Hint for Problem 126

Note that $\binom{n+k-1}{k} = \binom{n+k-1}{n-1}$. So we have to figure out how choosing either k elements or $n-1$ elements out of $n+k-1$ elements constitutes the choice of a multiset. We really have no idea what set of $n+k-1$ objects to use, so why not use $[n+k-1]$? If we choose $n-1$ of these objects, there are k left over, the same number as the number of elements of our multiset. Since our multiset is supposed to be chosen from an n-element set, perhaps we should let the n-element set be $[n]$. From our choice of $n-1$ numbers, we have to decide on the multiplicity of 1 through n. For example with $n = 4$ and $k = 6$, we have $n + k - 1 = 9$. Here, shown with underlines, is a selection of $3 = n - 1$ elements from [9]: $1, 2, \underline{3}, 4 underline 5, 6, 7, \underline{8}, 9$. Note that $\binom{n+k-1}{k} = \binom{n+k-1}{n-1}$. How do the underlined elements give us a multiset of size 6 chosen from an [4]-element set? In this case, 1 has multiplicity 2, 2 has multiplicity 1, 3 has multiplicity 2, and 4 has multiplicity 1.