Lesson Opener

Making Connections
Have a discussion with students about estimating.

Have you ever used estimation before making a purchase? If an item cost $4.26, why would you use the benchmark of 5 instead of 4? ($4 is not enough money to purchase the item.)

Using the Digital Lesson
Ask the students about the different animals they see in their neighborhood. Discuss whether the animals are moving through the neighborhood during the day or at night.

Learning Task
- What is the problem to be solved? (the best estimate of the difference of two decimals)
- What is the number 3.75 written in expanded form? (3 + \( \frac{7}{10} \) + \( \frac{5}{100} \) or 3 + 0.7 + 0.08)
- What is 3.75 rounded to the nearest tenth? (3.8)
- What decimals in hundredths could have been rounded to 1.8? (Possible answers: 1.75, 1.76, 1.77, 1.78, or 1.79 and 1.81, 1.82, 1.83, and 1.84)

Literacy and Mathematics
- Have students locate and label a point on a number line that corresponds to 3.75 and another point that corresponds to 1.8. Have students write an inequality that compares the two numbers and explain their reasoning. (Possible inequalities: 1.8 < 3.75 or 3.75 > 1.8. On a number line, numbers to the left of a number are less than the number. Numbers to the right of a number are greater than the number.)
Unlock the Problem

A word in this problem suggests that you should estimate instead of finding an exact answer. Read the problem to discover the word. The word “about” suggests an estimate.

Have students relate how they round a decimal to how they would round a whole number. They should conclude that rounding either decimals or whole numbers involves place value. Then have students estimate the sum of the three decimals by rounding each number to the nearest whole number.

Try This!

Have students estimate the difference for A and B at the bottom of the page. Students can round to the nearest dollar: $27.95 to $28 and $11.72 to $12 and subtract, or round to the nearest ten dollars: $27.95 to $30 and $11.72 to $10 and subtract.

- What real-world situation can be modeled by the subtraction $27.95 – $11.72? Possible answer: $27.95 and $11.72 represent the cost of two books. Subtract $11.72 from $27.95 to find how much more one book costs than the other book.

Try This! Use rounding to estimate.

A Round to the nearest whole dollar. Then subtract.

Round to the nearest whole number. Then add.

\[
\begin{align*}
3.4 & \quad 3 \\
2.78 & \quad 3 \\
+4.19 & \quad 4 \\
\hline
10 & \\
\end{align*}
\]

So, there will be about 10 minutes of recording time on the CD.

Differentiated Instruction

ELL Language Support

ELPS 2.C.1, 2.C.4, 3.D.2

Strategy: Model Language

- Students learn meaning by repeating modeled sentences.
- Show a number line with benchmarks for decimals.

\[
\begin{array}{c}
0 \\
0.25 \\
0.5 \\
0.75 \\
1 \\
\end{array}
\]

- Explain that these numbers are benchmarks.
- Show 0.23 on the number line. The closest benchmark to 0.23 is 0.25. Have students repeat the sentence.
- Identify benchmarks for other decimals. Have students repeat each sentence.
**Use Benchmarks**

Benchmarks are familiar numbers used as points of reference. You can use the benchmarks 0, 0.25, 0.50, 0.75, and 1 to estimate decimal sums and differences.

**Example**

Use benchmarks to estimate. $0.76 - 0.22$

Locate and graph a point on the number line for each decimal. Identify which benchmark each decimal is closer to.

Think: $0.76$ is between $0.75$ and $1$. It is closer to $\underline{0.75}$. Think: $0.22$ is between $0$ and $0.25$. It is closer to $\underline{0.25}$.

So, $0.76 - 0.22$ is about $\underline{0.50}$.

Possible explanation: If I use rounding to estimate, $0.76 - 0.22$ will be about $0.6$. If I use benchmark decimals, it will be about $0.50$.

**Share and Show**

**Math Talk**

Use the Example to explain how using rounding or benchmarks to estimate a decimal difference can give you different answers.

