

# Decimal Rounding

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- Strand:** Number and Number Sense
- Topic:** Rounding decimals, through the thousandths, to the nearest whole number, tenth, or hundredth.
- Primary SOL:** 5.1 The student, given a decimal through thousandths, will round to the nearest whole number, tenth, or hundredth.

## Materials

- Base-10 blocks
- Decimal Rounding activity sheet (attached)
- “Highest or Lowest” Game (attached)
- Open Number Lines activity sheet (attached)
- Ten-sided number generators with digits 0–9, or decks of cards

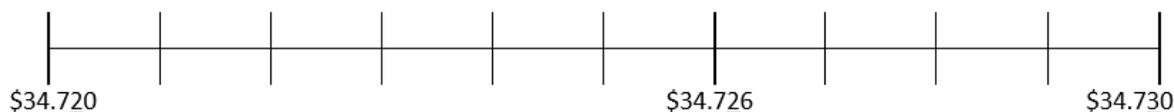
## Vocabulary

*approximate, between, closer to, decimal number, decimal point, hundredth, rounding, tenth, thousandth, whole*

## Student/Teacher Actions: What should students be doing? What should teachers be doing?

1. Begin with a review of decimal place value: Display a decimal in the thousandths place, such as 34.726, using base-10 blocks. In pairs, have students discuss how to read the number using place-value names, and review the decimal place each digit holds. Briefly have students share their thoughts with the class by asking:
  - What digit is in the tenths place? The hundredths place? The thousandths place?
  - Who would like to share how to say this decimal using place value?
2. Ask, “If this were a monetary amount, \$34.726, how would we determine the amount to the nearest cent?” Allow partners or small groups to discuss this question. It may be helpful if students underlined the place that indicates cents (the hundredths place) in order to keep track of the rounding place.

Distribute the Open Number Lines activity sheet and display this number line on the board. Guide students to recall that the nearest cent is the same as the nearest hundredth of a dollar. Starting with a blank number line, allow students to discuss which two-hundredths the number \$34.726 falls between, as well as where on the number line \$34.726 might fall (between \$34.72 and \$34.73).



Students can see that, on the number line, \$34.726 is closer to \$34.730 than to \$34.720. Ask students how far \$34.726 is from \$34.730 and 34.720. Because \$34.726 is only four

thousandths from \$34.730, the number \$34.726 rounds to \$34.730. In addition, since the zero is not necessary as placeholder, we can write it as \$34.73.

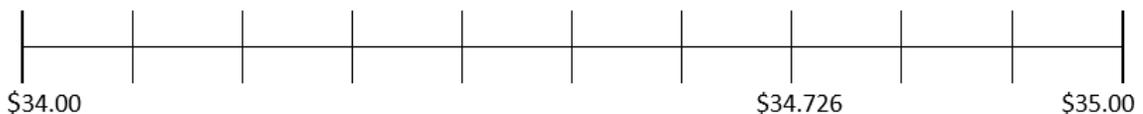
- Follow the same process to round the number to the nearest tenth. First, discuss which two-tenths \$34.726 falls between (between \$34.7 and \$34.8).



Ask, “When rounding to the nearest tenth, is \$34.726 closer to \$34.70 or \$34.80?”

Students may underline the numeral in the tenths place (e.g.; \$34.726). Pose questions so students think, why is \$34.70 closer to \$34.726 than \$34.80, indicating to round the number to \$34.70.

- Ask students to explain how to round to the tenths place. Direct students to the hundredths place. They should notice two hundredths is two jumps away from \$34.70 on the number line, as opposed to eight jumps away from \$34.80. Thus, \$34.726 rounded to the nearest tenth is \$34.70, or 34.7.
- Finally, round 34.726 to the nearest whole. It might be helpful to think of this as rounding \$34.726 to the nearest dollar. Which whole-dollar amounts does \$34.726 fall between? (\$34.00 and \$35.00) Which is \$34.726 closer to: \$34.00 or \$35.00? How many jumps away from \$34.00, and how many from \$35.00?



It can be seen on the number line that \$34.276 is closest to \$35. Rounded to the nearest whole number, 34.726 is 35.

- Distribute number cards and copies of the Decimal Rounding activity sheet. Model and complete the first question by drawing four cards to create a decimal. Discuss as a class how to round this number to the nearest hundredth, tenth, and whole.
- Have students complete the activity, working independently or in pairs. Circulate around the classroom to check for understanding and note which students may need more support.

