Here is the formula that gives the number of ways a 120-cell can be distinctly colored using at most or exactly k colors, and the number of functionally different Magic120Cell programs with at most or exactly k colors, using a different definition of f(n,k) for each problem.

$$S = \frac{1}{7200}[f(120,k) + f(60,k) + 60\cdot f(30,k) + 336\cdot f(12,k) + 336\cdot f(24,k) + 40\cdot f(20,k) + 40\cdot f(40,k) + 450\cdot f(62,k) + 1440\cdot f(6,k) + 1200\cdot f(10,k) + 288\cdot f(32,k) + 288\cdot f(16,k) + 960\cdot f(8,k) + 960\cdot f(4,k) + 400\cdot f(44,k) + 400\cdot f(22,k)]$$

For the number of ways a 120-cell can be colored using at most k colors:

$$f(n,k) = k^n$$

For the number of ways a 120-cell can be colored using exactly k colors:

$$f(n,k) = \sum_{r=0}^{k} (-1)^r \binom{k}{r} (k-r)^n$$

For the number of Magic120Cell programs with at most k colors:

$$f(n,k) = \sum_{i=1}^{k} \left[\frac{1}{i!} \sum_{j=0}^{i} (-1)^{i-j} \binom{i}{j} j^n \right]$$

For the number of Magic120Cell programs with exactly k colors:

$$f(n,k) = \frac{1}{k!} \sum_{j=0}^{k} (-1)^{k-j} \binom{k}{j} j^n$$