Numbers and Operations in Base 10

Learning Objectives

- Students will identify ones and tens.
- Students will make quantities on a place value chart to 99 using base ten blocks.
- Students will add with regrouping using base ten blocks.

Materials

- Counting and Quantity Cards
- Five Frame Mat
- Ten Frame Mat
- Base Ten Worksheet
- Fraction Cards
- Linking Counting Cubes
- Counting Frame
- Ten Frame Cards
- Magnetic Whiteboard
- Magnetic Numbers
- Worksheet Pockets
- Place Value Chart

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., science goggles, science beakers) and three-dimensional counters and manipulatives. Sample words and phrases include:

- Numbers 1-9
- Base ten
- Place value
- Hundreds
- Tens
- Ones

Anchor Instruction for All Students

Prior to beginning instruction, anchor instruction by referencing the story, *Science Experiments*. Say, **We read the book, *Science Experiments*. In our book, we learned about science. Can you remember what we learned from our book?** Allow your students to use the pictures from the book to help facilitate the discussion. **We use numbers in science! Numbers tell us how many. We can count things that we investigate in science!**

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 1	LEVEL 2	LEVEL 3
INTRODUCE	Say, **Numbers are all around us! We can use base ten blocks to help us see larger numbers and the Place Value chart will help us organize the base ten blocks.** Show students the base ten blocks (rods and units) and Place Value chart. **We learned to add numbers and we will continue today. Let's count by 100's to warm up. 100, 200, 300…1000!** **Now let's practice using our flats to count by 100's.** Use base ten flats and worksheet.		

Model-Lead-Test Instruction

This instruction is leveled for three types of support needs. All instruction is delivered in a model-lead-test format. You will teach students how to count by presenting a specific number of counters to your students in an organized or scattered array. For students needing additional support, consider using the counters on the magnetic board with the Five and Ten Frames (physical objects to manipulate versus pictures), printing and laminating counters using a pull off system, or counting larger three-dimensional objects.

	LEVEL 1	LEVEL 2	LEVEL 3
MODEL	Use one Ten Frame. Say, **Today we are going to subtract using our Ten Frame. Subtract means take away. Can you say "subtract"?** Wait for student to respond. **My turn. The problem is 6-3. First, I make 6 on the Ten Frame, count with me…1,2,3,4,5,6. Now, I TAKE AWAY 3. I start at the end and remove 3.** Take away the 6th, 5th, and 4th units. **Count with me as I take away…1, 2, 3. Now, how many are left? Count with me 1, 2, 3. 3!** **6 – 3 = 3** **Repeat with 7-4 and 5-2.**	Use worksheet and base ten blocks. Say, **My turn. This is the hundreds column** (point). **Say "hundreds." This is the tens column** (point). **Say "tens." This is the ones column** (point). **Say "ones."** **We are going to make 3-digit numbers with base ten blocks.** Show units, rods, and flats. **This is a unit cube. It is equal to 1. This is a rod. It has 10 unit cubes in it. This is a flat! It has 100 unit cubes in it.** Lay out 2 flats, 1 rod, and 5 units. **First, count how many hundreds. Two hundred flats. I write "2" in the hundred's column.** **Next, count how many tens. 1 ten rod. I write "1" in the ten's column.** **Last, count how many ones. 5 ones. I write "5" in the one's column.**	Use worksheet and base ten blocks. Say, **My turn. This is the hundreds column** (point). **Say "hundreds." This is the tens column** (point). **Say "tens." This is the ones column** (point). **Say "ones."** **We are going to make 3-digit numbers with base ten blocks.** Show units, rods, and flats. **This is a unit cube. It is equal to 1. This is a rod. It has 10 unit cubes in it. This is a flat! It has 100 unit cubes in it.** Lay out 2 flats, 1 rod, and 5 units. **First, count how many hundreds. Two hundred flats. I write "2" in the hundred's column.** **Next, count how many tens. 1 ten rod. I write "1" in the ten's column.** **Last, count how many ones. 5 ones. I write "5" in the one's column.**

