



MATHEMATICS CHALLENGE FOR YOUNG
AUSTRALIANS
PRIMARY: YEARS 5, 6 and 7
WARM UP PROBLEM 03: SOLUTION

Misplaced in Space

1. Assign 15 to K , 16 to L , 17 to M and so on. After you reach 26, you need to start again at 1. $S + K + Y = 23 + 15 + 3 = 41$.
2. P and Q are consecutive letters, so the two numbers that sum to 21 are also consecutive and must be 10 and 11. Then 13 10 21 23 25 says *SPACE*.
3. A , B and C are consecutive letters. The numbers representing them are consecutive too. If not, the possibilities are $\{A = 26, B = 1, C = 2\}$ or $\{A = 25, B = 26, C = 1\}$, neither of which gives sum 42.

The only consecutive numbers adding to 42 are 13, 14 and 15. So

$$M + A + R + S = 25 + 13 + 4 + 5 = 47.$$

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4. The numbers for the letters of E , H , L and O are *either* increasing *or* they are not.

In the first case with $E = x$, then $H + O + L + E$ is represented by $(x + 3) + (x + 10) + (x + 7) + x = 4x + 20$. So $4x + 20 = 48$ from which $x = 7$. The code shift is 2.

Therefore,

$$B + L + A + C + K = 4 + 14 + 3 + 5 + 13 = 39.$$

In the second case, we tabulate the possibilities, from $E = 26$ to $O = 1$:

E	26	25	24	23	22	21	20	19	18	17
H	3	2	1	26	25	24	23	22	21	20
L	7	6	5	4	3	2	1	26	25	24
O	10	9	8	7	6	5	4	3	2	1
Total	46	42	38	60	56	52	48	70	66	62

This code has E represented by 20, a shift of 15.

Therefore,

$$B + L + A + C + K = 17 + 1 + 16 + 18 + 26 = 78.$$