MATHCOUNTS® Problem of the Week Archive

Word Values – July 26, 2021

Problems & Solutions

Can you believe summer is almost over? June is gone and we're in the last week of July already! Not only did they feel like short months, but their names are relatively short, too, with just four letters each. If the "value" of a word is determined by multiplying the letter values of each letter in the word, and letter values are assigned such that A = 1, B = 2, C = 3, …, Y = 25 and Z = 26, what is the value of the word JULY?

If we write out the entire alphabet and then match each letter with its corresponding value, we can see that JULY has a value of 10 × 21 × 12 × 25 = ***63,000****. That's a big value for such a little word!*

Using the same process as above, we would see that the three-letter combination XYZ has a value of 24 × 25 × 26 = 15,600, even though XYZ isn't really a word. How many different three-letter combinations have a value of 60? Remember that in a combination, XYZ is the same as ZYX.

We are trying to find three-letter values with a product of 60. Keep in mind that the greatest possible letter value is 26. If we look at the prime factorization of 60, and keep in mind that we can use 1 as a factor, too, we will get the following factor triples that contain factors less than 27: (1, 4, 15), (1, 6, 10), (2, 6, 5), (2, 3, 10), (3, 4, 5), (1, 3, 20), (2, 2, 15), (1, 5, 12). Each of these ***8*** *factor triples corresponds to a three-letter combination with a value of 60.*

What word has a value of 455 and is a type of stone?

Upon factoring 455, we see that its prime factorization is 5 × 7 × 13. This means that the only factors of 455 that are less than 27 are 1, 5, 7 and 13. According to this, our word must have an E, G and M and could have some As. Using just the E, G and M, we can make the word ***GEM****, a precious or semi-precious stone!*

MATHCOUNTS® Problem of the Week Archive

Word Values – July 26, 2021

Problems

Can you believe summer is almost over? June is gone and we're in the last week of July already! Not only did they feel like short months, but their names are relatively short, too, with just four letters each. If the "value" of a word is determined by multiplying the letter values of each letter in the word, and letter values are assigned such that A = 1, B = 2, C = 3, …, Y = 25 and Z = 26, what is the value of the word JULY?

Using the same process as above, we would see that the three-letter combination XYZ has a value of 24 × 25 × 26 = 15,600, even though XYZ isn't really a word. How many different three-letter combinations have a value of 60? Remember that in a combination, XYZ is the same as ZYX.

What word has a value of 455 and is a type of stone?