	LEVEL 1	LEVEL 2	LEVEL 3
MODEL (CONTINUED)		**This is a 3-digit number- 215 ("two hundred fifteen;"** *do not say "and" between*). **Can you say, "two hundred fifteen?"** Repeat with 309. Lay out 3 flats and 9 units. **First, count how many hundreds. Three hundred flats. I write "3" in the hundred's column. Next, count how many tens. There are no ten rods- zero. I write "0" in the ten's column. Last, count how many ones. 9 ones. I write "9" in the one's column. This is a 3-digit number- 309. This can be tricky to read because there are 0 tens, and 9 ones. I read this as "three hundred nine." Can you say, "three hundred nine?"** Do a few more examples with quantities 100-999.	**This is a 3-digit number- 215 ("two hundred fifteen;"** *do not say "and" between*). **Can you say, "two hundred fifteen?"** Repeat with 309. Lay out 3 flats and 9 units. **First, count how many hundreds. Three hundred flats. I write "3" in the hundred's column. Next, count how many tens. There are no ten rods- zero. I write "0" in the ten's column. Last, count how many ones. 9 ones. I write "9" in the one's column. This is a 3-digit number- 309. This can be tricky to read because there are 0 tens, and 9 ones. I read this as "three hundred nine." Can you say, "three hundred nine?"** Do a few more examples with quantities 100-999.
LEAD	**Let's work together.** Repeat using quantities of 10 or less.	**Let's work together.** Repeat with examples 100-999.	**Let's work together.** Repeat with examples 100-999.
TEST	**Your turn. Show me how to solve this problem.** Write and read a number sentence.	**Your turn. Complete the worksheet.** Wait for each student response.	**Your turn. Complete the worksheet.** Wait for each student response.

	LEVEL 1	LEVEL 2	LEVEL 3
PROMPTING AND ERROR CORRECTION	**Note:** To be used during the Test phase as needed.		
	If the student does not respond after 4 seconds, point to frame and say, **Make the first set- (#).** Wait for the student to make the set. **Now take away (#).** If correct, deliver specific verbal praise. *If the student makes an error, say* **Stop! Watch me.** Model creating number using base ten. **Your turn.** *If the student does not respond after 4 seconds*, say, **Do it with me.** Use hand-over-hand guidance and physically prompt the student to the make the combination.	*If the student does not respond after 4 seconds,* point to frame and say, **how many hundreds? How many tens? How many ones?** Wait for the student to point. If correct, deliver specific verbal praise. *If the student makes an error, say* **Stop! Watch me.** Model creating number using base ten. **Your turn.** *If the student does not respond after 4 seconds*, say, **Do it with me.** Use hand-over-hand guidance and physically prompt the student to the make the combination.	*If the student does not respond after 4 seconds,* point to frame and say, **how many hundreds? How many tens? How many ones?** Wait for the student to point. If correct, deliver specific verbal praise. *If the student makes an error, say* **Stop! Watch me.** Model creating number using base ten. **Your turn.** *If the student does not respond after 4 seconds*, say, **Do it with me.** Use hand-over-hand guidance and physically prompt the student to the make the combination.
REINFORCE	**Great job subtracting!**	**Great job making 3-digit numbers with hundreds!**	**Great job making 3-digit numbers with hundreds!**

Measuring Student Learning

Using the task-analytic data sheet, collect data on student-specific responses during the base ten lesson. Monitor student progress regularly and make data-based decisions to ensure instruction is individualized.

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.

Time and Money

Learning Objectives

- Students will identify paper money and their values.
- Students will identify quantities of a combination of bills.
- Students will tell time to the hour and half hour.
- Students will tell time by the minute in increments of 5's.

Materials

- Time Cards
- Money Cards
- Time Worksheet
- Money Worksheet
- Classroom Money Set
- Wooden Demonstration Clock
- Magnetic Whiteboard
- Magnetic Display Tray
- Magnetic Picture Pockets
- Worksheet Pockets

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., science goggles, science beakers) and three-dimensional counters and manipulatives. Sample words and phrases include:

- Money
- Time
- $1.00
- $10.00
- Various times to the hour/half hour
- "I don't know" or "I need help"

Core Vocabulary and Concepts

LEVEL 1	LEVEL 2	LEVEL 3
$1, $5 Price tag Hour	$1, $5, $10 Quarter to	$1, $5, $10, $20 minute

Anchor Instruction for All Students

Prior to beginning instruction, anchor instruction by referencing the story, *Science Experiments*. Say, **We read the book, *Science Experiments*. Scientists do different experiments! When a scientist does an experiment, sometimes they measure time. They could measure the time that it takes for something to change or the time that it takes something to move. How else do we measure time?**

Introduce Math Concepts and Core Vocabulary: Time

Note to teachers: Write schedules on board. Level 1 may pair with pictures of activities to enhance comprehension of schedule.

