Unit 7, Week 2: Week of 2/25 Kathy Caraway/RRISD

Weekly Lessons/Overview and Goals: students will begin exploring decimals as they relate to fractions.

Unit TEKS

Represent Decimals to Hundredths

- **4.2B** represent the value of the digit in whole numbers through 1,000,000,000 [*999,999 in this unit*] and decimals to the hundredths using expanded notation and numerals; – R RC1
    - **4.2A** interpret the value of each place-value position as 10 times the position to the right and as one-tenth of the value of the place to its left; – S RC1
- **4.2E** represent decimals, including tenths and hundredths, using concrete and visual models and money; – S RC1

Compare and Order Decimals

- **4.2F** compare and order decimals using concrete and visual models to the hundredths; – S RC1

Relate Fractions and Decimals

- **4.2G** relate decimals to fractions that name tenths and hundredths; – R RC1
- **4.2H** determine the corresponding decimal to the tenths or hundredths place of a specified point on a number line. – S RC1
- **4.3G** represent fractions and decimals to the tenths or hundredths as distances from zero on a number line. – S RC1 [*include measuring lengths to the nearest half, fourth, fifth, tenth, or hundredth of a unit, as appropriate*]

Add and Subtract Whole Numbers and Decimals

- **4.4A** add and subtract whole numbers and decimals to the hundredths place using the standard algorithm; – R RC2

Problem Solving (Some of the types of problems students should be solving during this unit)

- **4.8C** solve problems that deal with measurements of length, intervals of time, liquid volumes, mass, and money using addition, subtraction, multiplication, or division as appropriate. – R RC3 [*word problems using measurement contexts, focus on decimals in this unit, addition and subtraction only in this unit*]
- **4.9B** solve one- and two-step [*addition and subtraction*] problems using data in whole number, decimal, and fraction form in a frequency table, dot plot, or stem-and-leaf plot. – S RC4

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Vocabulary		
• Compare • compose • **Decimal** • **decimal fraction** • Decompose • Difference • digit • equation • expanded notation	• Fraction • **hundredths** • **hundredths place** • measure • measuring tape • mental computation • meter stick • model • money	• number line • numeral • open number line • place value • Position • Ruler • strip diagram • sum • **tenths** • value • yardstick

Monday: Introducing Decimals Through Fractions
Essential Question: How are decimals and fractions similar?

Engage: Notice and Wonder

Explore: A student said that 4.25 was larger than 4.5 because there were three digits in 4.25 and only two in 4.5. Do you agree? If not, write some decimal numbers that are larger than 4.5. Print for students

Explain: Using the RRISD lesson and base ten blocks, make comparisons to decimals and money. As you explore a number line with decimals, identify the symmetry as well as talk about how we read decimals.
https://docs.google.com/document/d/1jKwbIhNjYxm4GxWD2srsuEt2Z0KmskfxJYaVY72mqEg/edit

Elaborate: Students will use place value cards to explore decimals.

Evaluate: Ask students to pair up and discuss how fractions and decimals are similar.

Tuesday: Introducing Decimals Through Fractions
Essential Question:
Module 8:Lesson 1: Introducing Decimal Fractions

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Engage: Problem of the Day: *Lilian decorated 2.5 cakes with chocolate icing. Her mom decorated 7.9 with vanilla icing. Write a fraction that is equivalent to the total number of cakes decorated with icing.*

Explore: Step in discussion

- Project the number 111 on the board and ask, What do the digits in this number tell us? Encourage students to describe that there is 1 group of one hundred, 1 group of ten, and 1 group of one in the number. Ask, How could we use base-10 blocks to represent the number? Show 1 hundreds block, 1 tens block, and 1 ones block. Display a tens block and a ones block and ask, What is the relationship between the amounts? Project the table shown above to demonstrate that moving from right to left, each place value is 10 times greater than the previous place value
- Display a base-10 ones block and say, This block is"one whole". What would 10 times as much look like? (A base-10 tens block.) Display a tens block and demonstrate how it visually shows 10 times as much. Ask, What would 100 times"one whole" look like? (A base-10 hundreds block.) Display a hundreds block and demonstrate how it visually shows 100 times as much. Open the Flare Place Value teaching tool and move blocks across the table to reinforce the relationships.
- Display the base-10 hundreds block and ask, If this was"one whole," what would one-tenth look like? (A base-10 tens block.) Display a tens block and demonstrate how it visually shows one-tenth of the hundreds block. Display tens block and ask, If this was"one whole," what would one-tenth look like? (A base-10 ones block.) Display a ones block and demonstrate how it visually shows one-tenth of the tens block. Display the base-10 ones block and ask, This is"one whole" so what do you think one-tenth would look like? Encourage suggestions and then using the Flare Place Value teaching tool move a ones block to the tenths column to show the representation of one-tenth. Say, There is no one-tenth block but if there was it would look like this. Project the next chart to emphasize that the ones place establishes the whole and that the place values to the left of the ones place build up from the whole by a factor of ten and the place values to the right of the ones place break down from the whole by a factor of ten. Highlight the "times 10" and"divided by 10" nature of the place values.
- Project the area model of 2.5 and explain that each square represents"one whole." Ask, What does one-tenth look like? (One-tenth of the area of the square.) What amount is shaded? Bring out the fact that there are 2 wholes and 5 one-tenths shaded. Ask, How would we write that amount using a mixed number? Invite a volunteer to write 2 5/10 on the board. Ask, What does the digit 2 tell us? (There are 2 groups of one.) What does the fraction tell us? (There are 5 groups of one-tenth.) How would we record that same information on the place value chart? Remind students that when a number is written, each digit tells us two pieces of information. It tells the number of groups and its position tells the number in each group. Record the digits 2 and 5 in the appropriate locations on the place-value chart.

