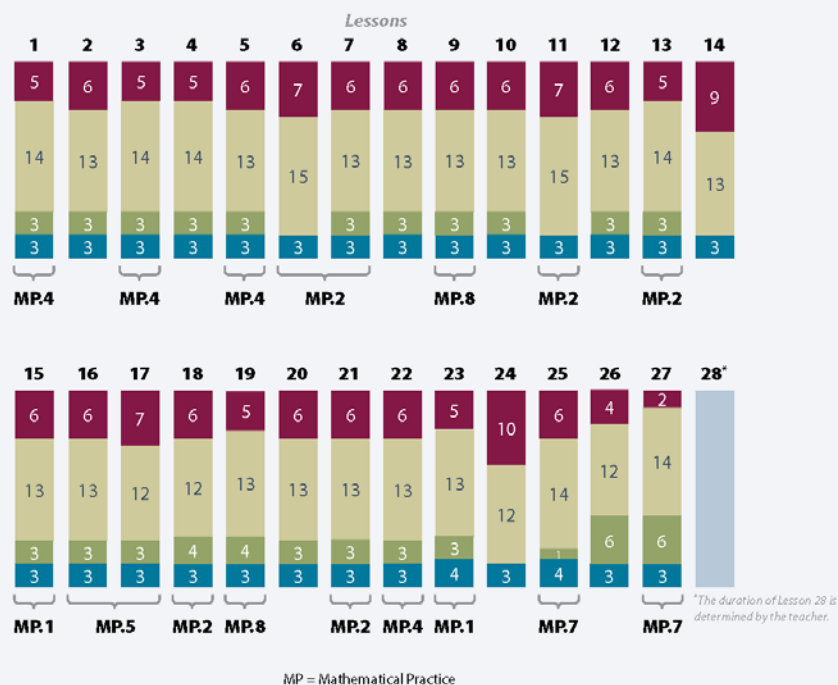
Topic F rounds out the module with an exploration of patterns. Children duplicate and extend simple repeated patterns using objects, sounds, and movements while identifying the repeating part of the pattern (**PK.OA.2**). Their work with repeating and growth patterns helps students to look for and make use of structure (**MP.7**).



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

Know number names and the count sequence.

PK.CC.1 Count to 20.

PK.CC.2 Represent a number of objects with a written numeral 0–5 (with 0 representing a count of no objects).

Understand addition as adding to, and understand subtraction as taking from.

PK.OA.1 Demonstrate an understanding of addition and subtraction by using objects, fingers, and responding to practical situations (e.g., If we have 3 apples and add two more, how many apples do we have all together?).

Understand simple patterns.

PK.OA.2 Duplicate and extend (e.g., What comes next?) simple patterns using concrete objects.

Foundational Standards

Count to tell the number of objects.

- PK.CC.3** Understand the relationship between numbers and quantities to 0–10; 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.
 - Understand that each successive number name refers to a quantity that is one larger.

PK.CC.4 Count to answer "How many?" questions about as many as 0–10 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 10, count out that many objects.

Sort objects and count the number of objects in each category.

PK.MD.2 Sort objects into categories; count the numbers of objects in each category.¹

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

Focus Standards for Mathematical Practice

- MP.1** **Make sense of problems and persevere in solving them.** Children identify story problems as addition or subtraction situations and find the unknown. They create and share their own addition and subtraction stories, and they identify how their representative drawings are similar to and different from their partner's drawings.
- MP.2** **Reason abstractly and concretely.** Children use actions, objects, and drawings to represent addition and subtraction stories, ultimately turning those experiences into number sentences. After students decontextualize the story to solve, they put the solution back into the context of the story, e.g., "There are 4 apples."
- MP.4** **Model with mathematics.** Children are able to use fingers, drawings, or abstract numerals to represent a set of up to 5 objects regardless of the type of object or its non-mathematical characteristics.
- MP.5** **Use appropriate tools strategically.** Students use different tools, such as concrete objects, fingers, or drawings to solve simple addition and subtraction word problems.
- MP.7** **Look for and make use of structure.** Children identify what is iterating (the structure) in a given pattern and therefore are able to extend the pattern indefinitely (use the structure).
- MP.8** **Look for and express regularity in repeated reasoning.** Children see that $3 + 2$ always represents a total of 5, whether the story problem involves linking cubes, bananas, elephants, or similar items.

Overview of Module Topics and Lesson Objectives

Standards	Topics and Objectives	Days
PK.CC.2	A Writing Numerals 0 to 5 Lesson 1: Write numerals 0 and 1. Lesson 2: Write numeral 2. Lesson 3: Write numeral 3. Lesson 4: Write numeral 4. Lesson 5: Write numeral 5.	5
PK.OA.1 PK.CC.2 PK.CC.3 PK.CC.4	B Contextualizing Addition Stories to Solve Lesson 6: Act out <i>add to with result unknown</i> story problems to solve. Lesson 7: Solve <i>add to with result unknown</i> story problems using objects from the story. Lesson 8: Represent <i>add to with result unknown</i> story problems using number sentences.	5

Standards	Topics and Objectives	Days
	Lesson 9: Solve <i>put together with total unknown</i> story problems with objects from the story and drawings. Lesson 10: Create and solve addition story problems using drawings.	
PK.OA.1 PK.CC.2 PK.CC.3 PK.CC.4	C Contextualizing Subtraction Stories to Solve Lesson 11: Act out <i>take from with result unknown</i> story problems to solve. Lesson 12: Solve <i>take from with result unknown</i> story problems using objects from the story. Lesson 13: Represent <i>take from with result unknown</i> story problems using number sentences. Lesson 14: Solve <i>take from with result unknown</i> story problems with objects from the story and drawings. Lesson 15: Create and solve subtraction story problems by drawing.	5
	Mid-Module Assessment: Topics A–C (interview style assessment, 4 days)	4
PK.OA.1 PK.CC.2	D Decontextualizing Addition Stories to Solve Using Fingers, Objects, and Drawings Lessons 16–17: Solve addition story problems using fingers. Lesson 18: Solve addition story problems with representative objects. Lesson 19: Solve addition story problems with representative drawings.	4
PK.OA.1 PK.CC.2	E Decontextualizing Subtraction Stories to Solve Using Fingers, Objects, and Drawings Lessons 20–21: Solve subtraction story problems using fingers. Lesson 22: Solve subtraction story problems with representative objects. Lesson 23: Solve subtraction story problems with representative drawings.	4
PK.OA.2 PK.CC.1 PK.CC.3c	F Duplicating and Extending Patterns Lesson 24: Identify patterns using objects. Lesson 25: Identify and duplicate patterns using sounds and movement. Represent those patterns with objects. Lesson 26: Duplicate and extend patterns with movement and objects. Lesson 27: Identify a growth pattern using objects. Lesson 28: Culminating task—create a story problem and act it out in the Children’s Math Theater.	5



Standards	Topics and Objectives	Days
	End-of-Module Assessment: Topics D–F (interview style assessment, 3 days)	3
Total Number of Instructional Days		35

Fluency

New Fluency Topics Appearing in Module 5 Instruction

- Count and read numerals to 10
- Rote count to 20
- Write numbers 0–5
- Decompose quantities 2–5
- Duplicate and extend an AB pattern

Familiar Fluency

- Rote count to 15
- Count one-to-one within 10
- Make a group of up to 10 objects
- Within 5, find 1 more/1 less
- Build numbers 0–5

Terminology

New or Recently Introduced Terms

- Add/Addition
- Addition story
- All together
- Are left
- Equals
- In all
- Math drawing
- Number sentence
- Pattern
- Plus
- Put together
- Repeating part

- Sixteen, seventeen, eighteen, nineteen, twenty (number words)
- Subtract/Subtraction
- Subtraction story
- Take away
- Total

Familiar Terms and Symbols

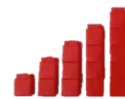
- 1, 2, 3, 4, 5, 6, 7, 8, 9, 10 (numerals)
- One, two, three, four, five, six, seven, eight, nine, ten, eleven, twelve, thirteen, fourteen, fifteen (number words)
- Counting the Math Way (count fingers from left pinky to right pinky)
- Group (objects sharing one or more attributes)
- How many
- Less
- More
- Number (numeral)
- Partners
- Set (group of objects)

Suggested Tools and Representations

- 5 frogs picture (Lesson 14 Template)
- Apple tree mat and cards (Lesson 8 Templates 1–2)
- Bean bags
- Concrete materials (e.g., linking cubes, teddy bear counters, blocks, beans, plastic animals, rocks, pebbles, large and small paper plates, pennies, etc.)
- Rice, sand, clay, dough
- Number stairs
- Number tower
- Numeral cards, 0–10
- Numeral writing rectangle (Lesson 5 Template 2)
- Paper doll cards (Lesson 6 Template)
- Personal white boards
- Picture Cards—6, 7, 8, 9, 10 (Lessons 20–23 Templates)
- Reader picture (Lesson 9 Template)
- Sun and star cards (Lesson 24 Template)



Number Tower



Number Stairs

Scaffolds²

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

Assessment Summary

Type	Administered	Format	Standards Addressed
Mid-Module Assessment Task	After Topic C	Interview with rubric.	PK.CC.2 PK.OA.1
End-of-Module Assessment Task	After Topic F	Interview with rubric.	PK.OA.1 PK.OA.2 PK.CC.1
Culminating Task	Lesson 28	Create a story problem and act it out in the Children's Math Theater.	PK.OA.1 PK.OA.2

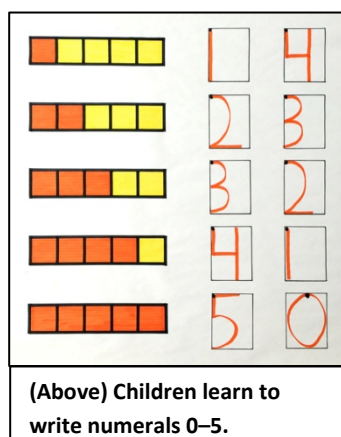
²Students with disabilities may require Braille, large print, audio, or special digital files. Please visit the website www.p12.nysed.gov/specialed/aim for specific information on how to obtain student materials that satisfy the National Instructional Materials Accessibility Standard (NIMAS) format.

Grade PK • Module 5 • Topics A–C

Family Math Newsletter

Addition and Subtraction Stories and Counting to 20

In the first half of Module 5, students write numerals 0–5 and count to 20. They explore addition and subtraction stories with numbers 0–5, a natural way for them to understand *adding to* and *taking from*. Stories are acted out, modeled with objects, drawn, or solved using pictures. Children ask and answer questions about the story, such as “How many in all?” or “How many are left?” They learn to distinguish the question from the story.



(Below) Students cross off pictures to solve a subtraction story: There are 4 beads on the necklace. Two beads come off. How many beads are left?



$$\begin{array}{r} 4 \text{ take away } 2 \text{ is } 2 \\ 4 - 2 = 2 \end{array}$$

Key Standards

- Know number names and the count sequence.
- Understand addition as *adding to* and understand subtraction as *taking from*.
- Understand simple patterns.

Looking Back

In Module 4, students compared length, weight, capacity, and numbers to 5. Students also counted to 15.

Looking Ahead

In Topics D–F of Module 5, students will explore addition and subtraction stories using fingers, objects, and drawings. Students will also work with simple patterns.

Words and Key Terms

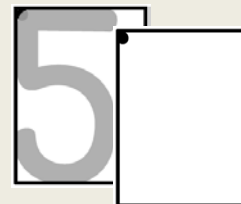
- Add
- All together
- Are left
- In all
- Put together
- Subtract
- Total
- Take away

How to Help at Home

- Make up addition or subtraction stories during everyday experiences. During bath time, say, “You have 3 toys in the tub. Here is 1 more toy. How many toys do you have now?”
- Work on a grocery list together. Have your child write the number of items needed such as apples, boxes of cereals, or cartons of milk.
- Ask for help with counting during everyday experiences. While cooking, say, “I need 10 tomatoes. Can you count out 10 tomatoes for me?”
- When reading any book, have your child touch and count the number of objects in pictures, “1, 2, 3, 4, 5, 6, 7. There are 7 dogs!”

Spotlight on Writing Numerals

Throughout the Pre-K year, children have learned to identify numerals and match them to a number of objects. Now, their fine motor skills have developed to the point where most children are ready to write. The standard in Pre-K is writing 0–5, advancing to writing numerals 6–20 in Kindergarten.

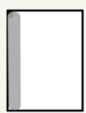


Number Formation Chants

Simple rhymes help children remember how to write each numeral. Some children will say the rhyme each time they write until the strokes become automatic.



Curve from the top;
be a hero!
Close the loop and
make a zero.



Top to bottom,
then I'm done.
I just wrote
the number 1.



Half a moon,
there's more to do;
slide to the right,
I wrote a 2.



Backwards C,
backwards C,
that is how
I write a 3.



Down the side,
to the right some more.
Top to bottom,
I've written 4.

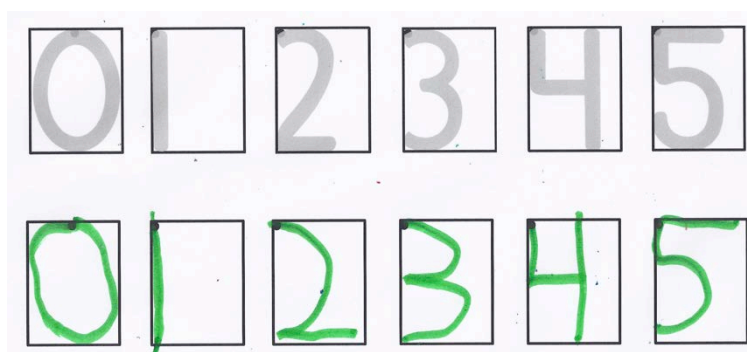


Down the side,
around a hive.
Give it a hat.
I've written 5.

Focus on Tools: The Writing Rectangle

The writing rectangle is a tool to help children write numerals systematically, to make handwriting easier for them in the future. Writing rectangles use a dot to show where to start the numeral. If children start from the dot and keep the numeral inside the rectangle, they will not reverse their numbers as readily (i.e., write them backwards).

Starting numbers and letters from the top is an important habit for your child to learn now. It will help her keep up when the writing demands increase in later grades. Numerals 1–5 all begin at the top left, with 0 starting in the center of the top side of the rectangle.



For some adults, it seems odd to start the 5 in the left corner and *add a hat* at the end. When in doubt, if children start at the left corner, they will be in the correct place for 7 out of 10 numerals (0, 8, and 9 are the exceptions). Starting the 5 at the left corner reinforces this idea.

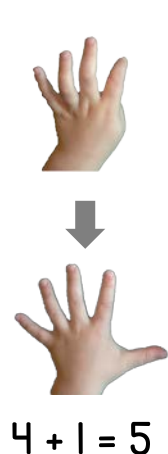
At first, children will trace the numbers inside the writing rectangle with and without a writing instrument, and then write them without tracing. Students do eventually write numerals 0–5 without the writing rectangle, but this tool provides them with a structure to form numerals correctly from the start.

Grade PK • Module 5 • Topics D–F

Family Math Newsletter

Addition and Subtraction Stories and Counting to 20

In the second half of Module 5, students continue to tell and solve addition and subtraction stories with numbers 0–5, now using fingers, cubes, math drawings, or numerals to represent the number of units (e.g., puppies) in the stories. For example, children solve, “Three puppies are playing. One puppy stops to rest. How many puppies are still playing?” using their fingers, cubes, or drawings of circles (see Spotlight on Math Models). In the final lessons, children replicate and extend patterns focusing on the repeating part of the pattern.



Join us for the Children's Math Theater to see our addition and subtraction stories come to life!

Key Standards

- Know number names and the count sequence.
- Understand addition as *adding to* and understand subtraction as *taking from*.
- Understand simple patterns.

Looking Back

In the first half of Module 5, children learned to write numerals 0–5. They used actions, objects, and drawings to solve addition and subtraction stories.

Looking Ahead

In Kindergarten, children will begin the year building upon the sorting and classifying skills they learned in Pre-Kindergarten. They will count, write, and sequence numbers 0–10.

Words and Key Terms

- Add
- All together
- Are left
- In all
- Pattern
- Put together
- Repeat
- Subtract
- Total
- Take away

How to Help at Home

- Make up addition or subtraction stories during everyday experiences. While grocery shopping, say, “There are 3 apples in the bag already. Let’s put in 2 more. How many apples do we have now?” (This encourages your child to use his fingers to represent the story since he can’t see the apples in the bag.)
- Look for patterns as you move through your community. Children will see patterns in buildings, fences, clothing, and art.
- Build varied patterns with your child whenever possible. This encourages spatial reasoning. For example, when serving dinner, put the components in a certain pattern, and then replicate that pattern on the other plates.

Spotlight on Math Strategies

Drawings allow us to see mathematical situations and relationships in a way that helps make sense of the situation. The ability to represent a problem with a quick and abstract drawing will be key to children's math success throughout elementary school and beyond.

Sample Activity

(from Module 5, Lesson 25)

Dribble and Pass

Students count to 20 while practicing a fun pattern (dribble, pass, dribble, pass...).



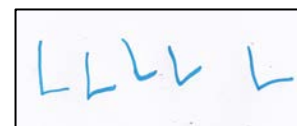
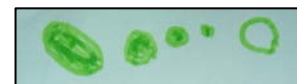
- T: Let's use a dribble and pass pattern with imaginary basketballs.
- T: First we'll dribble, and then we'll pass. Then we'll dribble, and then we'll...?
- S: Pass!
- T: You've got it! Now let's count the Say Ten way as we dribble and pass.
- T/S: 1 (dribble), 2 (pass), 3 (dribble), 4 (pass), 5 (dribble)...

In the lesson that follows, students learn to identify and duplicate patterns using objects.

Focus on Tools: Math Drawings

Math drawings are different from the drawings children create for artistic expression. In an artistic drawing, children may focus on details, color, or the type of media used. Math drawings focus only on representing the situation efficiently so that children can make sense of the situation and find an accurate solution promptly.

The drawings on the right represent the following addition story: Four lizards are running. Another lizard starts to run. Now how many lizards are running? The image at the top shows a time-consuming, detailed drawing of the lizards. Below that is a math drawing using circles to represent the lizards (notice that the original lizards are shaded circles and the new lizard is an empty circle). Another math drawing uses the letter L to represent lizards. Children can use any of these drawings to solve the problem, but the last two drawings took less time and effort to create, allowing the focus to stay on solving the problem.



By comparing their drawings with those of other students, children learn to think flexibly, "How are our drawings the same? How are they not exactly the same? Did we come to the same answer?" They see many different perspectives and make connections between them. As they learn more problem-solving strategies in later grades, this flexible thinking helps them continue to see and understand multiple ways to solve a problem.



Topic A

Writing Numerals 0 to 5

PK.CC.2

Focus Standards:	PK.CC.2	Represent a number of objects with a written numeral 0–5 (with 0 representing a count of no objects).
Instructional Days:	5	
Coherence -Links to:	GK–M1	Numbers to 10

Children have been working with the numerals 1–5 since Module 1, as well as the number 0 since Module 3. Throughout the year, they have had many opportunities to match a number of objects with a prewritten numeral and develop their fine motor skills. In Topic A, children build on this experience and begin to write numerals 0–5 (**PK.CC.2**).

Lesson 1 begins with writing 0 and 1. The number 1 is particularly easy to write; it is a simple stroke from top to bottom. Often, certain numerals will already be familiar because of their similarities to letters. For example, 0 looks like the letter O. During this first lesson, students focus on starting all of their numbers from the top because that has a significant impact on their ability to write efficiently in later grades.

One numeral is introduced in each of the subsequent lessons in the topic (Lesson 2 focuses on 2, and so on). Numeral formation is taught using simple rhymes. Children may use tactile materials, such as clay, dough, sand, or rice, to remember the strokes for each numeral. They develop this learning by writing using personal white boards and crayons or pencils on paper. Students first trace the numeral and then practice writing it independently using a writing rectangle and a marked starting point to help prevent reversals. In each lesson, children have the opportunity to count the number of cubes in a linking cube train and write the matching numeral.

In Topic A Fluency Practices, students strengthen their core fluency counting skills to 20, both the Say Ten Way and the regular way, through energizing movements, such as ski jumps, elephant splashes, and alligator snaps. They practice decompositions of 3 and 4, and they increase their motor memory by forming numbers kinesthetically in rice.



A Teaching Sequence Toward Mastery of Writing Numerals 0 to 5

Objective 1: Write numerals 0 and 1.
(Lesson 1)

Objective 2: Write numeral 2.
(Lesson 2)

Objective 3: Write numeral 3.
(Lesson 3)

Objective 4: Write numeral 4.
(Lesson 4)

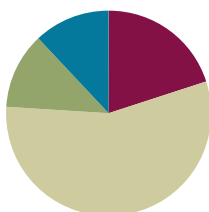
Objective 5: Write numeral 5.
(Lesson 5)

Lesson 1

Objective: Write numerals 0 and 1.

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)

- Peek-a-Boo Counting **PK.CC.3b** (3 minutes)
- Alligator Snaps **PK.CC.1** (2 minutes)

Peek-a-Boo Counting (3 minutes)

Materials: (T) 2 sets of 3 objects (e.g., 3 bananas and 3 bears), 2 manila file folders with ends stapled together to form a screen.

Note: This fluency activity builds upon students' recent work with decompositions of 3 and strengthens their memory as they answer *how many* questions to 3. The use of *wait time* encourages students to subitize rather than having them *touch and count*.

T: (Before beginning the activity, place 2 bananas and 1 bear on a desk or table behind the screen.)
Peek-a-Boo! (Raise and lower the screen.) Peek-a-Boo! (Again.)

T: Wait for the signal. How many things did you see in all? (Signal when ready.)

S: 3.

T: Wait for the signal. How many bananas? (Signal when ready.)

S: 2 bananas.

T: Wait for the signal. How many bears? (Signal when ready.)

S: 1 bear.

T: Very good. Let's play again!

Continue with other decompositions of 3. As students progress, determine if they can remember the number for longer periods of time. Encourage them to show the number on their fingers the Math Way instead of saying it.

Alligator Snaps (2 minutes)

Note: Say Ten counting facilitates the core fluency goal of rote counting to 20 while laying a foundation that helps students understand place value in later years.

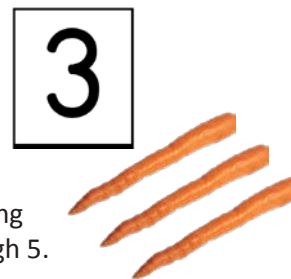
T: It's lunchtime in the swamp, and Allie Alligator is ready to eat. Pretend you're Allie catching fish for lunch. Let's count the snaps the Say Ten Way.

Demonstrate arms open wide, one above the other, mimicking alligator jaws. Close arms and hands together to make a snapping sound while saying each number to 20 the Say Ten Way.

Application Problem (3 minutes)

Materials: (T) Numeral cards 0–5 (Template), 5 carrot sticks (or pretend carrots-orange strips of paper)

Show students the numeral 0 card and ask, "What number is this?" (Zero.) Show students your empty hands. Ask, "How many carrot sticks am I holding?" (Zero.) Say, "1 more than 0 is?" (One.)



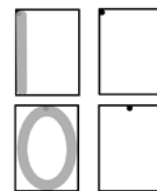
Show students the numeral 1 card and ask, "What number is this?" (One.) Show 1 carrot stick and ask, "How many carrot sticks is this?" (One.) Add another carrot stick and say, "1 more than 1 is?" (Two.) Have students repeat the process, identifying the numeral 2, counting 2 carrot sticks, and then identifying 1 more. Continue through 5.

Note: In this problem, students practice counting and recognizing written numbers in anticipation of writing numbers in today's Concept Development. The problem also supports the forthcoming transition from comparison (*more*) to addition in Topic B.

Concept Development (14 minutes)

Part 1: Concept Introduction

Materials: (T) 5-linking cube train (composed of 1 cube of 1 color and 4 cubes of another color), chart paper or white board



Prepare 2 charts:

- One with writing rectangles and dots (as shown to the right)
- One that can be used through Lesson 5 to record each day's 5-train.
 - Show the 5-train. Ask children to count how many cubes are in the train. (Five.) Have them count the number of yellow and orange cubes.
 - Draw the train on the board and have children ensure it matches the concrete train. Say, "I can draw a picture of the train to help me remember there is 1 orange cube."
 - Say, "I can also write the number 1 to show 1 orange cube. Use your finger to write 1 in the air while I write it on the board."



4. Say the rhyme for 1 while writing 1 in the first writing rectangle, “Top to bottom, then I’m done. I just wrote the number 1.” Highlight that you started from the dot at the top. (Leave the second writing rectangle empty until Lesson 4.)
5. Practice two more times using the separate writing rectangles as students air trace the numeral and say the rhyme.
6. Show the 5-train again. Ask, “How many blue cubes are in the train?” Remind them that the math word for none is zero.
7. Repeat Steps 2–4 to demonstrate writing 0. Say the rhyme for 0 while writing, “Curve from the top, be a hero! Close the loop and make a 0.”

Part 2: Practice

Materials: (S) Problem Set, crayon

Distribute the Problem Set and crayon to each student at a table. The Problem Set can be inserted into students’ personal white boards for additional practice.

MP.4

1. Direct children’s attention to the mud puddle at the top of the Problem Set and have them say how many pigs are in the mud.
2. Demonstrate how to finger trace the 1, starting from the top. Say the rhyme while tracing. Then, have students trace and say the rhyme. Repeat a few times and check to ensure they start on the dot at the top.
3. Demonstrate tracing with a crayon. Invite children to pick up a crayon and trace the 1 while saying the rhyme. Continue until all rectangles are filled.
4. Direct children’s attention to the mud puddle again. Have them count how many cats are in the mud.
5. Repeat Steps 2–3 to practice writing 0.



NOTES ON MULTIPLE MEANS OF REPRESENTATION:

Students who are struggling with number formation would benefit from tracing numbers made from a variety of textures (e.g., puffy paint, sandpaper, string, and chalk) as they repeat the rhyme. This will help develop students’ motor memory for each number formation.

Student Debrief (3 minutes)

Lesson Objective: Write numerals 0 and 1.

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 toward 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.



CENTER CONNECTION:

Set up the sensory center with dough and shallow rectangular trays (children’s shoe box tops work well). Help children make numerals 0 and 1 using the dough. The rectangular tray mimics the writing rectangle and helps prevent reversals. After they have built the numerals using dough, invite students to write the numerals using paper and crayon.

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

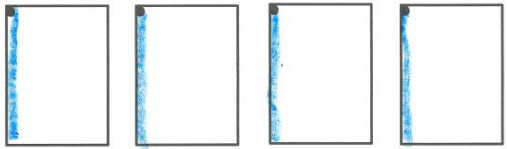
- Where do you see numbers written in our classroom?
- Which one was faster? Drawing the cubes to show 1 orange cube? Or, writing the number 1?
- Why is it important to be able to write numbers?
- Watch me carefully while I write 1 and 0. (Write both numbers starting from the bottom.) What mistake did I make?

NYS COMMON CORE MATHEMATICS CURRICULUM Lesson 1 Problem Set PK•5

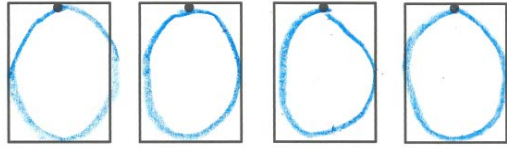
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How many  ?

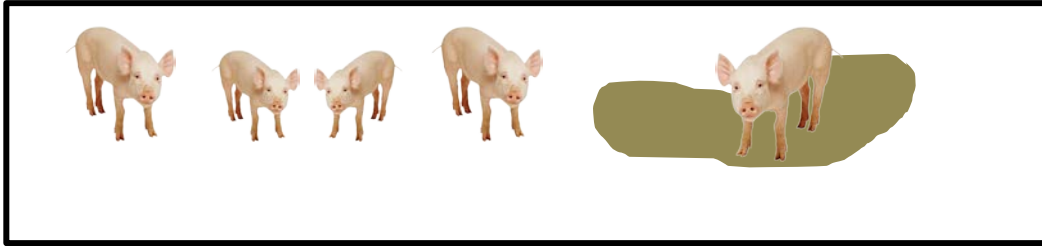


COMMON CORE Lesson 1: Write numerals 0 and 1. Date: 8/19/14 engage^{ny} 5.A.5

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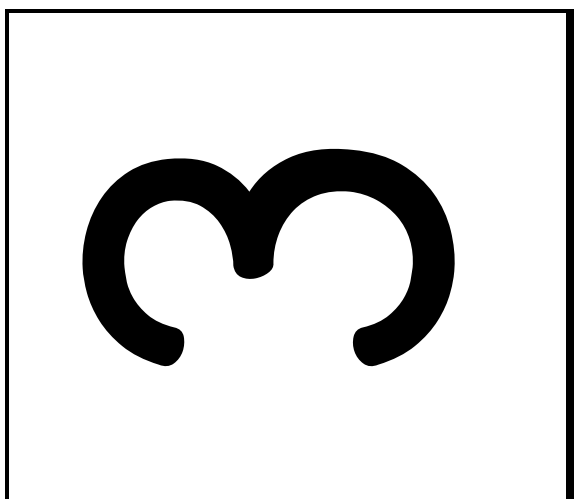
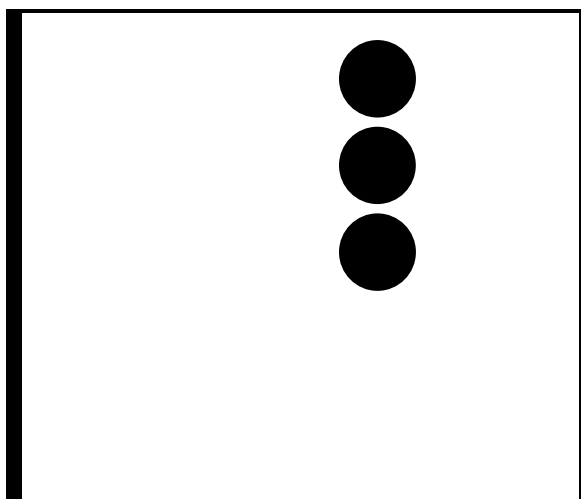
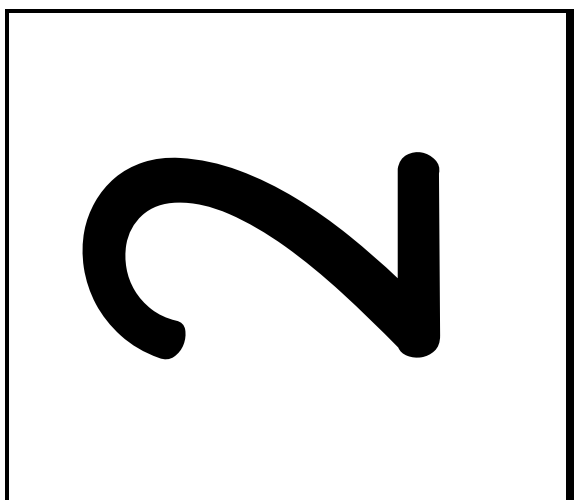
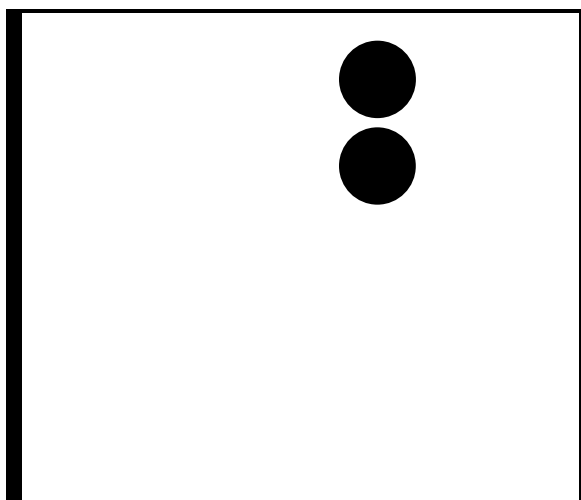
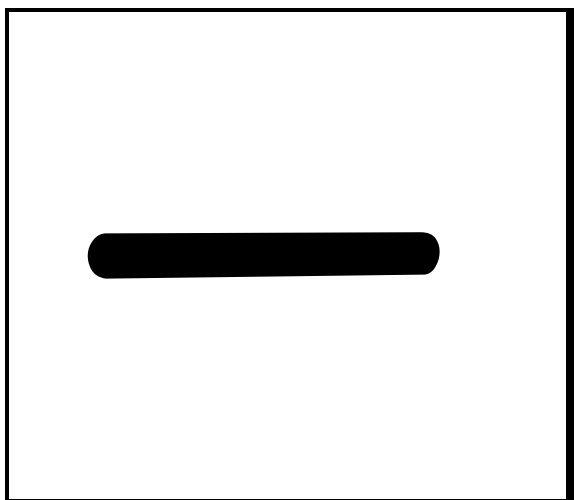
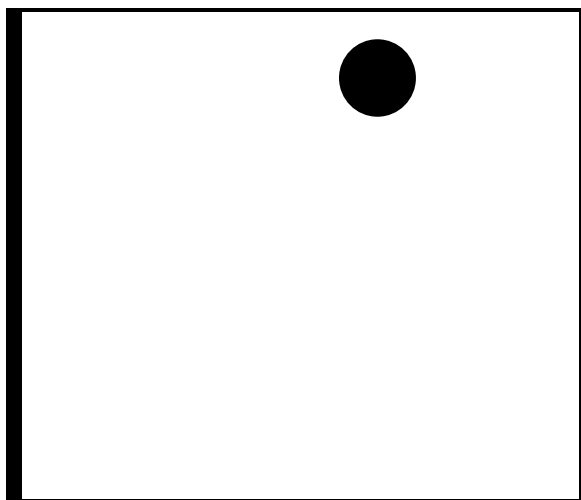
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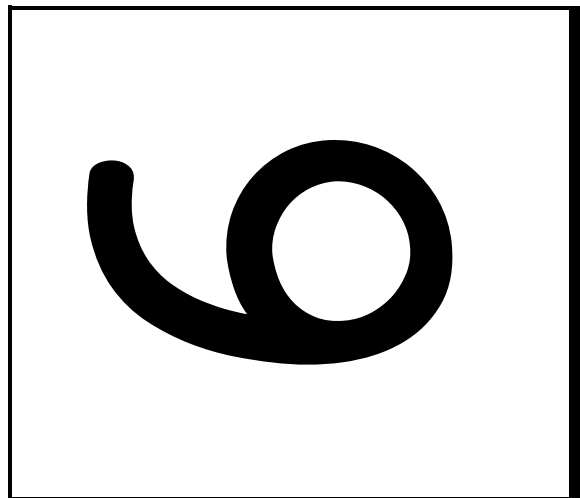
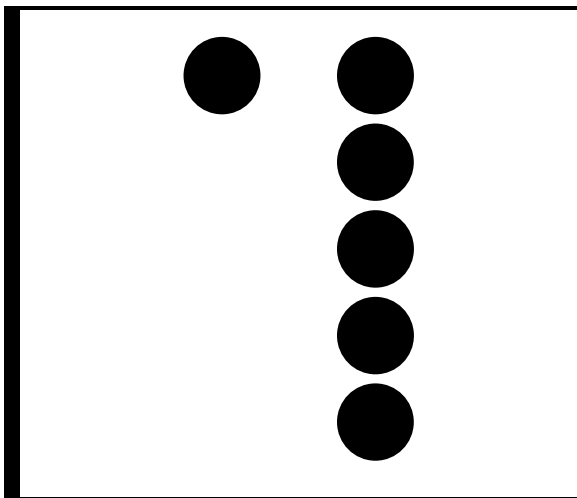
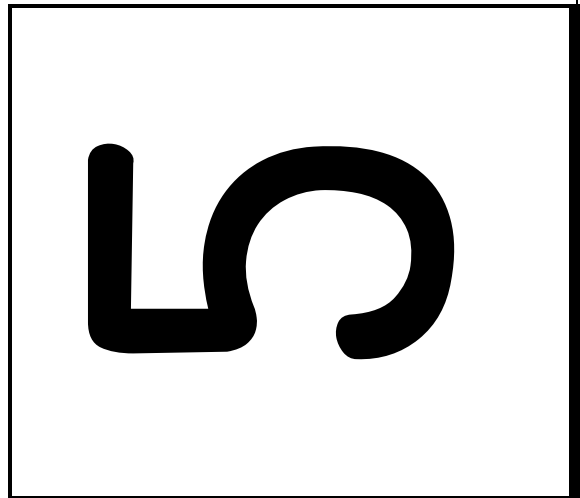
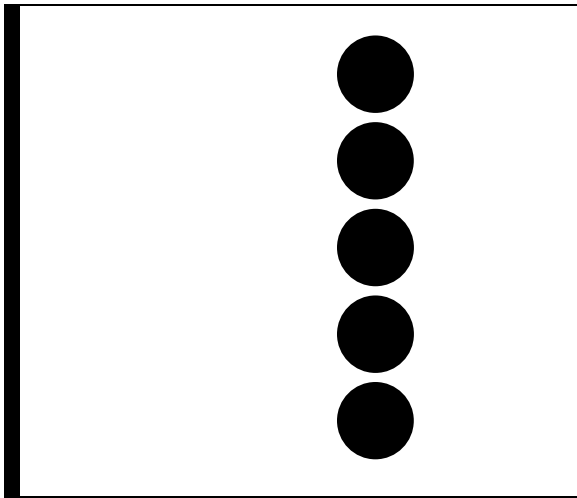
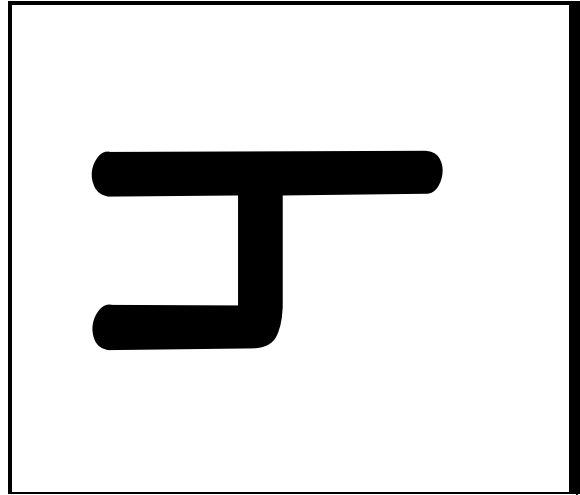
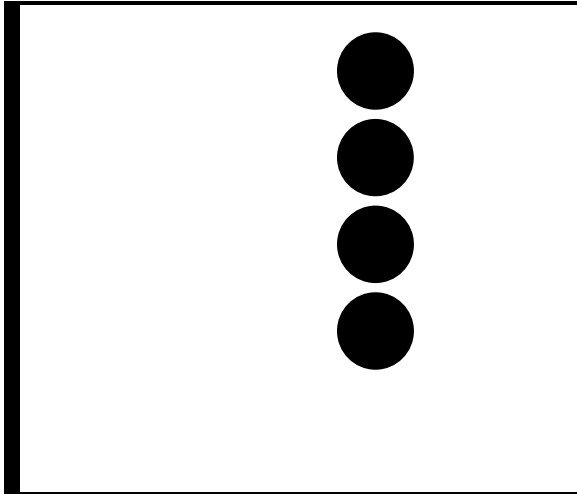
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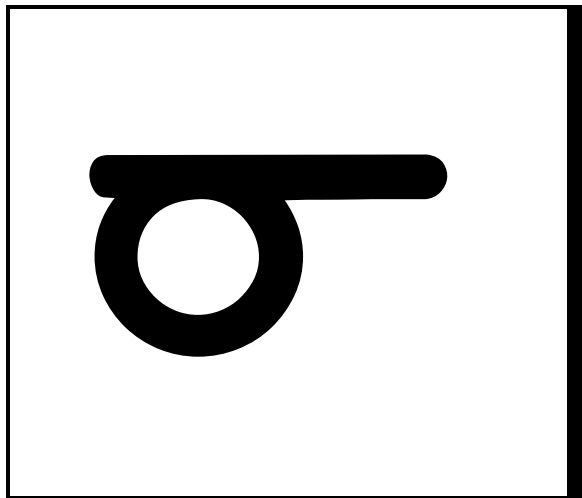
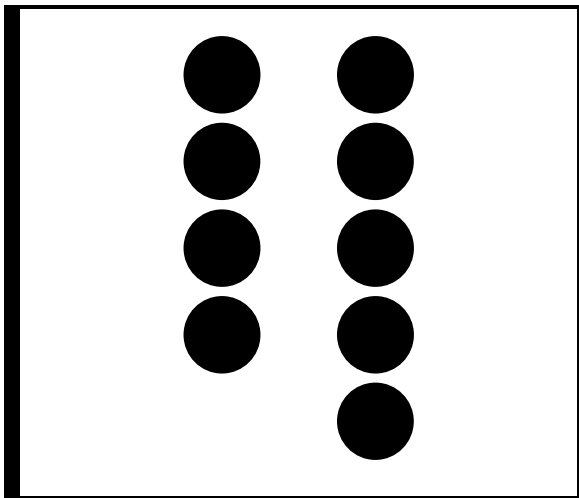
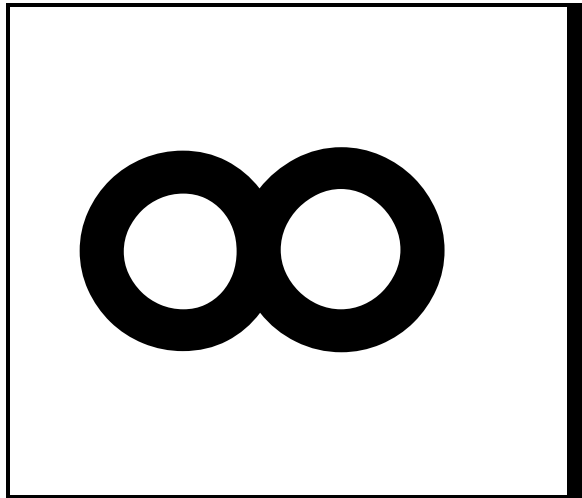
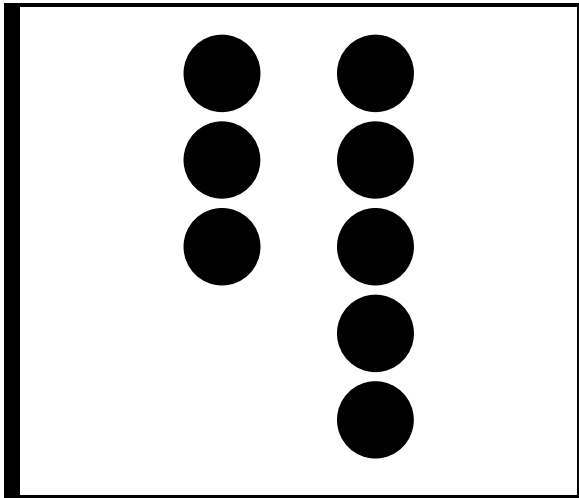
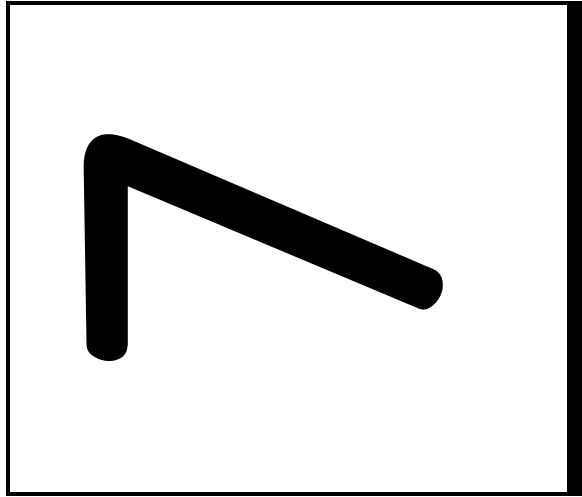
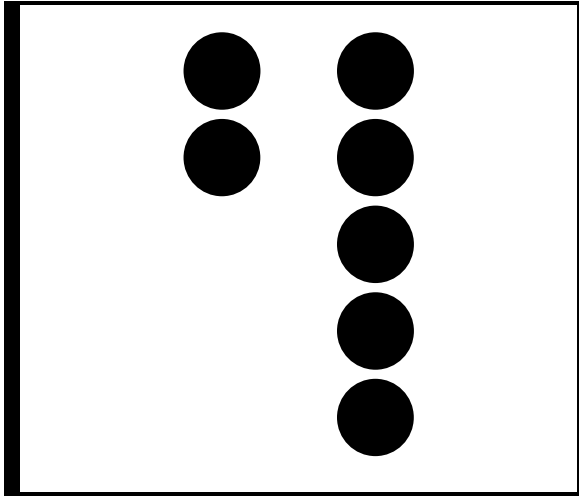


