Grade 4 Unit 1.2

Problem Solving Involving Multi-digit Numbers

Key Content from This Unit:

Through the use of multistep word problems with whole numbers, students apply perimeter formulas and addition/subtraction algorithms. It is important to connect the standard algorithm to previously learned strategies and choose the most efficient method based on the problem. Students solve multistep word problems using whole numbers and letters for unknown quantities that result in whole numbers. The concept of perimeter is mastered.

Vocabulary to Know:

Perimeter: The distance around the outside of a shape.

Estimate: to make an approximate or rough calculation often based on rounding

***Computation algorithm*:** A set of predefined steps applicable to a class of problems that gives the correct result in every case when the steps are carried out correctly.

***Computation strategy*:** Purposeful manipulations that may be chosen for specific problems, may not have a fixed order, and may be aimed at converting one problem into another

What is estimation?

Estimation skills include identifying when estimation is appropriate, determining the level of accuracy needed, selecting the appropriate method of estimation, and verifying solutions or determining the reasonableness of situations using various estimation strategies. Estimation strategies include, but are not limited to:

- front-end estimation with adjusting (using the highest place value and estimating from the front end, making adjustments to the estimate by taking into account the remaining amounts),
- clustering around an average (when the values are close together an average value is selected and multiplied by the number of values to determine an estimate),
- rounding and adjusting (students round down or round up and then adjust their estimate depending on how much the rounding affected the original values),
- using friendly or compatible numbers such as factors (students seek to fit numbers together - e.g., rounding to factors and grouping numbers together that have round sums like 100 or 1000),
- using benchmark numbers that are easy to compute (students select close whole numbers for fractions or decimals to determine an estimate)

What came before this:

Students applied rounding, estimation, addition and subtraction concepts learned in the previous units to solve problems. They continued to practice adding and subtracting multi-digit numbers in real-word problems.

What comes after this:

Students will continue to solve one and two step problems throughout the year.

Common Core Focus:

- Solve multistep whole number addition/ subtraction problems.
- Apply the perimeter formulas of rectangles in real-world and mathematical situations.
- Represent problems using equations where a letter stands for an unknown quantity.
- Mentally compute and estimate answers to assess reasonableness.
- Use the standard algorithm to add and subtract multi-digit whole numbers up to 1,000,000.

4.MD.3,4.OA.3, 4.NBT.4

Spotlight on the Math Practices

Model with Mathematics

Mathematically proficient students can apply the mathematics they know to solve problems arising in everyday life, society, and the workplace.

In this unit, students *model with mathematics* when they:

- Explain the meaning of a problem and look for entry points to its solution.
- Monitor and evaluate progress and change course if necessary.
- Check their answers to problems using a different method.
- Ask, "Does this make sense?"

How Can You Help at Home?

- Pose real world problems that have multiple steps
- Ask your student to estimate and explain why their answers make sense
- Use mental math strategies to compute larger numbers

KEY MATHEMATICAL MODELS of the COMMON CORE

Partial Sums and Differences

123 + 234 =

100 + 20 + 3
+ 200 + 30 + 4
300 + 50 + 7 = 357

238 + 473 =

200 + 30 + 8
+ 400 + 70 + 3
600 + 100 + 11= 711

548 – 325

500 + 40 + 8
– 300 + 20 + 5
200 + 20 + 3 = 223

614 – 459

600 + 10 + 4
– 400 + 50 + 9

becomes

500 + 100 + 14
– 400 + 50 + 9
100 + 50 + 5= 155

Some Resources to Help at Home

- http://www.ixl.com/math/grade-4/perimeter - What is the perimeter
- http://www.mathplayground.com/mathhoops_Z1.html - Math word problems games
- http://www.mathplayground.com/PartyDesigner/PartyDesigner.html - Use area and perimeter to design a party
- http://www.bbc.co.uk/bitesize/ks2/maths/number/addition_subtraction/play/ - Practice with addition and subtraction