Counting and Cardinality

Prior to Instruction

Program student AAC devices with numbers and mathematical symbols. For students who are not fluent using devices to communicate, provide students with visual response options and communication cards. For students with emerging symbolic communication, use concrete representations of objects from the book (i.e., toy frog, toy bugs) and three-dimensional counters and manipulatives. Sample words and phrases include:

- Numbers I-10
- Count
- Multiples of 10's to 100

Anchor Instruction for All Students

Prior to beginning instruction, anchor instruction by referencing the story, *Frog's Bright Idea*. Say, **We read the book, Frog's Bright Idea**. We can count things from **our story! We can count the bugs that the frog catches!** Give your students a handful of counters (ideally pretend bugs) and have your students pretend to be frogs and catch/count the bugs.



Learning Objectives

- Students will identify numbers I-10 and I-100.
- Students will count to a specific number.
- Students will count objects with one-to-one correspondence.
- Students will solve simple multiplication facts.

Materials

- Number and Quantity Cards
- Multiplication Cards
- Counting Mat (Matching)
- Counting Mat
- Counting Worksheets
- Linking Counting Cubes
- Number Line
- Counting Frame
- Magnetic Whiteboard
- Magnetic Numbers
- Magnetic Display Tray
- Magnetic Picture Pockets
- Worksheet Pockets



INTRODUCE

Introduce Numbers - Reciting Numbers in a Sequence

	LEVEL I	LEVEL 2	LEVEL 3
INTRODUCE	Frogs like to hop. Let's hop and count! Get ready! Pretend to hop and count. Teacher's choice: Review any counting skills (e.g., forward and backward counting with a model). Great job counting. Let's try it again. You can repeat this as a group or have individual students do it.	Frogs like to hop. Let's hop and count! Get ready! Pretend to hop and count. Teacher's choice: Review any counting skills (e.g., counting on from numbers other than 1; counting backward from a specific number). Great job counting. Let's try it again. You can repeat this as a group or have individual students do it.	Frogs like to hop. Let's hop and count! Get ready! Pretend to hop and count. Teacher's choice: Review any counting skills (e.g., skip counting). Great job counting. Let's try it again. You can repeat this as a group or have individual students do it.
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	LEVEL I	LEVEL 2	LEVEL 3

Say, Numbers are all around us! A number tells us how many. We are going to practice identifying numbers and counting different things. Let's remember our book.

Relate to Story: There are so many numbers in the story! Let's count. For students without number recognition have students identify a number versus not a number ("1" versus book).

Number Identification and Math Vocabulary with Constant Time Delay

This instruction is recommended for all levels of learners. In this final lesson there is only foursecond delay because there are no new skills presented. Review what has been learned thus far.

Four Second Delay Round

Complete 5-10 Trials/Student. Recommended for students needing substantial to moderate prompting and support.

Materials: Number line with missing numbers and multiplication facts

Insert target numerals in varying order in script below.

- Level I: Fills in numbers 1-10 in sequential order on a number line
- Level 2 & 3: Reviews multiplication facts

TEACHER SAYS	STUDENT RESPONSE	FEEDBACK
Say, Let's practice putting the numbers on the number line. What number goes here? Wait	Student touches or says the word/fact "(#)" within four-seconds. Then student matches to quantity.	Say, Wonderful! You found the number (#)! Read sequence again emphasizing missing numbers.
four seconds. Multiplication: What is (fact)?	Student does not respond.	Point to the correct response. Say, (#). This number is the number (#). What number? Wait for student response.
	Student responds incorrectly.	Point to the correct response. Say, (#). This number is the number (#). What number? Provide physical guidance if necessary. After the student touches or says the name of the number, provide specific verbal praise. Say, That's it! That number is (#)!



Instructional Tips!

- For students needing additional support, consider altering the task demand and have your students practice matching identical numbers. Have your students practice matching number cards to response options and programmed responses on AAC devices to promote communication.
- For students struggling during the four second delay round, return to the zero second delay round for a number of trials or only present the target number to the students. After the student responds given one response option, slowly introduce distractors.