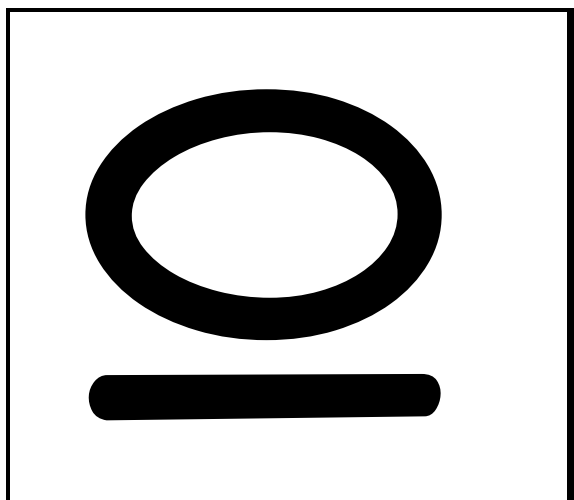
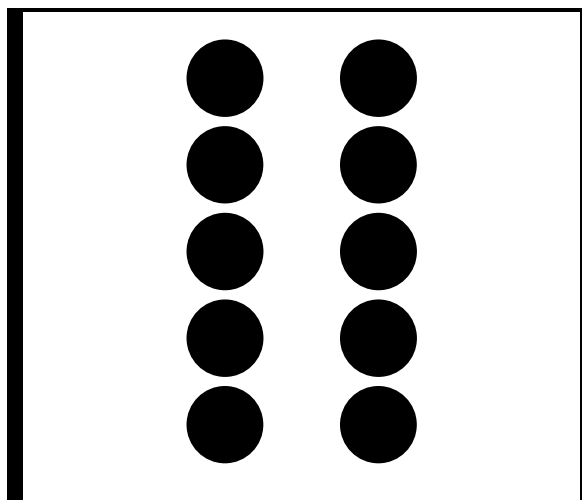
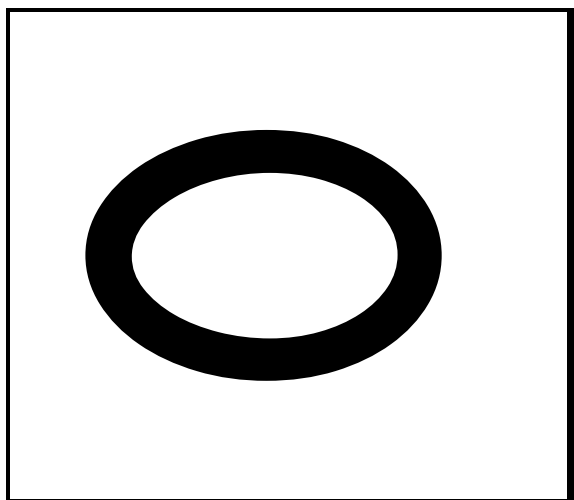
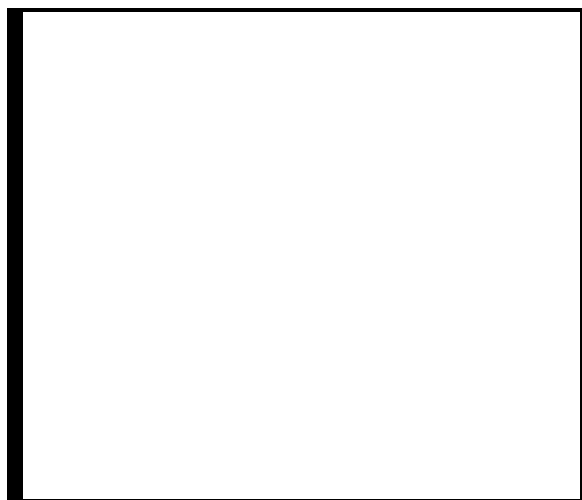
How many  in  ?

How many  ?









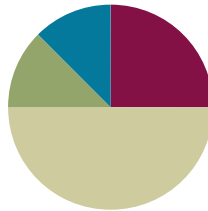
numeral cards (Print and fold lengthwise so the outline on the numeral side matches the outline on the dot side. While the paper is folded, cut out individual cards. Do not cut along the fold! Laminate with cards folded so that numeral and dots match.)

Lesson 2

Objective: Write numeral 2.

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)

- Hide and Seek: Friends and Chairs **PK.CC.5** (4 minutes)
- Elephant Splashes **PK.CC.1** (2 minutes)

Hide and Seek: Friends and Chairs (4 minutes)

Note: This activity provides practice with seeing embedded numbers—in this case, within 4. The empty chair(s) clearly show the missing part and decompositions of 4.

Set up 4 chairs in the front of the classroom, and invite 4 students to take a seat.

T: Let's count the friends. Ready?

S: 1, 2, 3, 4.

T: Close your eyes. (Tell one of the students seated on a chair to hide in a designated location in the room.)

S: (Eyes closed.)

T: Open your eyes. How many friends do you see now?

S: 3.

T: How many are hiding?

S: 1.

T/S: Come out, come out, wherever you are! (The student comes out from hiding, and returns to his or her seat.)

T: Let's count to see how many now.

S: 1, 2, 3, 4. Just like before!

Repeat with different numbers of students hiding.

Elephant Splashes (2 minutes)

Note: Varying movements helps keep counting exercises fresh as students strengthen their core fluency counting skills.

T: Eli elephant loves to swing his trunk to splash his friends! Pretend you're Eli. Swing your trunk and count to 20 with me.

Demonstrate swinging an arm back and forth, mimicking an elephant's trunk. Count to 20, keeping the movement synchronous with the count. If time permits, count again, but tell students to stop at 19.

Application Problem (3 minutes)

Materials: (T) Numeral cards 1–5 (Lesson 1 Template), 5 leaves

Show students numeral card 1 and ask, "What number is this?" (One.) Show 1 leaf.

T: How many leaves do you see? Raise your hand when you are ready to tell me. (Wait until all hands are raised, and then signal.)

S: 1 leaf.

T: (Put another leaf in line.) How many leaves did I add?

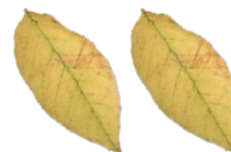
S: 1 leaf.

T: How many leaves do you see in all? Raise your hand when you are ready to tell me. (Wait, and then signal.)

S: 2 leaves!

T: (Pointing) 1 and 1 more is...?

S: 2.



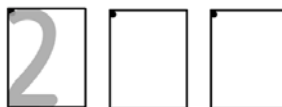
Repeat the process to 5 as time permits.

Note: Providing wait time rather than touching and counting allows students to use their own strategy to count the objects. Note that, in the vignette, students reply using the units, e.g., "5 leaves," rather than simply saying "5."

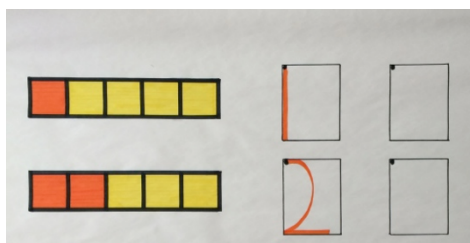
Concept Development (12 minutes)**Part 1: Concept Introduction**

Materials: (T) 5-linking cube tower (2 of a color, 3 of another color), chart paper or personal white board

Prepare chart paper or a personal white board with writing rectangles and dots as shown below. Continue to draw the train on the same chart used in Lesson 1.



1. Show the 5-train. Ask children to count how many cubes are in the whole train. (5.) Have them count the number of yellow and orange cubes.
2. Say, “I can write the number 2 to help me remember that there are 2 orange cubes. Use your finger to write 2 in the air while I write it on the board.”
3. Say the rhyme for 2 while writing 2 in the first writing rectangle, “Half a moon, there’s more to do; slide to the right, I wrote a 2.” Emphasize starting from the dot at the top.
4. Practice at least twice with students air tracing the numeral and saying the rhyme.
5. Draw the train on the board and have children check to ensure it matches the concrete train. Ask children to count the orange squares. Write 2 in the first writing rectangle while children air trace and say the rhyme. Leave the second writing rectangle empty until Lesson 3.



Part 2: Practice

Materials: (S) Problem Set, crayon

Distribute the Problem Set and crayon to each student. A Problem Set can be inserted into students’ personal white boards for additional practice.

1. Direct children’s attention to the animals at the top of the Problem Set and have them count how many cows are on the farm.
2. Demonstrate how to trace the 2 while saying the rhyme. Have students do the same. Repeat a few times. Ensure that students start at the top dot.
3. Demonstrate tracing and writing with a crayon. Invite children to pick up a crayon to trace and write the 2 while saying the rhyme. Continue until all rectangles are filled.
4. Direct children’s attention to the animals again. Guide them to answer the *how many* questions at the bottom of the page.



NOTES ON MULTIPLE MEANS OF REPRESENTATION:

Students who are struggling to form numbers correctly would benefit from a multi-sensory approach, for example, building each number with clay, or tracing each number in a sand tray or in shaving cream as they repeat the number rhyme.

Student Debrief (3 minutes)

Lesson Objective: Write numeral 2.

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 toward 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 explore new concepts.

- Do you see a 2 written anywhere in our classroom?
- (Demonstrate writing 1 and 2 while students air trace.) What is different about writing 1 and 2?
- (Show numerals 0 and 2.) Which numbers have straight lines? Which numbers have curved lines?
- (Show a tower of 5 cubes with 3 of one color and 2 of another color.) Let's play show and tell. Use this tower to tell about the number 5.



CENTER CONNECTION:

Set up the sensory center with sand inside shallow rectangular trays (children's shoe box tops work well). Help children write numerals 0, 1, and 2 in the sand. The rectangular tray mimics the rectangle used when writing and helps prevent reversals. After they have written the numerals in sand, invite students to write the numerals using paper and crayon.

NYS COMMON CORE MATHEMATICS CURRICULUM Lesson 2 Problem Set PK•5

Name Sophie Date _____



How many  ?



How many  ?



How many  ?

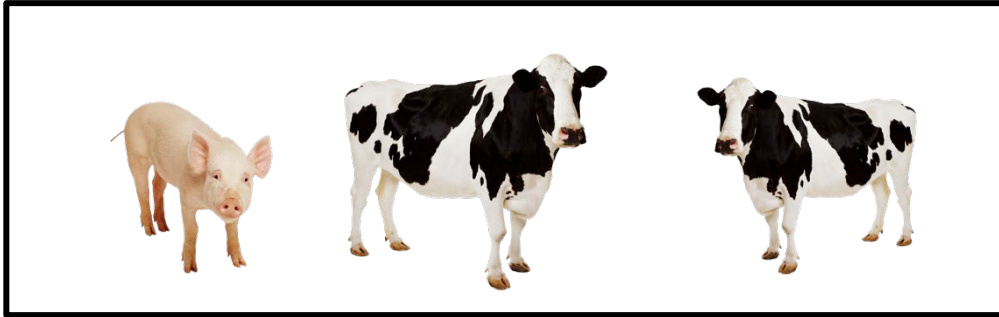


COMMON CORE Lesson 2: Write numeral 2. Date: 8/15/14 engage^{ny} 5.A.7

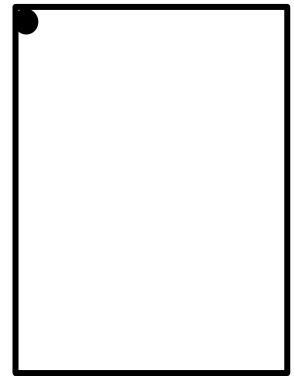
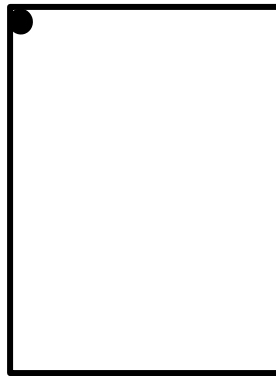
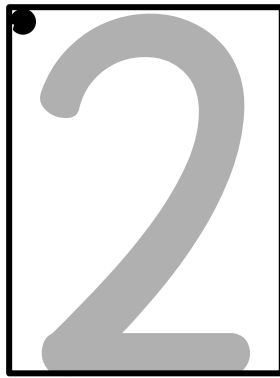
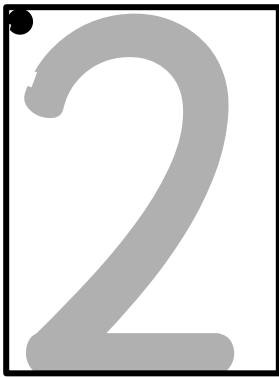
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Name _____

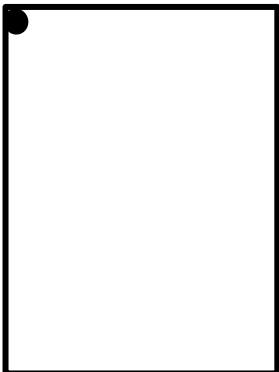
Date _____



How many  ?



How many  ?



How many  ?

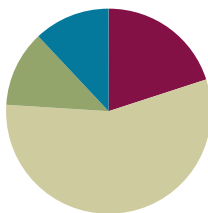


Lesson 3

Objective: Write numeral 3.

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)

- Numbers in Rice **PK.CC.2** (3 minutes)
- Elephant Splashes **PK.CC.1** (2 minutes)

Numbers in Rice (3 minutes)

Materials: (T) Numeral cards 0–2 (Lesson 1 Template) (S) Tray of sand or rice (or sealed plastic baggie with paint)

Note: In this activity, students practice forming recently learned numerals kinesthetically, strengthening their motor memory.

T: (Point to your nose.) How many noses do you have?

S: 1.

T: (Show numeral card 1.) Say the chant with me while you trace the number in your rice!

S: (While tracing.) Top to bottom, then I'm done. I just wrote the number 1.

Repeat for eyes ("Half a moon, there's more to do; slide to the right, I wrote a 2.") and tails ("Curve from the top, be a hero! Close the loop and make a 0.").

If time permits, continue with other body parts for numbers 0–2.

Elephant Splashes (2 minutes)

Note: This activity targets one of the core fluencies for Pre-K students—rote counting to 20.

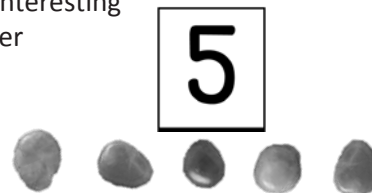
T: Silly Eli elephant is at it again! Let's pretend we're Eli. Let's swing our trunks to splash our friends as we count to 18 the Say Ten Way.

Demonstrate swinging an arm back and forth, mimicking an elephant's trunk. Count to 18 the Say Ten Way, keeping the movement synchronous with the count.

Application Problem (3 minutes)

Materials: (T) Numeral cards 0–5 (Lesson 1 Template), 5 interesting rocks (S) Baggies with 5 pebbles

Show students numeral card 5 and ask, “What number is this?” (Five.) Show 5 interesting rocks in a line and say, “Wait for the signal; how many rocks do you count?” After students respond chorally, “5 rocks,” have them put 5 pebbles in a line in front of them. Then, have students remove 1 rock. Say, “Wait for the signal. Five. 1 less is?” After students respond chorally, “4 rocks,” show the 4 card and repeat the process as time permits.



Note: In this problem, students practice counting and reading written numbers. The problem also supports the forthcoming transition from comparison (*less*) to subtraction in Topic C.

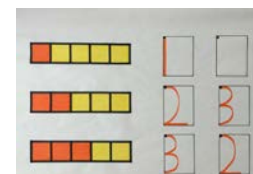
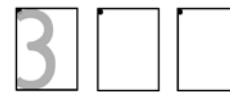
Concept Development (14 minutes)**Part 1: Concept Introduction**

Materials: (T) 5 linking cube tower (3 of a color, 2 of another color), chart paper or personal white board, markers



Prepare chart paper or a white board with rectangles and dots as shown on the right.

1. Show the train. Ask children to count how many cubes are in the train. Have them count the number of yellow and orange cubes.
2. Say, “I can write the number 3. It’s much easier and quicker than drawing a picture to show what I mean. Use your finger to write 3 in the air while I write it on the board.”
3. Say the rhyme for 3 while writing 3 in the first writing rectangle, “Backwards C, backwards C, that is how I write a 3.” Point out that you started from the dot at the top.
4. Practice two more times with students air tracing the numeral and saying the rhyme.
5. Draw the train on the board and have children check to ensure it matches the concrete train. Ask children to count the orange squares. Write 3 in the first rectangle while children air trace and say the rhyme.
6. Ask them to count the yellow squares. Write 2 in the second rectangle while children air trace and say the rhyme, “Half a moon, there’s more to do; slide to the right, I wrote a 2.”
7. Help children see that they can fill in a writing rectangle for another train. Write in 3 for the number train drawn in Lesson 2.



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

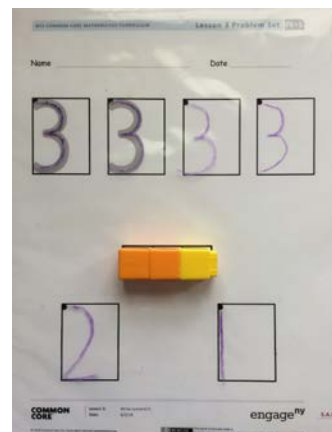
Students struggling with directionality would benefit from additional practice tracing before writing independently. Use a yellow highlighter to write 3s in the blank writing rectangles on their Problem Sets, and have the students trace the numbers.

Part 2: Practice

Materials: (S) Problem Set inserted into personal white board, dry erase crayon, 5 linking cubes (3 of a color, 2 of another color)

Distribute a Problem Set and crayon to each student.

1. Demonstrate tracing the 3 with a crayon. Invite children to pick up a crayon and trace the 3 while saying the rhyme. Continue until all rectangles are filled.
2. Distribute linking cubes to each student. Direct students to make a 3-train of 2 orange and 1 yellow, as well as place it on their Problem Set as shown on the right. Support students so that cubes of the same color are touching.
3. Guide students to count the orange cubes and write the number in the first rectangle. Then, count the yellow cubes and write the number in the second rectangle.
4. Provide students time to discover other ways to show 3 using their linking cubes and write the number of cubes of each color.



MP.4

Student Debrief (3 minutes)

Lesson Objective: Write numeral 3.

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 toward 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.

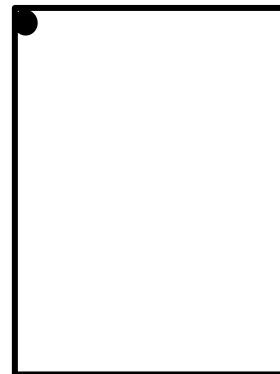
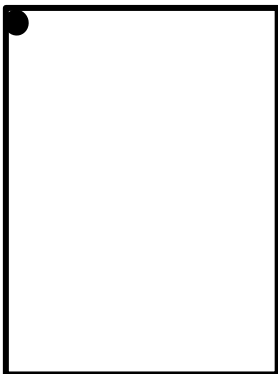
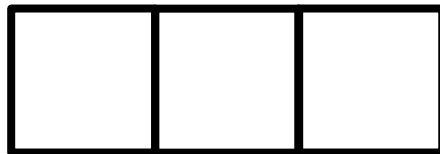
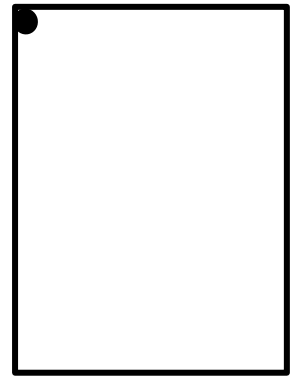
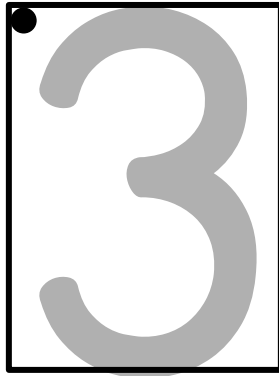
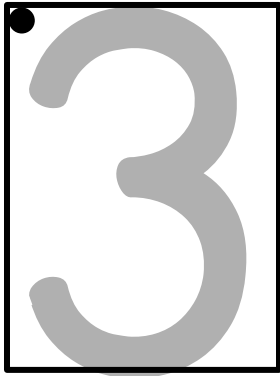
- What do you like about writing the number 3?
- (Display student work showing 3 in different ways, i.e., $3 + 0$, $1 + 2$, $2 + 1$, and $0 + 3$.) What is the same about all of these? What is different?
- Today you found partners of 3. Say some of the partners of 3.
- Look around our classroom. Where do you see a number 3? What is that 3 telling us?

**CENTER CONNECTION:**

Invite students to search the classroom for items in sets of 3. Encourage them to make a list of their findings. They should write the numeral 3 and then draw a picture or use inventive spelling to show the type of object. Provide an example of a list entry before sending children on their search. To make the activity more challenging, invite students to search for items in groups of 2 or 3.

Name _____

Date _____

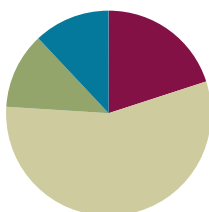


Lesson 4

Objective: Write numeral 4.

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)

- Decompose 4 **PK.CC.5** (3 minutes)
- Say Ten Ski Jumps **PK.CC.1** (2 minutes)

Decompose 4 (3 minutes)

Materials: (T) 3 paper plates (1 large, 2 small), 4 crayons, numeral card for 4 (Lesson 1 Template)

Note: Students have been working consistently with the composition and decomposition of numbers 0–5. This lays a strong foundation for work with decomposition and composition of numbers to 10—a Kindergarten standard.

T: (Place 4 crayons on the large plate.) I want to share these crayons with a friend. Let's count them! (Touch as students count.)

S: 1, 2, 3, 4.

T: That is the number I have here! (Place the 4 card on the larger plate. What are some ways I can share?

S: (Make suggestions.) Give your friend 1. → Give your friend 2.

T: Okay, let's start by just sharing 1. (Decompose the group of 4 crayons by placing 1 crayon on one smaller plate. Have students count as you move the rest to the other plate.)

T: Let's put them back together and share them in a different way. (Recount and repeat as time allows.)



Say Ten Ski Jumps (2 minutes)

Note: Varying movements helps keep counting exercises fresh as students strengthen their core fluency counting skills.

T: Let's go on a ski adventure. Take out your ski poles. (Demonstrate holding imaginary ski poles).
Let's count and ski together.

Jump left to right to mimic skiing. Count to 19. Then count again to 20 the Say Ten way.

Application Problem (3 minutes)

Materials: (T) Pad of paper or menu items (Template), marker, pretend menu including 3 items (pictures of juice, pretzels, and strawberries, or other appropriate items to order) or menu items (Template)

Note: This Application Problem returns students to a café setting. Set up a chair next to a small table to resemble a café. Today's activity helps students see how written numerals communicate meaning.

Call on two students, one to be a customer and one to be a waiter (give the waiter the pad and marker). Facilitate role-playing of ordering food at the café. The exchange might occur as follows:

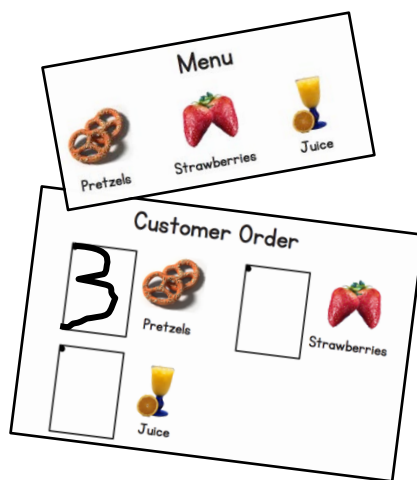
Waiter: Hello, what would you like to order?

Customer: I would like some pretzels.

Waiter: How many would you like (restrict the order of up to 3)?

Customer: 3.

Waiter: Writes the number 3 on the pad and shows the rest of the class.



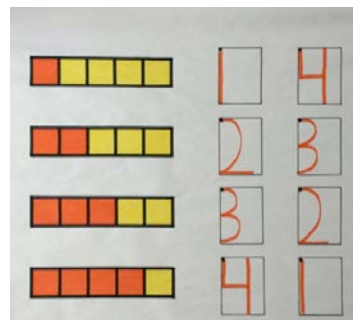
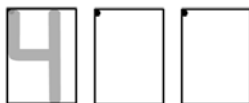
Repeat as time allows, providing as many students as possible a chance to be the waiter or customer. Tell the students that the café will be set up during the centers today.

Concept Development (14 minutes)

Part 1: Concept Introduction

Materials: (T) 5 linking cube tower (4 of a color, 1 of another color), chart paper or personal white board, markers

Prepare chart paper or a white board with writing rectangles and dots as shown on the right.



1. Show the train. Ask children to tell how many cubes are in the train. (Five.) Have them count the number of yellow and orange cubes.
2. Say, "I can write the number 4 to quickly show that there are 4 orange cubes. Use your finger to write 4 in the air while I write it on the board."
3. Say the rhyme for 4 while writing 4 in the first rectangle: "Down the side, to the right some more. Top to bottom, I've written 4." Point out to begin from the dot at the top.
4. Practice two more times with students, air tracing the numeral and saying the rhyme.
5. Draw the train on the board and have children check to ensure it matches the concrete train. Have them count the orange squares. Write 4 in the first rectangle while children air trace and say the rhyme.
6. Ask them to count the yellow squares. Write 1 in the second rectangle while children air trace and say the rhyme, "Top to bottom, then I'm done. I just wrote the number 1."
7. Help children see that they can fill in a writing rectangle for another train. Write in 4 for the number train drawn in Lesson 1.



NOTES ON MULTIPLE MEANS OF REPRESENTATION:

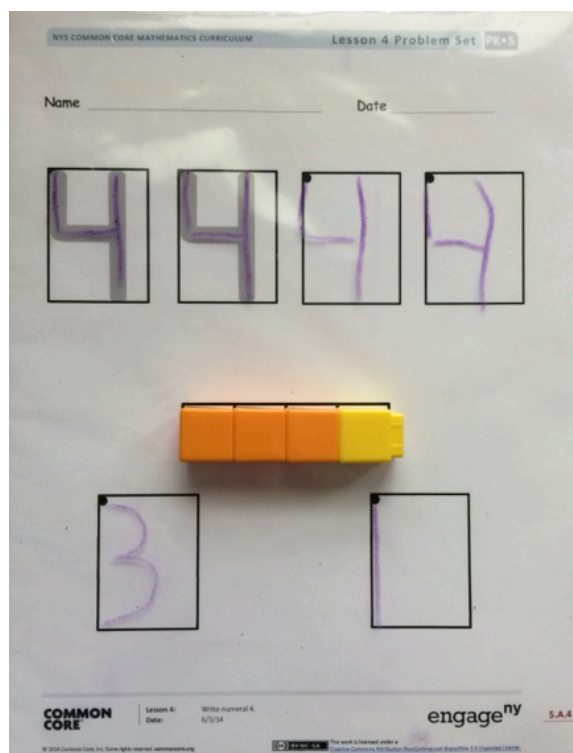
For students who continue to start writing their numbers from the bottom, place a small smiley face or star sticker on the starting dot before they begin to write. This will help the student call attention to where they should begin.

Part 2: Practice

Materials: (S) Problem Set inserted into personal white board, dry erase crayon, 8 linking cubes (4 of a color, 4 of another color)

Distribute Problem Sets and crayons to each student.

1. Demonstrate tracing with a crayon. Invite students to pick up a crayon and trace the 4 while saying the rhyme. Continue until all rectangles are filled.
2. Distribute linking cubes to each student. Direct students to make a 4-train of 3 orange and 1 yellow and place it on their Problem Set as shown on the right.
3. Guide students to count the orange cubes and write the number in the first rectangle. Then, count the yellow cubes and write the number in the second rectangle.
4. Provide children time to discover other ways to make 4-trains and write the number of cubes of each color.



Student Debrief (3 minutes)

Lesson Objective: Write numeral 4.

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 toward 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.

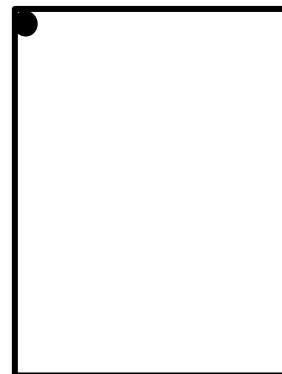
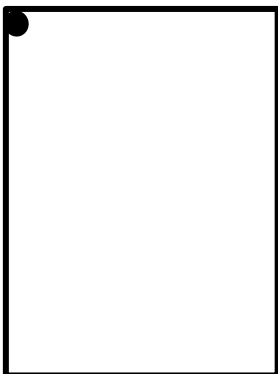
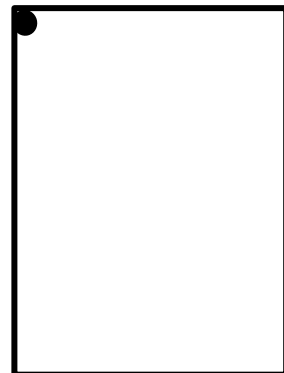
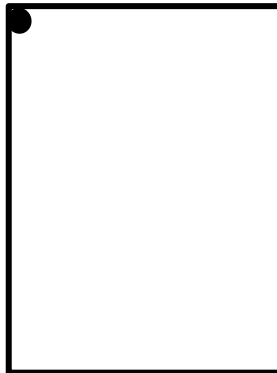
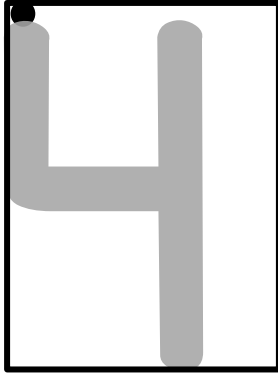
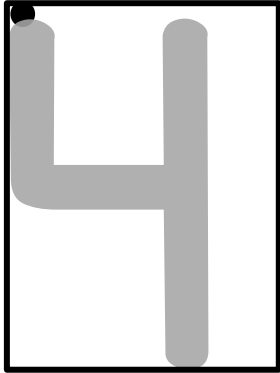
- Look at the trains we've been drawing over the last few days. What do you notice about the colors? The numbers?
- (Show numbers 0–4.) Which numbers have only straight lines? Which numbers have only curved lines? Which number has both straight and curved lines? (Put numbers into categories based on these attributes.)
- (Display student work showing 4 in different ways, i.e., $4 + 0$, $1 + 3$, $2 + 2$, $3 + 1$, and $0 + 4$.) What is the same about all of these? What is different?
- Today, you found partners of 4. Say some of the partners of 4. (Consider having children use fingers on both hands to show partners of 4.)

**CENTER CONNECTION:**

Set up the kitchen center as a café so students can continue role-playing customer and waiter. Place several personal white boards with the template inserted into them, as well as dry erase crayons to encourage several orders of different numbers of items.

Name _____

Date _____



Menu



Pretzels



Strawberries



Juice

Customer Order

A large empty rectangular box with a black border and a small black dot in the top-left corner, intended for writing the quantity of pretzels ordered.

Pretzels

A large empty rectangular box with a black border and a small black dot in the top-left corner, intended for writing the quantity of strawberries ordered.

Strawberries

A large empty rectangular box with a black border and a small black dot in the top-left corner, intended for writing the quantity of juice ordered.

Juice

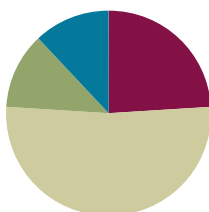
menu items

Lesson 5

Objective: Write numeral 5.