	LEVEL 1	LEVEL 2	LEVEL 3
INTRODUCE	**In our daily schedule there is a lot to do! We do activities on the hour, half hour, and 5-minute intervals! We will practice time on our clocks today.**		

Model-Lead-Test Instruction

This instruction is leveled for two types of support needs. All instruction is delivered in a model-lead-test format. If working in a small group, allow each student a chance to answer each item independently during the test phase. Use the system of least prompts procedure to provide support as needed.

	LEVEL 1	LEVEL 2	LEVEL 3
MODEL	Use digital and analog clock matching worksheet with times 9:30-12:30. **We are going to find clocks that tell the same time. Remember on this kind of clock** (show the wooden demonstration clock) **the hour hand is the short hand and tells us what hour it is. The minute hand is the long hand.** Show digital clock. **On this kind of clock, when the minute is to the half hour, we say :30, or half past (#).** **Watch me. The hour hand is between 11 and 12, and the minute hand is on the 6. It is 11:30. This digital clock says 11:30 so they match.** Use the wooden demonstration clocks and times 7:00-11:45. **Remember, read the half hour as 30 because it is one half of an hour, which is 30 minutes. We also say half past the hour. Now we are going to add in quarter past the hour and quarter to the next hour.** **Watch me. When the minute hand points to the 3, it is quarter past the hour, or :15. For example, we would read this as 9:15, or quarter past 9.** Repeat for a few examples. **Watch me. When the minute hand points to the 9, it is quarter to the next hour, or :45. For example, we would read this as 9:45, or a quarter to 10 because it is almost 10:00.** Repeat for a few examples. Use times 7:01-11:59 with the wooden demonstration clocks. **We are telling time to the minute. We have already practiced counting by 5's. In between each number on the wooden demonstration clock are tick marks which represent one minute.** Show 10:57. **See the closest time to this is 10:55. Now I can count up from 55 to see where the hand is…55, 56, 57. It is 10:57.** Repeat using examples in the beginning of the hour, middle of the hour, and closer to the hour.		

	LEVEL 1	LEVEL 2	LEVEL 3
LEAD	**Let's work together and match the two clocks. What time?** Wait first before prompting. Make sure the student states the number and "half past."	**Let's work together.** Move the hour hand to various times in nonsequential order and alternate between :15 and :45. **What time?** Wait first before prompting. Make sure the student states both the time and "quarter past/quarter to."	**Let's work together.** Move the hour hand to various times in nonsequential order. **What time?** Wait first before prompting. Make sure the student states the time to the closest minute.
TEST	**Your turn.** Students should match the clocks. Wait for each student response.	**Your turn.** Present various times to the student and have the student read the time. Wait for each student response.	**Your turn.** Present various times to the student and have the student read the time. Wait for each student response.
PROMPTING AND ERROR CORRECTION	**Note:** To be used during the Test phase as needed.		
	If the student does not respond after 4 second or makes an error, say **_(#):30. Match.** Wait for the student to respond. If correct, deliver specific verbal praise.	*If the student does not respond after 4 second or makes an error,* say **The hour hand is pointing to (#) and the minute hand is pointing to (3/9) so it is (#:15/#:45). We read this as quarter past/ quarter to. Your turn.** Wait for the student to respond. If correct, deliver specific verbal praise	*If the student does not respond after 4 second or makes an error,* model finding the closest 5 min and counting on to find the minute. **Your turn.** Wait for the student to respond. If correct, deliver specific verbal praise
REINFORCE	**Awesome job telling time by the half hour on two kinds of clocks!**	**Awesome job telling time by the quarter hour!**	**Awesome job telling time to the minute.**

Generalization and Extension Activities

To promote generalization, consider opportunities to vary the types of images you use (both the content of the images and the format of the images) and look for opportunities to incorporate real-life materials or examples. Some students may need concrete objects rather than pictures for schedules. They can paste responses, write responses, or draw their own responses. They can use the response options from the example/non-example instruction, or they can think of their own responses.

Introduce Math Concepts and Core Vocabulary: Money

	LEVEL 1	LEVEL 2	LEVEL 3
INTRODUCE	**I can COUNT money. I use money to buy all kinds of things! Today we are counting money. Let's review:** Pick up each coin and state the value or have students choral respond value. **How much are [pennies/nickels/dimes/quarters] worth?** Wait for students to respond. **This is paper money. Look at the number in the corner. How much?** Ask for $1.00, $5.00, $10.00, and $20.00 bills.		

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. You will teach students how to sort the money into corresponding columns.