Counting and Number Sense - Differentiated Systematic and Explicit Instruction

Follow the instructional steps below. Adapt the steps or language, as needed, to account for student-specific needs. After each step, provide specific verbal feedback for correct responses and participation.

	LEVEL I	LEVEL 2	LEVEL 3
INTRODUCE	Say, Today we are going to begin working on division! Division means to distribute into equal groups. Sometimes we call this fair shares. You can see why. Do a demonstration with food or toys (e.g., 6 cookies divided by 3 people) where you distribute equally among the students participating in the lesson.	Say, Today we are going to continue working on multiplication and division! You have to look closely to decide if it is a multiplication or division problem.	Say, Today we are going to continue working on multiplication and division! You have to look closely to decide if it is a multiplication or division problem.

Model-Lead-Test Instruction and a System of Least Prompts

This instruction is leveled for three types of support needs. All instruction is delivered in a model-leadtest format. You will teach students how to count by presenting a specific number of counters to your students in an organized or scattered array. Use the counting graphic organizer to help your students visually organize the counters and count to specific numbers. For students needing additional support, consider using the counters on the magnetic board, printing and laminating counters using a pull off system, or counting larger three-dimensional objects.

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LEVEL I	LEVEL 2	LEVEL 3
Use counting mat and 12 counters. Watch me first!	Use counters or draw diagrams to match word problems on worksheet.	Use counters or draw diagrams to match word problems on worksheet.
Frog caught 6 bugs. He wanted to share with 3 friends. How many bugs did each frog get? Division means to distribute into equal shares. We can see how many bugs each friend gets by distributing them equally. Have 6 counters and distribute them one-by-one into 3 groups. Look! I divided the bugs equally into each group and there are 2 bugs in each group. This is the division sign, ÷. This symbol means divide, or make equal shares. Say, "divide." Wait for students to respond. Repeat with several more examples.	 Watch me first! Frog caught 6 bugs. He wanted to share with 3 friends. How many bugs did each frog get? In the last lesson, we divided into equal shares, but sometimes you may not have counters to do that and you must use your fact knowledge. Today we are going to see how division is the inverse of multiplication. We can set up our division equation into a multiplication equation and solve. Is the same as 3 x ? = 6. Three times what equals 6? Use your facts, fingers, or skip counting to figure it out. Wait for students to respond. The answer is 2. Three times <u>2</u> equals 6. Repeat with more examples related to word problem worksheet. 	Watch me first! I have to look at my problems and decide if it is multiplication or division. I can draw it out or use facts to solve. Use the same procedures previously trained. Model at least one multiplication and one division problem.

	LEVEL I	LEVEL 2	LEVEL 3
LEAD	Say, Let's work together and take turns. We are going to practice counting out the starting amount (point to first number in problem), dividing into equal groups (point to second number in problem), and counting the number in each group to solve the problem (point to ? in problem). Remember one touch, one count. Use the Level 2 worksheet problems.	Let's work together. Repeat the procedures with different division facts.	Let's work together. Repeat the procedures with different multiplication and division facts (2-3 examples from the worksheet).
TEST	Say, Your turn. This is the problem ?. Show me how to count out (#) counters to start. Student should count out starting amount. Optional: have student divide counters, or model this. How many are in the group? This is our answer! Student should count the number in the group to solve the problem.	Your turn. Show me how to solve this problem. Have your students solve problems on the worksheet.	Your turn. Show me how to solve this problem. Have your students solve problems on the worksheet.
PROMPTING AND ERROR CORRECTION	If the student does not respond after 4 seconds, say, Count the number in the group. Wait for the student to count. If correct, deliver specific verbal praise. If the student makes an error, Stop! Watch me. Model, and have the student recount from the beginning. Your turn. If the student does not respond after 4 seconds, say, Do it with me. Use hand-over-hand guidance and physically prompt your student to count the pictures.	If the student does not respond after 4 seconds or makes an error, For counting- correct the counting error and point to the counters. For division- help the student set up the problem as a multiplication problem.	If the student does not respond after 4 seconds or makes an error, For counting- correct the counting error and point to the counters. For multiplication and division-help the student set up the problem.
REINFORCE	Terrific job finding the answer to the division problem!	Great job dividing!	Great job dividing!