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)

- How Many? Number Practice **PK.CC.2** (4 minutes)
- Say Ten Ski Jumps **PK.CC.1** (2 minutes)

How Many? Number Practice (4 minutes)

Materials: (T) Numeral cards 6–10 (Lesson 1 Template) (S) Per pair: 10 baggies of 6–10 interesting objects, 1 type per bag (buttons, coins, beans, crayons, erasers, etc.)

Note: Students maintain fluency practice by counting and reading written numbers through 10. Observe to see how children organize objects for counting.

Pass out 1 baggie to each pair of students.

T: With your partner, count the items in your bag. (Provide time to count.) (Show numeral card 10.) What number is this?

S: 10.

T: If you have 10 items, stand up with your partner. If you have a different number of items in your baggie, put your hands on your head.

Continue showing different numeral cards, allowing partners to recount the items in their bags to determine whether they should stand up or put their hands on their heads.

Say Ten Ski Jumps (2 minutes)

Note: This fluency activity targets one of the core counting fluencies—rote counting to 20.

T: I had so much fun skiing with you yesterday that I want to ski again! Take out your ski poles. (Demonstrate holding imaginary ski poles). Today, let's count to 20 the Say Ten Way as we ski.

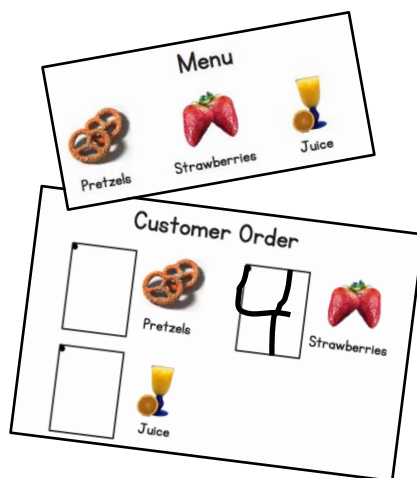
Jump left to right, holding your imaginary ski poles to mimic skiing as you count to 20 the Say Ten Way. Then, count again to 17.

Application Problem (3 minutes)

Materials: (S) Per pair: pad of paper or menu items (Lesson 4 Template), marker, pretend menu including 3 items (pictures of juice, pretzels, and strawberries, or other appropriate items to order) or menu items (Lesson 4 Template)

Note: Students return to the café context from the previous lesson as they continue to see how written numerals communicate meaning.

Pair students and assign 1 to be the waiter and 1 to be the customer. Facilitate role-playing of ordering food at the café as in the previous lesson, restricting orders of up to 4. Have children switch roles and order again.

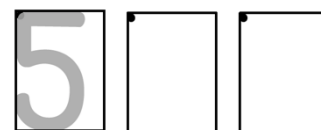


Concept Development (13 minutes)

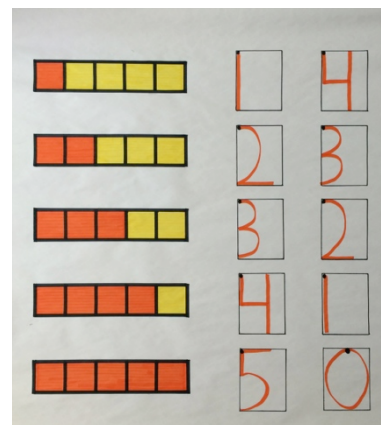
Part 1: Concept Introduction

Materials: (T) 5-train (5 of a color), chart paper or white board, markers

Prepare chart paper or a white board with writing rectangles and dots as shown on the right.



1. Show the 5-train. With the group, count how many cubes are in the train. (Five.) Ask, "How many are orange? How many are yellow?"
2. Ask, "What is the quickest way to show that there are 5 orange cubes? Let's write the number! Use your finger to write 5 in the air while I write it on the board."
3. Say the rhyme for 5 while writing 5 in the first rectangle: "Down the side, around a hive. Give it a hat, I've written 5." Point out having started from the dot at the top and returned to the top to "give it a hat."
4. Practice two more times with students air-tracing the numeral and saying the rhyme.
5. Draw the train on the poster begun in Lesson 1, and have students check to ensure it matches the concrete 5-train. Ask students to count the orange squares. Write 5 in the first rectangle while students air trace and say the rhyme.
6. Ask children the number of yellow squares. Write 0 in the second rectangle and say the rhyme. (Curve from the top, be a hero! Close the loop and make a 0.)



Part 2: Practice

Materials: (S) Per student: Problem Set inserted into personal white board, dry erase crayon, 10 linking cubes (5 of a color, 5 of another color), make 5 (Template 1) inserted into opposite side of personal white board

Distribute a Problem Set and crayon to each student.

MP.4

1. Demonstrate tracing with a crayon. Invite students to pick up a crayon and trace the 5 while saying the rhyme. Continue until all rectangles are filled.
2. Distribute linking cubes. Direct students to make a 5-train (any 2 differently colored combinations, such as orange and yellow) and place it on their Problem Set. Support students so that cubes of the same color are touching.
3. Guide students to count the orange cubes and write the number in the first rectangle. Then, count the yellow cubes and write the number in the second rectangle.
4. Have students turn over their personal white boards. They should make a different 5-train, and write the number of cubes in each color.
5. Direct students to switch personal white boards with their partner and find a different way to make 5 on the bottom of Template 1, writing the number of cubes in each color.



NOTES ON MULTIPLE MEANS OF ENGAGEMENT:

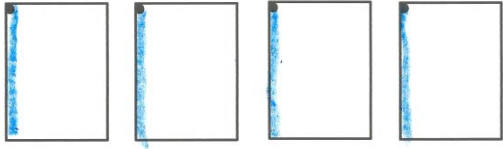
Challenge students who are ready to find all of the ways to make 5 with the yellow and orange cubes. Teachers may want to tell them they will use each of the numbers they have learned to write.

NYS COMMON CORE MATHEMATICS CURRICULUM Lesson 1 Problem Set PK•5

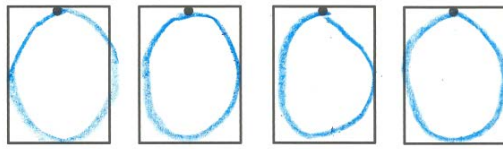
Name JESSIE Date _____



How many  in  ?



How many  ?



COMMON CORE Lesson 1: Write numerals 0 and 1. Date: 8/19/14 **engage^{ny}** S.A.5

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Student Debrief (3 minutes)

Lesson Objective: Write numeral 5.

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 toward 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.

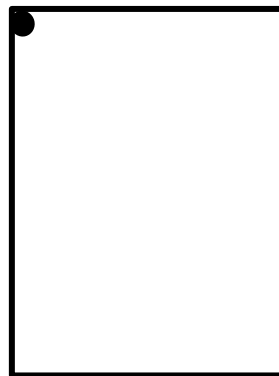
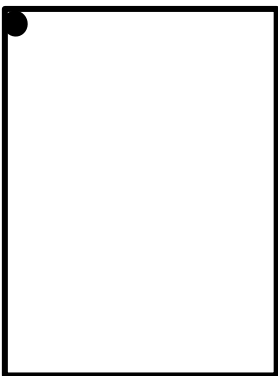
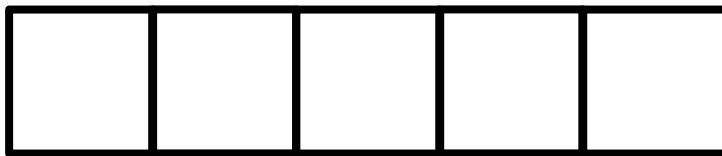
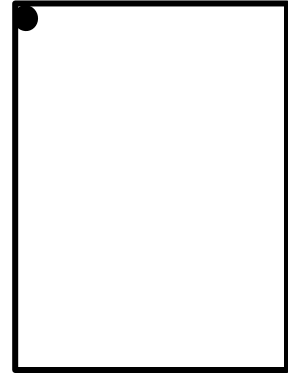
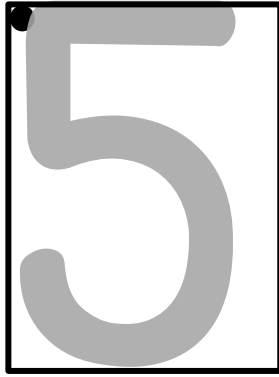
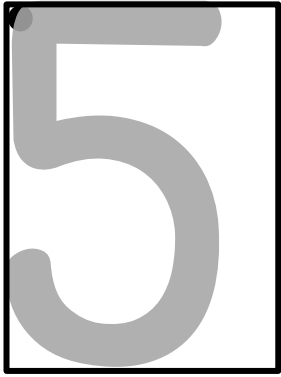
- (Remove the cube trains from a completed Template 1.) How could you use the numbers written here to make the tower again?
- (Display partner work from Templates 1 and 2.) What partners of 5 do you see? (Consider having children use fingers on both hands to show partners of 4.)
- (Display the chart with 5-trains.) How are the trains that we've been making throughout the past few days like your trains? What partners of 5 do you see?
- (Point to the numeral 4 on the chart.) Which color cube does this 4 tell us about in the train? (Point to the other numeral 4.) This one? (Continue the same process, moving between the abstract numbers and corresponding cubes. Say as little as possible so that students have the opportunity to discover the relationships and patterns!)

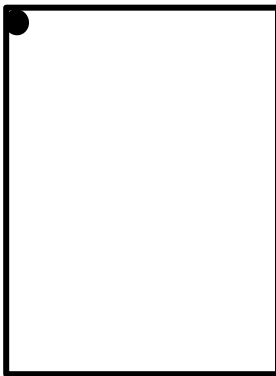
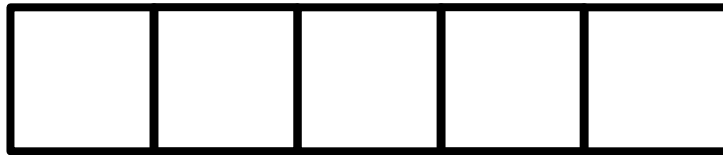
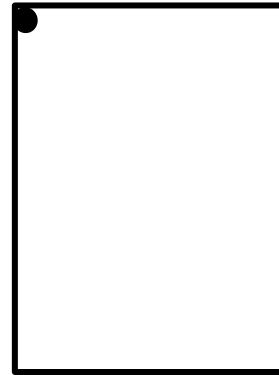
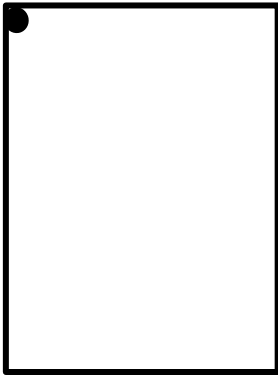
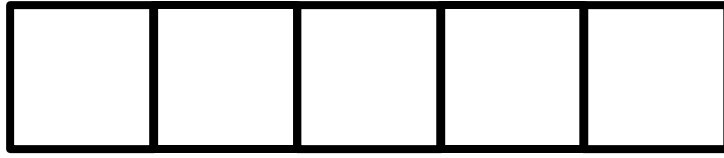
**CENTER CONNECTION:**

Prepare bags with 0–5 objects and personal white boards with the numeral writing rectangle template inserted (Template 2). Have children count the number of items in each bag and write the corresponding numeral on their personal white boards.

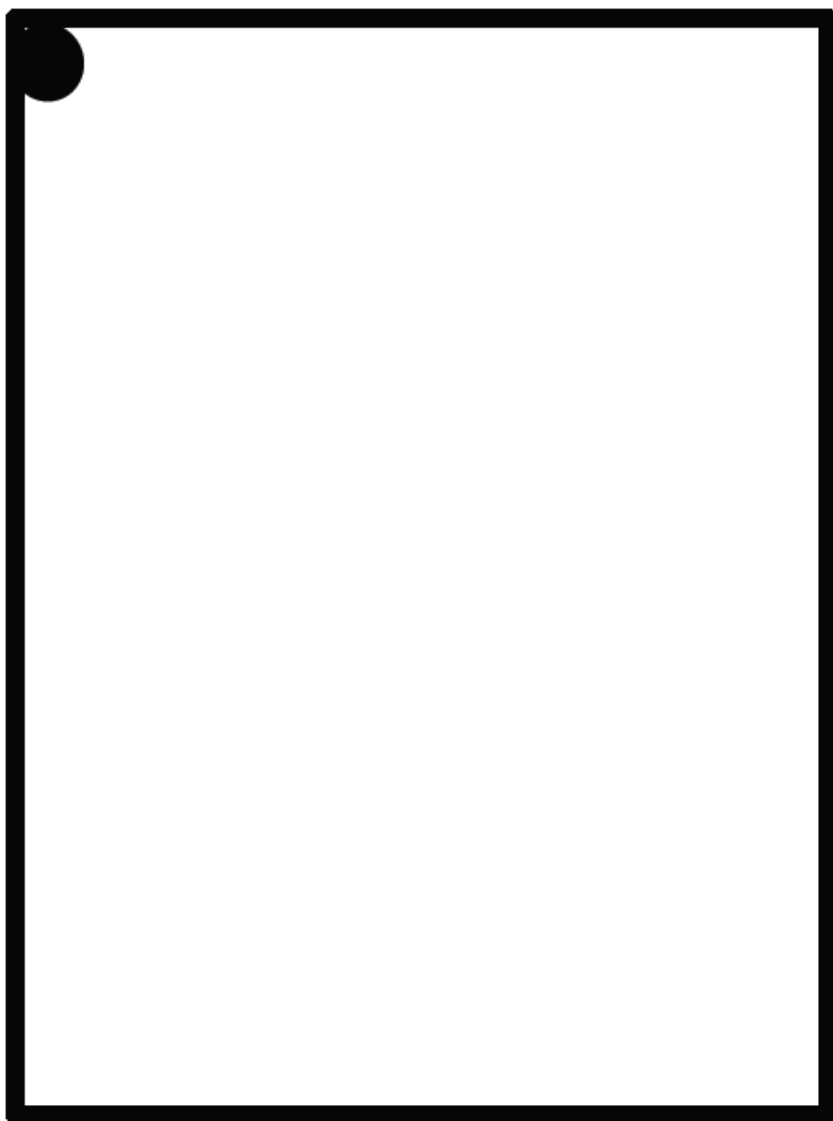
Name _____

Date _____





make 5



numeral writing rectangle



Topic B

Contextualizing Addition Stories to Solve

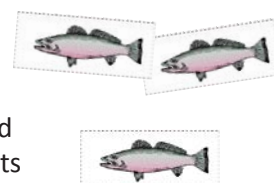
PK.OA.1, PK.CC.2, PK.CC.3, PK.CC.4

Focus Standards:	PK.OA.1	Demonstrate an understanding of addition and subtraction by using objects, fingers, and responding to practical situations (e.g., if we have 3 apples and add two more, how many apples do we have all together?).
Instructional Days:	5	
Coherence -Links to:	GK-M1	Numbers to 10
	GK-M4	Number Pairs, Addition and Subtraction to 10

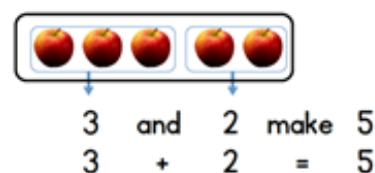
Topic B marks an exciting point in Pre-Kindergarten math learning as students begin exploring the addition of numbers to 5 through story problems. They build on the comparison work of Module 4, so *putting more* indicates addition: "If we have 3 apples and *add 2 more*, how many apples do we have altogether (PK.OA.1)?" Throughout this exploration, students use concrete objects, pictures, or drawings to count the parts and total (PK.OA.1).

In Lesson 6, students act out *add to with result unknown* stories, counting to find the total: "2 friends are picking up trash. 2 more friends come to help. How many friends are picking up trash all together?" Students take turns being a part of the action and counting the parts (2 friends and 2 friends) and the total (4 friends). Asking questions is one of the most difficult parts of posing word problems. Students begin restating the situation, as well as the question, in their own words to prepare for creating their own word problems in later lessons.

In Lesson 7, children begin using objects to solve addition stories (PK.OA.1). For example, they use pictures of fish to solve this problem (shown to the right): "There were 2 fish splashing in the river. 1 more fish came to splash. How many fish are splashing now?" Then, students work in pairs to solve addition stories, and they write the answer in their writing rectangles. Throughout this topic, the objects children manipulate are similar to the objects in the story.



Students expand their knowledge of addition in Lesson 8 by making a statement and learning to say a number sentence: "3 apples and 2 apples make 5 apples. 3 plus 2 equals 5." The boxed drawings used in this lesson emphasize the parts and total (shown on the following page). The teacher will write a number sentence ($3 + 2 = 5$) as an exposure to



the more abstract concept, but children are not expected to write or master number sentences in Pre-Kindergarten.

In Lesson 9, students work with *put together with total unknown* story problems. On the surface, these problems appear similar to the problems of Lessons 6–8, but they lack the embedded action of the previous problems. Instead, they focus on a set of objects and part-whole relationships: "1 book is lying on the couch. 2 books are being read. How many books are there in all?" In this lesson, students create simple drawings, compare them, and practice saying the number sentence together.

Students have an opportunity to create their own addition stories in Lesson 10. For example, given $2 + 3 = 5$, students provide the context by creating a story for the abstract number sentence. They create detailed drawings to accompany their stories, as well as help share and solve one another's problems. Teachers continue to provide language support as students ask and answer questions because this is one of the more challenging aspects of addition word problems.

In Topic B Fluency Practices, students participate in rote counting exercises by means of ski jumps, swimming, swinging monkeys, or similar ways. Students must remain attentive to the counting sequence as the stop number varies; for example, at 17 or 18. Students also maintain fluency practice with counting objects (buttons, coins, beans, etc.) up to 10 and reading written numerals. In addition to these core fluency practices, students also decompose 4 bean bags, counting on their fingers the number of bean bags tossed.

A Teaching Sequence Toward Mastery of Contextualizing Addition Stories to Solve

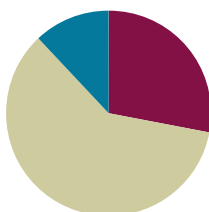
- Objective 1:** Act out *add to with result unknown* story problems to solve.
(Lesson 6)
- Objective 2:** Solve *add to with result unknown* story problems using objects from the story.
(Lesson 7)
- Objective 3:** Represent *add to with result unknown* story problems using number sentences.
(Lesson 8)
- Objective 4:** Solve *put together with total unknown* story problems with objects from the story and drawings.
(Lesson 9)
- Objective 5:** Create and solve addition story problems using drawings.
(Lesson 10)

Lesson 6

Objective: Act out *add to with result unknown* story problems to solve.

Suggested Lesson Structure

■ Fluency Practice	(7 minutes)
■ Concept Development	(15 minutes)
■ Student Debrief	(3 minutes)
Total Time	(25 minutes)



Fluency Practice (7 minutes)

- Bean Bag Toss **PK.CC.3b** (5 minutes)
- Swim and Count **PK.CC.1** (2 minutes)

Bean Bag Toss (5 minutes)

Materials: (T) 4 bean bags, 1 red mat, and 1 blue mat placed side by side (bath towels or pieces of bulletin board paper may be used)

MP.2

Note: This fluency activity develops students' understanding of decompositions of 4, supporting this module's work with addition and subtraction. Here, students show the number of bean bags with their fingers, a decontextualization of the situation. This anticipates writing addition and subtraction number sentences, as well as a decontextualization of a situation.

T: (Show 4 bean bags on a table.) Count the bean bags. Ready?

S: 1, 2, 3, 4.

T: Everyone will get a turn to toss a bean bag, such as this (demonstrate). The only rule is that it must land on one of the mats. (Distribute the bean bags to 4 students.)

S: (Toss bean bags onto the mats.)

T: Use your fingers to show how many landed on the blue mat.

S: (Show corresponding fingers, e.g., 3.)

T: Show how many landed on the red mat.

S: (Show corresponding fingers on the other hand, e.g., 1.)

T: Put your hands together to show how many bean bags in all.

S: (Put hands together to show 4 fingers.)

T: We can talk about it like so. 3 (point to the 3 bean bags) and 1 (point to the 1 bean bag) make 4. Let me hear you say that.

S: 3 and 1 make 4 (as teacher points to indicate).

Pass the 4 bean bags to the next 4 students and repeat the process. It may be necessary to direct students to toss all 4 bean bags to one side or the other to generate all decompositions of 4.

Swim and Count (2 minutes)

Note: This fluency activity challenges students to remain attentive to the counting sequence while engaging in physical exercise and varying the stop number.

T: Let's stand up, put our swim goggles on, and dive into the pool! Swim and count with me. We'll stop at 20.

S: 1, 2, 3...20 (keeping arm movements synchronous with the count).

T: Great counting! Hold your nose! Let's dive underwater!

Count again, stopping at 16. Inevitably, some students will count beyond the designated stopping number. Maintain a playful attitude while being cautious not to encourage deliberate mistakes.

Concept Development (15 minutes)

Part 1: Concept Introduction

Materials: (T) White board or chart paper

Note: The Application Problem is embedded into today's Concept Development, a structure that allows more time for students to act out and understand the problems.

Prepare the math story theatre, a *stage* where children can perform the action of the word problem. Rotate actors so all children have an opportunity to act and solve the word problem.

1. Invite 3 children to sit on the stage. While saying the word problem, tap students to indicate when they become part of the action. Say, "Listen to my **addition story**: Two friends are dancing. One more friend comes to dance."
2. Ask, "Who can tell the story again?" Then ask, "How many friends are dancing **in all**?" Provide wait time, and then signal children to answer. Write 3 on the board, saying "3 friends."
3. Ask, "Who remembers the question?" Guide half of the children to restate the question and the other half to say the answer.
4. Select 4 new actors. Say, "Two friends are picking up trash. Two more friends come to help." Invite a student to tell the story again.
5. Repeat Steps 2–3, asking, "How many friends are picking up trash **all together**?"
6. Repeat as time allows with other problems, such as, "Two sisters are swimming in the pool. Three playmates come to swim. How many are swimming now?"



NOTES ON REMEMBERING:

As students realize they have the capacity to remember, they engage in metacognition and become aware of their own mental activity, as well as the power of their minds. Encourage them with phrases such as "Yes, you did remember. That is awesome that your brain can do that!" or "Can you remember some of the ways we made four today with our bean bags?"

Part 2: Practice

Materials: (S) Per pair: 3 paper doll cards (Template, cut apart)

Pair students and send them to tables with 3 paper dolls. Replace Partner A and B with children's names.



1. Instruct Partner A to count the paper dolls.
2. Say, "Listen to my addition story. Partner A, make the paper dolls match my story: Someone is eating lunch all by himself. Two friends come to eat lunch with him." (Partner A matches the dolls to the story.)
3. Instruct Partner B to retell the story and check to ensure the paper dolls match.
4. Ask, "How many friends are eating all together?"
5. Instruct both partners to repeat the question and agree on the answer (3 friends).



NOTES ON MULTIPLE MEANS OF ACTION AND EXPRESSION:

Encourage students, particularly English language learners, to use their words as they act out the story using paper dolls, synchronizing language with the actions to support understanding.

Student Debrief (3 minutes)

Lesson Objective: Act out *add to with result unknown* story problems to solve.

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 toward 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 (**addition story, in all, all together**).

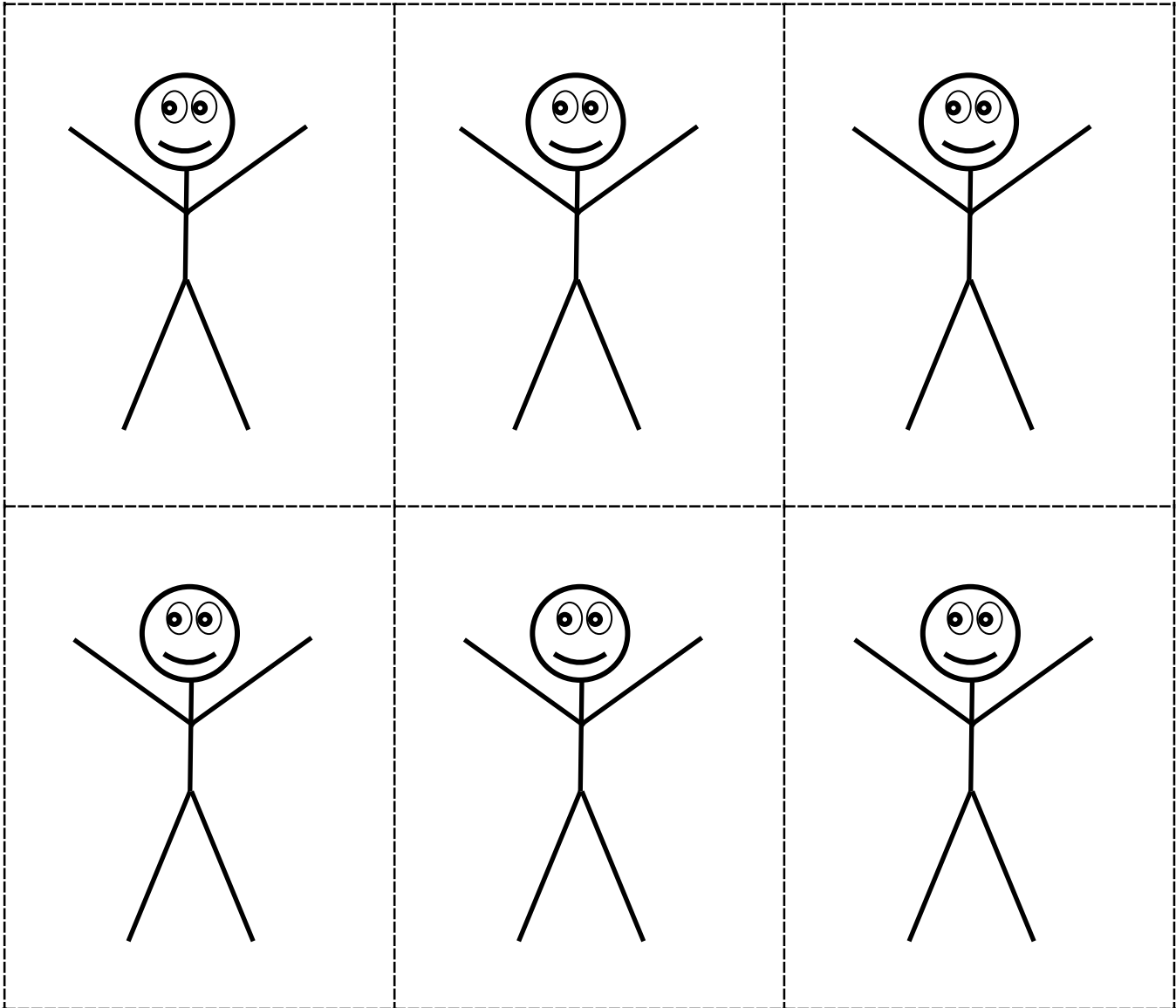
- Today, we told an **addition story** about dancing. In the addition story, did more people come to dance, or did people leave?
- We asked a question about the dancing addition story, "How many friends are dancing **in all**?" What did we do to answer the question?
- How did acting help you understand the addition story?
- How did acting help you remember the question?
- We told another addition story about friends picking up trash. We asked, "How many friends are picking up trash **all together**?" What did we want to know?



CENTER CONNECTION:

At the dramatic play center, invite students to act out add to stories. For example, one student might be the bus driver and other students are passengers on the bus. Encourage students to imagine stories as people enter the bus, such as, "One person got on the bus. Two more people got on the bus. How many people are on the bus?"

Cut.



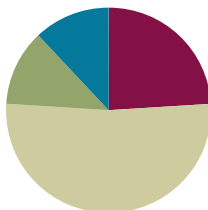
paper doll cards

Lesson 7

Objective: Solve *add to with result unknown* story problems using objects from the story.

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)

- Stand Up on Your Number **PK.CC.2** (4 minutes)
- Alligator Snaps **PK.CC.1** (2 minutes)

Stand Up on Your Number (4 minutes)

Materials: (T) Numeral cards 2–6 (Lesson 1 Template) (S) per pair: 1 baggie of 2–6 interesting objects, 1 type per bag (buttons, coins, beans, crayons, erasers, etc.)

Note: Students maintain fluency practice by counting and reading written numerals 2–6. Observe to see how children organize objects for counting. This activity is repeated throughout Topic B. Each day the lowest and highest numbers increase by 1; for example, Lesson 8 will work with numerals 3–7, etc.

Pass out 1 baggie to each pair of students.

T: With your partner, count the items in your bag. (Provide time to count.)

T: (Show the 6 card.) What number is this?

S: 6.

T: If you have 6 items, stand up with your partner. If you have a different number of items in your bag, put your hands on your head.

Continue showing different numeral cards, allowing partners to recount the items in their bags to determine whether they should stand up or put their hands on their heads.

Alligator Snaps (2 minutes)

Note: Say Ten counting facilitates the core fluency goal of rote counting to 20 while laying a foundation that helps students understand place value in future grades. Encourage students to clap once for each number, reinforcing that *ten 1* is one number, not two.

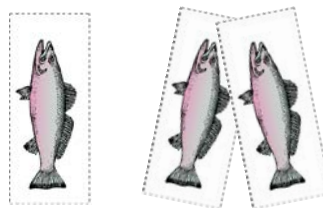
T: It's Allie Alligator's lunchtime again. Let's pretend we're Allie catching fish for lunch. She wants 16 fish today. Let's count to 16 the Say Ten Way.

Demonstrate with arms open wide, one above the other, mimicking alligator jaws. Close arms and hands together to create a snapping sound while saying each number to 16 the Say Ten Way. Repeat to 20.

Application Problem (3 minutes)

Materials: (S) 3 small fish cards (Template 2) in a baggie per pair

Select 3 students to act out this story: The fisherman caught 1 fish in the morning. He caught 2 more fish in the afternoon. How many fish did he catch in all?



Give each pair of students 3 fish cards. Instruct Partner A to show the first part of the story as it is acted out. Then, instruct Partner B to show the next part of the story. Guide students to remember the question and then touch and count to solve.

Note: This is an *add to result unknown* problem. Acting out the story and using objects to solve serves as a transition to working solely with objects during the Concept Development.

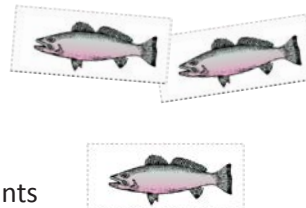
Concept Development (13 minutes)

Part 1: Concept Introduction

Materials: (T) 5 large fish cards (Template 1) (S) bag with 5 small fish cards (Template 2), numeral writing rectangle (Lesson 5 Template 2) in personal white board

Distribute a bag and personal white board to each student. In this lesson, students are asked to count out objects from a larger group. The teacher demonstrates this activity in Part 1, providing students a model for counting and organizing their objects based on the addition story.

1. Say, "Listen to my **addition** story: There were 2 fish splashing in the river. One more fish came to splash."
2. Say, "What was happening in the story at first?" Display 2 fish as students do the same with their fish.
3. Say, "Tell me what happened next." Display another fish as students do the same.
4. Ask, "How many fish are splashing now?" Provide wait time, and then signal students to answer on their personal white boards. Write 3 on the board, saying "3 fish." Ask, "How did you know the answer?"
5. Say, "2 fish and 1 fish make 3 fish." Have students repeat.



6. Repeat Steps 1–4 with more word problems, such as the following:
 - 3 fish jumped into the air. One more fish jumped, too. How many fish jumped?
 - Mr. Fox caught 2 fish at first. Then, he caught 3 fish. How many fish did he catch all together?

Part 2: Practice

Materials: (S) Bag with 5 small fish cards (Template 2), numeral writing rectangle (Lesson 5 Template 2) in personal white board

- MP.2

1. Say, “Use your fish to show my addition story. Four fish went to swim in a shady part of the lake. One more fish went to swim there, too.”
 2. Have children turn to a partner and retell the addition story. Encourage them to set up their fish as they retell the story.
 3. Ask, “How many fish went to swim in the shady part of the lake?” Provide wait time as children write the answer on their boards, and then signal for students to share answers with a partner. Circulate and comment, “Yes, you wrote 5. There are 5 fish swimming in the shady part of the lake.”
 4. Invite partners to remember the question and share. Then ask, “How did you know the answer? Tell your partner.”
 5. Guide students to say the number statement, “4 fish and 1 fish make 5 fish.”
 6. Repeat Steps 1–5 with the following word problems:
 - Two fish swam down the waterfall. Two other fish swam down the waterfall. How many fish swam down the waterfall in all?
 - One fish goes to sleep. Two more fish go to sleep. How many fish are sleeping now?



NOTES ON MULTIPLE MEANS FOR ACTION AND EXPRESSION:

Circulate as students work, and support students who are struggling by repeating the story, one sentence at a time. Have students check the number of fish used to represent each part of the story.

Student Debrief (3 minutes)

Lesson Objective: Solve *add to with result unknown* story problems using objects from the story.

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 toward 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.



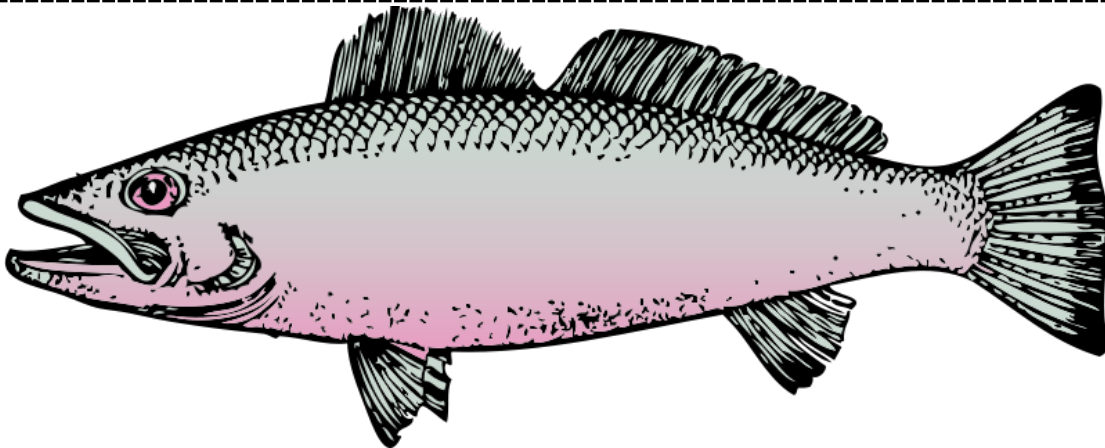
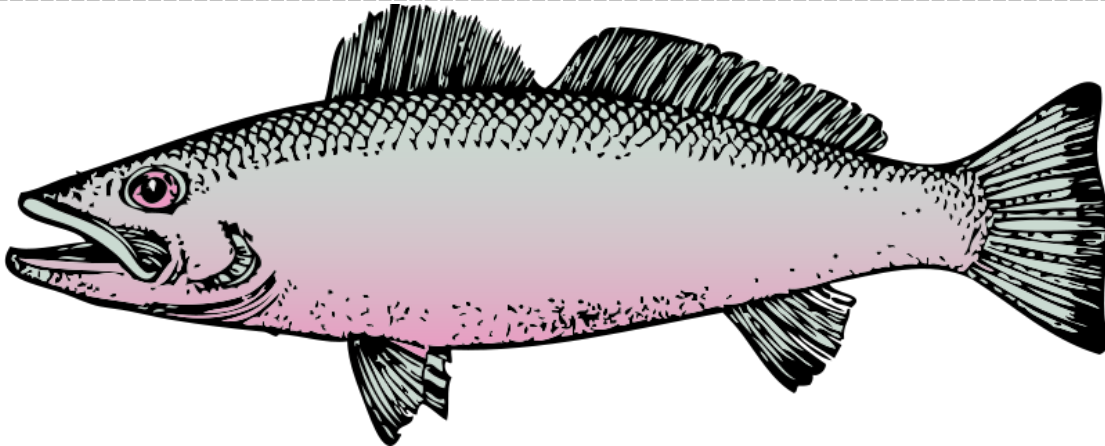
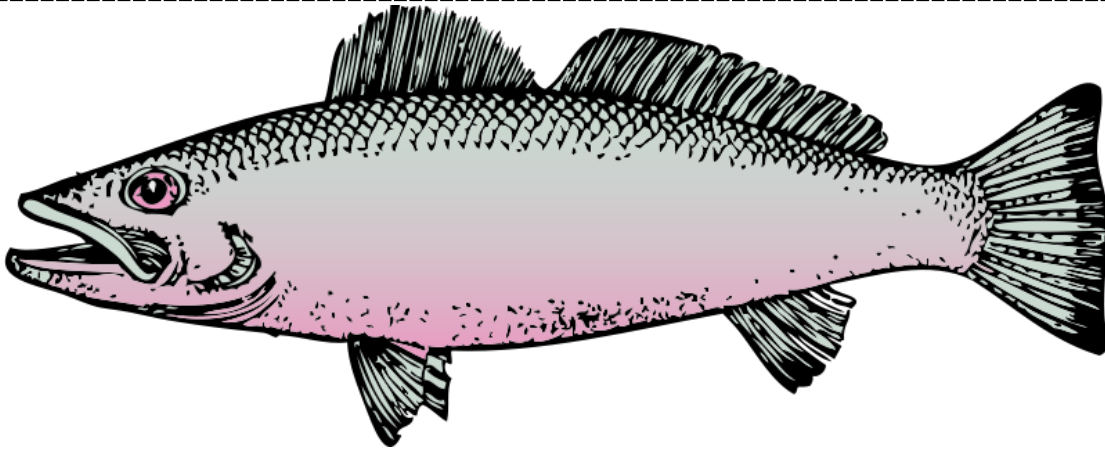
CENTER CONNECTION:

At the block center, invite students to build towers and create problems, such as, “I used 1 block. I added 4 more blocks. How many blocks are there in all?” Students can touch and count to check their answers.

