MTI

Genelle Eggerton
Eggerton.genelle@lexington.k12.oh.us

Jayme Diener
Jdiener@laca.org

Vanessa Bumgardner
Vbpatches3@gmail.com

Natalie Grandstaff
Grandsta@bcs-k12.org

Title: Introduction to Rounding

Learning Goals for Students:

- Investigate, understand, and use place value to manipulate numbers.
- Build on understanding of place value to round whole numbers.

1. ***Number and Operations...***

   Prior to implementing rules for rounding**,** students need to have opportunities to investigate place value. A strong understanding of place value is essential for the developed number sense and the subsequent work that involves rounding numbers.

   Building on previous understandings of the place value of digits in multi-digit numbers, place value is used to round whole numbers. Dependence on learning rules or mnemonics can be eliminated with strategies such as the use of a number line to determine which multiple of 10 or of 100 a number is closer. (5 or more rounds up, less than 5 rounds down). As students' understanding of place value increases, the strategies for rounding are valuable for estimating, justifying, and predicting the reasonableness of solutions in problem-solving.

   Continue to use manipulatives such as hundreds charts and place-value charts. Have students use a number line or a roller coaster example to block off the numbers in different colors.

   Rounding can be expanded by having students identify all the numbers that will round to 30 or round to 200.

   (http://www.sandi.net/cms/lib/CA01001235/Centricity/Domain/14642/CCGPS_Math_3_Unit1FrameworkSE.pdf)

3.NBT.A.1

Number & Operations in Base Ten

Use place value understanding and properties of operations to perform multi-digit arithmetic. [1]

1. Use place value understanding to round whole numbers to the nearest 10 or 100.

Mathematical Practices

2. Reason abstractly and quantitatively.

Mathematically proficient students make sense of quantities and their relationships in problem situations. They bring two complementary abilities to bear on problems involving quantitative relationships: the ability to *decontextualize* — to abstract a given situation and represent it symbolically and manipulate the representing symbols as if they have a life of their own, without necessarily attending to their referents—and the ability to *contextualize*, to pause as needed during the manipulation process in order to probe into the referents for the symbols involved. Quantitative reasoning entails habits of creating a coherent representation of the problem at hand; considering the units involved; attending to the meaning of quantities, not just how to compute them; and knowing and flexibly using different properties of operations and objects.

8. Look for and express regularity in repeated reasoning.

Mathematically proficient students notice if calculations are repeated, and look both for general methods and for shortcuts. Upper elementary students might notice when dividing 25 by 11 that they are repeating the same calculations over and over again, and conclude they have a repeating decimal. By paying attention to the calculation of slope as they repeatedly check whether points are on the line through (1, 2) with slope 3, middle school students might abstract the equation $(y – 2)/(x – 1) = 3$. Noticing the regularity in the way terms cancel when expanding $(x – 1)(x + 1)$, $(x – 1)(x^2 + × + 1)$, and $(x – 1)(x^3 + x^2 + × + 1)$ might lead them to the general formula for the sum of a geometric series. As they work to solve a problem, mathematically proficient students maintain oversight of the process, while attending to the details. They continually evaluate the reasonableness of their intermediate results.

Materials Used:

"How Many Jellybeans?" by Andrea Menotti

"1001 Animals to Spot" by Ruth Brocklehurst

Chart Paper

Markers

Dice/Recording Sheets

Deck of Cards

Number Cards for Human Number Line

Sidewalk Chalk

Procedures:

Day 1- Break students into groups and give them a piece of chart paper. Ask the question, "How many ways can you make 10? How many ways can you make 100? How many ways can you make 1000?"

After ample time, have student post for a gallery walk and hold a group discussion.

Show pictures of real world items in these quantities (I.e.- Jellybeans, balloons, buttons, etc.)

Read the Jellybean book to the class

Guided Questions

"Which strategies were more efficient in making 10, 100, 1000?"

Day 2- Number Talk; Write 8,435 on the chart paper. Ask students what they can tell the class about this number. Spend 10-15 minutes in this number talk.

Reread jellybean book and then create a bond with quantity, symbols, and words.

Use Georgia Math Unit 1 activity, Three Other Ways http://www.sandi.net/cms/lib/CA01001235/Centricity/Domain/14642/CCGPS_Math_3_Unit1FrameworkSE.pdf

Day 3- introduction to Rounding

Create a human number line on the sidewalk. Use sidewalk chalk to mark tens from 0-100. Teacher gives students a number and asks them to represent their number on the number line.

Guided Questions

"Why did you strategically place your number between ___ and ____?"

"How do you see your number in relation to ____?"

Bring students together in small groups. Have them discuss what they know about rounding and estimating. Students will chart their responses on a clipboard and share with the class.

Guided Questions

"Does rounding a number change its value relative to other numbers?"

"How is rounding used in real life?"

"How do we round numbers to tens and hundreds?"

Students create an anchor chart for procedures for rounding.

Use riddles, from Georgia Math, with the number line to answer the riddles, http://www.sandi.net/cms/lib/CA01001235/Centricity/Domain/14642/CCGPS_Math_3_Unit1FrameworkSE.pdf

Day 4- Review anchor charts that students created. Break students into the following math stations:

1. Create your own riddle

2. Dice Game- role a three digit number and round the number to the nearest 100, role two dice and round to the nearest ten

3. Place Value War- http://www.sandi.net/cms/lib/CA01001235/Centricity/Domain/14642/CCGPS_Math_3_Unit1FrameworkSE.pdf

4. Dice Game #2- roll four dice and make the largest number

5. Grouping Jellybeans

Day 5- Write a three and four digit number that equals 1000 when rounded to the nearest hundred. Explain your thinking.