Let $2^n + 2^{n-1} + \cdots + 2^{n-k} = S$.

We multiply both sides by 2:

$$2 \times (2^n + 2^{n-1} + \cdots + 2^{n-k}) = 2S$$

$$\rightarrow 2^{n+1} + 2^n + \cdots + 2^{n-k+1} = 2S$$

Next, we subtract S from both sides:

$$(2^{n+1} + 2^n + \cdots + 2^{n-k+1}) - (2^n + 2^{n-1} + \cdots + 2^{n-k}) = 2S - S$$

$$\rightarrow 2^{n+1} - 2^{n-k} = S$$

Recall that $2^n + 2^{n-1} + \cdots + 2^{n-k} = S$, we can conclude that:

$$2^n + 2^{n-1} + \cdots + 2^{n-k} = 2^{n+1} - 2^{n-k}$$