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

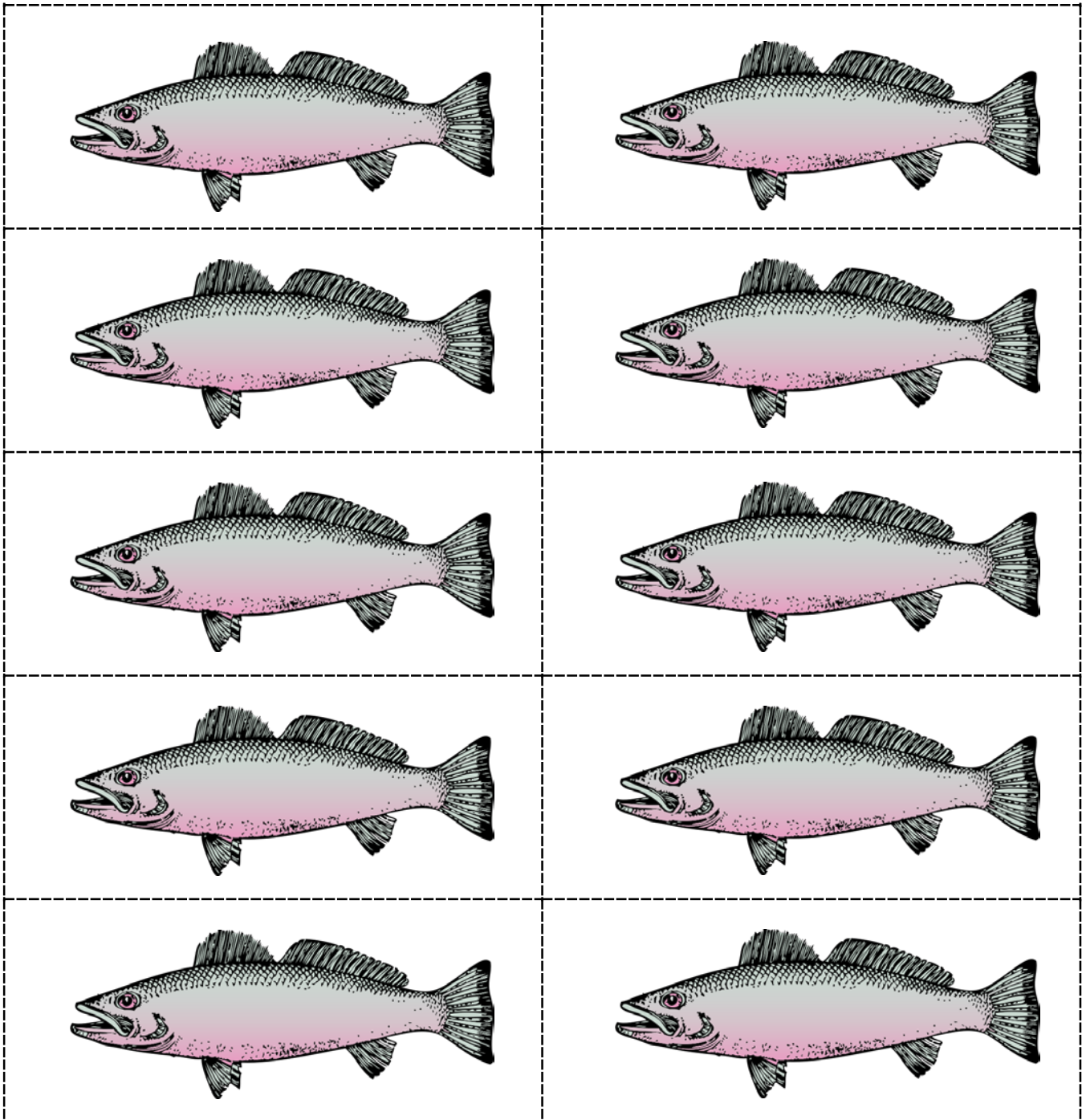
- In our stories, did we add more fish or take away fish?
(Wait for students to respond.) We call this **addition**.
- Show me 3 fish. When I say, “Add 2 fish,” show me what to do with your fish.
- When we add more fish, what happens to the group of fish?
- Yesterday, we used dolls to act out addition stories. How is what we did with the fish like what we did with the paper dolls?

Make 1 copy. Cut.



large fish cards

Copy and cut. Each student needs 5 fishes.



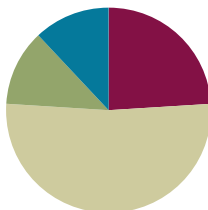
small fish cards

Lesson 8

Objective: Represent *add to with result unknown* story problems using number sentences.

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)

- Stand Up on Your Number **PK.CC.2** (4 minutes)
- Elephant Splashes **PK.CC.1** (2 minutes)

Stand Up on Your Number (4 minutes)

Materials: (T) Numeral cards 3–7 (Lesson 1 Template) (S) Per pair: 1 baggie of 3–7 interesting objects, 1 type per bag (buttons, coins, beans, crayons, erasers, etc.)

Note: Students maintain Fluency Practice by counting and reading written numerals 3–7. Observe to see how students organize objects for counting.

Pass out 1 baggie to each pair of students.

T: With your partner, count the items in your bag. (Provide time to count.)

T: (Show numeral card 7.) What number is this?

S: 7.

T: If you have 7 items, stand up with your partner. If you have a different number of items in your bag, put your hands on your head.

Continue showing different numeral cards, allowing partners to recount the items in their bags to determine whether they should stand up or put their hands on their heads.

Elephant Splashes (2 minutes)

Note: This activity targets one of the core fluencies for Pre-K students—rote counting to 20.

T: Silly Eli elephant is at it again! Let's pretend we're Eli. Let's swing our trunks to splash our friends while counting to 17.

Demonstrate swinging an arm back and forth, mimicking an elephant's trunk. Count again to 17 the Say Ten Way, maintaining synchronous movement with the count.

Application Problem (3 minutes)

Materials: (S) Numeral writing rectangle (Lesson 5 Template 2) in personal white board

Select 3 students to act out the following story—1 seed grows into a flower. 2 more seeds grow into flowers. How many flowers are there now?

Provide students time to count and write the answer on their personal white boards. Invite volunteers to discuss how they solved the problem. Guide students to answer the question with a number statement, “1 flower and 2 flowers make 3 flowers.”



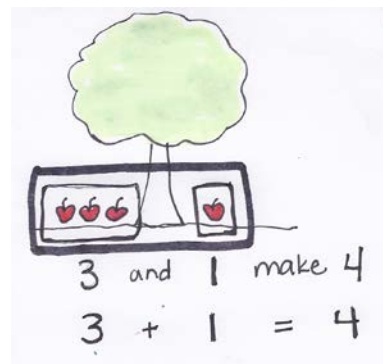
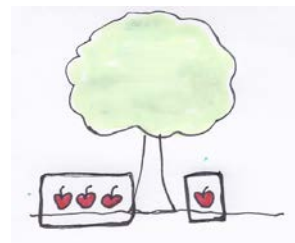
Note: This *add to with result unknown* problem type segues into the introduction of number sentences in the Concept Development.

Concept Development (13 minutes)

Part 1: Concept Introduction

Materials: (T) 5 apples, enlarged apple tree mat (Template 1) (S) Numeral writing rectangle (Lesson 5 Template 2) in personal white board

1. Say, “Listen to my addition story: 3 apples fell on the ground. 1 other apple fell.”
2. Say, “Tell me what happened first in the story.” After students answer, place 3 apples on the apple tree mat (below the tree) and draw a box around them.
3. Say, “Tell me what happened next.” Follow the procedure in Step 2.
4. Box all of the apples and ask, “How many apples are on the ground now?” Provide wait time, and then signal students to answer by showing their personal white boards.
5. Say the statement, “3 apples and 1 apple make 4 apples.” Students repeat.
6. Say, “There’s a special way to talk about this addition story: 3 **plus** 1 **equals** 4. Say the **number sentence** with me (while writing on the board).”
7. Repeat Steps 2–6 with the following word problem (using the apple mat): Mom picked 3 apples. Dad picked 2 apples. How many apples did they pick in all?



Part 2: Practice

Materials: (S) Apple tree mat (Template 1), 5 apple cards (Template 2), numeral writing rectangle (Lesson 5 Template 2) in personal white board

Pair students to work on these problems, if necessary. Send children to prepared tables.

1. Say, "Listen to my addition story: Kojo saw 2 apples in the tree. Then, he saw 3 more."
2. Have students turn to a partner and retell the addition story. Encourage them to match their apples to the story. Support students in terms of counting the correct number of apples.
3. Ask, "How many apples did Kojo see?" Have students repeat the question aloud to a partner. Then, have them solve and write the answer on their personal white boards.
4. As a class, make the statement, "2 apples and 3 apples make 5 apples," and then the number sentence, "2 plus 3 equals 5."
5. Repeat Steps 1–4 with the following word problem: Dad picked 1 apple. Kojo picked 4 apples. How many apples did they pick in all?



NOTES ON MULTIPLE MEANS OF ENGAGEMENT:

Challenge students who are ready to write the number sentences to write answers that match the stories.

Student Debrief (3 minutes)

Lesson Objective: Represent *add to with result unknown* story problems using number sentences.

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 toward 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.

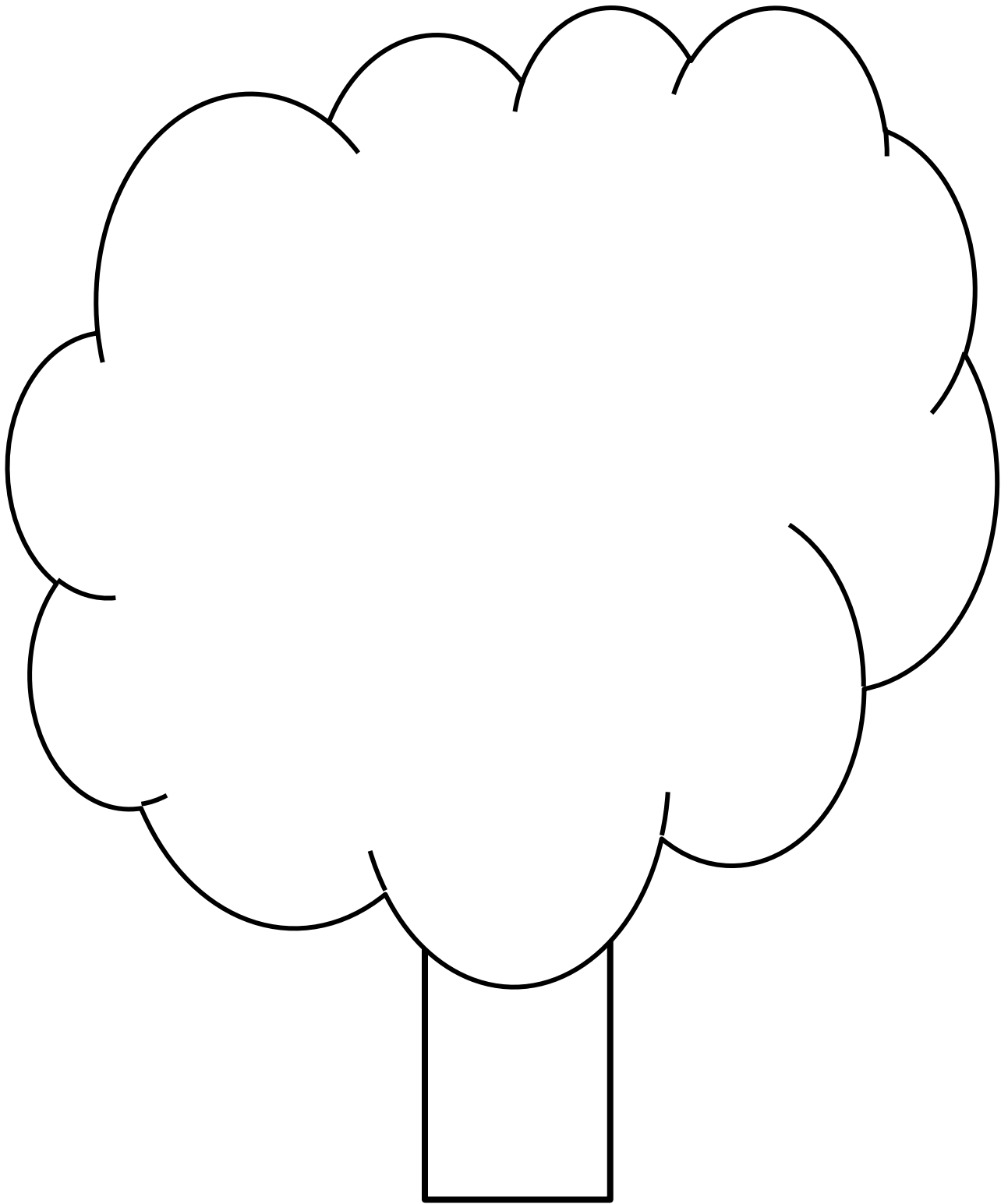
You may choose to use any combination of the questions below to help students express ideas, make connections, and use new vocabulary (**plus**, **equals**, **number sentence**).

- Think about our last addition story. How many apples did Kojo's dad pick? (Show 1 apple.) How many apples did Kojo pick? (Show 4 apples.) How many apples did they pick all together?
- How would we say that as a **number sentence**? (1 **plus** 4 **equals** 5.)
- (Write $1 + 4 = 5$.) What is special about number sentences? (Draw students' attention to the + and = symbols.)



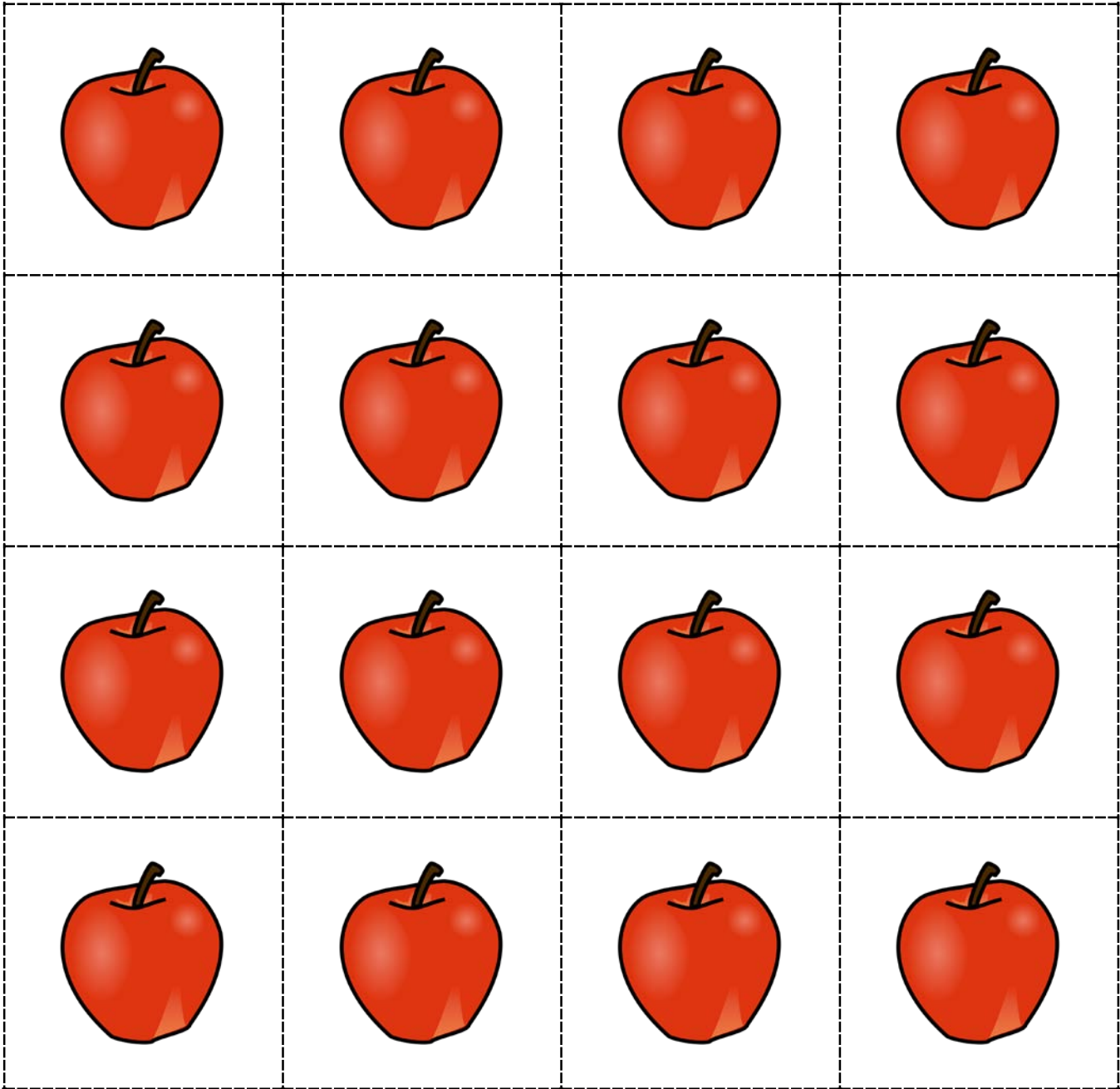
CENTER CONNECTION:

Continue to incorporate addition stories into the dramatic play and block centers as described in previous lessons. Now, ask children to say the number sentence after solving. When possible, write the equation to help guide their sentences at first, but wait to write until after children have said the number sentence as they become proficient.



apple tree mat

Copy and cut. Each student needs 5 apples.



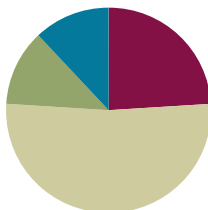
apple cards

Lesson 9

Objective: Solve *put together with total unknown* story problems with objects from the story and drawings.

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)

- Stand Up on Your Number **PK.CC.3, PK.CC.4** (4 minutes)
- Ski Jumps **PK.CC.1** (2 minutes)

Stand Up on Your Number (4 minutes)

Materials: (T) Numeral cards 4–8 (Lesson 1 Template) (S) per pair: 1 baggie of 4–8 interesting objects, 1 type per bag (buttons, coins, beans, crayons, erasers, etc.)

Note: Students maintain fluency practice by counting and reading written numerals 4–8.

Pass out 1 baggie to each pair of students.

T: With your partner, count the items in your bag. (Provide time to count.)

T: (Show numeral card 8.) What number is this?

S: 8.

T: If you have 8 items, stand up with your partner. If you have a different number of items in your bag, put your hands on your head.

Continue showing different numeral cards, allowing partners to recount the items in their bags to determine whether they should stand up or put their hands on their heads.

Ski Jumps (2 minutes)

Note: This fluency activity targets the core counting fluency—rote counting to 20.

T: Let's ski jump as we count again! Take out your ski poles. (Demonstrate holding imaginary ski poles). Let's count to 20 the regular way as we ski.

Jump from left to right, holding your imaginary ski poles to mimic skiing as you count to 20. Then, count again to 20 the Say Ten Way.

Application Problem (3 minutes)

Materials: (S) Numeral writing rectangle (Lesson 5 Template 2) in personal white board

Select 5 students to act out the following addition story: 3 children are reading at the library. 2 more children come to read. How many children are reading all together?

Give children time to count and write the answer on their personal white boards. Invite volunteers to discuss how they solved the problem. Say the statement and number sentence as a group, “3 children and 2 children make 5 children. 3 plus 2 equals 5.”

Note: This *add to with result unknown* problem introduces the class to solve *put together with total unknown* problems (e.g., “2 children are reading and 3 children are looking at picture books in the library. How many children are in the library in all?”) While the former involves the action of *adding to*, there is no action in the latter story, making it a less engaging, and thus more challenging, problem.



Concept Development (13 minutes)

Part 1: Concept Introduction

Materials: (T) Reader picture (Template) in personal white board, chart paper, marker (S) Numeral writing rectangle (Lesson 5 Template 2) in personal white board

For the first problem, fold the reader picture so only the couch is showing. For the second problem, display the full picture and select book titles that are familiar to students.

1. Display the folded reader picture. Say, “Listen to a new addition story about the library: 1 book is lying on the couch. 2 books are being read.”
2. Ask, “How many books are lying on the couch?” Circle that book and write 1 below. Have students draw 1 book on their personal white boards.
3. Repeat Step 2 for books being read as students draw two more books on their personal white boards. Read the expression as a class, “1 + 2.”
4. Ask, “How many books are there in all?” Circle all of the books and invite students to write the answer on their personal white boards. Say the number sentence together (while the teacher writes it), “1 + 2 = 3.”
5. Display the full reader picture. Say, “There are 3 copies of *Chicka Chicka Boom Boom*. There are 2 copies of *The Hungry Caterpillar*.”
6. Have students retell the story while drawing a picture of the books. Read the expression as a class, “3 + 2.”
7. Repeat Step 4.



Part 2: Practice

Materials: (S) Paper folded in half, 1 red and 1 green crayon

Pair students and send them to prepared tables. Instruct them to draw 1 addition story on each half of the paper.

1. Say, "Use your paper and crayons to draw my addition story: The hungry caterpillar ate 1 red apple and 2 green pears. How many pieces of fruit did he eat in all?"
2. Instruct partners to retell the story with the question, compare drawings, and solve. When the partners agree on the answer, they write the answer on their paper.
3. Say the number sentence together (while the teacher writes it), " $1 + 2 = 3$."
4. Repeat Steps 1–3 with another addition story: 2 boys are reading. 1 girl is reading. How many children are reading all together?



NOTES ON MULTIPLE MEANS OF ENGAGEMENT:

Provide opportunities for multiple retellings of the addition story. Use prompts such as, "There are..." Do not insist on precision, but rather encourage statements that meaningfully communicate two parts to the addition story.

Student Debrief (3 minutes)

Lesson Objective: Solve *put together with total unknown* story problems with objects from the story and drawings.

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 toward 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.

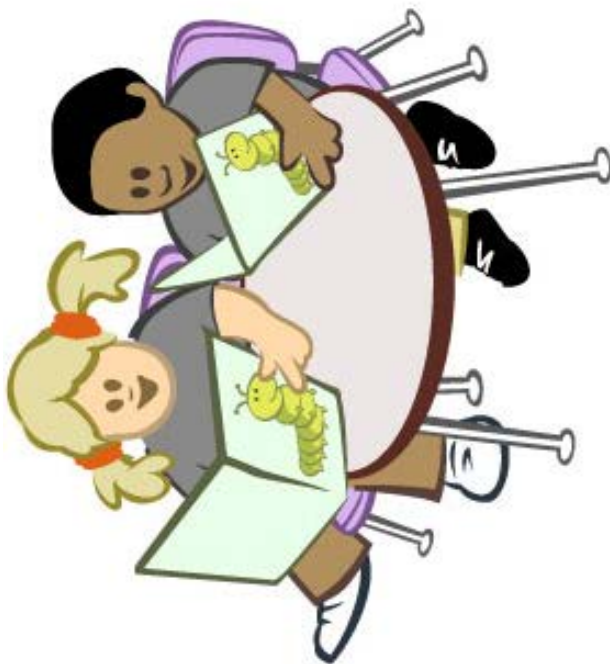
- How did the pictures help you solve the addition stories?
- Pretend you don't have any objects or pictures to count. How can drawing help you solve?
- (Write the number sentence $3 + 2 = 5$.) This is the number sentence we used to tell how many children were reading at the library. We used the same number sentence to tell how many books there were in all. How can the same number sentence work for both stories?
- Did you notice anything cool about the stories you practiced with your partner? Let's look at and say their number sentences, " $2 + 1 = 3$ and $1 + 2 = 3$."

MP.8



CENTER CONNECTION:

Create 5 bags of counters that students can use to create stories. Bags should contain 2–5 objects in two different colors (e.g., 1 blue bear and 2 red bears). Invite partners to make addition statements or number sentences based on the objects (e.g., "1 bear and 2 bears make 3 bears" or "1 plus 2 equals 3").



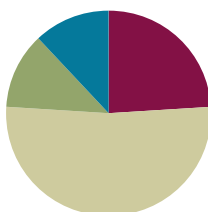
reader picture

Lesson 10

Objective: Create and solve addition story problems using drawings.

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)

- Stand Up on Your Number **PK.CC.3, PK.CC.4** (4 minutes)
- Swinging Monkeys **PK.CC.1** (2 minutes)

Stand Up on Your Number (4 minutes)

Materials: (T) Numeral cards 5–9 (Lesson 1 Template) (S) per pair: 1 baggie of 5–9 interesting objects, 1 type per bag (buttons, coins, beans, crayons, erasers, etc.)

Conduct activity as outlined in Lessons 8–9, but use numeral cards 5–9.

Swinging Monkeys (2 minutes)

Note: Varying movements helps keep counting exercises fresh as students strengthen their core fluency counting skills.

- T: Miguel Monkey loves to swing through the jungle! Pretend you're Miguel Monkey. Reach your arms up to grab the vines and swing through the jungle.

Demonstrate stretching one arm at a time into the air, mimicking a monkey grabbing vines and swinging through the jungle. Count to 18, maintaining synchronous movement with the count. Repeat to 20.

Application Problem (3 minutes)

Materials: (T) 4 balls of 1 type (for example, tennis balls), 1 ball of a different type (for example, basketball), basket (S) personal white board

Place 2 balls in the basket and 3 balls outside of the basket where students can easily see them. Give students time to observe the balls and share what they observe. Ask students to draw the balls on their personal white boards.



Note: This problem transitions directly into the Concept Development, where students create addition stories. Their observations about the balls can be used as a basis for addition stories. Using easy-to-draw objects, such as balls, will accelerate the drawing process.

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

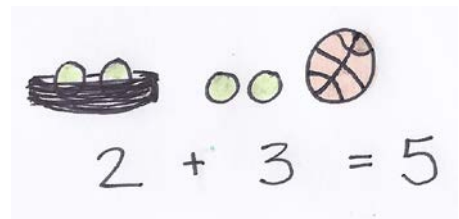
Materials: (T) Balls and basket from Application Problem (S) Personal white board

Place 2 balls in the basket and 3 balls outside of the basket where students can easily see them.

1. Say, "Let's create an addition story about these balls." Guide students to say a complete sentence about the balls in the basket.
2. Have students turn to a neighbor and say a sentence about the balls outside of the basket. Have them draw their story on their personal white boards.
3. Say, "Now, we need to ask a question about the balls. What question could we ask?" Guide students to see that they can ask a *how many* question about the balls.
4. Say the full addition story as a class: "There are 2 balls in the basket. There are 3 balls outside of the basket. How many balls are there in all?"
5. Have students exchange drawings and count to solve. Write the number sentence on the board ($2 + 3 = 5$) as students say "2 plus 3 equals 5."
6. Challenge students to think of a different addition story using the same number sentence of $2 + 3 = 5$. Reduce the language scaffolding as students become more comfortable telling addition stories.

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

Provide sentence stems for students who are struggling to produce complete sentences: "There are ___ balls in the basket" and "There are ___ balls outside of the basket."



Part 2: Practice

Materials: (S) Bag containing 2–5 objects, blank paper, crayons

Consider using familiar objects from the previous lessons in Topic B (e.g., bear counters, fish cutouts, apple cutouts, paper dolls) to provide familiar contexts for creating addition stories.

1. Tell students that they will create their own addition stories. Release students who do not want a bag to work independently on their drawings.
2. Demonstrate how to use the objects in the bag to help create a story.
3. Release students with bags to work on their drawings. As students complete their drawings and are ready to share their stories, match them with a partner.
4. Encourage students to say a number sentence to match their drawings (e.g., “1 plus 4 equals 5”).
5. As time permits, have students dictate their addition stories while writing them on the drawing or a sticky note.


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

Some students will be able to create stories using imagination alone, while others will need objects to help initiate their stories and keep the total within 5. Encourage students who are ready to create their own contexts.

Student Debrief (3 minutes)

Lesson Objective: Create and solve addition story problems using drawings.

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 toward 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.

- Invite a few students to share their addition stories and drawings. Have the class solve. (Consider taking a video of students sharing their stories for their portfolios.)
- Where was the question in your addition story? At the beginning or the end?
- How did your drawing help your partner answer the question?
- What was fun about creating an addition story? What was hard?


CENTER CONNECTION:

Create a focus on math at the library center with books recommended by the National Association for the Education of Young Children (<http://www.naeyc.org/files/tyc/file/MathbooklistSchickedanzexcerpt.pdf>).

- Baker, K. *Quack and Count*
- Fox, M. *Hattie and the Fox*
- London, J. *Count the Ways, Little Brown Bear*



Topic C

Contextualizing Subtraction Stories to Solve

PK.OA.1, PK.CC.2, PK.CC.3, PK.CC.4

Focus Standards:	PK.OA.1	Demonstrate an understanding of addition and subtraction by using objects, fingers, and responding to practical situations (e.g., if we have 3 apples and add two more, how many apples do we have all together?).
Instructional Days:	5	
Coherence -Links to:	GK–M1	Numbers to 10
	GK–M4	Number Pairs, Addition and Subtraction to 10

In Topic C, children shift focus to subtraction stories with numbers 1 to 5, again acting them out, using fingers, manipulating objects, drawing, and counting pictorial representations to model the problem (**PK.OA.1**). Throughout this topic, students will use these tools to count the total number of objects, the number taken away, and the result.

In Lesson 11, children act out *take from with result unknown* stories, counting themselves to find how many are left. For example, "Three friends are dancing. One friend stops to sit down. How many friends are dancing now?" Children take turns being a part of the action and counting the whole (3 friends), the number taken away (1 friend), and the result (2 friends). Asking subtraction questions involves new vocabulary, so children will again restate the situation and the question in their own words to practice this skill.

In Lesson 12, children begin to use objects to solve subtraction stories (**PK.OA.1**). For example, they use teddy bear counters to model and solve the following: "Five bears are eating dinner. Three bears leave to sleep in a cave. How many bears are eating now?" Children move and hide the objects to solve, for example, using a cup to represent a cave. Similarly to Topic B, children manipulate objects reminiscent of the story.

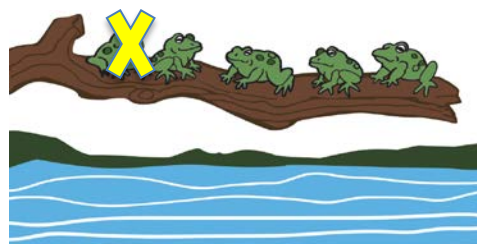
In Lesson 13, children make subtraction statements: "4 beads take away 2 beads is 2 beads." (In Pre-Kindergarten, the term *take away* better represents the action of subtraction; *minus* is terminology learned in Kindergarten.) They learn to cross off a part in drawings to show subtraction (see image on next page). The teacher writes a number sentence ($4 - 2 = 2$) to provide exposure to equations; however, children are not expected to write or master number sentences in Pre-Kindergarten.



$$\begin{array}{r} 4 \text{ take away } 2 \text{ is } 2 \\ 4 - 2 = 2 \end{array}$$

In Lesson 14, children work with both objects and drawings to solve *take from with result unknown* problems inspired by the popular children's song, "Five Green and Speckled Frogs." Students cross off a part to subtract and make the statement, "5 take away 1 equals 4," as shown at right. Then, students begin to draw their own stories about a frog gobbling up some bugs on a log.

Students have an opportunity to create their own subtraction stories in Lesson 15. Again, they create detailed drawings to accompany their stories and to help them share and solve one another's problems. Teachers continue to provide language support when children ask and answer questions.



In Topic C Fluency Practice, students begin by practicing *put together* story situations; they draw a numeral card and take the corresponding number of bears. Students continue to practice rote counting to 20 and counting a group of 10 in various configurations via activities such as Feed the Frog. The Hide and Seek activity reinforces partners of 3 and 4 as students hide a part of the whole, a foundational concept for understanding subtraction.

A Teaching Sequence Toward Mastery of Contextualizing Subtraction Stories to Solve

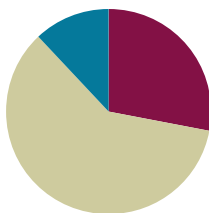
- Objective 1:** Act out *take from with result unknown* story problems to solve.
(Lesson 11)
- Objective 2:** Solve *take from with result unknown* story problems using objects from the story.
(Lesson 12)
- Objective 3:** Represent *take from with result unknown* story problems using number sentences.
(Lesson 13)
- Objective 4:** Solve *take from with result unknown* story problems with objects from the story and drawings.
(Lesson 14)
- Objective 5:** Create and solve subtraction story problems by drawing.
(Lesson 15)

Lesson 11

Objective: Act out *take from with result unknown* story problems to solve.

Suggested Lesson Structure

■ Fluency Practice	(7 minutes)
■ Concept Development	(15 minutes)
■ Student Debrief	(3 minutes)
Total Time	(25 minutes)



Fluency Practice (7 minutes)

- How Many in All? PK.CC.3, PK.CC.4, PK.OA.1 (5 minutes)
- Swinging Monkeys PK.CC.1 (2 minutes)

How Many in All? (5 minutes)

Materials: (S) Single-sided numeral cards 0–5 (Lesson 1 Template), teddy bear counters in a cup (different colors for each partner)

Note: This partner activity provides experiences with put together story situations while providing practice with counting, cardinality, and one-to-one correspondence with up to 10 objects. Circulate to assess informally.

- Each partner draws a numeral card and takes the corresponding number of bears.
- Partners tell each other how many bears: "I have 2 red bears" or "I have 3 green bears."
- Partners put their bears together and count to determine how many bears in all: "We have 5 bears in all."

Students put their bears back in the cup, pick new cards, and repeat the activity.

Swinging Monkeys (2 minutes)

Note: This activity targets one of the core fluencies for Pre-K students—rote counting to 20. Practicing the same movement two days in a row enables students to become comfortable with the physical activity, so it can be easily repeated in later lessons.

T: Miguel Monkey is ready to swing again! Pretend you're Miguel Monkey. Reach your arms up to grab the vines and swing through the jungle as we count to 19 the Say Ten Way.

Demonstrate stretching one arm at a time into the air, mimicking a monkey grabbing vines and swinging through the jungle. Count to 19 the Say Ten Way, keeping the movement synchronous with the count. Then, count to 19 the regular way.

Concept Development (15 minutes)

Part 1: Concept Introduction

Materials: (T) White board or chart paper

Note: The Application Problem is embedded in today's Concept Development, a structure that allows more time for students to act and make sense of the problems.

Prepare the math story theatre. Rotate actors so that all children have an opportunity to act and solve.

1. Invite 3 children to sit on the stage. While saying the word problem, tap students to indicate when they become part of the action. Say, "Listen to my **subtraction story**: Three friends are dancing. One friend stops to sit down."
2. Ask, "Who can tell the story again?" Then ask, "How many friends did we **take away**?"
3. Ask, "How many friends are dancing now?" Provide wait time. Then, signal the students to answer. Write 2 on the board, saying "2 friends."
4. Ask, "Who remembers the question?" Guide half the children to restate the question and half to say the answer.
5. Select four new actors. Say, "Four frogs are on a log. One jumps off." Invite a student to retell the story.
6. Repeat Steps 2–3, asking, "How many frogs **are left**?"
7. Repeat as time allows with other problems, such as: "Five dancers are on the stage. One dancer jumps off the stage. How many dancers are left?"

Part 2: Practice

Materials: (S) Per pair: 4 paper doll cards (Lesson 6 Template)

Pair students and send them to tables with 2 paper dolls.

Replace Partner A and B with the children's names.

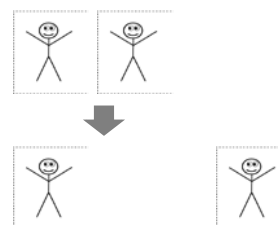
MP.2

1. Say, "Listen to my story. Partner A, make the paper dolls match my story. Two children are eating lunch. One child leaves to play on the slide."
2. Instruct Partner B to retell the story and to check that the paper dolls match.
3. Ask, "How many children are eating now?"
4. Have both partners repeat the question and agree on the answer (one child).
5. Give each pair two more paper dolls. Have children switch roles and repeat Steps 1–4 with other word problems such as: Four kids are in the art center. Two kids go to a different center. How many kids are left in the art center?



NOTES ON MULTIPLE MEANS OF ENGAGEMENT:

Flexible student groupings can allow for challenging additional activities for those who are ready. Some possible activities might include: using larger numbers, encouraging students to create their own subtraction stories, and alternating between addition and subtraction stories.



Student Debrief (3 minutes)

Lesson Objective: Act out *take from with result unknown* story problems to solve.

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 toward 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 (**are left**, **subtraction story**, **take away**).

- Today we told a **subtraction story** about frogs. In our subtraction story, did we add or **take away**?
- We asked a question about our frog subtraction story, "How many frogs **are left**?" Can anyone think of a different way to ask the question?
- How does a group of people change when we take away people?
- How did acting help you to understand the subtraction story?
- How did acting help you to remember the question?

**CENTER CONNECTION:**

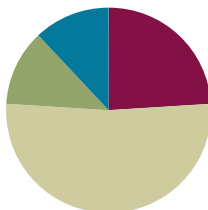
At the dramatic play center, invite students to act out subtraction stories. For example, one student might be the lifeguard at the pool where 5 children are swimming. Encourage students to make up stories as students get out of the pool, such as, "Five children were in the pool. Two children got out. How many children were left?"

Lesson 12

Objective: Solve *take from with result unknown* story problems using objects from the story.

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)

- Stand Up on Your Number **PK.CC.2** (4 minutes)
- Balance Challenge **PK.CC.1** (2 minutes)

Stand Up on Your Number (4 minutes)

Materials: (T) Numeral cards 6–10 (Lesson 1 Template) (S) Per pair: one baggie of 6–10 interesting objects, one type per bag (buttons, coins, beans, crayons, erasers, etc.)

Note: Students maintain fluency with counting and reading written numbers through 10. Observe how children organize objects for counting.

Pass out one baggie to each pair of students.

- T: With your partner, count the things in your bag.
(Provide time to count.)
- T: (Show numeral card 10.) What number is this?
- S: 10.
- T: If you have 10 things, stand up with your partner. If you have a different number of things in your bag, put your hands on your head.

Continue showing different numeral cards, allowing partners to count again the items in their bag to determine whether they should stand up or put their hands on their head.



NOTES ON MULTIPLE MEANS OF ENGAGEMENT:

Provide assistance for students who are struggling with counting by prompting them to organize their manipulatives in a linear configuration. Challenge students who are ready to arrange their objects in a circular or scattered configuration before counting.

Balance Challenge (2 minutes)

Note: This activity addresses one of the core fluency goals for the grade—rote counting to 20. Varying the stop number challenges students to remain attentive to the counting sequence.

