

Chapter 4 Fifth Grade

Division

Dividend – The number being divided or shared.
Divisor – The number of pieces into which the dividend is divided or shared.
Quotient – The answer to a division problem.

$$96 \div 8 = 12$$

Dividend Divisor Quotient

$$\begin{array}{r} 12 \\ 8 \overline{)96} \end{array}$$

Division

Dividing by Multiples of 10, 100, and 1,000

- Find the pattern: $45,000 \div 5 = ?$
- Divide using the pattern: $45 \div 5 = 9$.
- Count the remaining zeros.
- The zeros before the \div symbol must be balanced by the zeros after.

$$\underline{45,000} \div \underline{5} = \underline{9,000}$$

$$\underline{40,000} \div \underline{80} = \underline{500}$$

Estimation

Estimate – To use simpler numbers to get an answer *close* to the exact answer. Estimates are used because they can be faster.

Estimating Quotients

- Round the divisor first. If the divisor is 12 or less, leave it alone.
- Make the dividend into a number compatible with the divisor.
 - Count by the divisor
 - Add zeros to equal the length of the original dividend.
 - Replace the dividend with the closest compatible number.
- Divide.

Problem Solving

Reasonableness

Check for Reasonableness: Does your answer make sense? Look at the remainder.

Example 1: Mr. Z is purchasing pizza for his math class. He has 30 students. Each pizza feeds 8 students. How many pizzas does he need?
 Solve: $30 \div 8 = 3 \text{ R}6$.
 Mr. Z does not want 6 students without pizza (the remainder) so he should purchase 4 pizzas.

Example 2: Sally makes tables. Each table needs 4 legs. She has 39 table legs. How many tables can Sally make?
 Solve: $39 \div 4 = 9 \text{ R}3$.
 Sally does not want a 3-legged table, so she can build 9 tables.

Dividing by 1-Digit Divisors

		7	2	<ul style="list-style-type: none"> • 6 cannot go into 4. • 6 goes into 43 seven times. $6 \times 7 = 42$ • The 7 is written above the 3. • $43 - 42 = 1$. Bring down the 2. • 6 goes into 12 two times. $6 \times 2 = 12$. • $12 - 12 = 0$, so there is no remainder.
6	4	3	2	
–	4	2	↓	
		1	2	
	–	1	2	
			0	

Dividing by 1-Digit Divisors

	2	0	7	R3
4	8	3	1	
-	8	↓	↓	
	0	3	↓	
	-	0	↓	
		3	1	
		2	8	
			3	

- 4 goes into 8 twice.
- $4 \times 2 = 8$. $8 - 8 = 0$.
- Bring down the 3.
- 4 cannot go into 3, so write a zero above the 3.
- Bring down the 1.
- 4 goes into 31 seven times. $4 \times 7 = 28$.
- $31 - 28 = 3$.
- 3 is the remainder.

Finding Factors

Factors – Numbers which can be multiplied together to make a number.

Example: 3 and 4 are *factors* of 12.

A number is divisible by another when the you can divide it without a remainder.

Example: 12 is *divisible* by 4.

All numbers have at least 2 factors: 1 and the number itself.

Find factors in pairs:
 $1 \times 12 = 12$; $2 \times 6 = 12$; $3 \times 4 = 12$.

The factors of 12 are: 1,2,3,4,6,12.

Divisibility Rules

A number is divisible by:

		Examples
1	All numbers are divisible by 1.	
2	If the number is even (ends with 2,4,6,8, or 0)	2, 28, 1,004
3	If the sum of the digits of the number is divisible by 3.	126 ($1 + 2 + 6 = 9$)
4	If the last two digits are divisible by 4.	1,024 ($24 \div 4 = 6$)
5	If the last digit is 0 or 5.	10, 15, 20, 25
6	If the number is divisible by BOTH 2 and 3.	4,002 (ends in 2; $4+2=6$)
9	If the sum of the digits is divisible by 9.	918 ($9 + 1 + 8 = 18$)
10	If the last digit is 0.	10, 100, 960

Prime and Composite Numbers

Prime Number – A number with only 2 factors: 1 and itself. Examples: 2, 3, 5, 7, 11, 13, 17

Composite Number – A number with more than 2 factors. Examples: 4, 6, 8, 9, 10, 12, 14, 15

Prime Factorization – Breaking a number into its prime factors

Factor Trees

24

3 x 8

3 x 2 x 4

3 x 2 x 2 x 2

$24 = 3 \times 2 \times 2 \times 2$

140

14 x 10

2 x 7 x 2 x 5

$140 = 2 \times 2 \times 5 \times 7$

Each branch ends in a prime number.

Make Diagrams and Equations

154 students are at tables. Each table can hold 6 students. How many tables are needed?

- Draw a diagram.

154 total students

6
- Write an equation.
 Let t = the number of tables needed.
 $154 \div 6 = n$
- Solve the equation.

		2	5	R4
6	1	5	4	
-	1	2	↓	
		3	4	
	-	3	0	
			4	
- Think about your answer.
 26 tables will be needed.