	LEVEL 1	LEVEL 2	LEVEL 3
MODEL	Use Worksheet with prices $1.00-$10.00. **I need to find the items that costs $1.00, 5.00, or $10.00.** Point to an item. **Look, I have enough money to pay for it. $1.00, $5.00, or $10.00!** Demonstrate. Have students repeat. Repeat a few more trials with examples and nonexamples.	**Watch me. This is a $10.00 bill, and this is a $20.00 bill. Show me the $10.00 bill.** Demonstrate. Have students repeat. **Show me the $20.00 bill.** Demonstrate. Have students repeat.	Pull up an electronic online advertisement for a popular superstore with high interest items online. Choose items that costs $1.99-9.99. **Watch me. I am going to make purchases using exact change. This item costs (read price). First, I use the dollar amount.** Count out dollars. Remember to start with largest bill first. **Then, I use change.** Count out change. Remember to start with largest coin first.
LEAD	**Let's work together.** Point to a price tag. Ask, **"how much does this cost?"** Wait for student to read price tag. **Show me how much money to use.** Wait for student to place bill on tag. Repeat for a few trials.	**Do it with me. Show me the $10.00 bill.** Demonstrate. Have students repeat. **Show me the $20.00 bill.** Demonstrate. Have students repeat.	**Do it with me. Let's pay exact change for [name item]. It costs [$ #.##].** Wait for student to use bills and coins.
TEST	**Your turn. Show me how to pay for these items.**	**Your turn. Show me the $10.00 bill. Show me the $20.00 bill.**	**Your turn. Show me how to pay for this item using exact change.**

	LEVEL 1	LEVEL 2	LEVEL 3
SYSTEM OF LEAST PROMPTS	**Note:** To be used during the Test phase as needed.		
	First prompt: If needed, after four seconds, say, **"Read the price tag. Use the dollar bill that matches."** *Second prompt*: If needed, after four seconds, read the value on the price tag and touch the bill. *Third prompt:* If needed, after another four seconds, model placing the bill on the price tag and have the student repeat.	*First prompt*: If needed, after four seconds, say, **This is the $10.00/$20.00.** *Second prompt*: If needed, after four seconds, model picking up the target bill. *Third prompt:* If needed, after another four seconds, use physical prompting.	*First prompt*: If needed, after four seconds, say **first count dollars, then coins. Remember to start with the largest bill or coin first.** *Second prompt*: If needed, after four seconds, model laying down bills and coins and counting, then have student repeat. *Third prompt:* If needed, after another four seconds, use physical prompting.
REINFORCE	**Great job paying for the item!**	**Great job! This is $10.00 and a $20.00.**	**Great job making purchases.**

Generalization and Extension Activities

To promote generalization, consider opportunities look for opportunities to incorporate real-life materials or examples of when you would use money to buy things.

Measuring Student Learning

Using the task-analytic data sheet, collect data on student-specific responses during the time and money lesson. Monitor student progress regularly and make data-based decisions to ensure instruction is individualized.

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:

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- or, to view and select any of these lessons at any time – go to the Curriculum tab in your enCORE teacher dashboard.

Geometry

Learning Objectives

- Students will identify the coordinate grid and its properties.
- Students will locate ordered pairs on a coordinate grid.
- Students will use line segments to connect points and create a shape.

Materials

- Geometry Cards
- Geometry Sort
- Geometry Worksheet
- Patterns Worksheet
- Shapes and Attributes Blocks
- Magnetic Whiteboard
- Magnetic Display Tray
- Magnetic Picture Pockets
- Worksheet Pockets

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 butterflies) and three-dimensional counters and manipulatives. Sample words and phrases include:

- Coordinate grid
- X-axis
- Y-axis

Core Vocabulary and Concepts

LEVEL 1	LEVEL 2	LEVEL 3
• Coordinate grid • X-axis • Y-axis • Ordered pair • Point • Triangle • Rectangle • Square	• Coordinate grid • X-axis • Y-axis • Ordered pair	• Coordinate grid • X-axis • Y-axis • Ordered pair

Anchor Instruction for All Students

Prior to beginning instruction, anchor instruction by referencing the story, *Science Experiments*. Say, **We read the book, *Science Experiments*. When scientists investigate, they find information. Sometimes the information that they find gets displayed in a graph, chart, or grid. Graphs, charts, and grids come in many different forms. Graphs, charts, and grids show information in a picture! When we learn how to read graphs, we learn how to see information quickly!** Show your students graphs, charts, or grids in various presentations.