T: Let's balance on one foot while we count to 5. Ready?

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

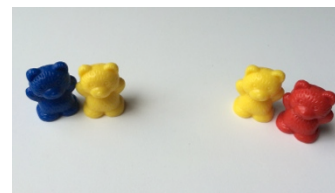
Repeat to 10, then to 15. If time permits, count again to 15 the Say Ten Way.

Application Problem (3 minutes)

Materials: (S) 4 teddy bear counters per pair

Select 4 students to act out this story—4 students are sitting on the rug. 2 students go back to their seats. How many students are left on the rug?

Give each pair of students 4 bear counters. Ask Partner A to show the first part of the story as it is acted out. Ask Partner B to show the next part of the story. Ask, "How many students are left on the rug?" Provide wait time, and then signal students to answer. Ask, "How did you know?"



Note: This is a *take from with result unknown* problem. Acting the story out and using objects to solve serve as a transition to working solely with objects during the Concept Development.

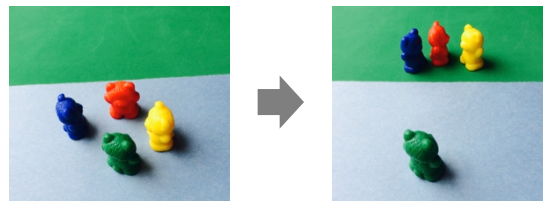
Concept Development (13 minutes)

Part 1: Concept Introduction

Materials: (T) Strip of blue construction paper, 4 teddy bear counters, cup or bowl (S) numeral writing rectangle (Lesson 5 Template 2) in personal white board

Distribute a personal white board to each student. Children are asked to count out objects from a larger group. The teacher demonstrates this in Part 1, giving children a model for counting and organizing their objects based on the subtraction story.

1. Say, "Listen to my **subtraction** story: There were 4 bears swimming in the river. Three bears got out of the river."
2. Say, "Tell me what was happening in the story at first." After students respond, model counting out 4 bears and place them on the construction paper strip (river).
3. Say, "Tell me what happened next." After students respond, take 3 bears off the construction paper.
4. Say, "Hmm...who can think of a good question for this story?" (Pause.)

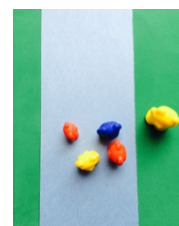


5. If necessary, rephrase the question, "How many bears are swimming now?" Provide wait time, and then signal students to answer on their boards. Write "1 bear" on the board and read it. Ask, "How did you know the answer?"
6. Guide students to say the number statement: "4 bears take away 3 bears is 1 bear."
7. Replace the construction paper with a cup. Repeat Steps 1–6 with the following word problem: Five bears were eating when they heard a noise. 2 bears hid in a cave (cup). This time, have students ask and answer the question with a partner, "How many bears were still eating?"

Part 2: Practice

Materials: (S) Cup or bowl with 5 teddy bear counters, strip of blue construction paper, numeral writing rectangle (Lesson 5 Template 2) in personal white board

1. Say, "Use your bears to show my subtraction story: Five bears are fishing in the river. One bear gets out of the river."
2. Have students turn to a partner and retell the subtraction story. Encourage them to set up their bears as they retell.
3. Guide one partner to ask a question (e.g., "How many bears are fishing now?" or "How many bears are left?") Provide wait time as children answer on their boards, then signal for them to share answers with a partner. Circulate and comment, "Yes! You wrote 4! There are 4 bears left."
4. Invite partners to remember the question and share. Then ask, "How did you know the answer? Tell your partner."
5. Guide students to say the number statement, "5 bears take away 1 bear is 4 bears."
6. Repeat Steps 1–5 with the following word problem: Five bears are eating dinner. Three bears leave to sleep in a cave (cup). How many bears are eating now? As students work, make sure that they are counting the bears that are left rather than those that are hidden.



Student Debrief (3 minutes)

Lesson Objective: Solve *take from with result unknown* story problems using objects from the story.

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 toward 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.



CENTER CONNECTION:

Have children fill five cups of water at a water table in the sensory center. Ask them to solve subtraction stories such as: "There were 5 cups of water. 1 cup spilled. How many cups of water are left?" Invite students to use the remaining cups to create more subtraction stories.

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

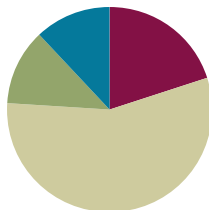
- In our stories, did we add more bears or take away bears? (Students respond.) We call this **subtraction**.
- Show me 5 bears. If I ask you to take away 2 bears, what will you do? How many bears are left?
- When we take away bears, what happens to the group of bears?
- (Retell a subtraction story.) Who remembers the question?

Lesson 13

Objective: Represent *take from with result unknown* story problems using number sentences.

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)

- Numbers in Rice **PK.CC.2** (3 minutes)
- Swim and Count **PK.CC.1** (2 minutes)

Numbers in Rice (3 minutes)

Materials: (T) Shape cutouts (Lesson 13 Fluency Template), if needed (S) Tray of sand or rice (or sealed plastic baggie with paint)

Note: In this activity, students practice forming numerals kinesthetically, strengthening their memory in the process. In this variation, point to various shapes throughout the classroom (or show a shape card) and invite students to hold up their fingers to match the number of sides or corners, rather than saying it. Provide wait time for those who need to count to do so. (Students repeat the chant below as they practice forming the numeral in the tray of sand or rice.)

1. Point to a shape (e.g., a square). Ask, "How many sides? Show me on your fingers." (Students show silently.)
2. Show the corresponding numeral card. (Students say the number name.)
3. Invite students to say the number formation chant and write the numeral in the air with your finger.

0: Curve from the top; be a hero! Close the loop and make a zero.
 1: Top to bottom, then I'm done. I just wrote the number 1.
 2: Half a moon, there's more to do; slide to the right, I wrote a 2.
 3: Backwards C, backwards C, that is how I write a 3.
 4: Down the side, to the right some more. Top to bottom, I've written 4.
 5: Down the side, around a hive. Give it a hat. I've written 5.

Swim and Count (2 minutes)

Note: This fluency activity challenges students to remain attentive to the counting sequence while engaging in physical exercise.

T: Everyone stand up, put your swim goggles on, and dive into the pool! Swim and count with me. We'll stop when we get to 20.

S: 1, 2, 3...20 (keeping arm movements synchronous with the count).

T: Great counting! Hold your nose! Let's dive under water!

Count to 20 again the Say Ten Way.

Application Problem (3 minutes)

Materials: (S) Per pair: 10 blocks or linking cubes in a baggie

Pair students and distribute the baggies. Ask one child in each pair to take 5 blocks out of the baggie and put them in a line. Ask the other child to take 5 blocks out and put them in a different line. Have each partner take turns touching and counting (out loud) all the blocks.

Note: This problem asks students to practice organizing and counting 10 objects and make 2 groups of 5. They will use these groups of 5 blocks in the Concept Development.



Concept Development (14 minutes)

Part 1: Concept Introduction

Materials: (T) 5 blocks (S) Problem Set in personal white board

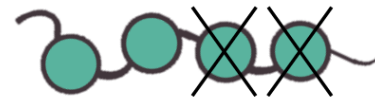
Seat children in a semicircle and select blocks that are large enough for all to see. Have them insert the Problem Set template into their board.

1. Say: "Listen to my subtraction story: David's tower is 5 blocks tall. Two blocks fall off. How many blocks are left?"
2. Say: "Tell me what happens first in the story." Draw a tower of 5 blocks while students do the same on their Problem Set in their personal boards.
3. Say: "Tell me what happens next." Cross off two blocks while students do the same.
4. Point to the 3 blocks, asking, "How many blocks are left?" Provide wait time, then signal students to answer by showing their boards.
5. Say the number sentence: "5 blocks take away 2 blocks is 3 blocks." Have students repeat.
6. Say: "There's a special way to tell about this subtraction story: 5 take away 2 equals 3. Say the number sentence with me (while writing on the board)."



$$\begin{array}{l} 5 \text{ take away } 2 \text{ is } 3 \\ 5 - 2 = 3 \end{array}$$

7. Repeat Steps 2–5 with the following word problem: There are 4 beads on the necklace. Two beads come off. How many beads are left?



$$\begin{array}{r} 4 \text{ take away } 2 \text{ is } 2 \\ 4 - 2 = 2 \end{array}$$

Part 2: Practice

Materials: (S) 5 blocks or linking cubes from Application Problem, Problem Set in personal white board

Pair students to work on the Problem Set if needed.

1. Say, "Listen to my subtraction story. The tower is 5 blocks tall. Three blocks fall off."
2. Have children turn to a partner and retell the subtraction story. Encourage them to match their blocks to the story.
3. Point to the Problem Set and say: "This is a picture of the tower. Let's cross off the blocks that fell."
4. Ask, "How many blocks are left?" Have students repeat the question aloud to a partner. Then, have them solve and write the answer on their Problem Set.
5. As a class, read the number sentence, "5 blocks take away 3 blocks is 2 blocks. 5 take away 3 equals 2."
6. Repeat Steps 2–5 with the following word problem: There are 4 beads on the necklace. One bead comes off. How many beads are left?

MP.2



NOTES ON MULTIPLE MEANS OF REPRESENTATION:

Often students learn a concept in an isolated fashion but have difficulty applying their knowledge to new situations. Provide opportunities for students to apply their knowledge of addition and subtraction stories in a variety of settings throughout the day, e.g., during snack, lunch, or in the block corner.

Student Debrief (3 minutes)

Lesson Objective: Represent *take from with result unknown* story problems using number sentences.

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 toward 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.

- Think about our last subtraction story. How many beads were on the necklace at first? (Show 4



CENTER CONNECTION:

Continue to incorporate subtraction stories into the dramatic play and sensory centers as described in previous lessons. Now ask children to say the number sentence after solving. Write the equation to help guide their sentences at first, but wait to write until after children have said the number sentence as they become proficient.

beads.) How many beads fell off? (Remove 1 bead.) How many beads are left?

- How would we say that as a number sentence? 4 take away...
- (Use 4 beads.) Listen and watch (moving beads), "3 beads *and* 1 more bead make 4 beads." Now, watch again, "4 beads *take away* 1 bead is 3 beads." What was different this time?

NYS COMMON CORE MATHEMATICS CURRICULUM Lesson 13 Problem Set PK•5

Name Nate Date _____





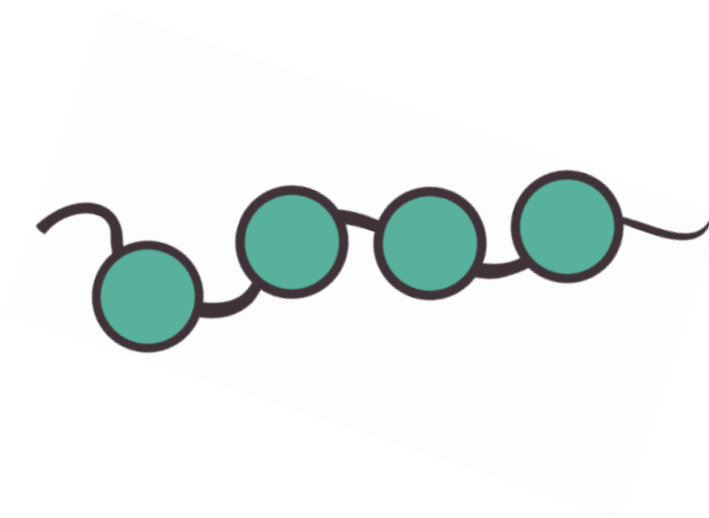


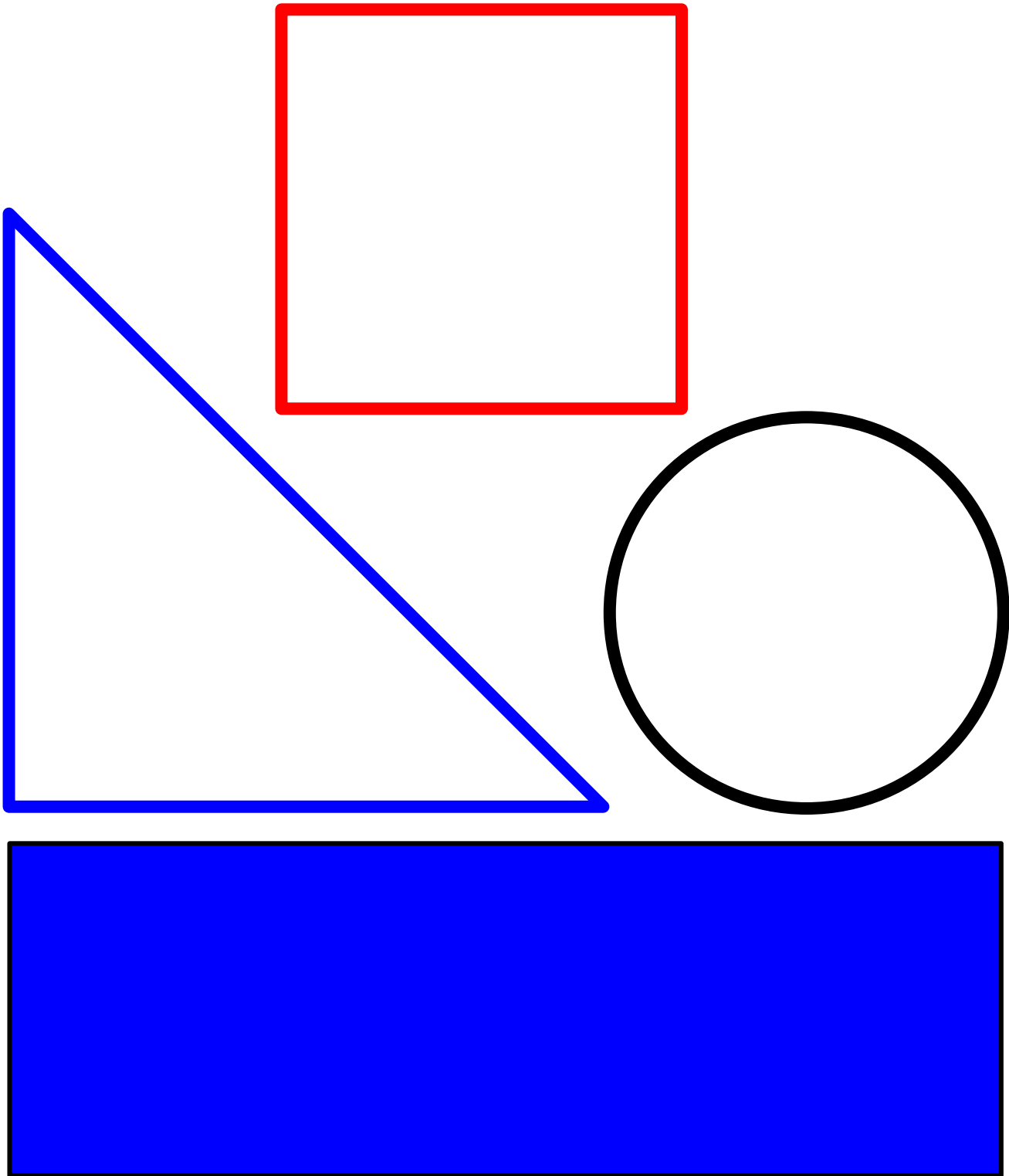
COMMON CORE Lesson 13: Represent *take from with result unknown* story problems using number sentences. Date: 8/15/14 engage^{ny} S.C.1

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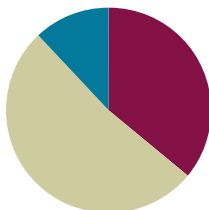
shape cutouts

Lesson 14

Objective: Solve *take from with result unknown* story problems with objects from the story and drawings.

Suggested Lesson Structure

■ Fluency Practice	(9 minutes)
■ Concept Development	(13 minutes)
■ Student Debrief	(3 minutes)
Total Time	(25 minutes)



Fluency Practice (9 minutes)

- Feed the Frog **PK.CC.4** (3 minutes)
- Hide and Seek **PK.CC.3** (4 minutes)
- Alligator Snaps **PK.CC.1** (2 minutes)

Feed the Frog (3 minutes)

Materials: (T) Numeral cards 0–10 (Lesson 1 Template) (S) 10 counters (beans)

Note: This activity maintains the children's ability to create and count a group of up to 10 objects in various configurations.

T: Pretend these beans are bugs to feed a hungry frog. (Show numeral card 5.) How many bugs does the hungry frog want to eat?

S: 5.

T: Count out 5 bugs and put them in a line. (Students do.)

T: Make your hand into a hungry frog and count as you eat each bug.

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

Repeat with the following suggested sequence: 6, 8, 7, 10, 9. If children are ready, have them organize their bugs into circles or 5-groups instead of 1 line.

Hide and Seek (4 minutes)

Materials: (S) Per pair: cup or bowl, 3 counters

Note: This activity prepares children to subtract by hiding a part in the Concept Development. It also reinforces partners of 3.

Pair students and give each pair a cup or bowl with counters. Make one partner the hider and the other partner the guesser.

T: How many bears are in your cup?

S: 3.

T: Guessers, close your eyes. Hiders, hide this many bears under your cup. (Show 2 fingers.)

T: Guessers, open your eyes. How many bears are not hiding?

S: 1.

T: Guess how many bears are hiding.

S: I don't know. → 2.

T: Hiders, show how many bears are hiding.

Have students switch roles and repeat, this time hiding 1 bear. Give partners a chance to play independently when they are ready.

Alligator Snaps (2 minutes)

Note: This activity targets one of the core fluencies for Pre-K students, rote counting to 20. Varying the stop number challenges students to remain attentive to the counting sequence.

T: It's Allie Alligator's lunchtime again. Let's pretend we're Allie catching fish for lunch. She wants 18 fish today. Let's count to 18 the Say Ten Way.

Demonstrate arms open wide, one above the other, mimicking alligator jaws. Tell students that Allie is still hungry, and count once more to 19 the regular way.

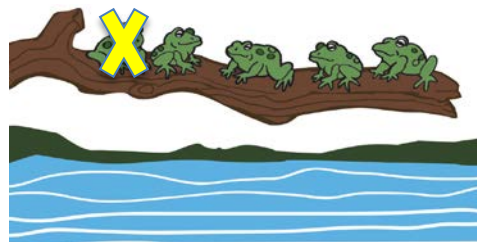
Concept Development (13 minutes)

Part 1: Concept Introduction

Materials: (T) 5 frogs picture (Template) (S) 5 frogs picture (Template) inserted in personal white board

Note: This Concept Development was inspired by the popular children's song, "5 Green and Speckled Frogs."

1. Display 5 frogs picture. Say, "Listen to my new subtraction story: Five green and speckled frogs sat on a speckled log. One jumped into a pool where it was nice and cool."
2. Say, "Tell me what happens first in the story. Does our picture show 5 frogs?" Have children count and confirm.
3. Say, "Tell me what happens next." Cross off 1 frog while students do the same.
4. Ask, "Who knows what the question might be?" Listen to different thoughts. Reiterate, "How many frogs are left?" Students repeat and count the remaining frogs.



$$5 - 1 = 4$$

- Say the number statement together, "5 frogs take away 1 frog is 4 frogs." Write the number sentence ($5 - 1 = 4$) saying, "5 take away 1 equals 4," and read it as a group.
- Ask, "What does the 5 in our number sentence tell us about?" Repeat the question for the numerals 1 and 4.
- Say, "Let's draw a subtraction story about the delicious bugs the frogs like to eat. Turn to the blank side of your board." Say: "Four bugs were on a log. A frog gobbled up 2 of them. How many bugs were still on the log?" Ask volunteers to retell each part of the story, pause to draw, and check with a neighbor. Encourage quick, simple drawings.
- Ask, "Who can remember the question?" Then, say the number sentence as a class, repeating Steps 5–6.

Part 2: Practice

Materials: (S) Per student: 5 frogs picture (Template) and numeral writing rectangle (Lesson 5 Template 2) inserted in personal white board

Pair students and send them to tables.

- Say, "Five green and speckled frogs sat on a speckled log. Two jumped into a pool where it was nice and cool. How many were sitting on the log?"
- Instruct partners to retell the story with the question. They cross off 2 frogs and check to make sure the picture matches the story.
- Write the number sentence on the board ($5 - 2 = 3$) while saying together, "5 take away 2 equals 3."
- Say, "Under your picture, draw my new subtraction story with bugs: Four little bugs were crawling on a log. A frog gobbled up 3 of them. How many bugs were left?"
- Instruct partners to compare their drawings and solve.
- Write the number sentence on the board ($4 - 3 = 1$) while saying together, "4 take away 3 equals 1."



NOTES ON MULTIPLE MEANS OF ACTION AND EXPRESSION:

Reread the problem one last time to allow students to check their work. Prompt students to circle the part of their drawing that answers the question. This provides students a chance to analyze their work and correct as needed.

Student Debrief (3 minutes)

Lesson Objective: Solve *take from with result unknown* story problems with objects from the story and drawings.

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 toward meeting the lesson objective.

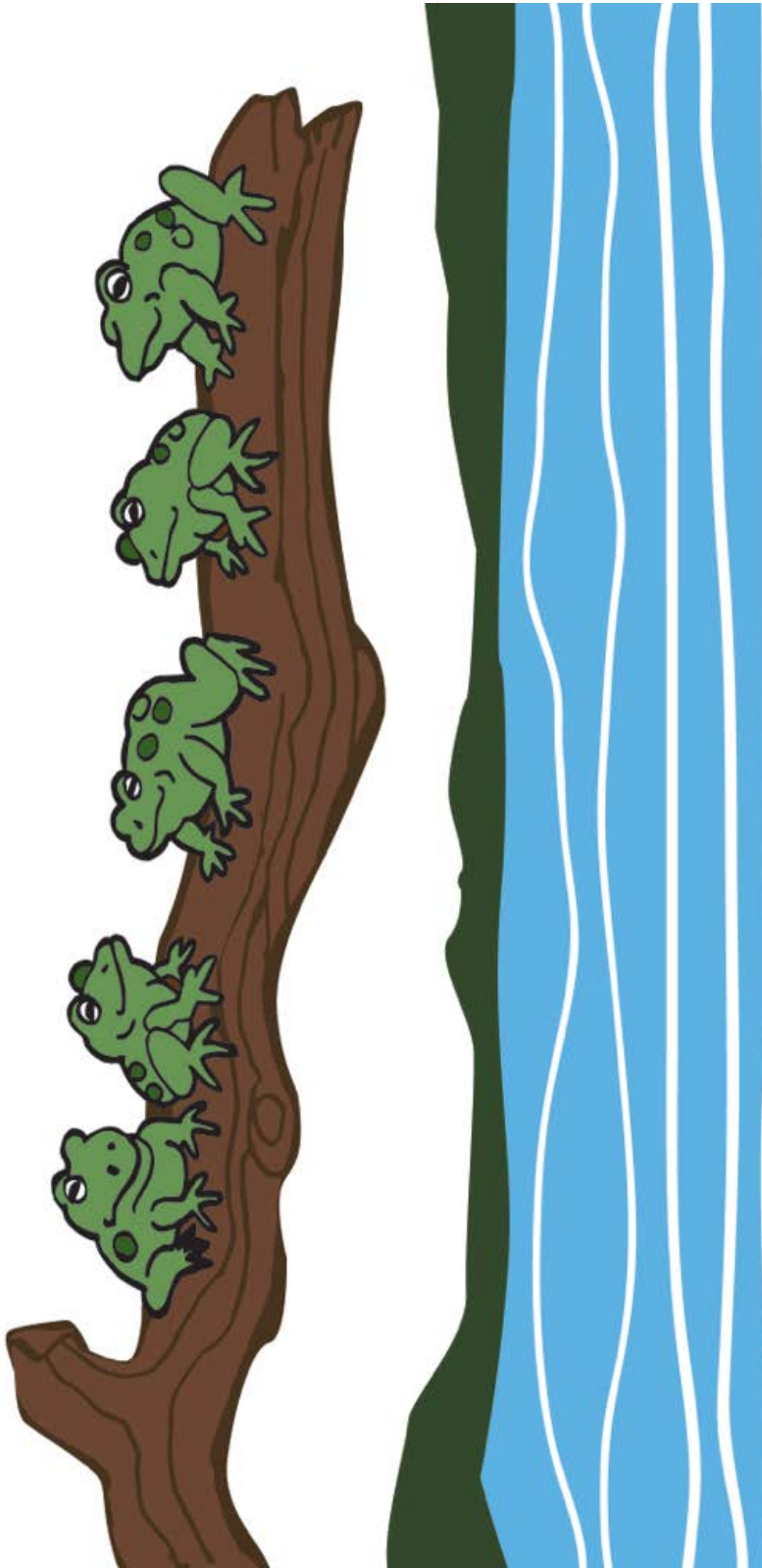
As students complete the Practice portion of the Concept Development, listen for misconceptions or misunderstandings that can be addressed in the Debrief.

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

- When we say take away, do things get put together or separated?
- What was different about the ways in which we showed subtraction stories today? Which way was your favorite? Why?
- (Write the number sentence $4 - 3 = 1$.) We used this number sentence to tell how many bugs were left in our last subtraction story. Could this same number sentence work for another story? Can you think of one?

**CENTER CONNECTION:**

While children are in the art center, look for opportunities to tell subtraction stories about what they are doing. For example, "Jonah had 5 crayons. He gave his red crayon to Sophie. How many crayons does Jonah have left?" Encourage children to solve and say the number sentence.



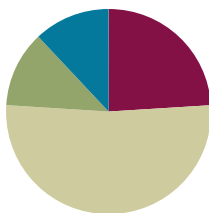
5 frogs picture

Lesson 15

Objective: Create and solve subtraction story problems by drawing.

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)

- Hide and Seek **PK.CC.3** (4 minutes)
- Elephant Splashes **PK.CC.1** (2 minutes)

Hide and Seek (4 minutes)

Materials: (S) Per pair: cup or bowl, 4 counters

Note: This activity prepares children to subtract by hiding a part. It also reinforces partners of 4.

Pair students and give each pair a cup or bowl with counters. Make one partner the hider and the other partner the guesser.

T: How many bears are in your cup?

S: 4.

T: Guessers, close your eyes. Hiders, hide this many bears under your cup. (Show 1 finger.)

T: Guessers, open your eyes. How many bears are not hiding?

S: 3.

T: Guess how many bears are hiding.

S: I don't know. → 1.

T: Hiders, show how many bears are hiding.

Have students switch roles and repeat, this time hiding 1 bear. Give partners a chance to play independently when they are ready.

Elephant Splashes (2 minutes)

Note: This activity targets one of the core fluencies for Pre-K students, rote counting to 20.

T: Eli Elephant wants to splash and play again! Let's pretend we're Eli. Let's swing our trunks to splash our friends as we count to 20 the regular way.

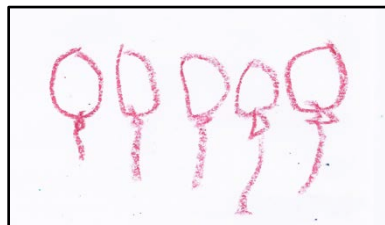
Demonstrate swinging an arm back and forth, mimicking an elephant's trunk. Count to 20 again the Say Ten Way, keeping the movement synchronous with the count.

Application Problem (3 minutes)

Materials: (T) 5 balloons (S) Personal white board

Display the 5 balloons where children can easily see them. Ask students to draw what they see on their boards and make a statement about it. Have students put their drawing next to a neighbor's. Have them count all of the balloons they drew.

Note: This problem transitions directly into the Concept Development where children will create subtraction stories. Using easy-to-draw objects such as balloons will speed up the drawing process.

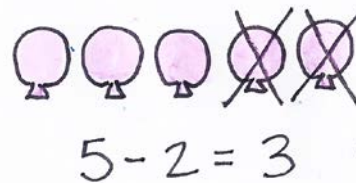


Concept Development (13 minutes)

Part 1: Concept Introduction

Materials: (T) 5 balloons from Application Problem (S) Personal white board

1. Say, "Let's create a subtraction story about our balloons." Instruct students to say a complete sentence about the balloons.
2. Have students turn to a neighbor and say a sentence about taking away some balloons. Tell students to be specific about how many balloons will be taken away.
3. Select one balloon scenario and have students draw (e.g., "Two balloons pop.")
4. Say, "Now, we need to ask a question about the balloons. What question could we ask?" Lead students to see that they can ask a *how many* question about the balloons.
5. Say the full subtraction story as a class: "We have 5 balloons. Two balloons pop. How many balloons are left?"
6. Have children exchange drawings and cross off balloons to solve. Write the number sentence on the board ($5 - 2 = 3$) while saying together: "5 take away 2 is 3."
7. Challenge students to think of a different subtraction story about taking away 2 balloons. Reduce the language scaffolding as children become more comfortable telling subtraction stories.
8. Write the number sentence for the new story: $5 - 2 = 3$. Ask students to talk about what the 2 stories have in common.



Part 2: Practice

Materials: (S) Baggie containing 2–5 beads and string, blank paper, crayons

Children can use the beads and string as a context for creating their own subtraction story. If they prefer to develop their own context, encourage them to do so.

- MP.1**
1. Tell children that they will create their own subtraction stories.
 2. Say: "You are going to use the beads and string in your baggie to help you create a story, just like we did with the balloons."
 3. Circulate and support students as they create 2 statements, and then ask a question (e.g., "I had 4 beads on my necklace. Two beads fell off. How many beads do I have now?").
 4. While students draw, check for understanding by having them quietly share their stories one-on-one.
 5. After students complete their drawings, match them with a partner to share stories and to solve by crossing off objects.
 6. When time permits, have children dictate their subtraction stories while the teacher writes them on the drawing or on a sticky note.



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

Allow students to respond in a variety of ways. Some students may need to draw their picture first to support their subtraction story. Others may need to tell their story to a partner before representing the story with pictures.

Student Debrief (3 minutes)

Lesson Objective: Create and solve subtraction story problems by drawing.

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 toward 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.

- Invite a few students to share their subtraction stories and drawings. Have the class draw and solve. (Consider taking a video of students sharing their



CENTER CONNECTION:

Invite children to continue creating subtraction stories in the writing center or art center. Children in the writing center may be ready to label their drawings with words or numerals. Children in the art center might enjoy creating more detailed drawings to go along with their stories.

In Topics D and E, children will learn about making quick, efficient drawings during math. Allow students to work on more elaborate drawings in the art center; this may help students who like to add detail to make this transition during math time.

stories for their portfolios.)

- Did any of our subtraction stories share a number sentence?
- How did your drawing help your partner to answer the question?
- What was fun about creating a subtraction story? What was hard?



Topic D

Decontextualizing Addition Stories to Solve Using Fingers, Objects, and Drawings

PK.OA.1, PK.CC.2

Focus Standards:	PK.OA.1	Demonstrate an understanding of addition and subtraction by using objects, fingers, and responding to practical situations (e.g., if we have 3 apples and add two more, how many apples do we have all together?).
Instructional Days:	4	
Coherence -Links to:	GK–M1	Numbers to 10
	GK–M4	Number Pairs, Addition and Subtraction to 10

Topic D builds on the work of Topic B, again providing opportunities for children to solve addition story problems while taking a step forward by representing the objects in the story with fingers, counters, and simple drawings. For example, in order to solve "2 apples and 1 more apple. How many apples in all?" students decontextualize the story to represent the apples with their fingers. To answer the problem, they must recognize that the answer is not simply 3 or 3 *fingers*, but rather, "There are 3 apples." In so responding, students have put the solution found on their fingers back into the context of the story (MP.2).

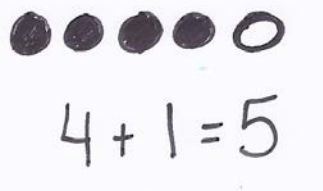
In Lessons 16 and 17, children use fingers to add (**PK.OA.1**). In Lesson 16, students represent the number of pieces of fruit (e.g., three oranges and one kiwi) inside two mystery bags. Instead of acting out the story, children show three fingers on one hand and one finger on the other hand, and they count all of the fingers to solve (MP.5). In Lesson 17, students work on one hand to solve animal story problems where they are adding 1 or 2 more, e.g., $3 + 1$, $3 + 2$, $4 + 1$. They also practice saying the number sentences without using the unit, "4 plus 1 equals 5" rather than "4 bunnies and 1 bunny makes 5 bunnies."

Children decontextualize using linking cube trains to solve addition zoo stories in Lesson 18, as shown on right. "One lion is napping under a tree. Oh look! Two more lions are coming to nap. How many lions are napping now?" Students count out one cube and two cubes to represent the lions in the story (**PK.OA.1**). In the Debrief, students consider more abstract addition questions such as, "2 and 2 make how many?" They observe as the teacher writes an addition sentence, and then re-contextualize the 4 as 4 *gorillas*.



$$1 + 2 = 3$$

Lesson 19 is very similar to Lesson 10 in that students create their own addition stories. The key difference is that children learn to make math drawings, quick representations of a story's objects. For example, circles are used to show lizards running (shown below). Some children love to create elaborate art, but the focus of this lesson is on efficient drawings to find an accurate solution promptly.



In Topic D Fluency Practices, students continue to organize and count up to 10 objects in linear and array configurations using pennies and cubes (to represent lazy lizards). They also count to 20 the regular and Say Ten Way, varying the speed and context (Birds of a Feather) and changing their volume (Squeak and Roar) to keep activities fresh and fun.

A Teaching Sequence Toward Mastery of Decontextualizing Addition Stories to Solve Using Fingers, Objects, and Drawings

Objective 1: Solve addition story problems using fingers.
(Lessons 16–17)

Objective 2: Solve addition story problems with representative objects.
(Lesson 18)

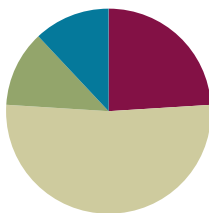
Objective 3: Solve addition story problems with representative drawings.
(Lesson 19)

Lesson 16

Objective: Solve addition story problems using fingers.

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 Pennies **PK.CC.4** (3 minutes)
- Birds of a Feather **PK.CC.1** (3 minutes)

Counting Pennies (3 minutes)

Materials: (S) cup or baggie of 8 pennies, work mat (construction paper)

Note: This fluency activity provides practice with organizing and counting up to 10 objects in linear and array configurations. (If time permits, tell students to make one object disappear by placing it under their chair and repeat the activity.)

Give one cup to each student.

- T: Empty your cup onto your work mat. Put your pennies in a straight line and count them. (Pause.) How many pennies? Show me on your fingers.
- S: (Show 8 on fingers.)
- T: Count them again from the other direction. (Pause.) How many? Show me.
- S: (Show 8 on fingers.)
- T: Now, put your pennies in two rows that are exactly the same and count them. (Pause.)
- S: (Make two rows with four pennies in each row.) How many? Show me.
- S: (Show 8 on fingers.)
- T: Put your pennies in a straight line again and count them. (Pause.) How many? Show me.
- S: (Show 8 on fingers.)



NOTES ON MULTIPLE MEANS OF ENGAGEMENT:

As you assess students' counting strategies, ensure success by scaffolding for students who may be having difficulty. Limit the number of objects in the cup until students can accurately count. Add one object at a time after students have experienced success with counting in both linear and array configurations.

Birds of a Feather (3 minutes)

Note: This activity targets one of the core fluencies for Pre-K students, rote counting to 20. Varying the speed and context help to keep counting exciting.

T: Let's all pretend we're huge bald eagles soaring through the sky. Flap your arms with me as we count to 20 the Say Ten Way. When we get to 20, let's sit down in our nests.

T/S: 1, 2, 3 ...ten 8, ten 9, 2 tens. (Slowly raise and lower arms to mimic an eagle gliding. Sit down.)

T: Good job. I had fun soaring through the sky. Now, let's be baby hummingbirds and fly to a flower to sip sweet nectar. This time flap your wings faster, like a hummingbird. Watch me! (Flap hands next to your body as if they are a baby bird's wings).

T: Are you ready? Let's fly and count to 20 the regular way.

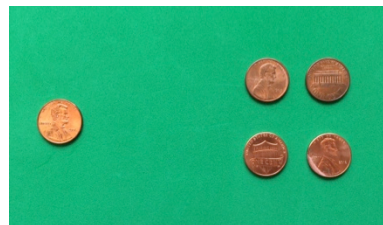
T/S: 1, 2, 3 ...18, 19, 20. (Flap hands at a relatively quick pace but slowly enough to keep movement synchronous with the count.)

Application Problem (3 minutes)

Materials: (S) 5 pennies per pair

Give one student in each pair five pennies. Instruct the student to count his/her pennies. Then say, "Give some of your pennies to your partner. Each of you count your pennies." Have children tell about how many each partner has, e.g., "I have one penny and my partner has four pennies."

Say, "Combine your pennies and count them." Encourage students to make an addition statement, such as "2 and 3 makes 5."



Note: Students practice decompositions of 5, which supports their understanding of addition and subtraction stories. If time permits, write the equation to match their addition statements and discuss what is the same about all of the number sentences.

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

Materials: (T) 2 paper lunch bags or lunch boxes, 5 small fruits of 2 varieties (e.g., oranges and kiwi)

Prepare one lunch bag/box with three pieces of fruit and the other with one piece of a different fruit. Reuse lunch bags/boxes for each round of the game.

1. Say, "Here are two mystery bags. Let's have two volunteers come forward to peek inside the bags." Without modeling for them, invite each student to count the pieces of fruit in the bag and show how many using fingers.
2. Say, "Jeremiah brought three pieces of fruit for lunch. Show me three fingers on this hand. (Shake right hand.) Priti brought one piece of fruit. Show me one finger on your other hand. (Shake left hand.) How many pieces of fruit do they have all together?"

3. Have students say the answer as they show it with their fingers, “They have four pieces of fruit.” Take the fruit out of the bag and confirm that there are four pieces. Write the number sentence as students say it, “3 plus 1 equals 4.”
4. Change the bags to have one and two pieces of fruit, and have two new volunteers come up, peek to see what’s inside, and show it on their fingers. Say, “Use two hands to show our friends’ fruit.”
5. Ask, “What question could we ask about their fruit?”
6. Have volunteers confirm the amount of fruit. As before, students state the number sentence as it is written on the board.
7. Play additional rounds of the mystery game as time allows.



$$3 + 1 = 4$$

Part 2: Practice

Materials: (S) per trio: 2 paper lunch bags with 1–4 small objects in each (e.g., pennies, counters, plastic kitchen food)

Create sets of bags in advance, making sure that the total number of objects between the two bags does not exceed 5. Place bag sets in trays or mark to show which bags go together, e.g., use color and shape to match. Place bags in an accessible location so children can exchange easily.

