SEGMENT 2

Math Foundations I

Learning Objectives

- Compare actual results of a simple experiment.

Materials

- Print the following worksheets and data sheets:
  - *Roberto Clemente* Math Warm-Up Worksheet 2 Lv 2 (per Level 2 student
  - *Roberto Clemente* Math Warm-Up Worksheet 2 Lv 3 (per Level 3 student)
  - *Roberto Clemente* Experiment Percentages Worksheet Lv 2 (per Level 2 student)
  - *Roberto Clemente* Experiment Percentages Worksheet Lv 3 (per Level 3 student)
  - *Classroom Resources* Number Cards Worksheet
  - System of Least Prompts Individual (per student) or Group Data Sheet
  - Constant Time Delay Individual (per student) or Group Data Sheet
- Gather the following materials from the enCORE Manipulatives Kit and/or your classroom:
  - Magnetic Whiteboard
  - Unilink Cubes
  - Money Set
  - Classroom whiteboard
  - Calculator (per Level 2 and 3 student)
  - Pencil (per teacher and Level 2 and 3 student)
  - Dry erase marker
  - Blank sheet of paper (per Level 1 student)

Prior to Instruction

To prepare for teaching this lesson segment, follow these steps:

1. Gather, print, and prepare all materials listed above.
2. If you plan to program students' AAC devices, program the following words:

LEVEL 1	LEVEL 2	LEVEL 3
• numbers (0 to 10)	• numbers (0 to 10) • fraction • numerator, denominator	• numbers (0 to 10) • fraction • numerator, denominator • percent

Anchor Instruction for All Students

Prior to beginning instruction, anchor instruction by referencing the Adapted Book *Roberto Clemente*. **In *Roberto Clemente*, we read about the baseball player, Roberto Clemente. When he was batting, if he hit the ball seven out of 10 times, what is the fraction that he hit the ball?** Wait for student responses.

Math Warm-Ups

The following activities are designed to cognitively and physically engage your students at the beginning of the math lessons, as well as provide frequent practice on important math skills.

Each Math Warm-Up Activity involves fine and/or gross motor movement. Alternative actions are listed at the end of each activity. Please change actions as needed for your students' individual abilities. For Level 2 and 3 students, a Warm-Up Worksheet is also included for independent or group work after the activity.

Materials: *Roberto Clemente* Math Warm-Up Worksheet 2 Lv 2 (per Level 2 student), *Roberto Clemente* Math Warm-Up Worksheet 2 Lv 3 (per Level 3 student), Money Set, pencil (per Level 2 and 3 student), classroom whiteboard, dry erase marker

Prior to Instruction: None.

	LEVEL 1	LEVEL 2	LEVEL 3
WARM-UP ACTIVITY	**Let's play a game of chance!** Show students a quarter from the Money Set. **This is a quarter. A quarter has two sides, heads and tails. We're going to take turns flipping the quarter 10 times and count how many times it lands on heads. Before we start, can you guess how many times it will land on heads?** Call on a student and wait for response. **Ok, let's see how close we get.** Students will take turns flipping the coin. A Level 3 student can tally the number of times it lands on heads on the classroom whiteboard. Alternative action: Hold up number of fingers to make a guess.		

Core Vocabulary and Concepts

Zero- and Four-Second Delay Rounds

Remember, in the Zero-Second Delay Round, provide the correct answer immediately. In the Four-Second Delay Round, wait for four seconds for the student to respond. Refer to the procedures outlined at the beginning of the Unit if needed.

LEVEL 1	LEVEL 2	LEVEL 3
• review numerator and denominator identification	• review converting a decimal into a percentage	• review converting a decimal into a percentage

Materials: Constant Time Delay Individual (per student) or Group Data Sheet, Magnetic Whiteboard, dry erase maker, calculator (per Level 2 and 3 student)

Prior to Instruction: For Level 1 students, write the fraction 2/5 in vertical form on the Magnetic Whiteboard. For Level 2 and 3 students, write 0.53 x 100 = ___% on the Magnetic Whiteboard.

TEACHER SAYS	STUDENT RESPONSE	FEEDBACK
Use the following instructions to target the concepts listed above: For Level 1 students, show the fraction 2/5 written on the Magnetic Whiteboard. Say, **Show me the numerator in this fraction.** Pause for response. **Touch the denominator.** Repeat with 5-10 trials, writing fractions that use single-digit numbers. For Level 2 and 3 students, give them a calculator. Say, **We need to convert this decimal into a percentage. Use your calculator to solve the problem. Show me the answer.** Repeat with 5-10 trials, using decimals to the hundredths place.	*Zero-Second Delay Round:* Student provides the correct response. *Four-Second Delay Round:* Student provides the correct response within four seconds.	For Level 1 students, say **Great work! You found the numerator and the denominator.** For Level 2 and 3 students, say, **Great job! 0.53 is the same as 53%.** Use Constant Time Delay (Individual or Group) Data Sheet to collect data on student responses.
	Student does not respond.	Model the correct response. **Your turn.** Wait for students to respond. Provide additional prompts or physical guidance as needed.
	Student responds incorrectly.	