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Instructional Tips!

- For students who need physical adaptations to the materials, consider using larger three-dimensional counters, magnetic counters, or counters that can be removed from a Velcro board. To adjust the complexity level of the task, consider the number of distractors and the organization of the counters.
- For students who are in the beginning stages of learning to count, teach your students to count in a linear array by pushing movable counters and counting from left to right.

Check for Understanding

LEVEL I	LEVEL 2	LEVEL 3
 Students will count total amount in division problem. Optional: Students will divide sets by fair shares. Students will count items in a group to solve. 	• Students will use multiplication to divide.	 Students will use multiplication or division to solve problems.

Generalization and Extension Activities

Practice creating word problems to match sets in the classroom.

Measuring Student Learning

Using the data sheet, collect data on student-specific responses during the counting and cardinality segment. Monitor student progress regularly and make data-based decisions related to instructional pacing, adapting levels of support, and increasing difficulty as needed.

Independent, Technology-Delivered Instruction

enCORE provides additional instruction and practice on the target skills and concepts addressed in this Unit. Both teacher-led and independent student lessons that automatically adapt to differentiate across learning levels are key components of enCORE:

- enCORE automatically selects and assigns these lessons to your students based on their learning level and the Unit you are currently teaching
- or, to view and select any of these lessons at any time go to the Curriculum tab in your enCORE teacher dashboard.



Operations and Algebraic Thinking

Prior to Instruction

Program student AAC devices with numbers and mathematical symbols. For students who are not fluent using devices to communicate, provide students with visual response options and communication cards. For students with emerging symbolic communication, use concrete representations of objects from the book (i.e., toy frog, toy bugs) and three-dimensional counters and manipulatives. Sample words and phrases include:

- Numbers I-10
- Count
- Multiply
- Group
- Make Sets

Anchor Instruction for All Students

Prior to beginning instruction, anchor instruction by referencing the story, *Frog's Bright Idea*. Say, **We read** the book, *Frog's Bright Idea*. We are going to solve math word problems related to our story. Today, we are going to add in our word problems.



Learning Objectives

- Students will multiply sets to show multiplication.
- Students will solve multiplication word problems to 100.

Materials

- Word Problem Strips
- Word Problem Worksheet
- Graphic Organizer
- Blank Problem-Solving Placemat
- Linking Counting Cubes
- Ten Frame Cards (optional, use as a graphic organizer)
- Blank Puzzle Pieces (optional, use to write and represent equations)
- Magnetic Whiteboard
- Magnetic Numbers
- Magnetic Display Tray
- Magnetic Picture Pockets
- Worksheet Pockets

Introduce Word Problem Solving

LEVEL I	LEVEL 2	LEVEL 3
Today, we are going to solve division word problems by making groups of things to match the word problem. This is the division sign. Show sign. When we divide, we make equal groups of things. This is called fair shares. Demonstrate with counters or a set of objects.	Today, we are going to solve division word problems by making groups of things to match the word problem. This is the division sign. Show sign. When we divide, we make equal groups of things. Demonstrate with counters or a set of objects. We are going to practice putting numbers and math signs in our number sentence to practice writing equations	Today, we are going to solve multiplication and division word problems. We are going to practice putting numbers and math signs in our number sentence to practice writing equations for our math problems.
	for our math problems.	



Model-Lead-Test and a System of Least Prompts

This instruction is leveled for three types of support needs. All instruction is delivered in a model-lead-test format.

