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Rounding and Estimating

Unit 3 Lesson 1

ROUNDING AND ESTIMATING

Students will be able to:

Understand the concept of estimation by rounding numbers.

Key Vocabulary:

- Rounding-off
- Estimate
- Place Value

ROUNDING AND ESTIMATING

ROUNDING OF AND ESTIMATION OF THE WHOLE NUMBERS

Example 1:

Round off 425 201 to the nearest thousand.

425 201

└───┬───> THOUSANDS PLACE

425 000

RULES IN ROUNDING OFF WHOLE NUMBERS

1. If the first digit immediately to the right of the round-off place is

A. Less than 5, the digit in the round-off place is retained.

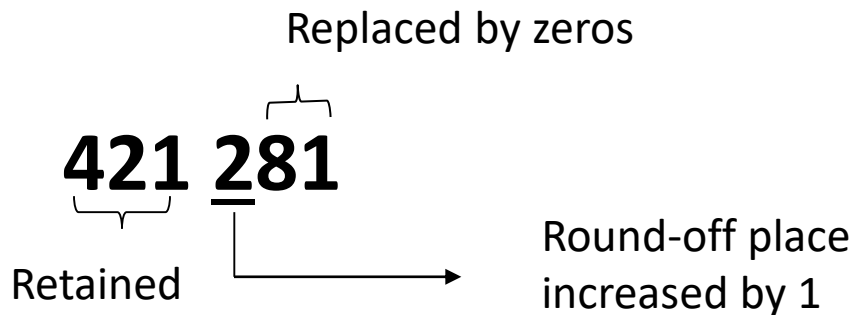
B. 5 or more, the digit in the round off-place is increased by

2. Digits to the left of the round-off place are retained.

3. Digits to the right of the round-off place are replaced by zeros.

ROUNDING AND ESTIMATING

Sample Problem 1: Round-off 421 281 to the nearest hundred.



421 300

$421\ 281 \approx 421\ 300$

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Sample Problem 2: Find the sum of 492, 512, 90, and 301. If we round of the numbers to the nearest hundred

$$\begin{array}{r} 492 \\ 512 \\ 90 \\ + 301 \\ \hline 1395 \end{array}$$

$$\begin{array}{r} 492 \approx 500 \\ 512 \approx 500 \\ 90 \approx 100 \\ \hline 301 \approx 300 \\ 1400 \end{array}$$

1395 round off to the nearest hundred is 1400, we call 1400 the estimated sum of the given numbers. The process is called *estimation*.

Estimation

The process of approximating the answer so that an unreasonable answer caused by careless mistakes can be recognized is called *estimation*.

ROUNDING AND ESTIMATING

Sample Problem 3: Estimate $921 - 512$ then determine the exact answer.

Solution:

921 is close to 900 and 512 is close to 500. Hence, $921 - 512$ is close to $900 - 500 = 400$.

While the exact answer is

$$921 - 512 = 409$$

While 409 is close to our estimate of 400.

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Sample Problem 4:

Choose the best pair of compatible numbers for $255 \div 50$.

a. $260 \div 50$

b. $260 \div 60$

c. $250 \div 50$

Solution:

C is the best choice. Think of the basic fact $25 \div 5$.

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Sample Problem 5:

Estimate $272 \div 4$.

$$4 \overline{)272} \longrightarrow 4 \overline{)280} \begin{matrix} 70 \end{matrix}$$

ROUNDING AND ESTIMATING

Front-End Estimation

Add (or Subtract) the first to get a rough estimate.

Adjust your estimate by using the remaining digits and looking for numbers that are compatible.

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Example 2:

Use front-end estimation to estimate the value of the variable.

$$3\,527 + 7\,969 + 5\,493 = N$$

Add the front-end digits

$3\,527 + 7\,969 + 5\,493$ is about 15 thousand.

Rough estimate: 15 000

Look at the other digits, $3\,527 + 7\,969 + 5\,493$, for compatible numbers: 1500

969 is about 1 000. Increase the estimate by 2 000.

Adjusted estimate: 17 000