Rounding and Estimation

Objectives:

…to round numbers to specific place values
…to estimate sums, differences, products and quotients

Assessment Anchor:

7.A.3.1 – Apply estimation strategies to a variety of problems.

A Sampling of Place Values

2,345,109.8672

<table>
<thead>
<tr>
<th>Millions</th>
<th>Hundred Thousands</th>
<th>Ten Thousands</th>
<th>Thousands</th>
<th>Hundreds</th>
<th>Tens</th>
<th>Ones</th>
<th>Tenths</th>
<th>Hundredths</th>
<th>Thousandths</th>
<th>Ten Thousandths</th>
</tr>
</thead>
</table>

NOTES

1. Locate the specific place value in the number you are looking at.
2. Go one spot to the right and use this digit as your decision digit.
   a. IF it is a 0, 1, 2, 3, or 4 …keep the place value number the same
   b. IF it is a 5, 6, 7, 8, or 9 …increase the place value number by one
   c. Change all the digits to the RIGHT of the place value to ZEROS!

***SPECIAL SITUATION!! - When the place value has a (9), and you need to increase it by one…Change the (9) to a (0) and proceed to the left and increase THAT digit by one as well.
Rounding and Estimation

EXAMPLES

Round to the nearest TENTHS place:

\[
\begin{align*}
83.521 & & 9.8523 & & 187.98 \\
\end{align*}
\]

Round to the nearest HUNDREDS place:

\[
\begin{align*}
3,578 & & 17,390.219 & & 328.1 \\
\end{align*}
\]

Round to the nearest ONES place (whole number):

\[
\begin{align*}
835.09 & & 199.542 & & 0.2998 \\
\end{align*}
\]

Vocabulary alert!!

ESTIMATE – an answer that is close to the real answer; to quickly perform an approximation

Estimating Sums and Differences:

1. Pick a place value to round the numbers.
2. Add or subtract these rounded numbers to get your ESTIMATE!

1) \[548.3 + 37.91\]

\[
\begin{align*}
550 & \quad \text{Rounded to tens place} & & 548.30 \\
\text{+ 40} & & & \text{+ 37.91} \\
590 & \quad \text{ESTIMATE} & & 586.21 \\
\end{align*}
\]
Rounding and Estimation

2) 57.34 – 24.9

\[
\begin{align*}
57 & \quad \text{Rounded to whole number} \quad 57.34 \\
-25 & \quad -24.90 \\
32 & \quad \text{ESTIMATE} \quad \text{ACTUAL} \quad 32.44
\end{align*}
\]

3) 95.72 + 189.5

\[
\begin{array}{c}
\text{ESTIMATE} \\
\text{ACTUAL}
\end{array}
\]

4) 4,582.4 – 2,119.73

\[
\begin{array}{c}
\text{ESTIMATE} \\
\text{ACTUAL}
\end{array}
\]

Estimating Products:

1. Pick a place value to round the numbers. CAN BE DIFFERENT FOR EACH NUMBER!!
2. Multiply these rounded numbers to get your ESTIMATE!

5) 49.23 \times 6.2

\[
\begin{align*}
50 & \quad \text{Rounded to tens place} \quad 49.23 \\
\times 6 & \quad \text{Rounded to whole number} \quad \times 6.2 \\
300 & \quad \text{ESTIMATE} \quad 9846 \\
295380 & \quad \text{ACTUAL} \quad 305.226
\end{align*}
\]
Rounding and Estimation

6) \(12.14 \times 21.5\)

<table>
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<tr>
<th>ESTIMATE</th>
<th>ACTUAL</th>
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7) \(3,015.4 \times 7.8\)

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<th>ACTUAL</th>
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</table>

**Vocabulary alert!!**

COMPATIBLE NUMBERS – numbers that can be divided evenly

**Estimating Quotients:**

1. Choose numbers that are close to the original numbers, but are COMPATIBLE (able to be divided easily).
2. Divide these compatible numbers to get your ESTIMATE!

8) \(54.79 \div 8.8\)

\[
\begin{array}{c}
54 \div 9 \quad \text{compatible numbers} \quad 144 \div 12 \\
6 \quad \text{ESTIMATE} \quad 12
\end{array}
\]

9) \(141.92 \div 11.5\)
Rounding and Estimation

10) $312.5 \div 19.74$  
11) $78.192 \div 5.08$

$300 \div 20 \quad \text{compatible numbers} \quad 80 \div 5$

15 $\quad \text{ESTIMATE} \quad 16$

12) $62.1 \div 9.18$

13) $63.5 \div 6.45$

14) $459.21 \div 47.9$

15) $245.6 \div 55.9$

“If you round the DIVISOR to something nice, it will be easy to find a multiple of that number that is closest to the DIVIDEND!”