Outcome 1 – Number Sense Worksheet

CO1A Students will demonstrate understanding of factors of whole numbers by determining the prime factors, greatest common factor, least common multiple, square root and cube root

Beginning	Approaching	Proficient	Mastery
I need help/I am inconsistent	I can consistently determine the prime factors of a whole number, GCF and LCM of whole numbers.	I can find the principal square root and cube root of whole numbers using the factors of the number. I am able to explain the strategy I use for finding prime factors, GCF or LCM, square root and cube roots.	I can report about the numbers 0 and 1 with respect to factors and multiples. I can perform error analysis. I am able to solve situational problems involving GCF, LCM, square roots and cube roots.

Level 2

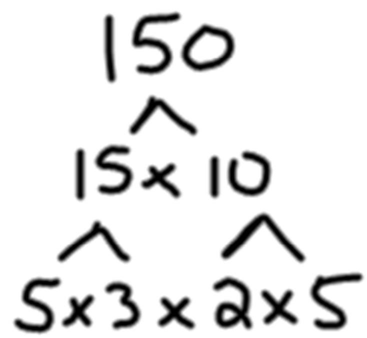
Example 1. Write the prime factorization of 150.

Step 1: Choose any two factors of 150 other than 150 and 1

Step 2: Continue to break down the factors until You are left with only prime factors

Note: Each row must multiply to give you 150.

Once you are left with only prime factors, you have Completed the prime factorization of 150.

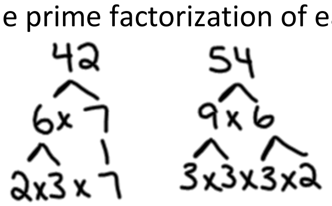


The prime factorization of 150 is 5 x 3 x 2 x 5. This can be written in any order.

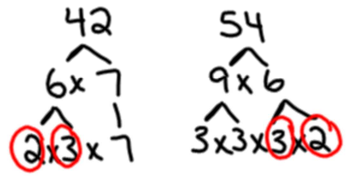
1. Write the prime factorization of the following:
   a) 48 b) 120 c) 81

Example 2. Determine the greatest common factor of 42 and 54. (The greatest common factor is the LARGEST number that can be divided evenly into both numbers)

Strategy 1: Complete the prime factorization of each number



Determine the factors that are COMMON in both sets of prime factors



Multiply the common factors within ONE set together.

2 x 3 = 6; 6 is the greatest common factor.

Strategy 2: List all of the factors of each number

42	54
1 x 42	1 x 54
2 x 21	2 x 27
3 x 14	3 x 18
6 x 7	6 x 9

Determine the common factors: 1, 2, 3, 6; 6 is the largest so 6 is the greatest common factor.

2. Determine the greatest common factor of the following numbers:

a) 24 and 32

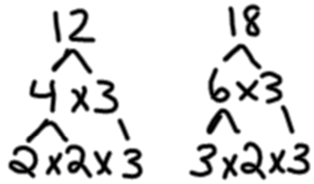
b) 60 and 96

c)36 and 45

d) 64 and 80

Example 3: Determine the lowest common multiple of 12 and 18. (The lowest common multiple is the smallest number that 12 and 18 both divide evenly into)

Strategy 1: Determine the prime factorization for each number



Write out ALL of the factors from the first number.

$$2 \times 2 \times 3$$

Go through the second number. Any numbers that can be paired up, write underneath, any That can't be paired up write with the first set of numbers.

$$\begin{array}{cccc} 2\times & 2\times & 3 & \times 3 \\ & 2 & 3 & \end{array}$$

Multiply the top row together.

$$\begin{array}{l} 2\times 2\times 3\times 3 = 36 \\ \quad\ 2\times 3 \end{array}$$

36 is the lowest common multiple.

Strategy 2: Skip count each number until you find a common value:

12, 24, 36, 48, 60, …
18, 36

36 is the lowest common multiple (Just a note – this strategy may look easy in this example, However, be cautious with numbers where you may have to do more than 10 skip counts for Each. It won't always be so quick!)

