Assume $n = 3p + q$, where p is the result of integer division $n/3$ and q is the remainder of the division.

If $q = 0$, n can be divided by 3.

If $q = 1$, $n + 2 = 3p + 1 + 2 = 3(p + 1)$ can be divided by 3.

If $q = 2$, $n + 4 = 3p + 2 + 4 = 3(p + 2)$ can be divided by 3.

Hence, it's proved true.