CONSTRUCTING TASK: Reasonable Rounding

Adapted from the numeracy project www.nzmaths.co.nz

STANDARDS FOR MATHEMATICAL CONTENT

MCC5.NBT.4 Use place value understanding to round decimals to any place. Perform operations with multi-digit whole numbers and with decimals to hundredths.

STANDARDS FOR MATHEMATICAL PRACTICE

1. **Make sense of problems and persevere in solving them.**
2. **Reason abstractly and quantitatively.**
3. **Construct viable arguments and critique the reasoning of others.**
4. **Model with mathematics.**
5. **Use appropriate tools strategically.**
6. **Attend to precision.**
7. **Look for and make use of structure.**
8. **Look for and express regularity in repeated reasoning.**

BACKGROUND KNOWLEDGE

Students should be familiar with showing the placement of decimals on number lines. They should know place value to the thousandths place and be able to determine relative values of decimal numbers.

ESSENTIAL QUESTIONS

- How can rounding decimal numbers be helpful?
- How can you decide if your answer is sensible?
- In what situation(s) would you not want to round decimals?

MATERIALS

- Reasonable Rounding sheet
- Pencils

GROUPING

Individual/Partner Task

TASK DESCRIPTION, DEVELOPMENT, AND DISCUSSION

In this task, students will investigate situations where rounding is appropriate, and some situations where rounding would not provide the degree of accuracy needed. Students will also decide when a number has been rounded correctly.

Comments

Many times students simply round numbers as requested, but it is more important for them to understand the usefulness of rounding in real-life situations. Math should be viewed in context and related to the lives of students.

Task Directions

Students will read the directions on the task sheet and work with partners to determine rounding for appropriate situations.

FORMATIVE ASSESSMENT QUESITONS

- Is this a sensible answer?
- Would it be reasonable to round the number in this situation?
- Why would a more accurate answer be appropriate?
- How do you know your answer is reasonable?

DIFFERENTIATION

Extension

- Students may develop their own rules for rounding and apply them to different situations to see if their rule works consistently.
- Some students may be able to devise more scenarios for using rounding.

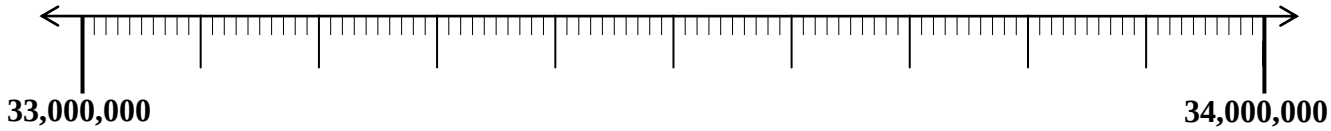
Intervention

- Prepare a list of four or five decimal numbers that students might have difficulty putting in order. They should all be between the same two consecutive whole numbers.
- Have students first predict the order of the numbers, from least to most.
- Next, have them place each number on a number line with 100 subdivisions (see below)

Name _____Date _____

REASONABLE ROUNDING

Sometimes we need to round decimal numbers when a close whole number is all that is needed to give good information. One example of this is in newspaper headlines. Headlines should be short and give summary information so that readers can quickly scan the information to learn the most important points. The U.S. government reports spending $33,883,641.31 in the 2009-2010 financial year. Discuss how to put this number into a newspaper headline. A sensible answer is "Government Spends $34 Million Last Year. Notice the following number line:



Where would 33,883,641.31 fall on this number line?

1. Round these numbers suitably for use in newspaper headlines.

Quality Stores Make a Profit of $3,493,631.29

_____

The Governor was Paid $251,419.91 Last Year

_____

Scientist Estimates There are 56,409.123 Possums in the United States

_____

Cost of Producing Cheese Drops to 81.8 Cents per Pound Due to Improved Efficiency at the Cheese Factory

_____

A Milk Factory Reports It Brought 27,309,604 Gallons of Milk from Farmers Last Year

_____

2. Mr. Brown rounded 14.486 to the nearest whole number by rounding 14.486 to 14.49 by the "over 5" rule. Then he rounded 14.49 to 14.5 by the same rule. Then he rounded 14.5 to 15 by the rule. Unfortunately this is wrong. Why is his answer wrong? How can using the "over 5" rule be misleading in some cases? Using a number line, show why his answer is wrong. Explain your thinking.