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| **Open Number Lines** **4.NBT.3-Task 1** |
| **Domain** | **Numbers and Operations in Base Ten** |
| **Cluster** | **Generalize place value understanding for multi-digit whole numbers.** |
| **Standard(s)** | **4.NBT.3** Use place value understanding to round multi-digit numbers to any place. |
| **Materials** |  Paper and pencil |
| **Task** | ***Activity 1:*** *Estimating sums and differences using an open number line.*Specified as a tool for estimating by the CCSSM, an open number line is simply a blank number line. One way that it can be used as an estimation tool is by counting up from a given number to reach benchmark numbers, and then totaling the 'jumps.' For example, to find the difference between 46 and 100, you can jump 4 (from 46 to 50) and then 50 (from 50 to 100) to get a difference of 54. It is not necessary to draw ticks on the number line for each unit.Model using the open number line to find distances between numbers for each scenario.* Molly needs to save $128 for a tablet. She received $47 for her birthday. About how much more does she need to save?

*I know that 47 is about 50. I'm trying to get to about 130. From 50 to 100 is 50. Then I need to go 30 more to 130. So 50 plus 30 is 80. She needs to save about 80 more dollars.** Mr. Smart's class read 362 books in the Read A Thon. Mrs. Walter's class read 275 books. About how many more books did Mr. Smart's class read?

*I know that 362 is about 400 and 275 is about 300. That's a difference of about 100.** Mrs. Collins' class read 446 books in the Read A Thon. That was about 100 more books than Mrs. White's class. How many books could Mrs. White's class have read? What are some exact numbers of books that would make sense?

*Since 446 is closer to 400 than 500, we can round 446 to 400 and Mrs. White's class could have read about 300 books. It would make sense to guess that Mrs. White's class could have read exactly 326 books since that rounds to 300. If you round 446 to 450, Mrs. White's class cold have read about 350 books.**Activity 2*Give students the following problems to practice using open number lines. Ask them to use open number lines in at least two different ways for each problem.* Find the difference between 429 and 216.
* Find the difference between 89 and 501.
* Find the difference between 350 and 1,050.
* Find the sum of 48 and 299.
* Find the sum of 12 and 372.

After students have had time to think about their solutions, allow time for them to share their ideas, noticing similarities and differences in how they thought about the numbers and how they used the open number lines to find the sums or differences.  |

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| **Rubric** |
| **Level I** | 1. **Level II**
 | **Level III** |
| Limited Performance* Students do not understand how to round a number to a given place value. They are unable to estimate sums and differences using benchmark numbers and/or open number lines as a tool for computation. They are unable to make reasonable estimates of sums or differences and explain why an estimate can include a range of exact numbers depending on the place value to which a number is rounded.
 | Not Yet Proficient* Students understand how to round a number to a given place value. They are able to estimate sums and differences using benchmark numbers and/or open number lines as a tool for computation, but may not be able to report more than one possible solution or way to find an answer. They are unable to explain why an estimate can include a range of exact numbers depending on the place value to which a number is rounded.
 | Proficient in Performance* Students understand how to round a number to a given place value. They are able to estimate sums and differences using benchmark numbers and/or open number lines as a tool for computation, and can to report more than one possible solution for finding each sum or difference. They are able to explain why an estimate can include a range of exact numbers, and can justify their estimates using place value.
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| **Standards for Mathematical Practice** |
| **1. Makes sense and perseveres in solving problems.** |
| **2. Reasons abstractly and quantitatively.** |
| 3. Constructs viable arguments and critiques the reasoning of others. |
| 4. Models with mathematics. |
| 5. Uses appropriate tools strategically. |
| 6**.** Attends to precision. |
| 7. Looks for and makes use of structure. |
| 8. Looks for and expresses regularity in repeated reasoning. |