

9. $85 = 5 \times 17$
 $1309 = 7 \times 11 \times 17$
8. 800
7. 2
6. $32 = 2^5$
 $50 = 2 \times 5^2$
 $40 = 2^3 \times 5$
5. 210
4. 7
3. 672
2. 8
1. $56 = 2^3 \times 7$ or $2 \times 2 \times 2 \times 7$
 $96 = 2^5 \times 3$ or $2 \times 2 \times 2 \times 2 \times 2 \times 3$
10. 17
11. 6545
12. 6
13. 360
14. 1
15. 5460

BASIC MATH

The Complete Course Lesson Twenty Two

Number Theory

KA8422

Teaching Guide & Worksheet

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HOW TO USE THE VIDEO AND TEACHING GUIDE

1. The "STOP TO THINK" signal means pause to think.
2. The "STOP TO WORK" signal means work the problem(s).
3. Rewind the tape and watch the lesson again if the concept is not clear.
4. Use "Learning Strategies" section of the Teachers Guide as memory aids and topics for classroom discussion.
5. Students should complete the exercises on the worksheet to confirm their understanding of this lesson.

Instructors may duplicate the worksheets as needed

PRIME NUMBERS

- A. A factor is a number that divides a particular number without a remainder
 1. A look at the factors of 36
 2. The factors are 1, 2, 3, 4, 6, 9, 12, 18, and 36
 - B. A multiple is a number obtained when multiplying a particular number by a whole number
 1. A look at the multiples of 36
 2. The multiples are 36, 72, 108, 144, ...
 - C. If 8 is factor of 24, then 24 is a multiple of 8
 - D. When numbers are classified by the number of factors, there are three categories
 1. The number "one" is the only number that has only one factor
 2. A "prime" number has only two factors, one and itself
 3. A "composite" number has more than two factors
 - E. The first eight prime numbers are 2, 3, 5, 7, 11, 13, 17, and 19
-

PRIME FACTORIZATION

- A. Prime factorization is the method by which the prime factors of a particular composite number are found
 1. Is 2 a factor?
 2. Is 3 a factor?
 3. Is 5 a factor?
 4. Is 7 a factor?
 5. Keep factoring until the "other" factor is prime
 - B. Each composite number has a UNIQUE product of prime factors
 - C. A factor tree is used to find the prime factors of a composite number
 1. If two is factor of the number, divide by two
 2. Repeat step 1 for as long as the answer can be divided by two
 3. Repeat steps 1 and 2 using three, then five, etc., until a prime number is obtained
-

THE GREATEST COMMON FACTOR

- A. The greatest common factor, or GCF, is the largest number that is a factor of all the numbers being investigated
 - B. Finding the GCF
 1. Use factor trees to find all prime factors for each number
 2. Circle all primes that are common to all the trees
 3. The product of the circled primes is the GCF of those numbers
 4. If there is only one common prime factor then it is the GCF
 5. If there is no common prime factor then the GCF is "one" since all numbers have "one" as a factor
 6. If the GCF of two or more numbers is "one" then the numbers are called "relatively prime"
-

THE LEAST COMMON MULTIPLE

- A. The least common multiple, or LCM, is the smallest number that is a multiple of all the numbers being investigated
- B. Finding the LCM
 1. Use factor trees to find all prime factors for each number
 2. For each prime number present in any tree, identify the maximum number of times that prime appears in any tree
 3. The product of these prime numbers is the LCM
 4. For relatively prime numbers the LCM is the product of the numbers

For 56 and 96

1. Find the product of primes for each
2. Find the GCF
3. Find the LCM

For 35, 42, and 70

4. Find the GCF
5. Find the LCM

For 32, 50, and 40

6. Find the product of primes for each
7. Find the GCF
8. Find the LCM

For 1309 and 85

9. Find the product of primes for each:
10. Find the GCF
11. Find the LCM

For 18, 24, 30, and 36

12. Find the GCF
13. Find the LCM

For 84 and 65

14. Find the GCF
15. Find the LCM