Concept Building

Materials: *Roberto Clemente* Experiment Percentages Worksheet Lv 2 (per Level 2 student), *Roberto Clemente* Experiment Percentages Worksheet Lv 3 (per Level 3 student), *Classroom Resources* Number Cards Worksheet, System of Least Prompts Individual (per student) or Group Data Sheet, Money Set, Magnetic Whiteboard, Unilink Cubes, blank sheet of paper, dry erase marker, calculator (per Level 2 and 3 student), pencil (per teacher and Level 2 and 3 student)

Prior to Instruction: For Level 2 and 3 students, draw a T-Chart on the Magnetic Whiteboard and label the two columns "Heads" and "Tails." Draw one tally mark under Heads and two tally marks under Tails.

	LEVEL 1	LEVEL 2	LEVEL 3
INTRODUCE	**Today we will be trying to identify the chance that something might happen. Let's look at this quarter and count how many sides it has.** Show a quarter from Money Set and count the sides, **1, 2. It has two sides, heads and tails. When I flip the quarter, it will have a one out of two chance to land on heads or tails. We know that is the chance that it could land on heads or tails, but let's do an experiment and see what happens when we flip the coin.**	**Today we will be conducting an experiment to find the percentage of times a coin lands on heads or tails.**	

	LEVEL 1	LEVEL 2	LEVEL 3
MODEL	Use Money Set, Unilink Cubes (as counters), Magnetic Whiteboard, and a dry erase marker. Show students a quarter from the Money Set. **For this experiment, I'm going to flip the coin three times and see how many times it lands on heads. Let's start by flipping the coin.** Write two columns on the Magnetic Whiteboard and label one "Heads" and one "Tails." **Each time I flip the coin, I will see which side it lands on.** Point to the two columns. **Then I will place one counter under Heads or under Tails.** Flip the coin. **It landed on [heads/tails].** Point to the Heads or Tails column and place one counter under it. **I will put one counter under [Heads/Tails]. Okay, let's flip the coin again.** Repeat the procedure for flipping the coin a second and third time. **Now, I want to build my fraction.** Draw a fraction line on the Magnetic Whiteboard. Point to the denominator place. **The denominator is the total number of times I flipped the coin. Let's count how many times in total I flipped the coin.** Point to each counter under Heads and Tails and count aloud. **1, 2, 3. I flipped the coin three times in total.** Write the number 3 in the denominator place. **My denominator is three. Next, let's find the numerator.** *(continued)*	Use Magnetic Whiteboard, calculator, and dry erase marker. **I have already conducted my experiment. Let's look at my results and find the percentage of time my coin landed on tails.** Draw a fraction line on the Magnetic Whiteboard and point to the denominator space. **First, I will find my denominator. The denominator will be the total number of times I flipped the coin. Watch me count my total number of tally marks.** Count aloud and point to each tally mark with one-to-one correspondence. **1, 2, 3.** Write the number 3 as the denominator. **My total number is three. Now, I'll find the numerator. The numerator will be the number of times the coin landed on tails. Let's count my tally marks to see how many times it landed on tails.** Point to each tally mark and count aloud. **1, 2.** Write 2 in the numerator place. **It landed on tails two times so I will write the number 2 as my numerator. I've built my fraction, so now I want to write it as a percent.** Point to numerator and denominator. **I will use my calculator to divide the numerator by the denominator, so I will divide two by three.** Use calculator to solve. Write = 0.66 on the Magnetic Whiteboard beside the fraction. **Two divided by three is 0.66.** Write x 100 = on Magnetic Whiteboard. **Now I need to multiply 0.66 by 100 to find the percentage.** Use calculator to multiply and write answer. **0.66 times 100 equals 66. When I flipped the coin three times, I landed on tails 66% of the time.**	