**Reference Origo as needed

Explain: Step Up, locating and comparing tenths

Elaborate: Students will work independently on the activity WS

Evaluate: Check and Review, count as a grade

Wednesday: Introducing Decimals Through Fractions
Essential Question: How can we compare decimals and fractions?
Module 8 Lesson 2: Locating and Comparing Tenths **OR you can lead the lesson based on Origo. If you do this, be sure to include lots of opportunities for practice and questions.**

Explore: Step in discussion

- Project the numbers 379, 207, 325, and 372 on the board and ask, How can we decide how to order these numbers from least to greatest? What would we look at first? Encourage students to describe that they look at the largest place value first when ordering numbers and that each digit tells how many groups there are of each place value. Ask, What is the least number? (207.) How do you know? (There are only 2 groups of one hundred in the number and the other numbers have 3 groups.) What do you look at to decide which is the next lowest number? Bring out the fact that the next sized place value is considered until all of the numbers have been ordered.

Explain: Step Up

- Project 1 7⁄10 on the board and ask, What do the numerals 1, 7, and 10 tell us about this number? (There is 1 group of one and 7 groups of one-tenth in the number.) How can we record the groups on a numeral expander? Invite a volunteer to write the number on the decimal numeral expander. (Note: Remember to include the decimal point when the expander is closed and remove the decimal point when any of the words are shown.) Ask, How would we write 1 and 7 tenths as a decimal fraction? Write 1.7 on the board and highlight how each digit tells the number of groups and the decimal point tells where the ones place is located in the number.
- Discuss the students' answers to Student Journal 8.2. Ask, How could we use a number line to help us organize the numbers from least to greatest? (The number line already organizes numbers from least to greatest. The numbers to the right are greater than the numbers to the left.) How can we use the improper fractions to order the numbers? (The numerators tell how many tenths there are in the number.) How can we use the decimal fractions to order the numbers? Encourage students to describe that they first look at the largest place value (which is the ones place) to see how many groups of one there are. Then they look at the tenths place to see how many tenths there are. Project the number line on the board. Refer to the left-most arrow and ask, What number does this arrow point to on the number line? (Seven-tenths.) How do you

know? (The whole is partitioned into ten equal-sized parts.) How do we write that as a common fraction? Invite a student to record 7⁄10 below the increment mark on the board. Ask, Can we write that fraction as a mixed number? (No, the number does not have a whole amount.) How would we record the fraction on the numeral expander? Encourage students to describe that there are no groups of one so a 0 is written for that place value and there are 7 groups of one-tenth so a 7 is written for that place value. Ask, What would it look like if the expander was closed? Where would the decimal point be? (The decimal point would be to the right of the 0 digit because it indicates the position of the ones place.) Repeat for the numbers indicated by the remaining three arrows on the number line.

- Project the Step In discussion from Student Journal 8.2 and work through the questions with the whole class. Remind students to record a zero in the ones place to show that there are no whole units. Read the Step Up and Step Ahead instructions with the students. Refer to Question 3 and remind them to record both the "count" and the "size" of the measurement unit. Make sure they know what to do and then have them work independently to complete the task. As you walk around the room, have students describe what each digit in the numbers indicates.

Elaborate: Students will work independently on the activity WS

Evaluate: Formative Quiz #1

Thursday: Linking Decimals to Our Place Value System
Essential Question: How do decimals connect to place value?
Lesson 3: Exploring Hundredths

Engage: Review quiz from yesterday

Explore: Step In Discussion

Explain: Step Up

- Project the grid and say, This grid represents one whole. What fraction of one whole does each column show? (One-tenth.) How do you know? (Each column is one tenth of the area of the whole grid.) How can we write one-tenth? Invite volunteers to write 5⁄10 and 0.1 on the board. Ask, How many tenths are equivalent to one whole? Encourage students to work in pairs to write addition and multiplication sentences to emphasize that 10 one-tenths is the same amount as one whole. Then, project the different equations they could have written.
- Project the grid shown above on the board and ask, How has each tenth been divided? Bring out the fact that each column is one-tenth and that each tenth has been divided into ten parts of equal area. Ask, What fraction is one small square?

