

Further investigations:

Help your child create multiplication and division tasks in contextual story problems in your everyday family life. For example, when planning a family picnic or get-together, figure out how many 8-pack hot dog buns you would need for your guests. Use this opportunity to discuss remainders.

<http://www.mathnstuff.com/papers/langu/big100s.gif>

Using a 100 square, your child can circle or shade in multiples of one number up to 100. For example, choosing the number 3 and circling multiples of 3 up to 100 will create a pattern of diagonal lines across the page. Look for other patterns and relate them to division.

Terminology:

Multiplier: The number in a multiplication problem that represents the number of (equal sized) groups

Multiplicand: The number in a multiplication problem that represents the number of objects in each (equal sized) group

Dividend: The number that is being divided

Divisor: The number dividing into the dividend. The divisor may be the number of equal groups to be formed or the size of each group.

Quotient: The result of a division problem. For example, in $72 \div 8 = 9$, the quotient is 9.

Remainder: The part of the dividend that is left after all possible equal-sized groups are created.

Algorithm: A procedure to carry out computation, such as steps for long division.

Product: The answer to a multiplication problem. For example, in $5 \times 9 = 45$, the product is 45.

Book'em:

Amanda Bean's Amazing Dreams
by Marilyn Burns

Anno's Mysterious Multiplying Jar
by Mitsumasa and Masaichiro Anno

A Remainder of One

by Elinor J. Pinczes

Related Files:

www.ceismc.gatech.edu/csi

Operation Multiplication and Divine Division

Students will:

Fourth Grade 2 of 6

- Develop pencil-and-paper multiplication algorithms (2- or 3-digit number multiplied by a 1- or 2-digit number) and division algorithms
- Deepen their understandings of various multiplication patterns
- Solve problems using properties and patterns of basic multiplication facts
- Become fluent in carrying out simple division problems (those that can be solved by using the basic multiplication facts)
- Understand some patterns and relationships of the operation (e.g., when you divide both the dividend and the divisor by the same number, the quotient remained unchanged)
- Solve, estimate, and mentally calculate using various patterns and relationships of division
- Compute using order of operations

Classroom Cases:

1. How does the remainder affect the answer in the following problems? Solve each problem and describe the significance of the remainder.

- a. Four classmates are sharing 13 chocolate bars. If they share them equally, how much will each student get?
- b. Jeremy has \$13 to spend on shoelaces that cost \$4 each. How many shoelaces can he buy?

Case Closed - Evidence:

a. This is a division problem, where we divide $13 \div 4 = 3r1$. Each student will get three whole candy bars and will have to divide the one left over. Divide the one candy bar into fourths, so each child will get $3\frac{3}{4}$ candy bars. The remainder is used as a part of the answer.

b. In this division problem, Jeremy divides \$13 by \$4. He can purchase 3 shoelaces. He can't do anything with the \$1 left over, so the remainder in this problem is ignored.

2. Solve the following multiplication problem two different ways: 45×83

Case Closed - Evidence:

$$\begin{array}{r} 83 \\ \times 45 \\ \hline 3200 \\ 120 \\ 400 \\ + 15 \\ \hline 3735 \end{array}$$

3. Solve the following division problem two different ways: $564 \div 3$

Case Closed - Evidence:

$$\begin{array}{r} 100 + 80 + 8 = 188 \\ 3 \overline{)564} \\ \underline{-300} \\ 264 \\ \underline{-240} \\ 24 \\ \underline{-24} \\ 00 \end{array}$$

$$\begin{array}{r} 188 \\ 3 \overline{)564} \\ \underline{-3} \\ 26 \\ \underline{-24} \\ 24 \\ \underline{-24} \\ 0 \end{array}$$

Clues:

Encourage your child to invent strategies for multiplying and dividing large numbers. Traditional algorithms can be abstract for students at this age, and they don't always encourage understandings of these operations. If your child is allowed to take the numbers apart or combine them in his own way, the abstract models will begin to make more sense.