	LEVEL I	LEVEL 2	LEVEL 3
MODEL	Note to teachers: Here you and dividing. My turn. Here is my wor First, I need to read my what information is key, information that will he Frog used a candle to ca 6 bugs. He wanted to sh many bugs did each frog (Step 2) Next, I need to co operation, I use to solve problem type! This is a co time we are given the to number of sides (3), and many bugs EACH frience multiplication! Remember, in a multiplication	re modeling a "think aloud" of rd problem. (Step 1) problem and find out Key information is lp me solve the problem. Atch bugs. Frog caught are with 3 friends. How g get? determine what by investigating the division problem. This otal (6 bugs) and the we must find out how I got. It is the opposite of ication problem, it will as are in EACH row, side, be total. In a division out how many are in oblem we see there are ids. How many bugs did must divide. to the numbers and the numbers in the problem. r number sentence. I first in the number	LEVEL 3 Note to teachers: Here you are modeling a "think aloud" of discriminating between multiplication and division. My turn. Here is my word problem. (Step 1) First, I need to read my problem and find out what information is key. Key information is information that will help me solve the problem. (Step 2) Next, I need to determine what operation, I use to solve by investigating the problem type! • Remember, in a multiplication problem, it will tell you how many things are in EACH row, side, or group and you find the total. • In a division problem, we must find out how many are in EACH group. What do you see in this problem? (Step 3) As you read, point to the numbers and the vocabulary referencing the numbers in the problem. Third, I need to fill- in my number sentence. I will put the number first in the number sentence because it is the first number
	will put the number	first in the number ne first number that I number sentence. I will _ in the next space in ecause it is the next ne number in the next	that I see. Put the number in the number
	my sign. This is a division write [" "]. Write the sign	on problem so I need to	Write the sign in the equation.

	LEVEL I	LEVEL 2	LEVEL 3
MODEL (CONTINUED)	(Step 4) Now, I am ready to set up my problem using the graphic organizer and counters! I need to choose the division problem graphic organizer because I am dividing. Select graphic organizer. Now, let's put our numbers in the graphic organizer. Fill in the graphic organizer with the numerals and sign. I will put a question mark in the last bubble because I need to solve to find out [summarize question by stating what you will be		 (Step 4) Now, I am ready to set up my problem using the graphic organizer and counters! Select graphic organizer. Now, let's put our numbers in the graphic organizer. Fill in the graphic organizer with the numerals and sign. I will put a question mark in the last bubble because I need to solve to find out [summarize question by stating what you will be solving for]. (Step 5) Next, I can [draw/use my counters to solve]. Model setting up the problem by using counters, or drawing to diagram the problem (Step 6) Last, I will count to solve. Count out loud. Repeat the question and state the answer with the numeral and what you solved for in the problem. We solved the math problem.
LEAD	 Fill in word problems with numerals 12 or less. Let's do some more problems together. Remember we are solving division problems! Repeat using the steps and think aloud process from the "model" section above. The student should demonstrate the action in the word problem: Count the number in a group. Fantastic job counting to find the answer! Repeat answer. 	 Fill in word problems with numerals. Note to teacher: Students should set up division problems using a multiplication fact – (# times ? equals #). Remember we are solving division problems! Repeat using the steps and think aloud process from STEP 2 in the "model" section above. Give each student an opportunity to fill in equation and graphic organizer. Fantastic. You solved the division problem! 	Fill in word problems with numerals 1-10. Note to teacher: Encourage students to diagram the problem using counters or drawing. Let's do some more problems together. Remember we are solving multiplication problems! Repeat using the steps and think aloud process from the "model" section above. Give each student an opportunity to fill in equation and graphic organizer. Fantastic job solving multiplication problems.

