

GRASSHOP PUZZLE-GAME

The Jumping Grasshopper game

An original puzzle-game which can be played as a paper and pencil game on square grid paper. It convincingly shows that just moving a point along a line in consecutive unit distances, following very simple rule, can produce a challenging game with subtle mathematical principles and surprises.

Its basic rule is very simple, the games can instantly be played and they are fun to play.

A **Grasshop- n** problem:

Given a line of integral length ' n ', the object is to start jumping from point 0, in successive jumps of consecutive lengths : **1-2-3-.....-n**, along the line, so as to make as many jumps as possible on the line and finish the **n-th** jump at the end point of the line, at point ' n '. **On a line of length "n" if this can be achieved the line has a solution, if not, the line of length "n" has no solution.**

The moves along the line can be in any direction but they are not allowed to leave the line. For greater lengths n , more than just one sequence of moves can be possible.

In competition games between two or more players, scores can be given according to who ended the game nearer to the end point n on a selected line of length n .

We can see that apart from the trivial $n = 1$ solution, the first solution (completed n - jumps ending at point- n) was achieved on line of four units length: $n=4$.

1-Can you find out the next three lengths $n = ?$ for which solutions are possible?

2-Can you find out how many solutions exist for the **first 40** length from $n=1$ to $n=40$?

3-Can you discover the **general rule, for which lengths n , are solutions possible. We shall call the resulting infinite number sequence as "the grasshopping number sequence": 1, 4, ?**