### Assessment

- Questions**
  - Why can rounding numbers be helpful? What is a situation where rounding is helpful? What is a situation where you would not want to round a number?
  - What are some other ways we can estimate?
  - How would you round a number to the nearest hundredth? Tenth? Whole?
- Journal/writing prompts**
  - Your friend needs help rounding 12.345 to the nearest hundredth, tenth, and whole. Write an explanation to help your friend understand.

- Explain how rounding a decimal is similar to and different from rounding a whole number.
- **Other Assessments**
  - Have students demonstrate and think aloud rounding a decimal, using an open number line.
  - Have students model rounding a decimal, using base-10 blocks or paper models.

### **Extensions and Connections**

- Have students play a game using the Decimal Rounding activity sheet. Each student will need their own activity sheet and will take turns rolling and rounding. Award points for the largest or smallest decimals rolled.
- Have students connect rounding decimals to the process of rounding whole numbers, which they learned in fourth grade, and discuss how they are similar and different.
- Have students connect rounding decimals to making change, and lead students in rounding the amount of change received from various purchases.
- Direct students to use estimation in multistep money problems. For example, given the prices of three items, have students estimate by rounding each price to the nearest dollar and determine whether they would have enough money to purchase all three items with a \$20 bill.

### **Strategies for Differentiation**

- Some students may need to work in pairs first when completing the Decimal Rounding activity.
- Some students may need to start rounding in whole numbers, moving to tenths, hundredths, and thousandths.
- Give students number cards and decimal-point cards to create a human decimal number. Ask students to act out how to round numbers through movement.
- Use base-10 materials to work when rounding to the nearest whole, tenth, and hundredth (including the Decimal Rounding sheet).

**Note: The following pages are intended for classroom use for students as a visual aid to learning.**

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## Decimal Rounding

Name \_\_\_\_\_ Date \_\_\_\_\_

Roll a number generator (or draw a card) enough times to fill in each blank to create a decimal number. Then round each decimal number to the nearest hundredth, tenth, and whole.

### Round 1:

Roll or draw a card 4 times and write each digit in the boxes below to create a decimal.

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- a) Round the number to the nearest hundredth and record your answer below.
  
- b) Round the original number to the nearest tenth and record your answer below.
  
- c) Round the original number to the nearest whole and record your answer below.

### Round 2:

Roll or draw a card 4 times and write each digit in the boxes below to create a decimal.

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- a) Round the number to the nearest hundredth and record your answer below.
  
- b) Round the original number to the nearest tenth and record your answer below.
  
- c) Round the original number to the nearest whole and record your answer below.

**Round 3:**

Roll or draw a card 4 times and write each digit in the boxes below to create a decimal.

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- a) Round the number to the nearest hundredth and record your answer below.
  
- b) Round the original number to the nearest tenth and record your answer below.
  
- c) Round the original number to the nearest whole and record your answer below.

**Round 4:**

Roll or draw a card 5 times and write each digit in the boxes below to create a decimal.

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- a) Round the number to the nearest hundredth and record your answer below.
  
- b) Round the original number to the nearest tenth and record your answer below.
  
- c) Round the original number to the nearest whole and record your answer below.

**Round 5:**

Roll or draw a card 5 times and write each digit in the boxes below to create a decimal.

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- d) Round the number to the nearest hundredth and record your answer below.
  
- e) Round the original number to the nearest tenth and record your answer below.
  
- f) Round the original number to the nearest whole and record your answer below.

**“Highest or Lowest” Game**

Once you complete 1–5 successfully, turn this activity into a partner game! Each partner needs a piece of paper and a pencil, and partners need one number generator or set of cards to share.

- 1) Decide on the number of digits to generate, and where to place the decimal point (such as five digits, with a decimal point after the second digit).
- 2) Decide what place value to round to (such as tenths). Decide whether the winner of the round must have the highest or lowest number after rounding.
- 3) Each partner draws the chosen number of spaces on their paper, putting the decimal point in the identified place. EXAMPLE: \_\_\_\_\_. \_\_\_\_\_
- 4) Players take turns rolling and filling in blanks on their own sheets. Once spaces are filled, round to the chosen place. The one who has the highest or lowest number wins a point.
- 5) Keep playing rounds until time runs out. The one with the most points wins the game.

## Open Number Lines