1. Place children in groups of three. They will continue to play the mystery bag game with two children holding the bags and one child showing the total on two hands.
2. Encourage the two children holding the bags to ask the question for the other child to answer, e.g., “How many pennies are there all together?”
3. The *holders* take the objects out of the bag to confirm the total. All three students say the number sentence together, e.g., “3 plus 2 equals 5.”
4. After each round, children select a new set of bags and change roles. Be sure to have at least three rounds of play so that each child has a chance to show the total.



CENTER CONNECTION:

Place lunch bags with numbers 1-3 written on the outside. Have plastic food from the kitchen in a large basket. Instruct children to make lunches with the indicated number of items in each bag. Once the bags are filled, encourage students to pick two bags to add together. Listen for students saying, for example, “1 roll and 2 apples are 3 things. 1 plus 2 equals 3.” Also note children who use their fingers to help them add. Seeing that one finger represents one food item is a foundational understanding for solving word problems.

Student Debrief (3 minutes)

Lesson Objective: Solve addition story problems using fingers.

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 toward 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.

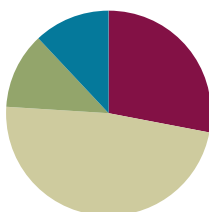
- (Have Jeremiah and Priti repeat their show of fingers.) What do Jeremiah's fingers tell us? What do Priti's fingers tell us?
- How did you use your fingers to find out how many pieces of fruit there were in all?
- When you played the group mystery bag game, what did you show with your fingers?
- Use your fingers to show my addition story: There were 2 balls in a bag. Three more balls were put in the bag. (Pause.) How many balls are in the bag in all? Which fingers show the balls that were already there? Which fingers show the balls that were added to the bag?

Lesson 17

Objective: Solve addition story problems using fingers.

Suggested Lesson Structure

■ Fluency Practice	(7 minutes)
■ Application Problem	(3 minutes)
■ Concept Development	(12 minutes)
■ Student Debrief	(3 minutes)
Total Time	(25 minutes)



Fluency Practice (7 minutes)

- Counting Pennies **PK.CC.5** (4 minutes)
- Birds of a Feather **PK.CC.1** (3 minutes)

Counting Pennies (4 minutes)

Materials: (T) 1 extra penny for each student (S) cup or baggie of 9 pennies, work mat

Note: Similar to Lesson 16, this fluency activity provides practice with organizing and counting up to 10 objects in a linear configuration.

Give one cup to each student.

- T: Empty your cup on your work mat. Put your pennies in a line. (Pause.) How many pennies? Show me on your fingers.
- S: (Show 9 on fingers.)
- T: Now, count your pennies from the other direction. (Pause.) How many? Show me.
- S: (Show 9 fingers.)
- T: (Give one more penny to each student.) Add one more penny. How many? Show me.
- S: (Show 10 on fingers.)
- T: Count your pennies from the other direction. (Pause.) How many? Show me.
- S: (Show 10 on fingers.)

If time permits, tell students to make one penny disappear by placing it under their chair and repeat the activity.

Birds of a Feather (3 minutes)

Note: In this activity, students practice one of the core fluency goals of Pre-K, rote counting to 20. Practicing the same movement two days in a row enables students to become comfortable with the physical activity, so it can be easily repeated in later lessons.

T: Are you ready to be bald eagles again? Hold out your wings and count to 20 the Say Ten Way. When we get to 20, let's relax in our nests.

T/S: 1, 2, 3...ten 8, ten 9, 2 tens. (Slowly raise and lower arms to mimic an eagle gliding. Sit down.)

T: Now we're baby hummingbirds, hungry for more nectar. Let's fly and count again. This time we'll count the regular way and stop at 18. Ready?

T/S: 1, 2, 3...17, 18. (Flap hands at a relatively quick pace but slowly enough to keep movement synchronous with the count.)

Application Problem (3 minutes)

Materials: (S) Raisins (small box), two napkins

Put two raisins on one of your napkins. Put one raisin on the other napkin. With your fingers show me how many raisins are on each napkin (using one or two hands is acceptable). Say, "A hungry little puppy came along and gobbled up all the raisins! How many raisins did the puppy gobble up?" Allow children to count the raisins one at a time as they put them in their mouths. Repeat with the following sequence of numbers: 1 and 4, 3 and 2, 1 and 1, 2 and 2, 3 and 1.

Note: This application problem leads into today's Concept Development, wherein students add two quantities together. Allowing them to use one or both hands to show their raisins helps students to understand that the same number can be represented in different ways.



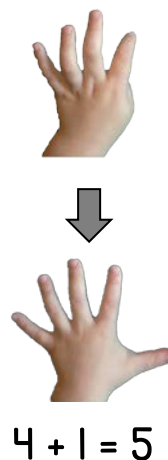
Concept Development (12 minutes)

Part 1: Concept Introduction

Materials: (T) White board or chart paper

Note: This lesson provides exposure to using the fingers on one hand to solve addition problems with totals to 5. Children may be more comfortable showing the addends on separate hands. While both methods should be accepted at this level, counting on fingers from left to right builds towards the strategy of counting on in future grades.

1. Say, "Listen to my addition story: There were 4 bunnies. Show me the 4 bunnies on your fingers." Students show four fingers the Math Way.
2. Say, "One more bunny hopped over. (Raise one more finger on the same hand.) Show me 1 more bunny on the same hand." Students do.



3. Ask, “How many bunnies are there now?” Provide wait time. Signal for children to answer chorally.
4. Write the number sentence on the board, $4 + 1 = 5$, as students say it.
5. Repeat Steps 1–4 with the following stories:
 - Three bunnies were white. One bunny was gray. How many bunnies were there all together?
 - Three bunnies were sleeping. Two more bunnies went to sleep. How many bunnies were sleeping in all?

Part 2: Practice

Pair students to work together to solve.

1. Say, “Listen to my addition story: Three puppies are playing. Another puppy comes to play.”
2. Have students turn to a partner and retell the addition story while holding up fingers on the left hand.
3. Ask, “How many puppies are playing now?” Partners tell one another the answer.
4. After students solve, write the number sentence on the board, $3 + 1 = 4$. Have students say the number sentence to their partners.
5. Repeat Steps 1–4 with the following problem: Ginger has 3 black puppies and 2 brown puppies. How many puppies does Ginger have in all?

MP.5



NOTES ON MULTIPLE MEANS OF REPRESENTATION:

Pairing the reading of word problems with visuals can support students who are visual learners or those who are deaf or hearing impaired. For example, provide a picture for the puppy stories.

Student Debrief (3 minutes)

Lesson Objective: Solve addition story problems using fingers.

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 toward 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.

- Show me this story on one hand: There are 2 brown puppies and 2 spotted puppies. (Write the number sentence on the board.) Can you show the same story using two hands? What do you notice



CENTER CONNECTION:

Place a tub of plastic animals in the center with some small boxes, i.e., barns. Encourage students to choose up to five animals. Then have them put some animals in the barn and some outside the barn and tell addition stories to each other. Remind students not to put too many animals in each place so that they can say the addition sentences learned in the Concept Development, e.g., “3 plus 1 equals 4.”

about the total each time?

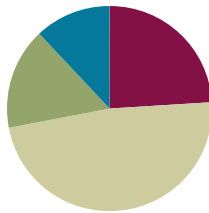
- Listen to my addition story: There are 3 green apples and 1 red apple. (Write the number sentence on the board.) With your partner, pick one person to show my story on one hand and the other person to show it on two hands. What is different about what you see? (Relate to part/whole thinking.)
- Do you like to use two hands or one hand to solve addition stories? Why?
- Use your fingers to show me 2 plus 1. (Have students share the different ways they solved using the fingers of one or two hands.)

Lesson 18

Objective: Solve addition story problems with representative objects.

Suggested Lesson Structure

■ Fluency Practice	(6 minutes)
■ Application Problem	(4 minutes)
■ Concept Development	(12 minutes)
■ Student Debrief	(3 minutes)
Total Time	(25 minutes)



Fluency Practice (6 minutes)

- Lazy Lizards **PK.CC.4** (4 minutes)
- Squeak and Roar **PK.CC.1** (2 minutes)

Lazy Lizards (4 minutes)

Materials: (S) cup of 9 linking cubes, tray

Note: This activity provides practice with organizing objects to count within 10, a core Fluency for Pre-K students. In this variation, students pretend the cubes are lizards in preparation for the Concept Development, where the cubes will be animals at the zoo.

Pass out one cup to each student.

- T: Empty your cubes onto your tray. Pretend your cubes are lazy lizards, napping on a rock.
- T: Wake up your lizards and move them in a line to count them. (Pause.)
- T: Use your fingers to show how many lizards there are.
- T: It's almost time for your lizards to go in their cage (the cup). Count them one more time from the other direction to make sure they're all here. Stand up when you think you know how many lizards you have. When I give my signal, tell me how many lizards you counted. Ready? (Give the signal.)
- S: 9.

If time permits, tell students to make one *lizard* hide by placing it under their chairs and repeat the activity to count 8.

Squeak and Roar (2 minutes)

Note: Changing the volume as students count requires them to pay close attention to the count sequence.

- T: Today, let's squeak count like a mouse and roar count like a lion!

T: When I put my hands by my mouth like this (cup hands to your mouth, as if telling a secret), squeak count as quietly as a little field mouse.

T: When I put my hands in the air like this (hold your arms out high and wide, making your fingers look like a lion's claws), roar count as loudly as a lion.

Guide students to squeak count to 10, and then roar count to 20 the regular way. Then repeat, alternating back and forth between squeak and roar counting.

Application Problem (4 minutes)

Materials: (S) 1–5 linking cubes

Give each student 1–5 cubes (petting zoo food). Say, “We are going to visit the petting zoo today. Count how many pieces of food you have. (Pause.) Find a friend who’d like to visit the zoo with you and count how many pieces of food you have all together. If you and your friend have *more than* 5 pieces of food together, sit down. If you and your friend have *fewer than* 5 pieces of food together, stay standing.” Repeat with new partners if time permits.

Note: Today’s Application Problem reviews the comparison work of Module 4 and continues the work of addition. Although the addition standard for Pre-kindergarten is totals to 5, children are able to employ counting strategies learned from previous modules to be successful with this task.



“Together we have more than 5 pieces of food.”

Concept Development (12 minutes)

Part 1: Concept Introduction

Materials: (T) 10 loose linking cubes (5 one color, 5 of another color) (S) 10 loose linking cubes (5 of one color, 5 of another color)

1. Tell children that they have been invited to help the zookeeper make sure all of the animals are in their habitats.
2. Say, “First, we’ll go past the lions. One lion is napping under a tree. Oh look! Two more lions are coming to nap.” Make a train with one cube for the lion that was napping. Add two different colored cubes for the lions that come to nap. Invite students to do the same.
3. Have children ask their neighbor a *how many* question about the lions, e.g., “How many lions are napping now?”
4. Quickly draw the train on the board and write the number sentence beneath as students say it aloud (do not use units), “ $1 + 2 = 3$.”
5. Ask, “What does the blue cube tell us? What do the two orange cubes tell us? What does the 3 tell us?” Make sure that students can put the story back into the lion context.
6. Repeat Steps 2–5 with the following story: There are 2 prairie dogs playing and 3 prairie dogs hiding. For this problem, have students make the train without a teacher model.
7. If time permits, encourage children to make up a different zoo addition story using the same 5-train.



$$1 + 2 = 3$$

MP.2

Part 2: Practice

Materials: (S) 10 loose linking cubes (5 one color, 5 of another color)

Pair children to work together.

1. Say, "Use your cubes to show this zoo story: Three seals are doing tricks. Another seal swims over to do tricks."
2. Have children ask their neighbor a *how many* question about the seals, e.g., "How many seals are doing tricks now?"
3. Have partners compare their trains and share their answers. As a class, say the number sentence, " $3 + 1 = 4$."
4. Have partners tell one another what each set of cubes represents, e.g., three seals doing tricks.
5. As time permits, repeat Steps 1–3 with other addition stories such as: There are 2 adult gorillas and 2 baby gorillas. How many gorillas are there all together?



NOTES ON MULTIPLE MEANS OF ACTION AND EXPRESSION:

Circulate and slowly repeat the story one sentence at a time as necessary to support students who have difficulty processing the whole story at once.

Student Debrief (3 minutes)

Lesson Objective: Solve addition story problems with representative objects.

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 toward 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.

- How did we help the zookeeper solve the zoo addition stories today?
- What is different about using cubes instead of lions to solve an addition story?
- (Repeat the gorilla story.) Use your fingers to solve the gorilla story. What's the same as using cubes? What's different?
- In the gorilla story, 2 and 2 make how many? (Write addition sentence.) What does the 4 tell us?
- (Remind students of the seal story and show the linking cube train. Tell a similar zoo story with 3 and 1 as parts and show the train.) What is the same about these 2 trains?



CENTER CONNECTION:

Make a variety of symbol cards (two types of symbols) up to 5 (shown):



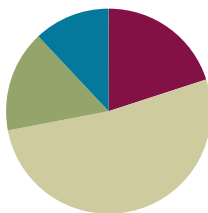
Place linking cubes of two different colors and symbol cards in the center. Allow students to use the linking cubes to represent the symbols on the card. Encourage students to say things like, "These two green cubes stand for the hearts and this yellow cube stands for the circle."

Lesson 19

Objective: Solve addition story problems with representative drawings.

Suggested Lesson Structure

■ Fluency Practice	(5 minutes)
■ Application Problem	(4 minutes)
■ Concept Development	(13 minutes)
■ Student Debrief	(3 minutes)
Total Time	(25 minutes)



Fluency Practice (5 minutes)

- Lazy Lizards **PK.CC.3** (3 minutes)
- Squeak and Roar **PK.CC.1** (2 minutes)

Lazy Lizards (3 minutes)

Materials: (S) Cup of 10 beans, tray

Note: This activity provides practice with organizing objects to count within 10, a core fluency for Pre-K students. In this variation, students arrange and count objects in both a line and an array configuration.

Pass out one cup to each student.

- T: Empty your beans on your tray. Pretend your beans are lazy lizards, napping on a rock.
- T: Wake up your lizards and move them in a line to help count them. (Pause.)
- T: Use your fingers to show how many lizards are on your rock. (Informally assess for accuracy.)
- T: It's almost time for your lizards to go back in their cage (the cup). Put them in two equal lines. Stand up when you think you know how many lizards you have. When I give my signal, tell me how many lizards you counted. Ready? (Give the signal.)
- S: 10.

If time permits, tell students to make one *lizard* hide by placing it under their chairs and repeat the activity to count 9.

Squeak and Roar (2 minutes)

Note: Changing the volume as students count requires them to pay close attention to the count sequence.

- T: Today, let's squeak count like a mouse and roar count like a lion!
- T: When I put my hands by my mouth like this (cup hands to your mouth, as if telling a secret), squeak

count as quietly as a little field mouse.

- T: When I put my hands in the air like this (hold your arms out high and wide, making your fingers look like a lion's claws), roar count as loudly as a lion.

Guide students to squeak count to 10, and then roar count to 20 the Say Ten Way. Then repeat, alternating back and forth between squeak and roar counting.

Application Problem (4 minutes)

Materials: (T) Lizard picture (Template 1) (S) Paper, crayons

Show a picture of a lizard. Give students four minutes to draw the lizard with lots of detail. They should draw as many detailed lizards as possible during this time.

Note: This activity helps children to see how time-consuming detailed drawings can be in comparison with the math drawings they will do in the Concept Development.



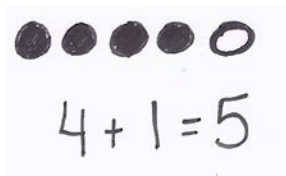
Concept Development (13 minutes)

Part 1: Concept Introduction

Materials: (T) chart paper, markers (S) Personal white board

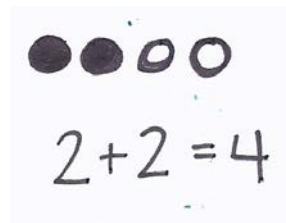
Note: Be sure to use the unit when expressing the answer to story problems. This is an important part of having children re-contextualize the story after making representative drawings.

1. Say, "Listen to my addition story. Four lizards are running. Another lizard starts to run. Now, how many lizards are running?"
2. Have children repeat the story and make a **math drawing** to match their retelling (use circles to represent lizards). Answer the question as a group, emphasizing that there are five *lizards*. Write and have students say the number sentence, " $4 + \text{plus } 1 = \text{equals } 5$. There are 5 lizards running."



MP.8

3. Say, "It took us a long time to draw one lizard, and I had to draw five for this addition story! What did I draw instead of lizards? Why do you think I did that?" Help children see that the circles were much faster to draw than lizards.
4. Say, "Use circles to draw this addition story. Two lizards have spots and two lizards have stripes. How many lizards are there in all?" Have children share their circle drawings and the answer to the question with a neighbor.
5. Have students say the number sentence together (while teacher writes it), " $2 + 2 = 4$. There are 4 lizards in all."
6. Guide a discussion about how much faster it was to draw circles than lizards. Say, "In math, we want to use simple math drawings that help us to solve problems. Using circles to stand for



lizards helped us to answer the question correctly without spending lots of time on our drawings."

Part 2: Practice

Materials: (S) Small writing rectangle (Template 2) inserted into personal white board, 5 children (Template 3, *see note box*)

1. Say, "Draw my addition story using lines. Two girls are hunting for lizards. Three boys join them. How many children are hunting for lizards now?"
2. Have partners compare math drawings and solve. When the partners agree on the answer, they write it on their boards.
3. Say the expression as a group, " $2 + 3$." Say the number sentence together (while teacher writes it), " $2 + 3 = 5$. There are 5 children hunting lizards."
4. Repeat with other problems as time permits.



NOTES ON MULTIPLE MEANS OF ACTION AND EXPRESSION:

Insert an image of five children (Template 3) into personal white board. Instruct students to draw lines (2 and 3) for the addition story above each child in order to match the person with the more abstract representation. Then, remove the template to show only the lines.

Student Debrief (3 minutes)

Lesson Objective: Solve addition story problems with representative drawings.

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 toward 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 (**math drawing**).

- Why do we draw circles and lines instead of lizards or children to solve problems in math?
- (Display circle drawing from earlier lizard problem.) This is my **math drawing** from the lizard addition story. Which lizards are these empty circles showing? Which lizards are these filled circles showing?
- (Show lines drawing from Part 2.) Can you help me think of another addition story that could match this math drawing?

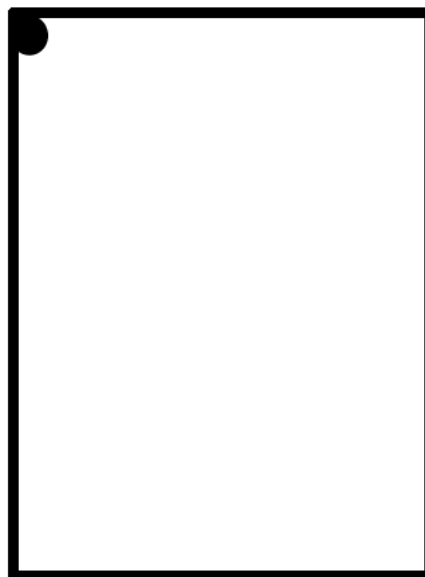


CENTER CONNECTION:

In the library center, place several ABC or 123 books with prominent, easily countable pictures, as well as paper and crayons. Encourage students to use the paper and crayons to draw simple representations (lines, circles, dots, etc.) of the pictures in the books. Listen for students saying things like, "I drew 3 lines to show the three dogs on this page."



lizard picture



small writing rectangle



5 children (see note box in the Practice portion of the Concept Development)



Topic E

Decontextualizing Subtraction Stories to Solve Using Fingers, Objects, and Drawings

PK.OA.1, PK.CC.2

Focus Standards:	PK.OA.1	Demonstrate an understanding of addition and subtraction by using objects, fingers, and responding to practical situations (e.g., if we have 3 apples and add two more, how many apples do we have all together?).
Instructional Days:	4	
Coherence -Links to:	GK–M1	Numbers to 10
	GK–M4	Number Pairs, Addition and Subtraction to 10

Topic E builds on the work of previous topics, providing opportunities for children to solve subtraction story problems with abstract representations (MP.4). As in Topic D, children decontextualize the story and use fingers, counters, and simple drawings to represent the objects in the story (**PK.OA.1**).

In Lessons 20 and 21, children use fingers to represent the stories and then subtract. For example, “There are 5 apples in a basket. Regina packed 2 apples in her lunchbox. How many apples are left?” Instead of acting out the story, children decontextualize, showing five fingers on one hand and hiding two fingers for the packed apples (shown at right). Students count their fingers to find how many are left and practice making subtraction statements without using the unit, “5 take away 2 is 3.” In Lesson 21, after again counting their fingers, students realize that the three remaining fingers represent, for example, the alligators in the story and re-contextualize the 3: “3 alligators were left” (MP.2).



$$5 - 2 = 3$$

Children decontextualize by using concrete objects like linking cubes to solve subtraction stories in Lesson 22. After they make a subtraction statement, e.g., “4 take away 1 equals 3,” students analyze what each numeral means, thus putting the numbers back into the context of the story.

In Lesson 23, children again practice making math drawings, this time decontextualizing by drawing quick representations of a subtraction story. To solve, children cross off the ones that *go away*. During the Debrief, the teacher takes student stories and turns them into more abstract questions, “4 take away 2 is...?” and writes the matching number sentence.

In Topic E Fluency Practice, students continue to sharpen their rote counting skills to 20. Every lesson in this topic includes the Find the Card activity whereby students read a written numeral 6–10 and match it with counting pictures arranged in varied formations. This activity reinforces another Pre-K core fluency skill, counting objects to 10.

A Teaching Sequence Toward Mastery of Decontextualizing Subtraction Stories to Solve Using Fingers, Objects, and Drawings

Objective 1: Solve subtraction story problems using fingers.
(Lessons 20–21)

Objective 2: Solve subtraction story problems with representative objects.
(Lesson 22)

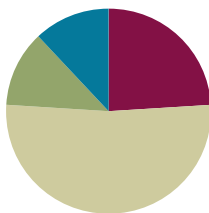
Objective 3: Solve subtraction story problems with representative drawings.
(Lesson 23)

Lesson 20

Objective: Solve subtraction story problems using fingers.

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)

- Find the Card **PK.CC.2, PK.CC.4** (4 minutes)
- Stomp and Count **PK.CC.1** (2 minutes)

Find the Card (4 minutes)

Materials: (T) Numeral cards 6 and 7 (Lesson 1 Template), (S) Baggie of 2 picture cards: 6 and 7 (Fluency Template), construction paper work mat

Note: Students maintain fluency practice with counting pictures arranged in varied formations and reading written numerals 6 and 7. This activity will be repeated throughout Topic E. Each day, an additional card will be added to the baggie.

Pass out one baggie to each student.

T: Lay your cards on your work mat.

T: (Show numeral card 6.) What number is this?

S: 6.

T: Find the card with six things. (Pause.)

T: Stand up with your card when you find it. (All the 6 cards are fruit. Check to see that students are holding the card with fruit. If a student is holding a vegetable card, gently suggest a recount.)

Repeat for 7, checking for vegetables.

Stomp and Count (2 minutes)

Note: Varying movements helps keep counting exercises fresh as students strengthen their core fluency counting skills to 20.

T: Let's pretend we're a team of grumpy giants. (Make a grumpy face.) Stomp like a giant with me.

T/S: (Make exaggerated stomps together.)

T: Now, let's count and stomp like grumpy giants up to 20.

Count and stomp to 20, keeping the movement synchronous with the count. If time permits, repeat the activity the Say Ten way.

Application Problem (3 minutes)

Materials: (T) Basket, 5 apples

Instruct the students to make a fist with their left hand on the table and to count to 5 the Math way.

1. Say, "We have 5 apples. I'll pretend to eat 2 apples." Pretend to eat two apples and hide them.
2. Ask, "How many apples do we have left? Show me that number of apples on your fingers the Math Way."
3. Ask, "How many apples did we have at first?" and "How many fingers did you show at first?" "How many apples did I pretend to eat?" and "How many fingers did you hide?" "How many apples are left?" and "How many fingers are still sticking out?"



Repeat.

Note: This Application Problem explores decompositions of 5; it relates five apples to the five fingers of one hand, supporting the concept that all the fingers of one hand make 5.

Concept Development (13 minutes)

Part 1: Concept Introduction

Materials: (T) Basket, 5 apples, paper lunch bag or lunch box

Place the apples in the basket where they can easily be seen and counted.

1. Say, "We are going to pack apples in lunchboxes. First, show me on one hand: How many apples are in the basket?" Model showing all five fingers on the left hand.
2. Hand one child a paper bag and invite her to pack some apples. Say, "Regina packed 2 apples." Hide two fingers to show the fruit she took away. Model hiding the thumb and pointer finger.
3. Ask, "How many apples are left?" Have students say the answer as they show it with their fingers: "Three apples are left." If needed, model counting the fingers still lifted. Take the fruit out of the basket to confirm there are three pieces left.
4. Write the number sentence as students say, "5 take away 2 equals 3."
5. Repeat Steps 1–3 with the remaining fruit in the basket. This time, have students ask a *how*



$$5 - 2 = 3$$

many question about the fruit.

6. Replace fruit as needed and continue to model until children understand the activity.

Part 2: Practice

Materials: (S) per pair: 5 small fruits (use apples from Lesson 8 Template 2 if needed), paper bag/lunchbox

Pair children and have them work at prepared tables.

1. Pairs will continue the activity from Part 1 with one student packing apples in the bag and making a statement, e.g., “I packed four apples in the bag.”
2. The other partner uses the fingers of one hand to show what happened to the apples.
3. The *packer* asks a *how many* question about the remaining apples, e.g., “How many apples are on the table now?”
4. Partners make a subtraction statement together, e.g., “5 take away 4 equals 1.”
5. After each round, partners change roles.



NOTES ON MULTIPLE MEANS OF ACTION AND EXPRESSION:

Note students who need to count each finger to answer the how many questions and provide extra practice with finger work. This practice should be kept fun and energetic.



CENTER CONNECTION:

Place sets of five lunch bags (different color bags will help keep the sets together) with numbers 1–5 written on them in the kitchen center. Set up five plastic food items in a basket for each set of lunch bags. Instruct students to pack the lunch bags with the indicated number of items from the basket. Remind students to count aloud as they pack or unpack the bags. Allow students to pack the bags in any order they choose. Some may fill the bags chronologically, and some may start with *Bag 3*. Have them return the food to the basket before packing the next bag.

Student Debrief (3 minutes)

Lesson Objective: Solve subtraction story problems using fingers.

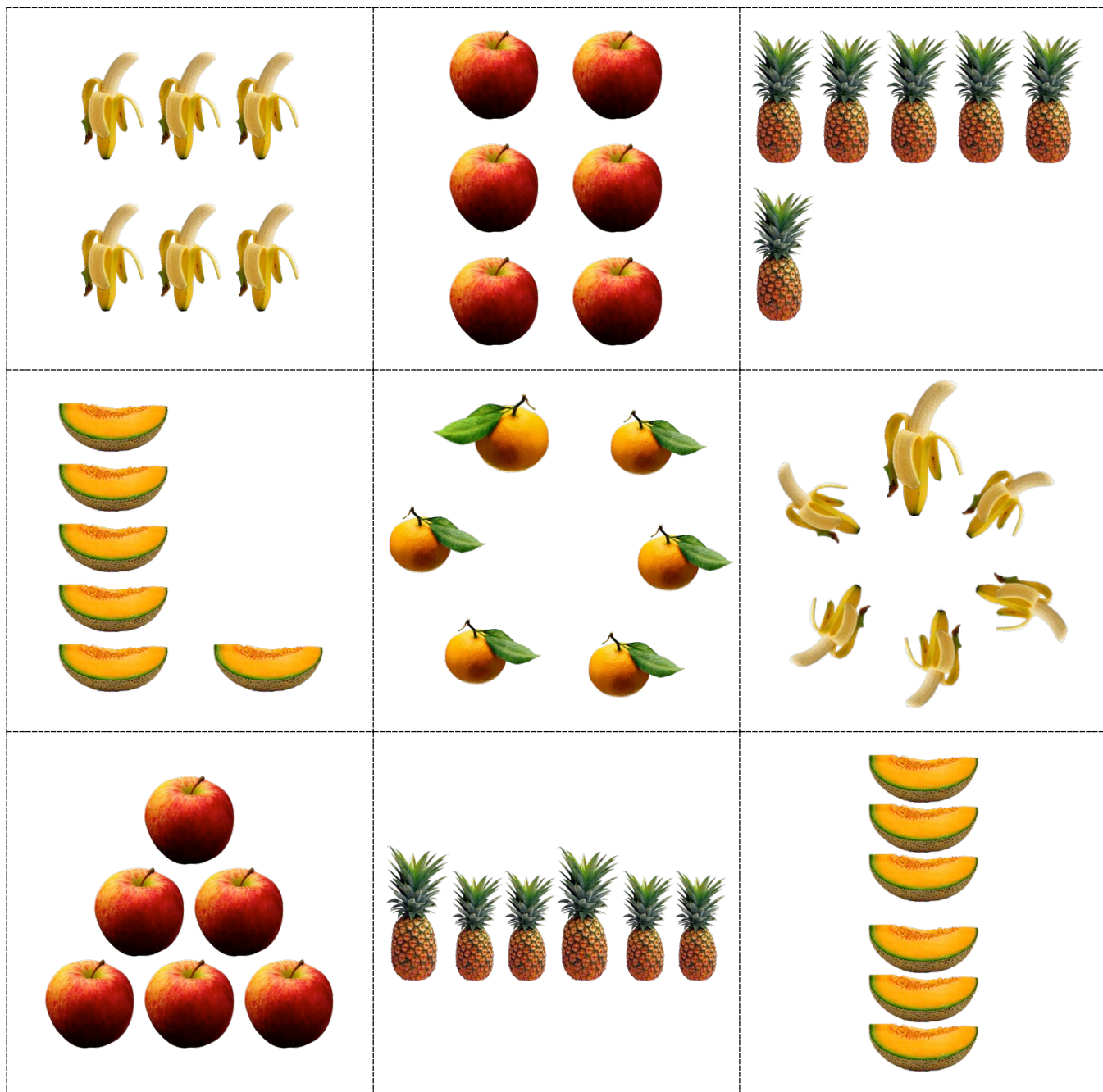
The Student Debrief is intended to invite reflection and active processing of the total lesson experience. It is also an opportunity for informal assessment. Consider taking anecdotal notes or using a simple checklist to note each child’s progress toward meeting the lesson objective.

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.

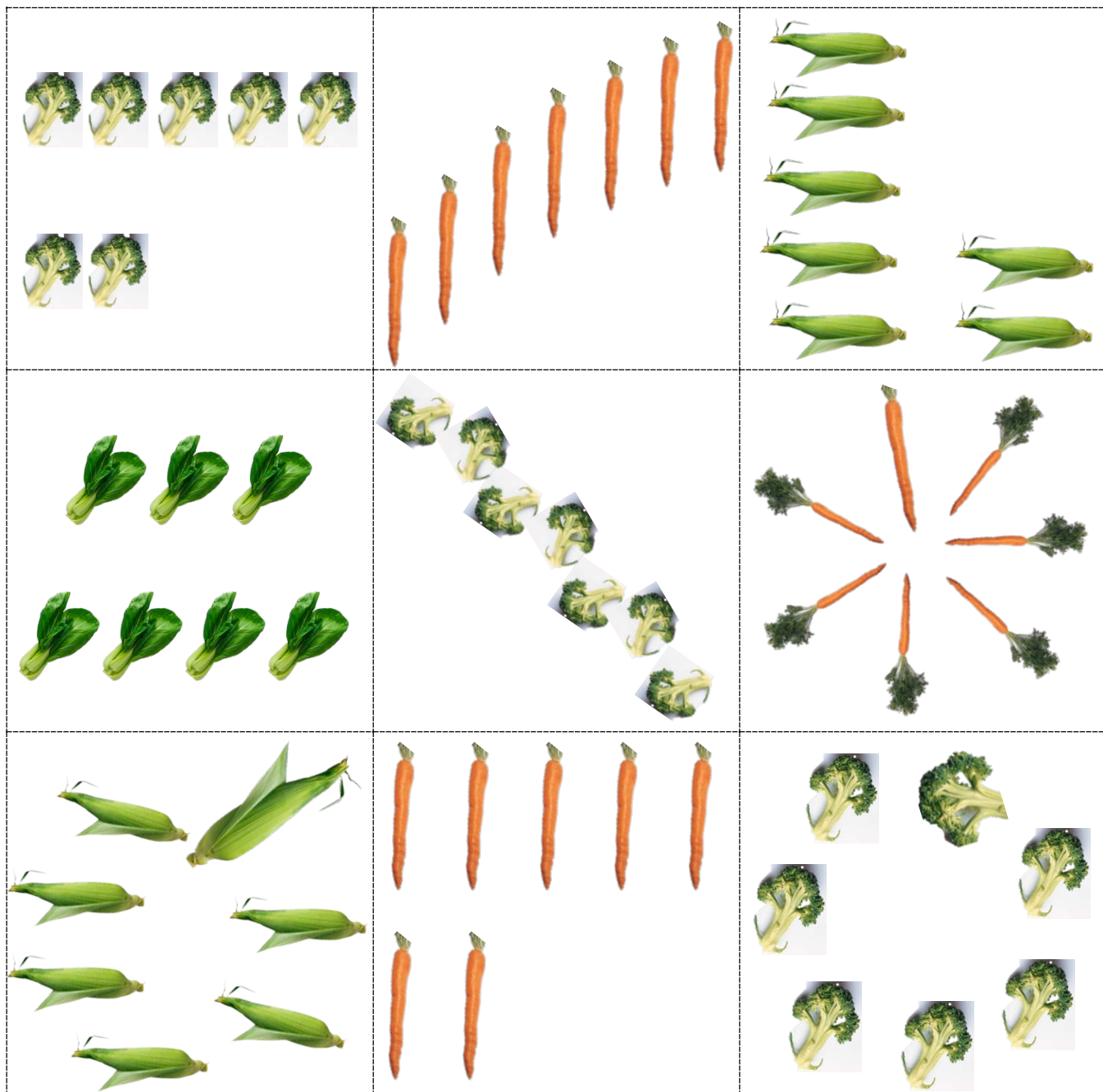
- What did we show with our fingers today?
- How did you use your fingers to show how many apples were left?
- Use your fingers to show my subtraction story: There were 4 balls. Two balls rolled away. (Pause.) How many balls were left?
- (Show four fingers.) What did the four fingers stand for? (Put down two fingers.) What did the fingers that were tucked away show? What about the two fingers that are left?

Cut along dashed lines. Put one 6-card and one 7-card in each bag.



picture cards: 6

Cut along dashed lines. Put one 6-card and one 7-card in each bag.



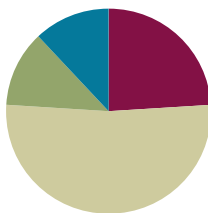
picture cards: 7

Lesson 21

Objective: Solve subtraction story problems using fingers.

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)

- Find the Card **PK.CC.2, PK.CC.4** (4 minutes)
- Stomp and Count **PK.CC.1** (2 minutes)

Find the Card (4 minutes)

Materials: (T) Numeral cards 6–8 (Lesson 1 Template) (S) baggie of picture cards from Lesson 20 with one 8-card added (Fluency Template), construction paper work mat

Note: Students maintain fluency with counting pictures arranged in varied formations and reading written numbers 6–8.

Pass out one baggie to each student.

- T: Lay your cards on your work mat.
- T: (Show the 8 card.) What number is this?
- S: 8.
- T: Find the card with eight things. (Pause.) Let me see you touch and count!
- T: Stand up with your card when you find it. (All the 8 cards are pond animals. Check to see that students are holding a card with ducks, fish, or frogs.)

As time permits, repeat for 6 (checking for fruit) and 7 (vegetables).



NOTES ON MULTIPLE MEANS OF ENGAGEMENT:

Students struggling to count the pictorial representations would benefit from having concrete manipulatives, such as beans, to support 1:1 correspondence. Place the manipulative directly on top of the image. Slowly remove the concrete manipulatives as students count with more accuracy and precision.

Stomp and Count (2 minutes)

Note: Say Ten counting supports the core fluency goal of rote counting to 20 while laying a foundation that helps students understand place value in later years. Encourage students to count once for each number. This will help them understand that *ten 1* is one number, not two.

T: Are you ready to be grumpy giants again? (Make a grumpy face). Let's stomp like a giant as we count to 20 the Say Ten Way.

T/S: 1, 2, 3...ten 9, 2 tens. (Make synchronous exaggerated stomps for each number.)

Application Problem (3 minutes)

Materials: (T) Box of toasted cereal o's (or another small healthy snack), napkin

Pass out napkins and five pieces of cereal to each student. With the class, put your left hand flat on the table and count the cereal by putting one piece at the end of each of your fingertips, beginning with the pinky.

T: How many pieces of cereal do you have?

S: 5.

T: Eat two pieces (at the end of the thumb and left index finger). How many do you have left?

S: 3.

T: Eat three more pieces. Now, how many do you have?

S: None.



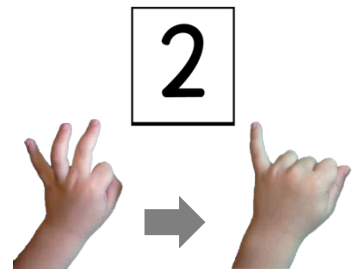
Repeat with different decompositions with totals of 5.

Note: This Application Problem reviews decompositions of numbers (5 is 2 and 3) and is also a natural and familiar lead into *taking away*.