3. Determine the lowest common multiple of the following pairs of numbers.

a) 8 and 12

b) 20 and 24

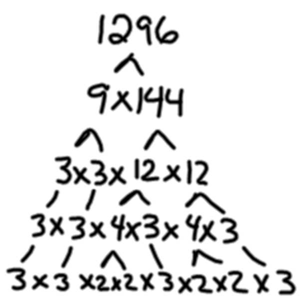
c)12 and 15

d) 18 and 24

Level 3

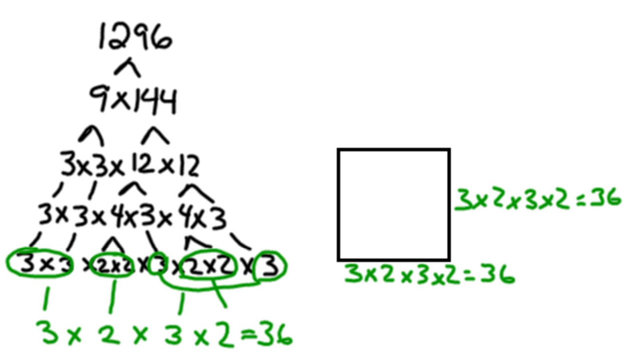
Example 4. Determine the perfect square of 1296 without simply plugging into your calculator.

Determine the prime factorization



Since you are finding the perfect square, you need to group the prime factors into groups of 2 which contain identical factors.

You then multiply one number from each pair to find the perfect square. (Why do we just multiply one from each pair? Think of a square – each side has to be the same, so you take one of each pair and place on a side of the square. The perfect square is equal to the side length of the square)



The perfect square of 1296 is 36; so $\sqrt{1296} = 36$ because 36 x 36 = 1296

4. Determine the perfect square of the following without just plugging into your calculator.

a) 576

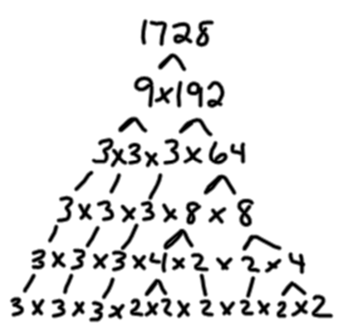
b) 196

c) 3600

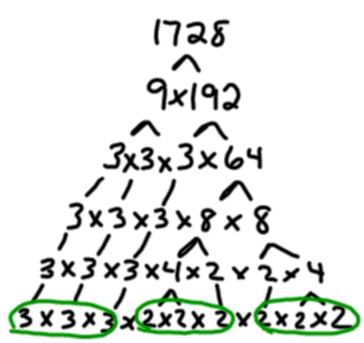
d) 324

Example 5: Determine the perfect cube of 1728 without simply plugging into your calculator.

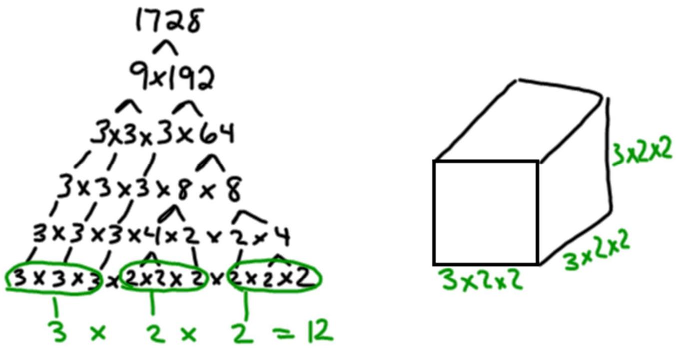
Determine the prime factorization



Since you are finding the perfect cube, you need to group the prime factors into groups of 3 which contain identical factors.



You then multiply one number from each group to find the perfect cube. (Why do we just multiply one from each group? Think of a cube – each side has to be the same, so you take one of each group and place on a side of the cube. The perfect cube is equal to the side length of the cube)



The perfect cube of 1728 is 12; that means $\sqrt[3]{1728} = 12$ because 12 x 12 x 12 = 1728.

5. Determine the perfect cube of the following without simply plugging into your calculator.

a) 216

b) 512

c)2744

d) 729

Level 4

The rubric states: I can report about the numbers 0 and 1 with respect to factors and multiples. I can perform error analysis. I am able to solve situational problems involving GCF, LCM, square roots and cube roots.

Look through your practice assignments to practice this level.