29/11/2025 Multiple Surprises
Saturday

1. If I add the same number to a set of three consecutive numbers, will the new set of numbers be consecutive?

Ans:- Yes. The new set of numbers will be consecutive.

Eg:-

6	7	8		16	17	18		
+ 1	1	1	+	3	3	3		
7	8	9		19	20	21		

2. If I know that a number is a multiple of 3, what do I need to add to it to get another multiple of 3?

Ans:- You need to add a multiple of 3 to a multiple of 3 to get the sum as the multiple of 3.

Eg:- 6 + 9 = 15
15 + 21 = 36
21 + 24 = 45

3. Which numbers are multiples of 2, 3, & 4?

Ans:-

Multiples of 2 = 2, 4, 6, 8, 10, 12, 14, 16, 18, 20

Multiples of 3 = 3, 6, 9, 12, 15, 18, 21, 24, 27, 30

Multiples of 4 = 4, 8, 12, 16, 20, 24, 28, 32, 36, 40

4. Can you use what you have discovered to help you find a few sets of 10 consecutive numbers in which:

" the 1st multiple of 1 :

" 2nd " " 2

" 3rd " " 3

" 4th " " 4

" 5th " " 5

" 6th " " 6

" 7th " " 7

" 8th " " 8

" 9th " " 9

" 10th " " 10

Ans: The set of 10 consecutive numbers after 1-10 is 2521-2530. If I add 2520 to 2520 then I get 5040. And if I add that

to 2520 then we get 7560 & so on.

5. Show several sets you found.

Ans:-

1	2521	5041	7561	10081	12601	and so on
2	2522	5042	7562	10082	12602	and so on
3	2523	5043	7563	10083	12603	and so on
4	2524	5044	7564	10084	12604	and so on
5	2525	5045	7565	10085	12605	and so on
6	2526	5046	7566	10086	12606	and so on
7	2527	5047	7567	10087	12607	and so on
8	2528	5048	7568	10088	12608	and so on
9	2529	5049	7569	10089	12609	and so on
10	2530	5060	7570	10090	12610	and so on

6. Explain your method

Ans:- First I tried 11-20, 21-30, 31-40 & so on till 221-230 & realised this method may take a lot of time. So, I decided to calculate the LCM of 1, 2, 3, 4, 5, 6, 7, 8, 9 & 10. by using the 'Prime Factorisation' method. So the LCM was 2520, hence, numbers 2521, 2522, 2523, 2524, 2525, 2526 .... 2530 are the list set of consecutive numbers after 1-10. As the rule follows: the list is a multiple of 1 to the tenth is a multiple of 10.

7. Can you use these ideas to find long sequences of 20 consecutive numbers that do not contain any primes?

Ans:- We observed that there are 25 prime numbers between 1-100 & 168 prime numbers between 1-1000. So, A sequence of consecutive numbers that do not contain any primes is a large number which can be arrived by factorial & addition (like in problem no. 1). To find a sequence of 20 consecutive number that do not contain any prime, we need to ensure all numbers are composite. Since '1' is not a composite number, the factorial number will be one greater than the sequence of 20 consecutive numbers which is 21!. We need to add the numbers from 2 to 21 to arrive at the 20 consecutive numbers. The 20 consecutive numbers not containing any primes are :-

$21!+2, 21!+3 \ldots 21!+21$.

(! = factorial)