	LEVEL 1	LEVEL 2	LEVEL 3
	Point to the numerator place. **The numerator will be the number of times the coin landed on heads.** Point to the Heads column. **I will look at my chart and count how many times the coin landed on heads. Let's count**. Point to each counter and count aloud with one-to-one correspondence the number of times the coin landed on heads. **It landed on heads [#] times.** Write the number [#] in the numerator place. **My fraction is built!** Point to each number and read aloud. **When I flipped the coin, I landed on heads [#] out of three times.** Repeat with some or all of the following examples: 7 total coin flips 4 total coin flips 8 total coin flips		
GUIDED PRACTICE	Use Number Cards Worksheet, Money Set, Unilink Cubes (as counters), Magnetic Whiteboard, and dry erase marker. Cut out Number Cards 0-10 from the Number Cards Worksheet. **Let's do an experiment together.** Write two columns on the Magnetic Whiteboard and label one "Heads" and one "Tails." Show students a quarter from the Money Set. **We're going to flip the coin six times and see how many times it lands on tails.** Point to the two columns. **Each time the coin lands,**	Use Experiment Percentages Worksheet Lv 2, Number Cards Worksheet, Magnetic Whiteboard, calculator, pencil, and dry erase marker. Cut out Number Cards 10, from the Number Cards Worksheet. Give each student an Experiment Percentages Worksheet Lv 2, calculator, and a pencil. Copy the first problem from the worksheet onto the Magnetic Whiteboard. **Let's work together to solve the first problem on your worksheet. The problem asks us to find the percentage of times**	Use Experiment Percentages Worksheet Lv 3, Magnetic Whiteboard, calculator, pencil, and dry erase marker. Give each student an Experiment Percentages Worksheet Lv 3, calculator, and a pencil. Copy the first problem from the worksheet onto the Magnetic Whiteboard. **Let's work together to solve the first problem on your worksheet. The problem asks us to find the percentage of times the coin landed on heads. Look at your chart. The experiment of tossing the coin has already been done**

LEVEL 1	LEVEL 2	LEVEL 3
we will place one counter under Heads or Tails. Who wants to flip our coin the first time? Call on a student. Student can flip the coin in their hands or drop the coin on the floor. **Good job! Did the coin land on heads or tails?** Call on student. Show the student the side of the coin it landed on and allow the student to point. **Great! It landed on [heads/tails], so under which column should we put our counter?** Student can point to correct column. Put one counter under the correct column. **Excellent. Now let's flip our coin again. Who wants to help me flip for the second time?** Repeat the same procedures to flip the coin another five times. **Now, it's time to build the fraction.** Draw a fraction line on the Magnetic Whiteboard. **The denominator is the total number of times we flipped the coin. How many times did we flip the coin? Let's count.** Point to counters and count aloud. **1, 2, …, 6. How many times?** Show the student two Number Cards (the correct response and one distractor). **Yes! We flipped the coin six times. Let's write the number six as the denominator for our fraction. Show me where to write the number six.** Show the Magnetic Whiteboard and allow student to point to the denominator place, then write the number 6. **Good!** *(continued)*	**the coin landed on heads. Look at your chart. The experiment of tossing the coin has already been done and here are your results. How many times was the coin tossed in total?** Call on a student. For minimally verbal students, show three Number Cards (one correct and two distractors). **Yes, 10. They flipped the coin 10 times.** Point to the denominator in the problem. **10 has already been listed as your denominator. We need to find the numerator. The problem asks us to see how many times the coin landed on heads.** Point to the tally marks. **Let's count how many times it landed on heads.** Call on a student. Count aloud as you point to each tally mark. **1, 2, …, 7. How many?** Wait for student response. **Right! It landed on heads seven times.** Write the number seven as your numerator on the Magnetic Whiteboard. **Now that we have our fraction, we need to make the fraction a percentage. First, you will divide seven by 10.** Show students their calculator. **Use your calculator to solve seven divided by 10.** Pause for response. **What is the answer?** Call on student. For minimally verbal students, have the student show you their answer on the calculator. **Great! Seven divided by** *(continued)*	**and here are your results. How many times was the coin tossed in total?** Call on a student. **Correct! It was flipped 10 times in total.** Point to the fraction on the Magnetic Whiteboard. **Where does our total number go?** Call on student and allow the student to point to the denominator blank. **Yes! Our total number will be our denominator.** Write 10 in the denominator place. **We'll write 10 here. Now we need to find the numerator by counting how many times the coin landed on heads.** Point to the tally marks. **Let's count.** Point and count aloud. **1, 2, …, 7. How many times did it land on heads?** Call on student. **Correct! It landed on heads seven times. Look at the problem; where do we need to write the number seven?** Pause for student response. **Yes!** Write 7 in numerator place on the Magnetic Whiteboard. **We need to write the number seven in the numerator place on our fraction. Write the number 7 on your worksheets.** **Now that we have our fraction, we need to convert it into a percentage. First, we'll need to divide.** Point to the calculator. **Use your calculator to divide seven by 10.** Pause for student response. **What is seven divided by 10?** Call on *(continued)*