LEAD

	LEVEL I	LEVEL 2	LEVEL 3
TEST	Your turn. Show me how to count to solve the division problem.	Your turn. Show me how to write a number sentence and solve this problem.	Your turn. Show me how to write a number sentence and solve this problem.
	Note:	To be used during the Test phase as	needed.
SYSTEM OF LEAST PROMPTS	First prompt: If needed, after four seconds, say, Count. Point to counters to count. Second prompt: If needed, after another four seconds, say I count like this. Model how to count. Third prompt: If needed, after another four seconds, using physical guidance to help the student count.	First prompt: If needed, after four seconds, say, Look at the important information in the problem to how to set up the problem. We know the division problem. Set it up to be a multiplication problem. Second prompt: If needed, after another four seconds, say: Change the division problem to a multiplication problem: (#) times ? "what" equals (#). Third prompt: If needed, after another four seconds, solve and have student repeat.	First prompt: If needed, after four seconds, say, Look at the important information in the problem to how to set up the problem. Use the think aloud in STEP 2 to help prompt. Second prompt: If needed, after another four seconds, say This is a [multiplication/ division problem]. Model (multiplication): making groups with counters in each, or (division) making total then dividing equally into one set of the rows/groups. Have the student repeat with the remaining. Third prompt: If needed, after another four seconds, model problem and then have the student repeat.
REINFORCE	Way to go! You solved the division problem.	Way to go! You solved the division problem.	Way to go! You solved the multiplication/division problem.

Instructional Tip! For students needing additional support, pre-teach math concepts and symbols using constant time delay.

Check for Understanding

LEVEL I	LEVEL 2	LEVEL 3
Students will count numbers in fair share group and identify the answer (15 or less).	Students will solve division problems and understand division is the inverse of multiplication.	Students solve multiplication and division problems.

Generalization and Extension Activities

To generalize, create division problems related to the story. Give your students bugs (i.e., pretend bugs, counters, objects, etc.) and have your students divide the bugs in different ways.

Measuring Student Learning

Using the data sheet, collect data on student-specific responses during the operations and algebraic thinking segment. Monitor student progress regularly and make data-based decisions related to instructional pacing, adapting levels of support, and increasing difficulty as needed.

Independent, Technology-Delivered Instruction

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Measurement and Data

Prior to Instruction

Program student AAC devices with numbers and mathematical symbols. For students who are not fluent using devices to communicate, provide students with visual response options and communication cards. For students with emerging symbolic communication, use concrete representations of objects from the book (i.e., toy frog, toy bugs) and three-dimensional counters and manipulatives. Sample words and phrases include:

- Numbers I-10
- Rectangle
- Area

NTRODUCE

• Units Squared

Anchor Instruction for All Students

Prior to beginning instruction, anchor instruction by referencing the stories read in the unit, *Frog's Bright Idea*. Say, We read the book *Frog's Bright Idea*! Frog searched far and wide for bugs to eat for dinner. We can find how far frog searched by calculating area. Let's keep solving for area.



Learning Objectives

- Students will understand measurement vocabulary.
- Students will identify the perimeter and area of an object.
- Students will calculate perimeter.
- Students will calculate area using the formula and multiplication.

Materials

- Measurement Cards
- Measurement Worksheets
- Magnetic Whiteboard
- Magnetic Display Tray
- Magnetic Picture Pockets
- Worksheet Pockets
- Shapes and Attribute Set

Introduce Measurement

LEVEL I

LEVEL 2

LEVEL 3

We have learned about measuring things using inches and feet. We also learned about measuring the perimeter, or the length of the outside boundary of an object. Demonstrate using plastic shapes. Area is the space an object contains or the surface of the object. Demonstrate using plastic shapes. Go around to each student and have them demonstrate perimeter and area.

