Neil Armstrong's First Birthday Without Him
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Neil + Alden + Armstrong = 201
He landed on the Moon on the 201st
day of 1969 (July 20, 1969)

8 0 5 1 9 3 0   8 0 5 2 0 1 3

(August 5, 1930-August 25, 2012)

He was 38 when he stepped on the Moon...
Happy 83rd Birthday, Neil Armstrong!

American astronaut Neil Alden Armstrong (August 5, 1930-August 25, 2012) was one of the first two humans who landed on the Moon in the Apollo 11 spacecraft on July 20, 1969, at 20:18 UTC. When Armstrong put his left boot on the lunar surface, he spoke the famous words, "That's one small step for a man, one giant leap for mankind."

Armstrong died last year, at age 82. This year, August 5, 2013 will mark his 83rd birthday and, sadly, his first birthday without him. As a tribute to this great honorable man and to celebrate his upcoming birthday, I constructed the following recreational numerical birthday brainteasers:

1. If numbers 1 to 26 are assigned to the letters of the English alphabet as A = 1, B = 2, C = 3, etc., the numbers assigned to the letters of Armstrong's names "Neil," "Alden," and "Armstrong" each add up to 40, 36, and 125 respectively. Interestingly enough, if Armstrong's birth date August 5 is expressed as 8-5 or simply 85, the product of the digits of 85 yield 8 x 5 = 40 (representing Neil), the difference between 40 and its reverse result in 40 – 04 = 36 (Alden), and 40 plus 85 is 125 (Armstrong)!
2. The numbers assigned to the letters of Armstrong's full name, "Neil Alden Armstrong," add up to 40 + 36 + 125 = 201. Amazingly, the 201st day of 1969 is the historic Moon landing date, July 20, 1969! What a unique coincidence!

3. Armstrong's 83rd birthday is special. Why? The reverse of 83 is 38, Armstrong's age when he stepped on the Moon. (As an aside, Armstrong's 38th birthday in 1968 expressed as 851968 is also interesting because it is divisible by 2^{16}.)

4. Armstrong was born on the 217th day of 1930, that is, August 5, 1930. Interestingly enough, the prime factors of 217 are 7 and 31 (since 7 x 31 = 217) and these two primes add up to 38, again: Armstrong's age when he landed on the Moon.

5. This year, July 20, 2013 (expressed as 7-20-2013 or simply, 7202013) marked the 44th anniversary of the historic Apollo 11 Moon landing. Interestingly enough, 7202013 = 3 x 7 x 13 x 23 x 31 x 37, where these primes add up to 114, which is three times 38 and twice 57 where 57 equals the sum of the numbers assigned to the letters of the word, "Moon." Also, if 114 is broken as 11 and 4, the product of these two numbers results in 44, the anniversary number of the historic Moon landing. In addition, the sum of the numbers assigned to the letters of Apollo is 71 and 71 plus 11 (the sum of "Apollo" and 11) equals 82, corresponding to Armstrong's death age.

6. Armstrong's 85th birthday in 2015 will be unique since 85 also represent his birth date, August 5!

7. The 58th anniversary of the historic Apollo 11 Moon landing to occur in 2027 is special for two reasons. Why? First, the full date of the 58th anniversary of Apollo 11 Moon landing is 7-20-2027, or simply 7202027, a palindrome date! Second, reverse of 58 is 85, representing Armstrong's birth date, August 5!

8. If year numbers in each century are expressed in terms of their rightmost two digits, Armstrong's 78th birthday in 2008 expressed as 8-05-08 was a palindrome day and his 128th birthday in 2058 written as 8-5-58 will also be a palindrome day. (His truly palindrome birthdays in all four-digit years will occur on 8-5-2258, 8-05-2508, and 08-05-5080.)

9. Armstrong's birth date 85 (August 5) represented in binary equals 1010101, a palindrome! (Also, 85 in octal equals 125.) In addition, the numbers assigned to the letters of "Neil Armstrong" add up to 165, which in binary equals to 10100101, another palindrome!

10. Armstrong's 102nd birthday in 2032 expressed as 8-05-2032 or simply 8052032 will be special since 2032 equals four times 508, which is the reverse of 805, representing August 5. Also, reverse of 102 is 201, representing Armstrong's full name.

11. Armstrong's 110th birthday in 2040 expressed as 852040 is interesting since both 2040 and 852040 are divisible by 85 (representing August 5).

12. If Armstrong's birth date August 5 is expressed as 8-05, or simply 805, the reverse of this number equals 508 which is 2 x 2 x 127. The difference between prime factors 2 and 127 is 125, representing "Armstrong."

13. Number 805 representing Armstrong's birth date, August 5, equals 23 x 35 where the reverse of the sum of these two numbers yields 85, which is again August 5!

14. Lastly, twice the sum of 201 (Neil Alden Armstrong) and 805 (August 5) yields 2012, Armstrong's death year.

You will definitely be missed on your 83rd birthday, Neil Armstrong!