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

Materials: (T) White board or chart paper, numeral cards 1–4 (Lesson 1 Template)

1. Say, "I'm going to tell another subtraction story today, but first I'm going to pick a card to tell me how many to take away. Oh, look! I picked the number 2. Let me think: Hmmm...I'd better start with a number that is greater than 2 so I can take 2 away! There were 3 ducks on the lake. Show me 3 ducks on your fingers." Show three fingers the Math Way.
2. Hold up the 2 card. "Two ducks flew away (hide two fingers on the same hand). Show me the 2 ducks that flew away by hiding 2 fingers."



3. Ask, “How many ducks are left?” Provide wait time. Signal for students to answer chorally.
4. Write the number sentence on the board as children say, “3 take away 2 is 1.” Have students answer in a complete sentence, re-contextualizing the answer, “1 duck is left.”
5. Have children turn to a neighbor and tell a different subtraction story about ducks on the lake. Listen carefully and choose a student to share his story with the class.
6. Repeat Steps 1–4 using a student’s subtraction story.
7. Pick another *take away* card, e.g., 3, and repeat Steps 1–4 with another problem: There are 5 frogs sitting on a log. Three frogs jump into the lake. How many frogs are sitting on the log?

Note: Include a situation whereby the total and amount being taken away are equal. Say, “Oh, the number being taken away doesn’t have to be greater; it can be the same, too! I have 5. I can take away 5.”

Part 2: Practice

Materials: (S) per pair: numeral cards 1–4 (Lesson 1 Template)

- MP.2**
1. Instruct Partner A to pick a card to tell how many to take away and think of a subtraction story: e.g., “Five alligators were in the lake. Two went away. How many were left?”
 2. Have Partner A tell the subtraction story while Partner B shows it on the fingers of the left hand and answers the question.
 3. Have Partner B retell the story while Partner A shows it.
 4. Encourage partners to make a subtraction statement, e.g., “5 take away 2 is 3,” and then to answer in a complete sentence, re-contextualizing the answer, “Three alligators were left.”
 5. Repeat Steps 1–4 as Partner B picks a *take away* card and tells a subtraction story.

Circulate and listen as children take turns telling a story and solving with fingers. Help students create questions and say the corresponding subtraction statement as needed.

Student Debrief (3 minutes)

Lesson Objective: Solve subtraction story problems using fingers.

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 toward 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.

- Invite a few students to share their subtraction stories. Have all students use their fingers to solve.



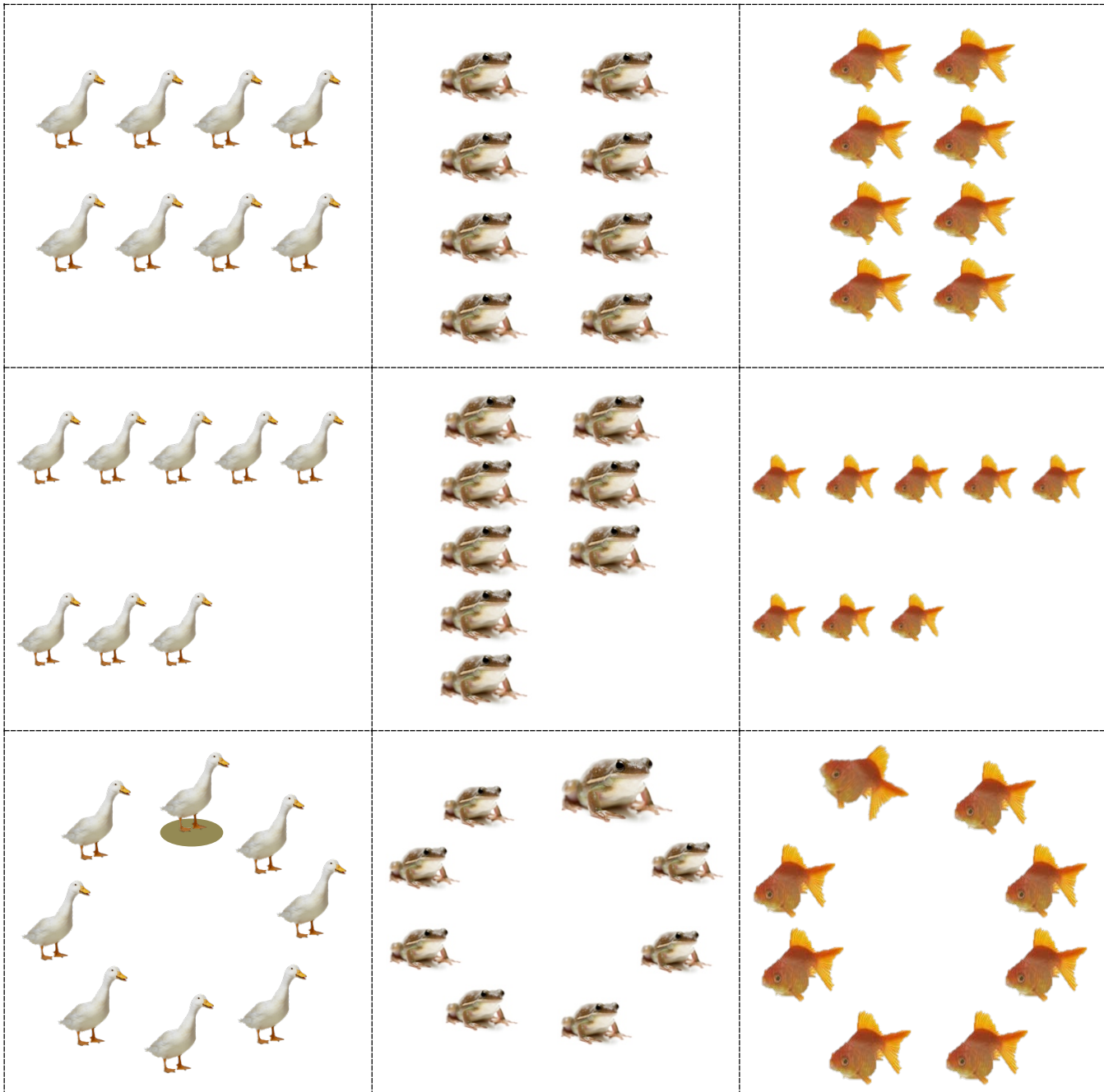
CENTER CONNECTION:

Put sets of five bears and a paper cup (for bears going home) at the center table. Encourage students to tell stories about some bears: “Four bears were playing, but then one had to go home (under cup).” Listen and prompt students to say, “4 take away 1 is 3,” as they tell their stories and ask *how many* questions about the bears.

(Consider taking a video of students sharing their stories as a record of their growth in Pre-K.)

- Use your fingers to show me 3 take away 2.
- Listen to this situation: Tommy picked the number 4 to take away. His story started with three bears playing. Show me this story on your fingers. What's wrong? Can we fix it?
- How do you think you could show a subtraction story with your fingers if you started with six ducks?

Cut along dashed lines. Add one 8-card to the baggies of 6 and 7 that were used in Lesson 20.



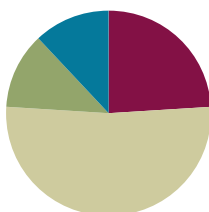
picture cards: 8

Lesson 22

Objective: Solve subtraction story problems with representative objects.

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)

- Find the Card **PK.CC.2, PK.CC.4** (4 minutes)
- Miguel Monkey **PK.CC.1** (2 minutes)

Find the Card (4 minutes)

Materials: (T) Numeral cards 6–9 (Lesson 1 Template), (S) baggie of picture cards from Lesson 21 with one 9-card added (Fluency Template), construction paper work mat

Note: Students maintain fluency practice with counting pictures arranged in varied formations and reading written numbers 6–9.

Pass out one baggie to each student.

T: Lay your cards on your work mat.

T: (Show the 9 card.) What number is this?

S: 9.

T: Find the card with 9 things. (Provide time to count.)

T: Hold up the card when you find it. (All the 9 cards are balls. Check to see that children are holding a card with balls.)

As time permits, repeat for 6 (checking for fruit), 7 (vegetables), or 8 (pond animals).

Miguel Monkey (2 minutes)

Note: This activity targets one of the core fluencies for Pre-K students, rote counting to 20.

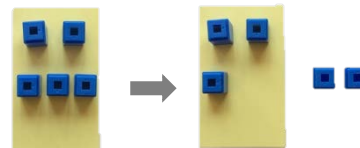
T: Miguel Monkey is ready to swing again. Pretend you're Miguel Monkey. Reach your arms up to grab the vines and swing through the jungle as we count to 20.

Demonstrate stretching one arm at a time into the air, mimicking a monkey grabbing vines and swinging through the jungle. Count to 20, keeping the movement synchronous with the count. If time permits, count again but stop at 19, challenging students to pay attention to the count sequence.

Application Problem (3 minutes)

Materials: (S) a small box lid or index card (car), 5 disconnected linking cubes

Say, “Put five people in your car (students put linking cubes on the index card). Drive your car to school to drop off two people.” Model sliding your index card a few inches and take out two cubes (people). Ask, “How many people are left in the car?” (3.)



Repeat the activity after filling up the car again with 3, 4, or 5 passengers.

Note: This Application Problem reviews *adding to* and *taking from* situations to 5 and supports the concept of objects representing real things.

Concept Development (13 minutes)

Part 1: Concept Introduction

Materials: (T) 5 linking cubes of the same color (S) 5 linking cubes of the same color



$$5 - 1 = 4$$

1. Tell students that they are going to work in the train yard. Say, “The big engine was pulling five cars.” Make a 5-train to show the cars, and invite students to do the same.
2. Say, “The last car was taken off.” Take off one cube and have children do the same.
3. Have students ask their neighbor a *how many* question about the train cars.
4. Quickly draw the 5-train on the board and cross off one car. Write the number sentence beneath as students say aloud (do not use units), “5 take away 1 equals 4.”
5. Ask, “What does the 5 tell us (point to the numeral 5)? What does the 1 tell us (point to the numeral 1)? What about the 4?” Make sure that children can put the story back into the train context, not just tell about the cubes.
6. Repeat Steps 1–5 with the following story: The big engine now has four cars. The last two cars were left in the shed.
7. If time permits, encourage students to make up a different subtraction story using the two cars that are left.

MP.4



NOTES ON MULTIPLE MEANS OF REPRESENTATION:

English language learners would benefit from frequent checks for understanding of word problems. One possibility is to have students repeat or rephrase the problem before solving, preferably with a partner who has strong language skills and can clarify misunderstandings.

Part 2: Practice

Materials: (S) 5 linking cubes

Pair children to work together.

1. Say, "Use your cubes to show this train story: Four passengers are riding the train. At the next stop, one passenger gets off. How many passengers are on the train now?"
2. Have partners compare their trains and share their answers. As a class, say the subtraction sentence, "4 take away 1 equals 3."
3. Have partners tell one another what each numeral in the subtraction sentence means in the story and with the cubes.
4. As time permits, repeat Steps 1–3 with other subtraction stories such as: There are five passengers in a train car. Three passengers move to another car. How many passengers are left?

Student Debrief (3 minutes)

Lesson Objective: Solve subtraction story problems with representative objects.

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 toward 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.

- How did we solve the subtraction stories today?
- What is different about using cubes instead of train cars to solve a subtraction story?
- (Repeat one of the passenger stories.) Use your fingers to solve the passenger story. What's the same about using cubes? What's different?
- (Remind students of the first train story and show the linking cube train. Tell a similar story starting with 5 and taking away 1. Show the train.) What is the same about these 2 trains?

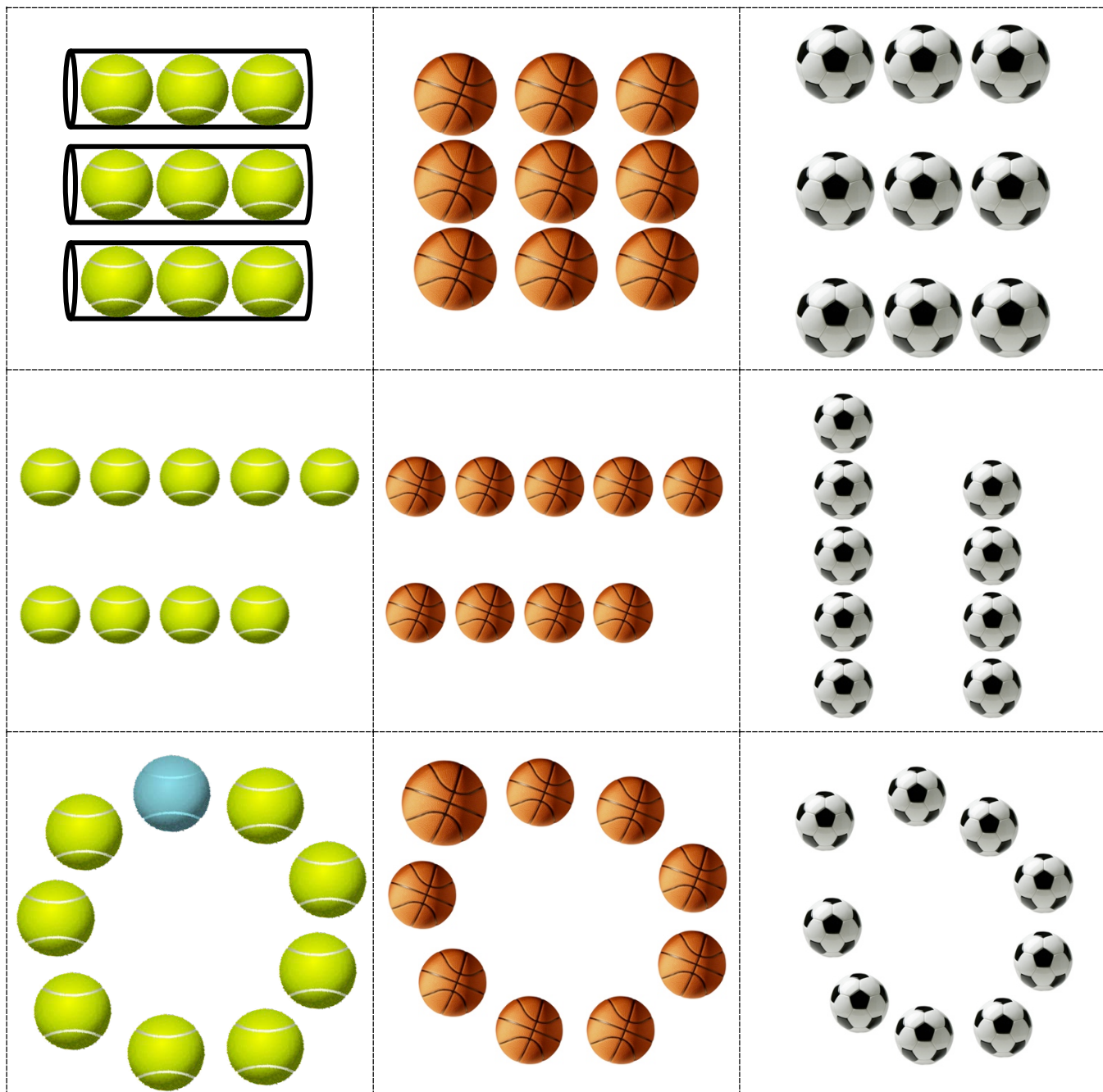
**CENTER CONNECTION:**

Use the symbol cards from Lesson 18 (shown) and linking cubes of two different colors for the center.



Have students make trains that match the cards. "These two green cubes stand for the hearts, and this yellow cube stands for the circle." Then have students break their trains at the color separation and hide one of the parts.

Cut along dashed lines. Add one 9-card to the baggies of 6 and 8-cards that were used in Lesson 21.



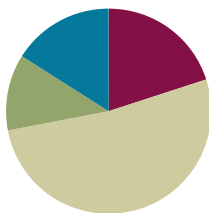
picture cards: 9

Lesson 23

Objective: Solve subtraction story problems with representative drawings.

Suggested Lesson Structure

■ Fluency Practice	(5 minutes)
■ Application Problem	(3 minutes)
■ Concept Development	(13 minutes)
■ Student Debrief	(4 minutes)
Total Time	(25 minutes)



Fluency Practice (5 minutes)

- Find the Card **PK.CC.2, PK.CC.4** (4 minutes)
- Ski Jumps **PK.CC.1** (1 minute)

Find the Card (4 minutes)

Materials: (T) Numeral cards 6–10 (Lesson 1 Template), (S) baggie of picture cards from Lesson 22 with one 10-card added (Fluency Template), construction paper work mat

Note: Students maintain fluency with counting pictures arranged in varied formations and reading written numbers 6–10.

Pass out one baggie to each student.

T: Lay your cards on your work mat.

T: (Show the 10 card.) What number is this?

S: 10.

T: Find the card with 10 things. (Pause.)

T: Stand up with your card when you find it. (All the 10 cards are food. Check to see that students are holding a card with hamburgers, hotdogs, or sandwiches.)

As time permits, repeat for 6 (checking for fruit), 7 (vegetables), 8 (pond animals), or 9 (balls).

Ski Jumps (1 minute)

Note: This activity targets the core counting fluency, rote counting to 20.

T: Take out your ski poles! (Demonstrate holding imaginary ski poles.) Let's count to 20 the Say Ten Way as we ski.

Jump left to right holding your imaginary ski poles to mimic skiing as you count to 20. Then, count again but stop at 17, challenging students to pay close attention to the count sequence.

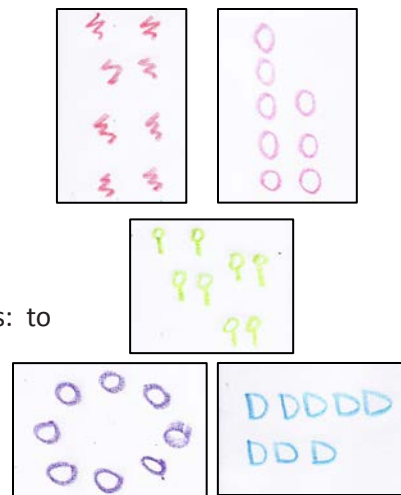
Application Problem (3 minutes)

Materials: (S) Blank paper, crayons

Say, “Amaya is having a party. There are 8 people dancing at the party.”

Have children make a math drawing of the eight dancers. Remind them that math drawings are quick and not detailed. Give one minute for drawing. Show a few of the drawings and discuss the different ways that children represented the dancers.

Note: This problem reminds children about the purpose of math drawings: to accurately and efficiently represent a mathematical situation. The drawing comparison provides other ideas about how eight dancers can be represented. This prepares children to use math drawings to solve subtraction stories in the Concept Development.

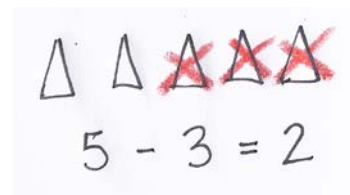


Concept Development (13 minutes)

Materials: (T) Chart paper, markers (S) Personal white board

Be sure to use the unit when expressing the answer to story problems. This is an important part of having children re-contextualize the story after making representative drawings.

1. Say, “Let’s use math drawings with a subtraction story: There are 5 pieces of cake. Three pieces are eaten. How many pieces of cake are left?”
2. Have students repeat the story one chunk at a time. Make a simple drawing to match their retelling. (Use triangles to represent pieces of cake.)
3. Have students answer the question as a group, emphasizing that there are two *pieces of cake left*. Write the number sentence and have students say, “5 take away 3 equals 2.”
4. Say, “I did not draw fancy pieces of cake. What did I draw instead?” Guide students to see that the triangles were a fast and easy way to draw pieces of cake.
5. Say, “Can anyone think of a subtraction story about people dancing at a party?” Have students share their ideas. Choose a story and repeat it for the class while students draw the first part of the story. Create a math drawing on the board again using triangles so that students recognize that the triangle can represent a piece of cake or a person dancing.
6. Invite a student to come up to the board and cross off objects on the math drawing to solve. Have students exchange their drawings with a neighbor and cross off to solve.
7. Guide a discussion about how students used math drawings to represent the objects in the story. Students share a few different ideas with the class.



Part 2: Practice

Materials: (S) blank paper, crayons

1. Tell students that they will create their own subtraction stories and share with a partner. Say, “Your drawing should show only the first part of the story. Let your partner cross off the things that go away.”
2. Circulate and support students as they create two statements and then ask a question.
3. While students draw, check for understanding by having them quietly share their stories one-on-one.
4. Match students with a partner to share stories and to solve by crossing off objects.
5. As time permits, write children’s subtraction stories on the drawing or on a sticky note as they dictate them.



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

Provide scaffolds for students who may have a difficult time thinking of their own subtraction stories. Possible scaffolds could include providing a model or picture of a story or asking questions for each of the components of the story problem. For example, “What would you like your story to be about? How many will you have to start? How many will be taken away?”

Student Debrief (4 minutes)

Lesson Objective: Solve subtraction story problems with representative drawings.

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 toward 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.

MP.1

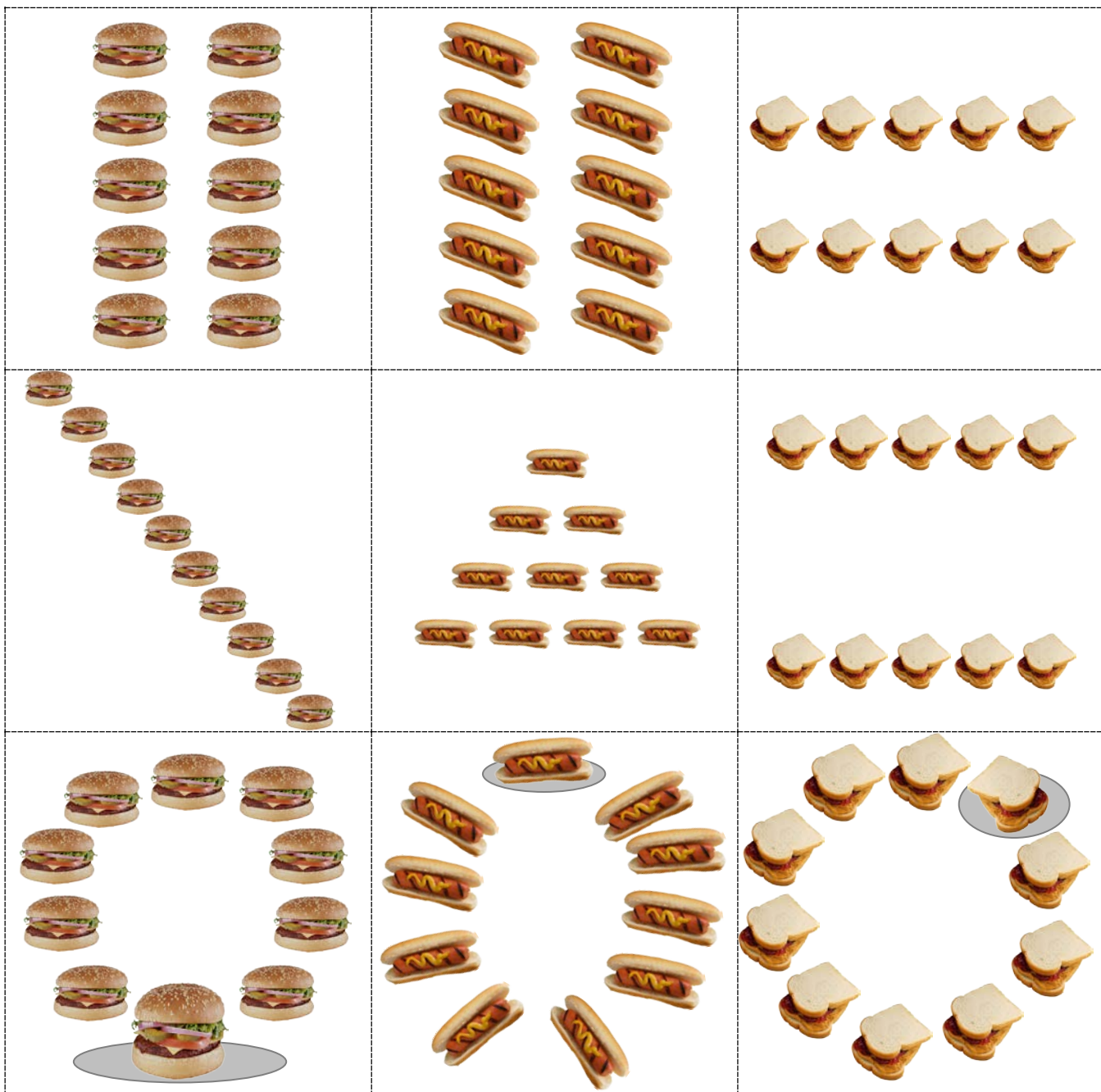
- When you make a math drawing, does it need to be fancy and detailed? Why not?
- Invite a few students to share and explain their subtraction stories and drawings. Have the class draw and solve.
- How were your drawings the same as your partner’s drawings? How were they different?
- In our cake story, we said, “5 take away 3 equals 2.” What did the 2 stand for?
- (Use the students’ subtraction stories to create questions like, “4 take away 2 is...?” Write the matching number sentence.)



CENTER CONNECTION:

In the library center, place several ABC or 123 books with easily countable pictures and small self-stick paper pads. Instruct students to count the items, e.g., pencils, on the page and then tell a story about how some of the pencils broke, covering them with the self-stick papers. Limit four self-stick papers per student and encourage students to use them over again for each group of items they count.

Cut along dashed lines. Add one 10-card to the baggies of 6-and 9-cards that were used in Lesson 22.



picture cards: 10



Topic F

Duplicating and Extending Patterns

PK.OA.2, PK.CC.1, PK.CC.3c

Focus Standards:	PK.OA.2	Duplicate and extend (e.g., what comes next?) simple patterns using concrete objects.
	PK.CC.1	Count to 20.
Instructional Days:	5	
Coherence -Links to:	GK–M1	Numbers to 10

Throughout their math experiences, students will look for and make use of structure (**MP.7**). In Topic F, children model repeating and growth patterns using objects, sounds, and movements.

In Lessons 24 and 25, children work with repeated patterns, learning to see the repeating part of the pattern, i.e., repetend, and repeat it consistently. They use concrete objects to identify a pattern in Lesson 24. For example, they talk about the pattern of day/night using sun and star cards (sun, stars, sun, stars...) and find patterns in daily activities like snack time where each student gets three square crackers and three round crackers. In Lesson 25, children follow the teacher's lead to make sound and movement patterns. In order to record the sound/movement pattern, students represent it using concrete objects such as linking cube trains (**PK.OA.2**).



In Lesson 26, students identify the repeating part of the teacher's pattern, duplicate it, and then extend it by predicting the next part (**PK.OA.2**). For example, they will copy the teacher's cube pattern, red, red, blue, blue, red, red, blue, blue, and then independently find the next four cubes (red, red, blue, blue).

Students have already worked with growth patterns as they explored the *1 more* pattern in the counting sequence using number stairs. They will take another look at this pattern in Lesson 27 and play with another type of growth pattern, *2 more*. For example, students create growth patterns with linking cubes to represent pairs of shoes being left by the front door when various family members come home.

The Pre-K curriculum culminates with the Children's Math Theater performance, whereby students create drawings and act out addition and subtraction stories to solve. This is an opportunity to celebrate the students' learning with the larger community.

In Topic F Fluency Practice, students continue to read written numbers and use strategies to count a set of objects (pennies) within 10, a core fluency goal. Students will explore patterns through games. In the What's Missing activity, the teacher leaves out one object/sound/movement in the pattern string, and students identify the missing part. They will also practice rote counting to 20 (**PK.CC.1**) in such activities as Dribble and Pass/Shoot. The students' movements follow an AB pattern (dribble, shoot, dribble, shoot, etc.). Finally, students practice simple decompositions, such as sharing four apple slices, which lays the foundation for thinking about part-whole relationships and anticipates work with the number bond.

A Teaching Sequence Toward Mastery of Duplicating and Extending Patterns

Objective 1: Identify patterns using objects.
(Lesson 24)

Objective 2: Identify and duplicate patterns using sounds and movement. Represent those patterns with objects.
(Lesson 25)

Objective 3: Duplicate and extend patterns with movement and objects.
(Lesson 26)

Objective 4: Identify a growth pattern using objects.
(Lesson 27)

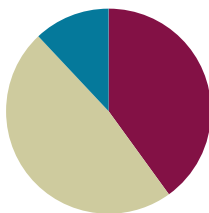
Objective 5: Culminating task – create a story problem and act it out in the Children's Math Theater.
(Lesson 28)

Lesson 24

Objective: Identify patterns using objects.

Suggested Lesson Structure

■ Fluency Practice	(10 minutes)
■ Concept Development	(12 minutes)
■ Student Debrief	(3 minutes)
Total Time	(25 minutes)



Fluency Practice (10 minutes)

- Decompose 4 **PK.CC.5** (4 minutes)
- Count Out Pennies **PK.CC.3** (4 minutes)
- Dribble the Basketball **PK.CC.1** (2 minutes)

Decompose 4 (4 minutes)

Materials: (T) 3 paper plates (1 large, 2 small), 4 apple slices, numeral card for 4 (Lesson 1 Template)

Note: This activity helps lay the foundation for thinking about part-whole relationships. The small plates show the parts and the large plate shows the total, anticipating the number bond, a model that students use from Module 4 of Kindergarten through Grade 5.

Place four apples slices on the large plate.

T: Count the apple slices I have for your snack today. (Touch as students count.)

S: 1, 2, 3, 4.

T: That is the number I have here! (Replace the apple slices with the 4-card on the larger plate. Lay out the small plates.) What are some ways I can share my apple slices with a friend?

S: Give your friend one. → Give your friend two.

T: Okay, let's start by sharing one. (Decompose the group of four apple slices by placing one slice on a smaller plate. Have students count as you move the rest to the other plate.)

T: Let's put them back together and share them in a different way. (Recount and repeat as time allows.)



Count Out Pennies (4 minutes)

Materials: (T) Numeral cards 6–10 (Lesson 1 Template) (S) baggie of 10 pennies per pair.

Note: Students maintain fluency with counting out objects from a larger set of 10 and reading written numbers 6–10. Pass out one baggie to each pair of students.

T: (Show the 6-card). What's my number?

S: 6.

T: Take six pennies out of your bag. (Provide time to count.)

T: Count them again as you put them back in your baggie.

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

Show numeral card 7. Gently remind any students who count past the target number to stop when they get to the number on your card.

Dribble the Basketball (2 minutes)

Note: In this activity, students review one of the core fluencies, rote counting to 20.

T: Let's pretend we are basketball players dribbling the ball.

S: (Students and teacher pretend to dribble the ball.)

T: Let's count to 20 together as we dribble. Start at 1 with me.

Count to 20 as you dribble.

Concept Development (12 minutes)

Part 1: Concept Introduction

Materials: (T) Sun and star cards (Template)

Keep students seated at their tables for Part 1.

1. "When I go to sleep at night, it is dark and the stars are in the sky. Pretend to go to sleep." As the children pretend to go to sleep, tape a star card to the board.
2. Say, "Wake up! It's morning! What is in the sky during the day?" When the students answer, "The sun," tape a sun next to the star card on the board.
3. Repeat this pattern of pretending to go to sleep (taping the star card on the board) and waking up with the class (taping the sun on the board) until you have at least three stars and three suns on the board in an AB pattern.
4. Pointing, say the pattern together, "Star, sun, star, sun, star, sun."
5. Say, "This is a **pattern**. Every day the stars and the sun repeat this pattern."
6. Remove suns and stars from the board and repeat the activity beginning with the sun first this time.



Part 2: Practice

Materials: (S) Two types of crackers (at least 3 of each per student), paper towel

1. Pass out crackers and paper towels to each student and say, "On your paper towel, put your snacks in a pattern, like we did with the stars and the sun."
2. Say, "Tell your neighbor your pattern, like 'round cracker, square cracker.'"
3. Say, "Eat the first two crackers of your pattern (Pause). Tell your neighbor the pattern that is still there."
4. Continue to eat two pieces and say the rest of the pattern until all the pieces are gone. This is a precursor to recognizing the repeating part of the pattern, or repetend.



NOTES ON MULTIPLE MEANS OF ACTION AND EXPRESSION:

Encourage students to discover patterns throughout their day and to make connections to the math, for example, when they are building with blocks in the block corner or when sorting fruit in the kitchen corner.

Student Debrief (3 minutes)

Lesson Objective: Identify patterns using objects.

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 toward 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.

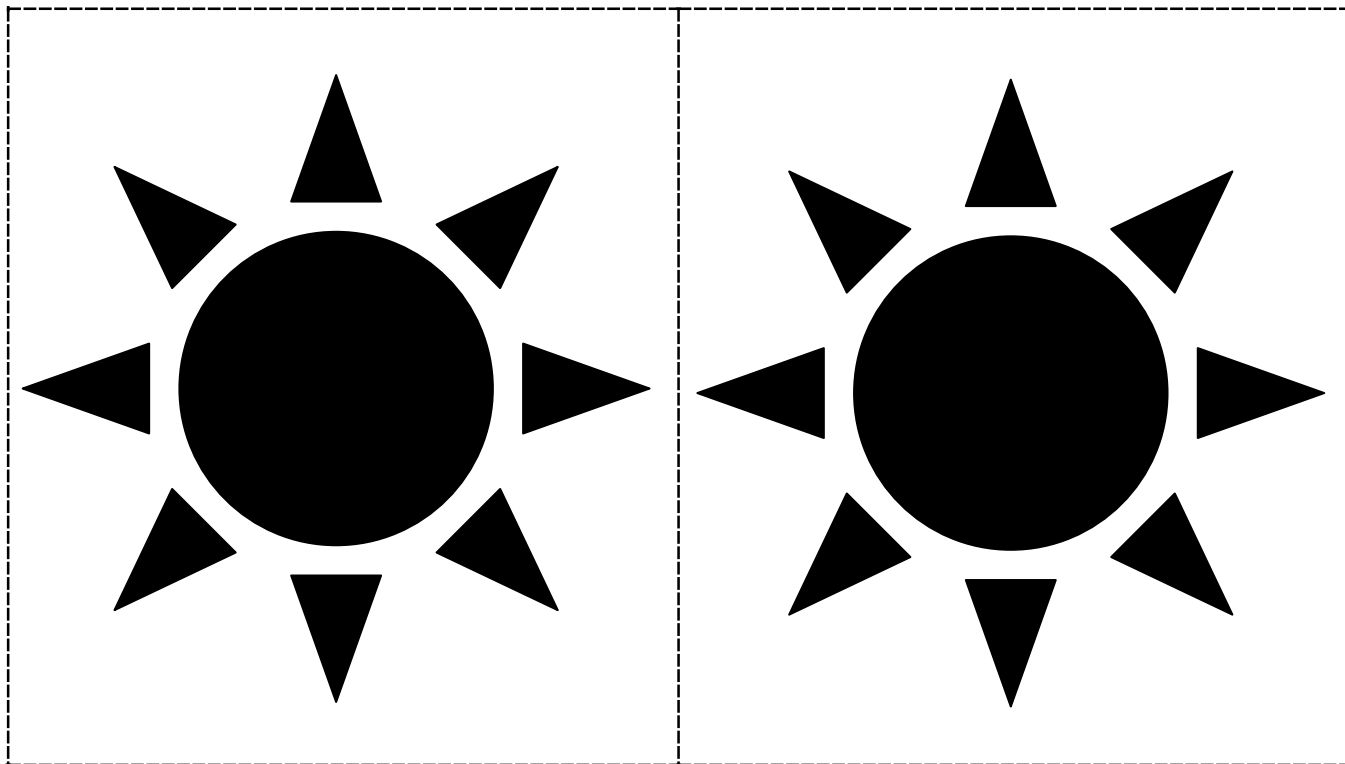
You may choose to use any combination of the questions below to help students express ideas, make connections, and use new vocabulary (**pattern**).

- (Have a bin of blue (B) and yellow (Y) linking cubes to explore this question.) Look at my **pattern**: BBYBBYBBY. Can you make a different pattern with these two colors? Share it with a partner.
- The objects in a pattern repeat. If we had red (R), green (G), and yellow (Y) apple slices in a RGYRGY pattern, how many apples would we have to eat until the repeating part started over again?
- Our pattern of the paper sun and stars (point) is a way to easily see a pattern of daytime and nighttime, being awake and going to sleep! We are using these objects to represent those patterns, just like we used blocks to represent lizards. What pictures might I use to represent the pattern of being at school and being at home?

