1. Consider the following game: There is a pile of \( n \) chips. A move consists of removing any proper factor of \( n \) chips from the pile. (For the purposes of this question, a proper factor of \( n \), is any factor, including 1, that is strictly less than \( n \)). The player to leave a pile with one chip wins. Determine the \( N \) and \( P \) positions and a winning strategy from an \( N \) position.

2. Consider the following game: There is a single pile of \( n \) chips. A move consists of removing (i) any even number of chips provided it is not the whole pile, or (ii) the whole pile, but only if it has 2 (mod 3) chips. The terminal positions are zero and one. Determine the Sprague-Grundy numbers of each pile size.
   (Compute the first 15 numbers and see if you can see a pattern.)

3. In a take-away game, the set \( S \) of the possible numbers of chips to remove is finite. Show that the Sprague-Grundy numbers satisfy \( g(n) \leq |S| \) where \( n \) is the number of chips remaining.