Tips for Helping at Home

Questions to ask:

• What is it that you don't understand (have the student be specific)?
• What about putting things in order?
• Could you try it with simpler numbers?
• Can you guess and check?
• Does this make sense?
• What can you do to explain your answer to show others what you are thinking?
• Does your answer seem reasonable?

Ask your child to tell how he or she got an answer.

• There are many ways of doing these problems--and no single "right" way. What's important for your child to know is how his or her own way works. This is all part of developing good common sense about numbers.
• Your child may be asked to find groups of things around the house that number about 100, about 200, about 300, and so forth. You can help in your child's search. Talk about the number of things you both are finding, for example:
* What about the nuts in this jar?
* Do you think that would be close to 100?
What about the squares in the ceiling?
• Any time you find that you yourself need to estimate or deal with large numbers, please involve your child. Whether you're buying food, or deciding how many tiles to buy to patch the floor, your child probably has some good ideas about how to go about it.

Web Resources

You will find web resources at:

http://www.dreamsbeginhere.org/static/aboutdcps/departments/acadprog/mathematics/index.asp

Mathematical Emphasis

Investigation 1: Finding Factors

• Understanding the relationship between skip counting and grouping (for example, as we count 3, 6, 9, 12, we are adding a group of 3 to the total each time)
• Becoming familiar with the relationships among commonly encountered factors and multiples (for example, is 3 a factor of 24? How many 3's does it take to make 24?)
• Increasing fluency in counting by single-digit numbers (2's, 3's, 4's, 6's, 8's) as well as by useful two digit numbers (10's, 20's, 25's)
• Developing familiarity with the factors of 100, an important landmark in our number system, and their relationships to 100

Investigation 2: Using Landmarks to Solve Problems

• Using knowledge about factors of 100 to understand the structure of multiples of 100 (if there are four 25's in 100, there are 12 25's in 300)
• Developing strategies to solve problems in multiplication and division situations by using knowledge of factors and multiples
• Estimating real quantities that are close to 200, 300 and 400
• Reading and using standard multiplication and division notation to record problems and answers

Investigation 3: Constructing a 1000 Chart

• Using factors of 100 to understand the structure of 1000 (How many 50's does it take to make 1000?)
• Estimating quantities up to 1000 (What can we find the classroom that numbers about 500?)
• Using landmarks to calculate "distances" within 1000 (How far is it from 650 to 950?)

Duval County Public Schools

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Investigations in Number, Data, and Space

Landmarks in the Hundreds
Grade 3

The Number System

Unit Goals:

• Students work with 100, factors of 100, and multiples of 100 (up to 1000)
• Students develop a sense of quantities
• Students develop their own strategies, based on what they know about these landmark numbers, to solve multiplication and division problems.

Proposed Time Frame:

4 weeks

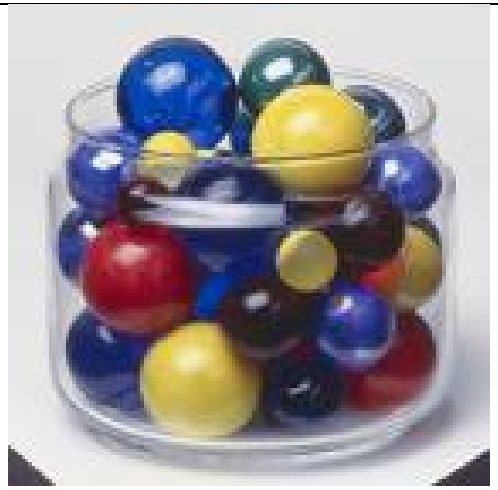
Vocabulary

Factor - a number that is multiplied by another number to find a product.

4 x 5 = 20

Multiple - the product of a given whole number and another whole number

4 x 5 = 20



Glossary

http://www.amathsdictionaryforkids.com/

About the Mathematics In This Unit

An important part of students' mathematical work in the elementary grades is building an understanding of the base ten number system. This unit provides activities that develop knowledge about important *landmarks* in that system - numbers that are familiar landing places, that make for simple calculations, and to which other numbers can be related.

Because our number system is based on powers of ten, the numbers 10, 100, 1000, and their multiples are especially important landmarks. In solving real problems, people with well-developed number sense draw on their knowledge of these important landmarks. For example, think about how you would solve this problem, in your head, before you continue reading:

If there are about 25 students in a class and 17 classes in our school, about how many students are there altogether?

Many people would use their knowledge that there are four 25's in every 100 to help them solve this problem mentally. Rather than multiplying 17 by 25, they would do something like this: "Four 25's in 100, eight in 200, 12, 16, that's 400, and one more makes 425.

Knowledge about 10, 100, 1000, their multiples, and their factors is the basis of good number sense. As students learn about 100, how to take it apart into its factors, and how to use it to construct other numbers, they gain the knowledge they need to develop their own strategies to solve problems using quantities in the hundreds. They develop good estimation strategies and are less likely to make the kinds of errors that result from the use of faulty algorithms.

For example, a student who has developed knowledge about 20 and its relationship to 100, who has experience counting by 20's, and knows what the pattern of the multiples of 20 is like, would never make this common error:

Using a written subtraction algorithm – whether faulty or correct - is not a sensible approach to solving this problem. Rather by inspecting the numbers and using knowledge of the important landmarks in the number system, students should eventually be able to solve this problem mentally with no trouble:

"380 to 400 is 20, then 20, 40, two more 20's gets to 440, so that's three 20's. The answer is 60.

Game

Calendar Math

Work together to find numerical expressions that are equal to the day's date. For example, if the date is March 19, students look for ways to make 19. Constraints on what numbers or operations they can use push students in developing their arithmetic skills.

Materials:
Calculators (for variation)

How to play:
Use today's date or another number (1 - 31) List as many expressions as possible within a predetermined time limit.

Example: The number is 12
6 + 6 4 x 3 12 + 0
1/2 x 24 3 + (-3) + 6 + 6

Variations:
Using constraints Example: You can't use any number that's a multiple of 2.

You can't use addition or subtraction
You must use more than one operation.
You must use one number that's bigger than 100 (1000, 5000)
You must start with 100
You must use at least three numbers.
You can't use 0.
You can only use 1's, 2's, 3's, and 4's

Russell, S. Investigations in Number, Data, and Space: Landmarks in the Hundreds. Dale Seymour Publications, 1998.