	LEVEL I	LEVEL 2	LEVEL 3
MODEL	Use shapes from math kit without enhancements. Watch me. Perimeter is the length of the outside boundary of a shape. Like this. Either use finger or a string to show length around outside boundary. Area is the surface of the object. Like this. Use fingers to show inner area of shape. Repeat with several shapes.	Use worksheet. Watch me. Use worksheet and do first example. I am going to find the perimeter and area of this rectangle. To find perimeter, we add the lengths of the outside edges to find the perimeter. Perimeter: in + in + in = in We are going to find the area of this rectangle. Area equals the length in inches or feet, times the width in inches or feet. Here is the formula: Area =length xwidth. When we measure in inches or feet we say, square inches or feet. We write the unit like this, "in ² " or "ft ² ." Practice reading and writing the unit of measurement. Repeat with other examples from the worksheet. Students may use a calculator if needed.	Use worksheet. Watch me. Use worksheet and do first example. I am going to find the perimeter and area of this rectangle. To find perimeter, we use the formula 2I + 2w = perimeter. We are given the length of two sides of the figure and we know the opposite sides are the same. Perimeter: in + in + in = in We are going to find the area of this rectangle. Area equals the length in inches or feet, times the width in inches or feet. Here is the formula: Area =length xwidth. When we measure in inches or feet we say, square inches or feet. We write the unit like this, "in ² " or "ft ² ." Practice reading and writing the unit of measurement. Repeat with other examples from the worksheet. Students may use a calculator if needed.
LEAD	Let's practice together. Use shapes from math kits and several objects from classroom. Say, Show me perimeter. Show me area. Give students the opportunity to respond.	Let's practice together. Complete 2-3 examples from the worksheet. Say, Find the perimeter and area of these shapes.	Let's practice together. Complete 2-3 examples from the worksheet. Say, Find the area of these shapes.



	LEVEL I	LEVEL 2	LEVEL 3
TEST	Your turn. Use plastic shapes from math kit. Say, Show me perimeter. Show me area. Repeat with 3 different shapes.	Your turn. Use worksheet. Students should solve for perimeter and area. Say, Find the perimeter and area of these shapes.	Your turn. Use worksheet. Students should solve for perimeter and area. Say, Find the perimeter and area of these shapes.
	Note: To be used during the Test phase as needed.		
PROMPTING AND ERROR CORRECTION	If the student does not respond after 4 seconds or makes an error, model and say, Look, this is [perimeter- the outside boundary of the shape; area- the surface of the	First prompt: If needed, after four seconds, say Look at the important information in the problem to figure out how to set up the problem.	First prompt: If needed, after four seconds, say Look at the important information in the problem to how to set up the problem.
	shape]. Wait for the student to say the correct response or	Perimeter = Adding all sides together.	Perimeter = Adding all sides together.
	point to the correct response.	Area = length x width. What is the length? What is the width? Now multiply.	Area = length x width. What is the length? What is the width? Now multiply.
		Second prompt: If needed, after another four seconds, say Watch me fill in the formula. Model writing the area formula with the numbers. Have the student calculate to solve.	Second prompt: If needed, after another four seconds, say Watch me fill in the formula. Model writing the area formula with the numbers. Have the student calculate to solve.
		<i>Third prompt:</i> If needed, after another four seconds, say I solve the problem like this. Model and have the student repeat.	<i>Third prompt:</i> If needed, after another four seconds, say I solve the problem like this. Model and have the student repeat.
REINFORCE	Excellent! You found the perimeter and area.	Excellent! You found the perimeter and area.	Excellent! You found the perimeter and area.

Check for Understanding

LEVEL I	LEVEL 2	LEVEL 3
Students will discriminate perimeter and area by demonstrating with hand or eye gaze with choice of two.	Students will discriminate and solve for perimeter and area.	Student wills calculate perimeter and area when given problems with 2 measurements (e.g., not all 4 on rectangle or square).

Generalization and Extension Activities

Create a classroom pond with frogs on lily pads and bugs in the air. Calculate the perimeter and area of the pond with your students.

Measuring Student Learning

Using the data sheet, collect data on student-specific responses during the measurement segment. Monitor student progress regularly and make data-based decisions related to instructional pacing, adapting levels of support, and increasing difficulty as needed.

Independent, Technology-Delivered Instruction

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