	LEVEL 1	LEVEL 2	LEVEL 3
	I'll write six here. Point to the numerator place. **Now let's find our numerator. It will be the number of times the coin landed on tails. You will need to count the number of counters in the Tails column.** Point to the columns on the Magnetic Whiteboard. **Which column is Tails?** Call on student to point to the column. **Correct! Let's count.** Count aloud as student points to each counter. **1, 2, …, #.** (Number will vary based on individual experiment). **How many times?** Show student two Number Cards (one correct response and one distractor). **Great! That's how many times the coin landed on tails, so we need to write that number as our numerator.** Point to the fraction on the Magnetic Whiteboard. **Where should the numerator go?** Allow student to point, then write the number in the numerator place. **Great job! You built the fraction based on the experiment.** Point to the fraction as you read it aloud. **The coin landed on tails [#] out of six times.**	**10 equals 0.7.** Write 0.7 into the problem on the Magnetic Whiteboard. **Let's write in 0.7. The last step is to multiply our decimal by 100.** Point to the calculator. **Use your calculator again to multiply 0.7 times 100.** Pause for student response. **Can someone tell me the answer?** Call on student. **Awesome job! 0.7 times 100 equals 70.** Write 70 next to the percent sign. **We've solved the problem! What percentage of the time did the coin land on heads?** Pause for response. **Yes, it landed on heads 70% of the time.**	student. **Great job!** Write 0.7 into the problem. **Let's write in 0.7. The last step is to multiply our decimal by 100.** Point to the calculator. **Use your calculator again to multiply 0.7 times 100.** Pause for student response. **What is your answer?** Call on student. **Excellent! It is 70, so we'll write 70 next to the percent sign.** Write 70 on the Magnetic Whiteboard. **We've solved the problem! What percentage did the coin land on heads?** Pause for response. **Great job! It landed on heads 70% of the time.**
INDEPENDENT PRACTICE	Use Number Cards Worksheet, two different colors of Unilink Cubes (as counters), blank sheet of paper, and pencil. Draw two columns, Heads and Tails, on a blank sheet of paper for the student. **Your turn to do an experiment and see how many times the coin will land on heads.** Give the	**Your turn. Look at the rest of the experiment results on your worksheet and find the percentage of times a coin landed on heads or tails.** Give students support with staying on task and provide prompts as needed. If the completed worksheet will not provide enough data, use System of Least Prompts (Individual or Group) Data Sheet to collect additional data as needed.	

LEVEL 1	LEVEL 2	LEVEL 3
student five counters. **We'll flip the coin five times, so here are your five counters.** Point to each column on the blank sheet of paper. **Each time the coin lands, you will look to see if it lands on heads or tails and then place one counter under the Heads or Tails column. Can you flip the coin?** Student can flip the coin in their hands or drop the coin on the floor. **Great job! Look at the coin and place one counter under the column to show which side the coin landed on.** Point to the columns. **Did it land on heads or tails?** Wait for student response. **Good! Now you'll need to flip the coin four more times.** Repeat the same procedure four more times. Draw a fraction line on the student's sheet of paper. **Now let's build a fraction based on your results. First, we'll write in the denominator, which is the total number of times you flipped the coin. Count how many counters you have in total.** Count aloud as the student points to each counter. **1, 2, …, 5.** Show the student two Number Cards (one correct and one distractor). **What was your total number?** Wait for student response. **Great! Place the number five in the denominator place on your fraction.** Have student place the Number Card in the denominator place. *(continued)*		

	LEVEL 1	LEVEL 2	LEVEL 3
	Excellent! Now, let's find the numerator. Point to the numerator place. **This will be the number of times the coin landed on heads. Count the number of counters under your Heads column.** Count aloud as the student points to each counter. **1, 2, …, #.** (Number will vary based on individual experiment). **How many?** Show the student two Number Cards (one correct and one distractor). **Good job! That's how many times the coin landed on heads. Can you place the number [#] in the numerator place on your fraction?** Pause for student response. **Wonderful! You built your fraction. In your experiment, the coin landed on heads [#] out of five times.** Use System of Least Prompts (Individual or Group) Data Sheet to collect data on student responses.		
PROMPTING AND ERROR CORRECTION	Verbal Prompt: **Count how many counters are under the Heads column.** Model Prompt: **Watch me count how many counters are under the Heads column.** Point to each counter and count aloud with one-to-one correspondence. Physical Prompt: **Count how many counters are under the Heads column.** Use hand-over-hand guidance and physically prompt the student to point to each counter under the Heads column with one-to-one correspondence.	Verbal Prompt: **Count how many tally marks are in the Heads column.** Model Prompt: **Watch me count how many tally marks are in the Heads column.** Point to each tally mark and count aloud with one-to-one correspondence. Physical Prompt: **Count how many tally marks are in the Heads column.** Use hand-over-hand guidance and physically prompt the student to point to each tally mark with one-to-one correspondence.	

	LEVEL 1	LEVEL 2	LEVEL 3
REINFORCE	Great job building a fraction to show how many times your coin landed on heads!	Great work finding the percentage of times the coin landed on heads!	