(One-hundredth.) How do you know? (One small square is one-tenth of one-tenth or one-hundredth of the whole.) How many hundredths are equivalent to one whole? (100.)

- Project the shaded grid and say, This grid represents one whole. How many columns are shaded? (Four.) How many additional squares are shaded? (Six.) What fraction of the whole does each column represent? (One-tenth.) What fraction of the whole does each small square represent? (One-hundredth.) How much is shaded in total? (4 one-tenths plus 6 one hundredths.) How many one-hundredths are shaded if we counted each one? (46 one hundredths.) Repeat the discussion with the three remaining grids.
- Project the Step In discussion from Student Journal 8.3 and work through the questions with the whole class. Read the Step Up and Step Ahead instructions with the students. Emphasize how the shaded region can be described by the columns and extra squares or described by the total number of squares. Make sure they know what to do and then have them work independently to complete the task.
- Discuss the students' answers to Student Journal 8.3. Ask, How many hundredths (tenths) are there in one whole? Encourage the students to explain that one whole is the same amount as 100 one-hundredths or 10 one-tenths. Refer to the second part of each example in Question 2 and ask, How did you decide how much more needed to be shaded to make one whole? Did you focus on the unshaded region, or did you think about how many tenths and hundredths were already shaded?

Elaborate: Students will work independently on the activity WS

Friday: Linking Decimals to Our Place Value System
Essential Question:
Lesson 4: Writing Hundredths as Decimal Fractions (without Teens or zeros)

Explore: Step In Discussion

- Project the place-value chart shown above and use the base-10 blocks to visually show how each block is related to the ones block. Remind the students about the "times 10" and"divided by 10" relationship of the place-value system. Highlight how the ones place is the center of the chart. Everything to the left is built up from the ones place by a factor of 10 and everything to the right is broken down from the ones place by a factor of 10. Emphasize that it is important to visualize what"one whole" is so that the other place values can be related to the whole.

Explain: Step Up

- Project the grids on the board and say, Each grid represents one whole. How many ones, tenths, and hundredths are

shaded? What number is shaded in total? Have two volunteers display the decimal numeral expander opened out to show all the words. Record the number of ones (1), tenths (4), and hundredths (5) on the expander and then display it again.

- Ask, How can we use this expander to help us read the number? Guide volunteers to demonstrate how the tenths can be decomposed into hundredths by closing the expander to hide the word"tenths." Say, 4 tenths and 5 hundredths is the same amount as 45 hundredths. Refer to the grid to show visually that they are the same amount
- Say, When we read decimal fractions, the whole number is read first. We then say the word "and" to indicate the separation of the whole amount from the fractional amount, and then the fractional amount is said. To say the fractional amount, the smallest place-value position is identified by the right-most digit and the number of groups of that place value is said followed by the place-value position. For example, the number 1.45 is read as"one and fortyfive hundredths." Project the number 1.45 and the number words one and forty-five hundredths below the grids on the board.
- Project the next area model and ask, How would we shade the blank grid to show this number without counting the individual hundredths? Encourage students to describe that 6 columns and 3 small squares could be shaded. Have students justify why that shows the amount written. Guide students to write and display the number on the expander and ask, How would we write that amount as a decimal fraction? Invite a student to write 1.63 on the board. Ask, What other ways could we write the amount?
- Project the Step In discussion from Student Journal 8.4 and work through the questions with the whole class. Ask, Can you "see" 1 group of one and 76 groups of one-hundredth in the diagram? Can you"see" 1 group of one, 7 groups of one-tenth, and 6 groups of one hundredth in the diagram? Ensure that the students can visualize both ways. Read the Step Up and Step Ahead instructions with the students. Make sure they know what to do and then have them work independently to complete the task. As you walk around the room, have students say the numbers aloud to practice how to say them.
- Discuss the students' answers to Student Journal 8.4. Refer to Question 2c and ask, How many tenths are there in the number? (Four.) How is the 4 tenths represented in the diagram (expander/decimal fraction/mixed number)? Make sure that students are able to identify the number of groups for each place value and how they are represented in each of the four different forms.

Elaborate: Students will work independently on the activity WS

Differentiation: A variety of activities (application, concrete, and kinesthetic) will be incorporated into both days to engage all learners. Kagan Structures

ARRC Plan