**Use rounding to estimate.** Possible estimates are given.

1. $2.34 \quad 2$  
   $1.9 \quad 2$  
   $+ 5.23 \quad + 5$  
   $\underline{9}$

2. $10.39 \quad 10$  
   $- 4.28 \quad - 4$  
   $\underline{- 6}$

3. $\underline{19.75}$  
   $\underline{20}$  
   $+ \underline{3.98}$  
   $+ \underline{4}$  
   $\underline{24}$

**Use benchmarks to estimate.** Possible estimates are given.

4. $0.34 \quad 0.25$  
   $0.1 \quad 0$  
   $+ 0.25 \quad + 0.25$  
   $\underline{0.50}$

**Math Talk**

Use Math Talk to focus on students’ understanding of how using rounding compares to using benchmarks to estimate.

**Math Talk**

Use Math Talk to focus on students’ understanding of how estimates relate to exact answers. Extend the discussion by having students name words and phrases that suggest an estimate.

**Math Talk**

Use Math Talk to focus on students’ understanding of how using rounding compares to using benchmarks to estimate.

**Enrich**

**Visual Small Group**

- Have students make a menu for an imaginary café they may wish to open. Invite students to be creative about what items they might include on the menu. They should consider the prices that they have paid for various items.
- Have them write the price of each item on the menu in dollars and cents.
- Have them list a combination of items from the menu that they could buy for $5, $10, and $20.
- To extend the activity, have students make “meals” out of the items that will cost less than buying the items individually.

**Cook’s Café**

<table>
<thead>
<tr>
<th>Menu</th>
<th>Prices</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tuna Sandwich</td>
<td>$5.95</td>
</tr>
<tr>
<td>Pizza Slice</td>
<td>$2.95</td>
</tr>
<tr>
<td>Veggie Bites</td>
<td>$2.95</td>
</tr>
<tr>
<td>Drinks</td>
<td>$1.95</td>
</tr>
</tbody>
</table>

Go to thinkcentral.com for additional enrichment activities in the Enrich Activity Guide.
Problem Solving

Use rounding or benchmarks to estimate. Possible estimates are given.

6. \(0.93 + 0.18\)  
7. \(8.12 + 5.52\)  
8. \(9.75 - 3.47\)

Practice: Copy and Solve Use rounding or benchmarks to estimate. Possible estimates are given.

9. \(12.83 + 16.24\)
10. \(-26.92 - 11.13\)
11. \(9.41 + 3.82\)

H.O.T. Estimate to compare. Write < or >. Possible estimates are given.

12. \(2.74 + 4.22\) \(<\) \(3.13 + 1.87\)
13. \(6.25 - 2.39\) \(<\) \(9.79 - 3.84\)

Problem Solving

Use the table to solve 14–16. Show your work.

<table>
<thead>
<tr>
<th>Name</th>
<th>Number of Miles Traveled</th>
<th>Type of Protein per Serving</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mrs. McEnery</td>
<td>36.92</td>
<td>1 cup low-fat milk</td>
</tr>
<tr>
<td>Mr. Harrison</td>
<td>50.58</td>
<td>1 scrambled egg</td>
</tr>
<tr>
<td>Mrs. Adams</td>
<td>21.16</td>
<td>1 cup low-fat milk</td>
</tr>
<tr>
<td>Mr. Volga</td>
<td>62.12</td>
<td>1 oat bran muffin</td>
</tr>
<tr>
<td>Mr. Volga</td>
<td>68.85</td>
<td>1 cup low-fat milk</td>
</tr>
<tr>
<td>Mr. Volga</td>
<td>73.23</td>
<td>1 scrambled egg</td>
</tr>
<tr>
<td>Mr. Volga</td>
<td>81.09</td>
<td>1 cup low-fat milk</td>
</tr>
<tr>
<td>Mr. Volga</td>
<td>105</td>
<td>1 scrambled egg</td>
</tr>
</tbody>
</table>

14. Representations For the week of April 4, 1964, the Beatles had the top four songs. About how long would it take to listen to these four songs?