Introduce Geometry

	LEVEL 1	LEVELS 2 & 3	
INTRODUCE	**The coordinate grid is a graphing tool we use in math to show locations of points on a plane.** Show a coordinate grid. **We are going to use the coordinate grid to locate things on a coordinate grid. Who remembers where the x-axis is?** Wait for student to respond by demonstrating a side-by-side motion on the x-axis. **Who remembers where the y-axis is?** Wait for student to respond by demonstrating an up-and-down motion on the y-axis. **Where is the origin point?** Student should find (0, 0). **We are ready to locate points on the coordinate grid!**		

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 1	LEVEL 2	LEVEL 3
MODEL	Show a coordinate grid. **This is a coordinate grid. Touch the coordinate grid. This helps us locate points on a plane.** Optional: place Wiki sticks or pipe cleaners of two different colors on the x- and y-axes. **It has two perpendicular lines, or axes, labeled like number lines. The horizontal axis is called the x-axis. Can you drag your finger side-to-side along the x-axis?** Wait for student to respond. **The vertical axis is called the y-axis. Can you drag your finger up and down along the Y axis?** Wait for student to respond. Point to a coordinate point. **This is the ordered pair (3, 4). Touch the point.** Wait for student to respond. **That is the point.** Repeat for a few more examples. Once the line segments have been connected, ask, **"What shape?"**	Use first quadrant only. **The first coordinate point is (3,4). We find 3 on the x-axis first. Drag your finger over to 3.** Wait for student to mimic you. **Now we find the y-coordinate. Drag your finger up to the 4 on the vertical number line- 1, 2, 3, 4.** Wait for student to mimic you. **This is the coordinate point (3,4). Let's try a few more.** Repeat with (6,4) and (6,8). **Now let's connect our points with line segments. Remember a line segment has two endpoints. What shape did we make?** Wait for Student to respond. **A right triangle!**	Use first quadrant only. **The first coordinate point is (3,4). We find 3 on the x-axis first. Drag your finger over to 3.** Wait for student to mimic you. **Now we find the y-coordinate. Drag your finger up to the 4 on the vertical number line- 1, 2, 3, 4.** Wait for student to mimic you. **This is the coordinate point (3,4). Let's try a few more.** Repeat with (6,4) and (6,8). **Now let's connect our points with line segments. Remember a line segment has two endpoints. What shape did we make?** Wait for Student to respond. **A right triangle!**
LEAD	**Let's work together to find the coordinate grid.** Show the coordinate grid, another graph, and a shape. **Now show me the x-axis; it goes side-to-side. Now show me the y-axis; it goes up-and-down.** Wait for student to demonstrate. **Touch the coordinate point.**	**Let's work together.** Repeat with a few examples from the worksheet. **What shape do the ordered pairs make?**	**Let's work together.** Repeat with a few examples from the worksheet. **What shape do the ordered pairs make?**

	LEVEL 1	LEVEL 2	LEVEL 3
TEST	**Your turn.** Hold up the coordinate grid and two distractors, **"Find the coordinate grid."** **Now show me the x-axis; it goes side-to-side. Now show me the y-axis; it goes up-and-down.** Wait for student to demonstrate. **Touch the coordinate point.**	**Your turn. Complete the worksheet.**	**Your turn. Complete the worksheet.**
PROMPTING AND ERROR CORRECTION	*If the student does not respond or makes an error after 4 seconds,* point to the coordinate grid, x-axis, and y-axis. **This is the [coordinate grid/x-axis/y-axis/coordinate point].** Wait for the student to respond. If correct, deliver specific verbal praise.	*If the student does not respond or makes an error after 4 seconds,* prompt the student with the coordinate point (e.g., over 3, up 2). Wait for the student to respond. If correct, deliver specific verbal praise.	*If the student does not respond or makes an error after 4 seconds,* prompt the student with the coordinate point (e.g., over 3, up 2). Wait for the student to respond. If correct, deliver specific verbal praise.
REINFORCE	**Excellent! You found things on the coordinate grid!**	**Excellent! You plotted ordered pairs and made the shape (name shape)!**	**Excellent! You plotted ordered pairs and made the shape (name shape)!**

Instructional Tip! For students who need a receptive response mode, you can create a yes/no response card or a green check mark and red X. These can be programmed in AAC device or made on notecards glued to popsicle sticks. Instead of saying "IS ___ or is NOT ___," students can point, press, or hold up yes/no responses.

Generalization and Extension Activities

To promote generalization, consider opportunities to vary the types of shapes you use and look for opportunities to incorporate real-life materials or examples. For example, have the students perform the positions using their bodies.

Measuring Student Learning

Using the task-analytic data sheet, collect data on student-specific responses during the geometry lesson. Monitor student progress regularly and make data-based decisions to ensure instruction is individualized.

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.