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Combining Lengths

1a) I started with finding a solution to the 3, 4, 5 consecutive lengths problem. We managed to get up to 9 lengths, and this is how we did it:

1 = 4 - 3	4 = 4	7 = 4 + 3
2 = 5 - 3	5 = 5	8 = 5 + 3
3 = 3	6 = 5 + 4 - 3	9 = 5 + 4

1b) We then made another set of consecutive numbers with 1, 3 and 5 length rods, and we got up to 9 again. This is how..

1 = 1	4 = 3 + 1	7 = (3 - 1) + 5
2 = 3 - 1	5 = 5	8 = 5 + 3
3 = 3	6 = 5 + 1	9 = 5 + 3 + 1

1c) Next, we tried to do the same, but this time with 4 rods. The rods we used were 1, 2, 3, 5, and we got up to 11 consecutive lengths.

1 = 1	5 = 5	9 = 5 + 3 + 1
2 = 2	6 = 5 + 1	10 = 5 + 3 + 2
3 = 3	7 = 5 + 2	11 = 5 + 3 + 2 + 1
4 = 3 + 1	8 = 5 + 3	That was how! :)

Furthermore, the last solution (4 rods), did not include any subtractions in the sums - it was all additions or numbers on its own. Therefore, it doesn't effect ~~whether~~ if you can only add lengths.