- “I Want to Hold Your Hand” 2.75 minutes
- “Can’t Buy Me Love” 2.30 minutes
- “I Want to Hold Your Hand” 2.75 minutes
- “Please Please Me” 2.00 minutes

15. Representations Gina had a scrambled egg, an oat bran muffin, and a cup of low-fat milk for breakfast. About how many grams of protein did Gina have at breakfast?

- Scrambled egg: 19 grams
- Oat bran muffin: 21 grams
- Cup of low-fat milk: 8.22 grams

About 19 grams

16. Multi-Step Pablo had a cup of shredded wheat cereal, a cup of low-fat milk, and one other item for breakfast. He had about 21 grams of protein. What was the third item Pablo had for breakfast?

- A scrambled egg
20. Fran bought sneakers for $54.26 and a shirt for $34.34. If Fran started with $100, about how much money does she have left?

A $35  B $20  C $5  D $80
Lesson Check

Fill in the bubble completely to show your answer.

13. Dylan wants to buy a book for $16.95 and a magazine for $4.50. About how much will he need to buy the items without having to round down to the nearest benchmark?
   A $15
   B $30
   C $25
   D $20

14. Sasha downloads a song that is 4.32 minutes long and one that is 8.28 minutes long. About how many minutes will it take all of her songs to play if she already has 13.8 minutes of songs?
   A 15 minutes
   B 30 minutes
   C 20 minutes
   D 26 minutes

15. Mike spends $23.40 on a present for his mom and a $18.95 on a present for his dad. If Mike started with $75, about how much money does he have left?
   A $30
   B $50
   C $20
   D $40

16. Danielle and Raj want to combine their money to buy a soccer ball. Danielle has $7.95. Raj has $6.35. Which benchmarks should they use to estimate the money they have?
   A $7.75 + $6.50
   B $8.00 + $6.25
   C $7.50 + $6.50
   D $6.00 + $6.50

17. Multi-Step Jesse, Max, and Kalel each ate 0.32 of a pizza pie. Which number shows the best estimate of how much of the pie they ate together?
   A 1.0
   B 0.5
   C 0.25
   D 0.10

18. Multi-Step George is giving two speeches at school. The first was 3.4 minutes long. Then he added 0.9 minutes to the speech. The second speech was 4.1 minutes long. Then he subtracted 1.4 minutes from it. Use benchmarks to estimate the length of each speech.
   A first speech: 4.0 minutes; second speech: 3.5 minutes
   B first speech: 4.0 minutes; second speech: 3.5 minutes
   C first speech: 4.5 minutes; second speech: 3.5 minutes
   D first speech: 4.5 minutes; second speech: 3.5 minutes

Homework and Practice

Use the Homework and Practice pages to provide students with more practice on the concepts and skills of this lesson.

1.6 Estimate Decimal Sums and Differences

Use rounding or benchmarks to estimate. Possible estimates are given.

1. 3.39
   - 4.58
   = -1.19
   + 3.25
   = +1.06
   - 6
   = -6

2. 6.77
   + 3.23
   = +10

3. 2.69
   + 5.02
   = +7.68
   - 6
   = -6

4. 9.76
   - 3.28
   = -6.48
   + 10

5. 7.36
   - 0.43
   = -6.93
   + 7

6. 5.55
   - 0.25
   = -5.80
   + 6

Estimate to compare. Write < or >.

7. 8.23 + 2.22
   > 3.21 + 5.89

8. 7.32 - 3.76
   < 9.23 - 4.28

9. $18.25 + $5.50
   < $10.75 + $15.00

10. 6.2 - 4.8
    < 7.23 - 5.08

Problem Solving

11. Li is running a race around the school track. He runs 0.327 kilometer during the first half of the race. What is the distance that he travels in the first half of the race, rounded to the nearest hundredth?
    0.33 kilometer

12. A video lasts 6.44 minutes. About how long does the video last, rounded to the nearest minute?
    about 6 minutes