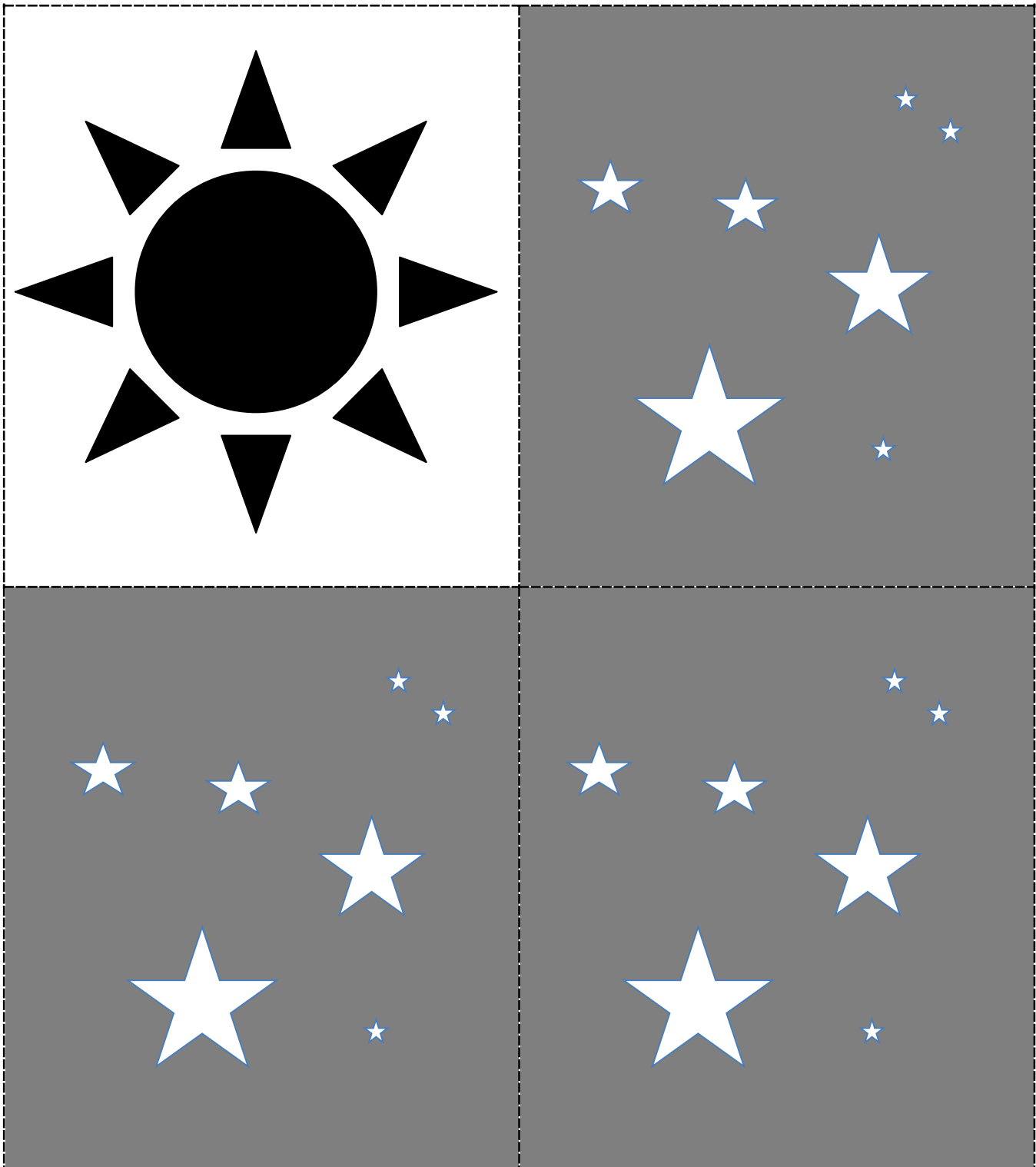


CENTER CONNECTION:

Use the art center as a place to explore patterns in nature. Find images of patterns on animals, plants, and other natural formations, e.g., zebra stripes, tree bark, snowflakes. Invite the children to say the pattern and draw or paint it.



sun and star cards



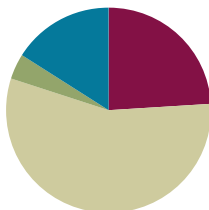
sun and star cards

Lesson 25

Objective: Identify and duplicate patterns using sounds and movement. Represent those patterns with objects.

Suggested Lesson Structure

■ Fluency Practice	(6 minutes)
■ Application Problem	(1 minute)
■ Concept Development	(14 minutes)
■ Student Debrief	(4 minutes)
Total Time	(25 minutes)



Fluency Practice (6 minutes)

- Count Out Pennies **PK.CC.3** (4 minutes)
- Dribble and Pass **PK.CC.1** (2 minutes)

Count Out Pennies (4 minutes)

Materials: (T) Numeral cards 6–10 (Lesson 1 Template) (S) baggie of 10 pennies

Note: Watch the strategies students use to take seven pennies out of their bags. Do they count as they take them out? Take a few out and then count? Arrange those they take out in one line? In rows?

T: (Show the 7-card). What's my number?

S: 7.

T: Take seven pennies out of your bag. (Provide time to count.)

T: Count them again as you put them back in your baggie.

S: 1, 2, 3, 4, 5, 6, 7.

Show the 8-card. Gently remind any students who count past the target number to stop when they get to the number on your card.

Dribble and Pass (2 minutes)

Note: In this activity, students do counting movements in an AB pattern while reviewing one of their core fluencies, rote counting to 20.

T: Let's use a dribble and pass pattern with imaginary basketballs.

T: First we'll dribble, and then we'll pass. Then we'll dribble, and then we'll...?

S: Pass!

T: You've got it! Now, let's count to 20 the Say Ten Way as we dribble and pass.

Application Problem (1 minute)

Materials: (T) Vegetables or play food, sticky notes

Set up a pattern, but remove one object as shown. Place a sticky note in place of the missing objects.

Tell children that a customer bought an item from Ms. Lee's display at her grocery store. Ask them to help Ms. Lee decide what goes in the blank space of her pattern.



Note: This activity asks children to use their knowledge of the familiar pattern to identify missing parts.

Concept Development (14 minutes)

Part 1: Concept Introduction

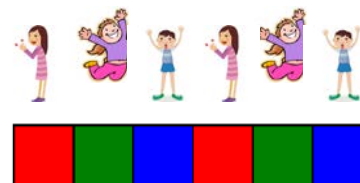
Materials: (T) Linking cubes (3 colors, e.g., red, green, blue)

1. Model the following pattern, but do not specify that it's an ABC pattern: clap, hop, hands up, clap, hop, hands up.
2. Say, "Show me the first part of the pattern. (Clap.) What is the next part? (Hop.) And the next? (Hands up.)"
3. Ask, "What should we do after we put our hands up?" Listen to student suggestions, e.g., "Start again!"
4. Say, "Yes, this part of the pattern repeats; we can call it the **repeating part**."
5. Say, "We can show this pattern with cubes. Let's choose a different color cube for each motion and build a train."
6. Show the pattern again slowly. Model building a train with the repeating part, e.g., red, green, blue, and continue the pattern with student suggestions.
7. Invite students to think of another ABC pattern with simple movements, e.g., thumbs up, pat your tummy, and clap. Repeat Steps 4–6. Be sure to highlight the repeating part.



NOTES ON MULTIPLE MEANS OF ACTION AND EXPRESSION:

Provide students with a variety of ways to respond. Some students will best recognize the pattern by only repeating the movements while others will benefit from pairing the actions with verbalizations, for example, by saying, "clap, hop, hands up" as they repeat the movements.



Part 2: Practice

Materials: (S) Linking cubes (3 colors)

Separate linking cubes according to color. Place tubs of three different color cubes at each table, e.g., red, blue, and yellow.

MP.7

1. Model a pattern similar to the one from Part 1 (hop, stomp, touch nose, hop, stomp, touch nose). Have students show the repeating part of the pattern.
2. Say, “Show this pattern with your cubes.” Guide students to choose a different color cube for each motion and to build a train.
3. Show the pattern again slowly so that students at tables can build an ABCABC pattern using colored linking cubes. Students should have at least two repeating parts in their linking cube trains when finished.
4. Say, “Break your linking cube train to show me the repeating part; it’s the group of cubes that shows all three movements in the pattern.”
5. Repeat with different movements.

Student Debrief (4 minutes)

Lesson Objective: Identify and duplicate patterns using sounds and movement. Represent those patterns with objects.

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 toward 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 (**repeating part**).

- (Repeat these movements: Clap, stomp.) Repeat after me to continue my pattern. (Add another motion: Clap, stomp, stomp.) Repeat after me to continue my pattern.
- Show an ABC tower with 9 linking cubes. What is the repeating part? (Break it off.) How many times do we see that part? (Break into three ABC groups.)
- (Show the following two linking cube towers: GRBGRB, RBGRBG.) What happens to the first tower if you move one green from the beginning to the end? (Move green cube.)
- (Show a RYRY, etc. linking cube pattern that is 10 cubes long.) Look at my pattern. What is the repeating part? Let’s remove the first two cubes. (Remove them.) Does the repeating part change?

**CENTER CONNECTION:**

Create a focus on pattern at the library center with books recommended by the National Association for the Education of Young Children (<http://www.naeyc.org/files/tyc/file/MathbooklistSchickedanzexcerpt.pdf>).

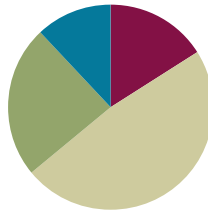
- Grossman, V. *Ten little rabbits*.
- Paul, A.W. *Eight hands round: A patchwork alphabet*.
- Pinkney, B. *Max found two sticks*.

Lesson 26

Objective: Duplicate and extend patterns with movement and objects.

Suggested Lesson Structure

■ Fluency Practice	(4 minutes)
■ Application Problem	(6 minutes)
■ Concept Development	(12 minutes)
■ Student Debrief	(3 minutes)
Total Time	(25 minutes)



Fluency Practice (4 minutes)

- Count Out Pennies **PK.CC.3** (4 minutes)

Count Out Pennies (4 minutes)

Materials: (T) Numeral cards 6–10 (Lesson 1 Template) (S) baggie or container of 10 pennies or objects

Note: Students maintain fluency with counting out objects and reading written numbers 6–10.

Pass out one baggie to each pair of students.

T: (Show the 10 card). What's my number?

S: 10.

T: Count out 10 pennies. (Provide time to count.)

T: Count them again as you put them back in your baggie.

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

Continue showing different numeral cards. Gently remind any students who count past the target number to stop when they get to the number on your card.

Application Problem (6 minutes)

Materials: (T) Xylophone or other instrument with at least 2 very different notes/tones

Play a note (A) on one end of the xylophone. Have children hop whenever they hear that note. Play a different note (B) on the other end of the xylophone. Have children step forward when they hear that note. If the instrument has a third note, play it (C) and ask children to step back.



Play the notes in a pattern as children move their bodies. Consider using the following suggested sequence: ABAB, ABCABC, BBCCBBCC, AABCAABC.

Note: In this problem, children see that the same set of sounds or movements can be rearranged to make different patterns. If a student struggles to distinguish between different notes, seat her next to the instrument so she can see which note is being played.

Concept Development (12 minutes)

Part 1: Concept Introduction

Materials: (T) Bin of linking cubes (of various colors)

1. Show an ABAB pattern: clap, hop, clap, hop. Have students stand and do it, too.
2. Ask students, “What is the repeating part of the pattern?”
3. Say, “Show me this whole pattern with linking cubes.” Students do, e.g., RYRY.
4. Ask students to extend the pattern: “What comes next in our pattern?” (Pause.) Use students’ suggestions to extend the pattern, doing it again.
5. Say, “Hmm...I wonder if we can extend the pattern with linking cubes.” Ask, “Who can show the next part of the pattern?” Call on two more students to do so.
6. Say, “Good! Let’s say the pattern together, ‘clap, hop, clap, hop...’ (while pointing to cubes).”
7. Repeat Steps 1–6 with a new pattern, identifying the repeating part with students and encouraging them to extend the pattern with cubes.



Note: Different patterns can be used: ABCABC, AABBAABB, ABBABB, etc.

Part 2: Practice

Materials: (S) Tray with 5 different linking cube trains (per table), e.g., GGB, YB, RRG, RGY, BGG

Send students to prepared tables with the linking cube tray in the middle.

1. Say, “On your table, there are trains with only the repeating part. You are going to use each train to build a pattern, like this.” Model how to build a pattern, beginning with the repetend, i.e., repeating part, AAB. Complete the next repeating part (eight cubes total).
2. Say, “Now, it’s your turn!” Students work independently to build various patterns with linking cube trains.
3. Circulate and ask questions to check for understanding: What is the repeating part? What comes next in the pattern?
4. Once students have successfully built a pattern, instruct them to return the train to the original



NOTES ON MULTIPLE MEANS OF ENGAGEMENT:

Provide a challenging extension for students who are ready by having them build upon a more difficult repetend, or by encouraging them to make their own repetend that the class can build upon.

- repeating part and place it back on the tray for another student.
5. Students should have time to practice with at least 2–3 trains.

Student Debrief (3 minutes)

Lesson Objective: Duplicate and extend patterns with movement and objects.

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 toward 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.

- If you know the repeating part of a pattern, can you make the pattern longer? How? Could it go on forever?
- Have you seen patterns outside? In your house? What patterns have you seen?
- (Show two trains from Part 2: GGBGGB, BGGBGG.) Do you need the same cubes to extend these patterns? How are they similar? Different?
- Does the American flag have a pattern? How do you know if it is or isn't a pattern? What is the repeating part?



CENTER CONNECTION:

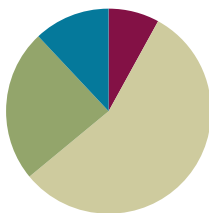
Create a center where children can use manipulatives to extend patterns. Linking cubes, beads, buttons, leaves, and rocks can be used to create the initial pattern. Pattern cards can also be created for reuse. Be sure to provide two complete pattern units before asking children to replicate or extend the pattern.

Lesson 27

Objective: Identify a growth pattern using objects.

Suggested Lesson Structure

Fluency Practice	(2 minutes)
Application Problem	(6 minutes)
Concept Development	(14 minutes)
Student Debrief	(3 minutes)
Total Time	(25 minutes)



Fluency Practice (2 minutes)

- Dribble and Shoot **PK.CC.1** (2 minutes)

Dribble and Shoot (2 minutes)

Note: In this activity, students do counting movements in an AB pattern while reviewing one of their core fluencies, rote counting to 20. Consider drawing students' attention to the pattern in the later teen numbers: sixTEEN, sevenTEEN, etc.

T: Today, let's use a dribble and shoot pattern.

T: First we'll dribble, and then we'll shoot. Then we'll dribble, and then we'll...?

S: Shoot!

T: You've got it! Now, let's count to 20 the Say Ten Way as we dribble and shoot.

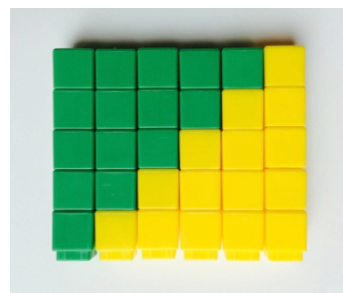
Count to 20 the Say Ten Way, alternating between dribbling and shooting as students count.

Application Problem (6 minutes)

Materials: (T) Linking cubes in two colors (enough for each child to have 10 cubes altogether)

Place linking cubes in piles where students can easily access them. Ask each student to make a tower with five cubes. Have students put the same colors next to each other in the tower, e.g., YYGGG rather than YGYGG.

Next, have students use their towers to create a pattern as pictured to the right. First, select a tower with five green cubes. Next, choose the tower with one yellow and four green cubes and place it beside the first tower. Continue until there are four towers next to each other. Ask children if they see a pattern. See if they can figure out the next two towers in the pattern.



With the extras, see if you can make another set. If one or two towers are missing, have students try to make the one(s) that would complete the pattern.

Note: This Application Problem shows a growth pattern, reminiscent of the number stairs that show the pattern of *1 more*. Encourage children to make these connections as a precursor to the lesson. Be prepared to create any partners of 5 needed to complete the pattern.

Concept Development (14 minutes)

Part 1: Concept Introduction

Materials: (T) Bin of colored linking cubes (red, blue, green) (S) Baggie of 18 (8 red, 6 blue, 4 green linking cubes per pair

Gather students in a circle on the floor. Give each pair a baggie of linking cubes to share.

1. Say, "Listen to my story: When Julia gets home from school, she takes off her shoes and puts them by the front door. I'm going to use my cubes to show her pair of red shoes. You do the same." Put two red cubes together as students do the same. 
2. Say, "In the afternoon, Julia's mom comes home from work and puts her blue shoes by the door." "Let's build a new tower to show all the shoes then. (Connect two red cubes and two blue cubes.) "I'm going to put the new tower next to the first tower of two red cubes. You do the same." 
3. Say, "In the evening, Julia's brother comes home from basketball practice and puts his green shoes by the door, too." "Let's build a new tower to show all the shoes then. (Connect two red cubes, two blue cubes, and two green cubes.) Put the new tower next to the first 2 towers." 
4. Say, "Look, we made a growth pattern! Who would like to continue the story? Who might come home next and put his or her shoes next to the door?"
5. Encourage students to continue the pattern. Check that each student's tower is growing by 2.

Part 2: Practice

Materials: (S) Bin of colored linking cubes (per table)

Instruct students to return to prepared tables.



NOTES ON MULTIPLE MEANS OF REPRESENTATION:

Provide a model of the tower for students having difficulty building the pattern, especially if they have not yet learned their color words. Ask specific questions like, "How is your tower growing?" Students can check their work against the model. This helps them to feel more comfortable taking risks.

MP.7

1. Say, "You are going to make a new tower as I tell another story."
2. Say, "Some friends were stomping outside in some rain puddles. George came inside first and put his blue rain boots by the door. Show my story with your cubes." Students connect two blue cubes.

MP.7

3. Say, “Jade came inside next and put his yellow rain boots by the door. Make a new tower to show what all the boots look like now.” Students connect two blue cubes with two yellow cubes.
4. Say, “With a partner, continue my story. Each of you tells one more story and adds on to your towers.”
5. Circulate and listen to students’ stories and representations, using parallel talk: e.g., “I heard Cecily say, ‘Angel came inside and put his green rain boots by the door. We need to add two more to a new tower.’”
6. Invite students to share their stories and to show their towers.

Student Debrief (3 minutes)

Lesson Objective: Identify a growth pattern using objects.

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 toward 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.

- (Create three different towers to show what the shoe line-up might look like by the door.) Which of these shows the shoes of one person? Of two people? How do you know?
- How are the shoes and boots patterns different from the patterns we have made before? How are they the same?
- Think about the number stairs we built earlier in the year to show the *1 more* pattern. How were our towers today like the number stairs? Did our towers grow by 1 more today?



CENTER CONNECTION:

At the art center, invite children to use colored dot painters to represent the shoes, or even mittens, by the door. Provide construction paper doors for students to glue. Encourage students to create and to share their story with a partner.

Lesson 28

Culminating Task – create a story problem and act it out in the Children’s Math Theater.

Suggested Lesson Structure

■ Culminating Task	(Duration to be determined by teacher.)
■ Student Debrief	(Duration to be determined by teacher.)
Total Time	

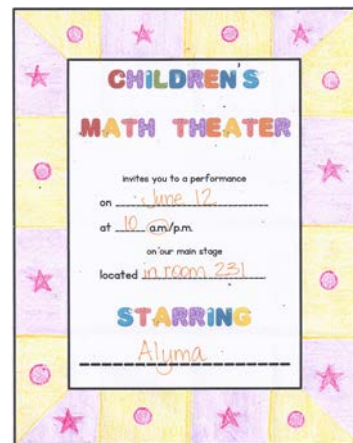
Culminating Task (Duration to be Determined by Teacher)

Part 1: Concept Introduction

Materials: (T) White board or chart paper, completed invitation (Template) (S) white paper, crayons

Note: To create the Children’s Math Theater, students will need to develop and practice their word problems and create invitations for guests. Because of the possible duration of this task, consider allowing children to continue working during the first days of assessment, saving the last day for students to host a performance for families or other members of the school community.

1. Tell students, “You have learned so much math this year! We are going create our own math stories to be acted out for our families and friends at the Children’s Math Theater. Each of you will have a chance to show and tell your own addition or subtraction story on stage!”
2. Create an addition story, e.g., “There is a nest with 3 baby birds. One more baby bird hatched from an egg. How many baby birds are there now?” Ask students to create a math drawing of the story.
3. Ask, “What number sentence matches our story?” On the back of your paper, write a number sentence to match the story, $3 + 1 = 4$. Have students say, “3 plus 1 equals 4.”
4. Have 4 students act out the story problem.
5. Repeat Steps 2–4 with a subtraction story, e.g., a nest with 4 baby birds and two of them fly out of the nest (2 crossed out). As you write the matching number sentence on the back of the paper, have students say, “4 take away 2 is 2.”

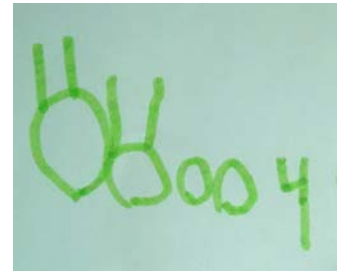


Part 2: Practice

Materials: (S) Large piece of white construction paper (12" x 18"), crayons, invitation (Template)

Send students to prepared tables to begin drawing their number stories. Fill out the performance details on the invitation before making copies for students.

1. Assign each child an addition or subtraction story.
2. Explain the directions: First, students will create their addition or subtraction story. Then, they will draw their story.
3. As the students work, circulate and have them dictate their matching addition or subtraction story. Consider writing it on the back of the paper as a reference. Students should have a solid memory of their story and the accompanying question for the audience to solve.
4. Support children as they tell their story and write a matching number sentence on the *back* of the paper. (This is so that an audience member can be called forward to write the matching number sentence and solve it on the day of the performance.) Check that students have a clear understanding of whether they have written an addition or subtraction sentence.
5. Distribute the blank invitation. Guide students to think of a pattern and practice it before beginning to draw on the invitation.
6. Circulate while students are working and have them explain the pattern on the invitation.



*Two gorillas are swinging from trees.
Two gorillas are on the ground. How many gorillas are there?*

Display a completed invitation with a pattern drawn around the border. Have students create their own pattern. As soon as possible, send children home with their invitations. An additional reminder about the performance is in the Topics D–F Family Math Newsletter.

Student Debrief (Duration to be Determined by Teacher)

Lesson Objective: Culminating Task—create a story problem and act it out in the Children’s Math Theater.

Note: Begin the Student Debrief with student performances, inviting students and guests to enjoy the number stories and answer the questions. Then, invite children to the circle for discussion.

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 toward meeting the lesson objective. As students complete the performance, listen for evidence of student understanding that can be celebrated 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.

- Who told an addition story? How do you know it was an addition story?
- Who told a subtraction story? How do you know it was a subtraction story?
- When you were in the audience, how did you answer the questions?
- What was your favorite thing about the Children’s Math Theater?



CENTER CONNECTION:

Children can use the dramatic play center as a chance to act out their number stories in preparation for the performance. If needed, consider creating a station for students to continue work on their invitation patterns during center time.

The logo for Children's Math Theater features the words "CHILDREN'S" and "MATH THEATER" in large, colorful, bubbly letters. Each letter has a small, friendly face with eyes and a smile. The letters are in various colors including red, purple, blue, green, and orange.

invites you to a performance

on _____

at _____ a.m./p.m.

on our main stage

located

.

The word "STARRING" is written in large, colorful, bubbly letters, similar to the logo above. Each letter has a small, friendly face with eyes and a smile. The letters are in various colors including blue, red, yellow, and purple.

invitation

Pre-Kindergarten Mid-Module 5 Assessment Instructions (Administer after Topic C)

Purpose: These assessments inform daily planning and track student skill development to support and strengthen parent-teacher communication of student progress, and provide valuable information for Kindergarten teachers.

Materials Needed: Module 5 Assessment Template, crayon, numeral cards 0–5, 5 balls, basket

Preparation: This may be a Pre-Kindergarten student's first assessment experience so it is critical to make it a positive experience. Greet the child warmly, sitting next to him/her rather than opposite. Tell the child that you want to play some number games with him or her.

Procedure: Use the specific language of the assessment, translating as necessary for English language learners. Use the second hand of a watch or clock to assure there is ample wait time and note when there is a significant delay in response, e.g., more than 20 seconds. Record the student's results in two ways: 1) the narrative documentation and 2) the overall score per topic. To ensure the most accurate results, it is important to allow the child to explain his or her reasoning in his or her primary language.

Initial Assessment: Use the rubric to determine at what step students are performing.

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)
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If the student is unable to get the correct answer on any part of the assessment, his score cannot exceed Step 3. However, if the student is unable to use his words to *tell* what he did, we do not count that against him quantitatively. If the student asks for or needs a hint or significant support, provide either, but the score is automatically lowered. This is to make sure that the assessment provides a true picture of what a student can do independently.

Repeated Assessment: If a student scores at Step 1 or 2, repeat that task again at two-week intervals, noting the date of the reassessment in the space at the top of the student's record sheet. Document student's progress on the same assessment form. If the student is very delayed in his response but completes it, reassess after two weeks to see if there is a change in the *time elapsed*.

Documentation Availability: Put the assessments in a three-ring binder or student portfolio. There are two assessments (mid and final) per module for each student. Use the Class Record Sheet following the rubric for an *At-a-Glance* look at students' strengths, progress toward meeting objectives, and follow-up lesson planning.

Student Name _____

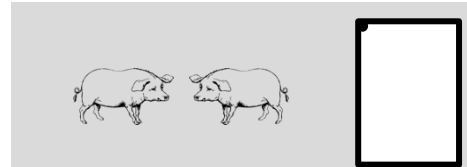
Topic A: Writing Numerals 0 to 5

Rubric Score _____ Time Elapsed _____

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

Materials: (S) Module 5 Assessment Template, crayon, numeral cards 0–5 (Lesson 1 Template)

1. (Place a copy of Assessment Template in front of the child and point to the box with two pigs.) How many pigs are in this box? Write the number in the box.
2. (Repeat for numerals 3–5.)



Note: If a child is unable to remember what the numeral looks like, show the numeral cards and ask her to find the correct number. Once she has found the correct number, invite her to write it in the box.

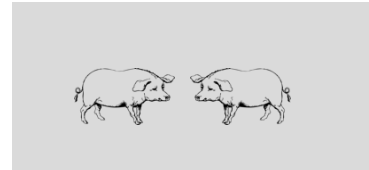
What did the student do?	What did the student say?
1.	
2.	

Topic B: Contextualizing Addition Stories to Solve

Rubric Score _____ Time Elapsed _____

Materials: (S) 5 small balls, basket, Module 5 Assessment Template, 5 linking cubes, crayon

1. Act out this problem for me: Barak has 3 balls. He gets 2 more balls for his birthday. How many balls does he have in all?
2. Say an addition sentence to tell what happened in the story.
3. (Show picture of two pigs from Assessment Template. Fold over the portion for writing the numeral.) There are 2 pigs in the pen. 2 more pigs come to the pen. How many pigs are there all together? You can use cubes or draw more pigs to solve.
4. Say an addition sentence to tell what happened in the story.



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

Topic C: Contextualizing Subtraction Stories to Solve

Rubric Score _____ Time Elapsed _____

Materials: (S) 5 balls, basket, Module 5 Assessment Template, crayon

1. Act out this problem for me: Barb has 5 balls at the playground. She loses 1 ball while she is there. How many balls are left?
2. Say the subtraction sentence to tell what happened in the story.
3. (Show picture of three balloons from the Assessment Template.) There are 3 balloons. 2 balloons popped. How many balloons are left? You can use the crayon on the drawing if you need it.
4. Say the subtraction sentence to tell what happened in the story.



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

Mid-Module Assessment Task Standards Addressed

Topics A–C

Know number names and the count sequence.

PK.CC.2 Represent a number of objects with a written numeral 0–5 (with 0 representing a count of no objects).

Understand addition as adding to, and understand subtraction as taking from.

PK.OA.1 Demonstrate an understanding of addition and subtraction by using objects, fingers, and responding to practical situations (e.g., if we have 3 apples and add two more, how many apples do we have all together?).

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 students 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.CC.2	The student shows little evidence of understanding how to write numerals, and is unable to write numerals even with numeral cards. The student may not be able to match a numeral card to the number of pigs in each picture.	The student is able to match a numeral to the number of pigs in each picture, but is unable to write most numerals without seeing numeral cards. Or, the student is able to write numerals but cannot match them to the number of pigs in each picture.	The student is able to write a numeral to match the number of pigs in each picture but needs to see 1 or 2 numeral cards in order to write them. There may be some reversals or incorrect formation of numerals.	The student correctly: Writes numerals 0–5 to match the number of pigs in each picture with correct formation and no reversals.



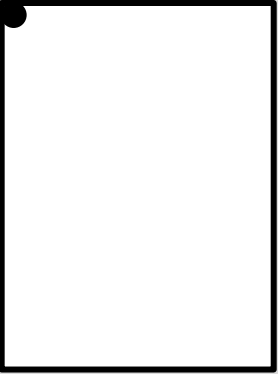
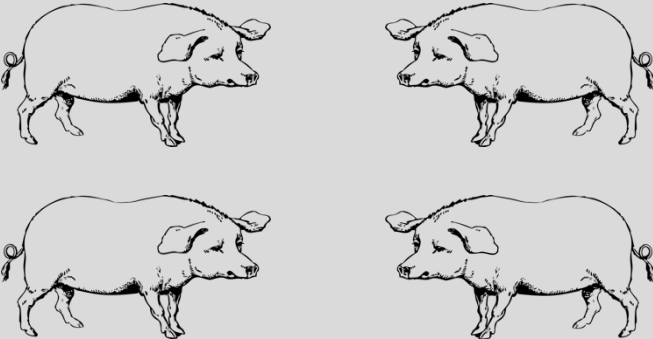
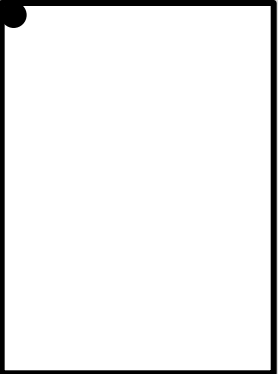
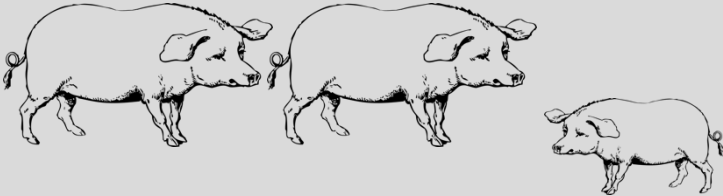
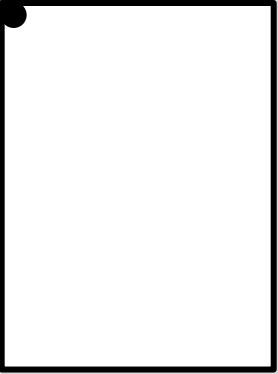
A Progression Toward Mastery

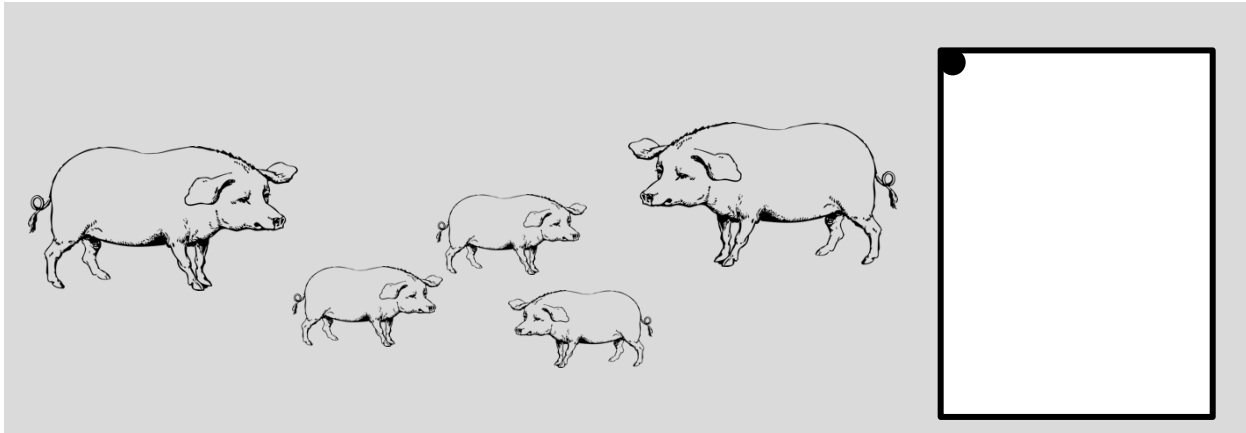
Topic B PK.OA.2	The student shows little evidence of understanding addition and is not able to use objects or drawings to represent addition stories.	The student shows evidence of beginning to understand how to: - Use objects and/or drawings to add, but is unable to state an addition sentence to match the story. OR - State an addition sentence but is unable to use objects or drawings to add.	The student demonstrates some understanding but is inaccurate and/or inconsistent in doing the following: - Using balls to model the addition story. - Stating an addition sentence to match the ball story. - Using the pig picture to solve the addition story. - Stating an addition sentence to match the pig story.	The student correctly: - Adds balls to model addition story. - States the addition sentence as “3 balls and 2 balls make 5 balls,” “3 and 2 is 5,” or “3 plus 2 equals 5.” - Uses pig picture to solve the addition story. The student may draw to solve. - States the addition sentence as “2 pigs and 2 pigs is 4 pigs,” “2 and 2 is 4,” or “2 plus 2 equals 4.”
Topic C PK.OA.1	The student shows little evidence of understanding subtraction and is not able to use objects or drawings to represent subtraction stories.	The student shows evidence of beginning to understand how to: - Use objects and drawings to subtract, but is unable to state a subtraction sentence to match the story. OR - State a subtraction sentence but is unable to use objects or drawings to subtract.	The student demonstrates some understanding but is inaccurate and/or inconsistent in doing the following: - Using balls to model subtraction story. - Stating a subtraction sentence to match the ball story. - Using the balloon picture to solve the subtraction story. - Stating a subtraction sentence to match the balloon story.	The student correctly: - Takes away balls to model subtraction story. - States the subtraction sentence as “5 balls take away 1 ball is 4 balls” or “5 take away 1 is/equals 4.” - Uses balloon picture to solve the story problem. The student may use crayon or objects to solve. - States the subtraction sentence as “3 balloons take away 2 balloons is 1 balloon” or “3 take away 2 is/equals 1.”

Class Record Sheet of Rubric Scores: Mid-Module 5 Assessment

Student Names	Topic A: Writing Numerals 0 to 5	Topic B: Contextualizing Additional Stories to Solve	Topic C: Contextualizing Subtraction Stories to Solve	Next Steps:

Module 5 Assessment Template





Pre-Kindergarten End-of-Module 5 Assessment (Administer after Topic F)

Student Name _____

Topic D: Decontextualizing Addition Stories to Solve Using Fingers, Objects, and Drawings

Rubric Score _____ Time Elapsed _____

Materials: (S) 7 counters, paper, crayon

	Date 1	Date 2	Date 3
Topic D			
Topic E			
Topic F			

1. Listen to my addition story: Four friends are eating snacks. One more friend comes to eat. How many friends are eating snacks now? Use your fingers to solve.
2. Say an addition sentence to tell what happened in the story.
3. Listen to my addition story: There are two elephants drinking from the pond. Two baby elephants come for a drink. How many elephants are there all together? Use the counters to solve. (Let the child count out the needed counters.)
4. Say an addition sentence to tell what happened in the story.

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

Topic E: Decontextualizing Subtraction Stories to Solve Using Fingers, Objects, and Drawings

Rubric Score _____ Time Elapsed _____

Materials: (S) 7 counters, paper, crayon

1. Listen to my subtraction story: Three ducks are swimming. One duck flies away. How many ducks are left? Use your fingers to solve.
2. Say a subtraction sentence to tell what happened in the story.
3. Listen to my subtraction story: Five deer are eating grass. Two deer run away. How many deer are eating now? Draw a picture or use counters to solve.
4. Say a subtraction sentence to tell what happened in the story.

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

Topic F: Duplicating and Extending Patterns

Rubric Score _____ Time Elapsed _____

Materials: (S) Pattern stick with 12 cubes (yellow, green, green), bucket of loose yellow, green, and red linking cubes

1. (Place pattern stick in front of the students.) This is my pattern. Can you tell me the pattern? What repeats?
2. Copy my pattern using these linking cubes. (Point to bucket of linking cubes.)
3. Use the cubes to continue the pattern.
4. Count to 20.

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

End-of-Module Assessment Task
Standards Addressed

Topics D–F

Know number names and the count sequence.**PK.CC.1** Count to 20.**Understand addition as adding to, and understand subtraction as taking from.****PK.OA.1** Demonstrate an understanding of addition and subtraction by using objects, fingers, and responding to practical situations (e.g., If we have 3 apples and add two more, how many apples do we have all together?).**Understand simple patterns.****PK.OA.2** Duplicate and extend (e.g., What comes next?) simple patterns using concrete objects.

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 students 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 D PK.OA.1	The student shows little evidence of understanding addition and is not able to use fingers or objects to represent objects in addition stories.	The student shows evidence of beginning to understand how to use fingers or objects to represent objects in addition stories. May not be able to say an addition sentence to match the stories.	The student demonstrates some understanding but is inaccurate and/or inconsistent in doing the following: - Using fingers or objects to model the stories. - Stating an addition sentence to match the stories.	The student correctly: - Uses fingers to model friends addition story. - States the addition sentence as “4 and 1 is 5,” “4 plus 1 equals 5,” or “4 friends and 1 friend is 5 friends.” - Uses objects to model elephant addition problem.



A Progression Toward Mastery

				States the addition sentence as “2 and 2 is 4,” “2 plus 2 equals 4,” or “2 elephants and 2 elephants is 4 elephants.”
Topic E PK.OA.1	The student shows little evidence of understanding subtraction and is not able to use fingers, objects, or drawings to represent objects in subtraction stories.	The student shows evidence of beginning to understand how to use fingers, objects, or drawings to represent objects in subtraction stories. May not be able to say a subtraction sentence to match the stories.	The student demonstrates some understanding but is inaccurate and/or inconsistent in doing the following: - Using fingers, objects, or drawings to model the stories. - Stating a subtraction sentence to match the stories.	The student correctly: - Uses fingers to model the duck story. - States the subtraction sentence as “3 take away 1 is/equals 2” or “3 ducks take away 1 duck is 2 ducks.” - Draws a picture or uses cubes to model deer story. - States the subtraction sentence as “5 take away 2 is/equals 3” or “5 deer take away 2 deer is 3 deer.”
Topic F PK.OA.2 PK.CC.1	The student is unable to duplicate or extend a simple pattern.	The student shows evidence of beginning to understand patterns but makes 3 or more mistakes in doing the following: - Identifying the repeating part of the pattern. - Duplicating the teacher’s pattern using linking cubes. - Extending the pattern by at least one iteration.	The student demonstrates some understanding but makes 1 or 2 mistakes in doing the following: - Identifying the repeating part of the pattern. - Duplicating the teacher’s pattern using linking cubes. - Extending the pattern by at least one iteration.	The student correctly: - Identifies the repeating part of the pattern. - Duplicates the teacher’s pattern using linking cubes. - Extends the pattern by at least one iteration.

Class Record Sheet of Rubric Scores: End-of-Module 5 Assessment

Student Names	Topic D: Decontextualizing Addition Stories to Solve Using Fingers, Objects, and Drawings	Topic E: Decontextualizing Subtraction Stories to Solve Using Fingers, Objects, and Drawings	Topic F: Duplicate and Extending Patterns	Next Steps: