

A Description of the Game

The idea of the game is for the player to move their token around the board (shown in Figure 1) collecting letters with the aim of forming a five-letter palindrome (eg 'VGDGV' or 'BUKUB').

	1	2	3	4	5	6	7	8
A	R	L	Q	S	T	Z	C	A
B	I	V	D	Z	H	L	T	P
C	U	R	O	Y	W	C	A	C
D	X	R	F	N	D	P	G	V
E	H	J	F	F	K	H	G	M
F	K	Y	E	X	X	G	K	I
G	L	Q	E	Q	F	U	E	B
H	L	S	D	H	I	K	Y	N

Figure 1: Game Board

Figure 1: Game Board Suppose square 2 is not on the edge of the board. We say square 1 is adjacent to square 2 if square 1 can be reached by moving one square up/down/left/right/diagonally from square 2.

O	Y	W	I
F	N	D	I
F	F	K	I

Figure 2: Example of adjacent squares

For example, in Figure 2, the eight squares surrounding the square containing N are all said to be adjacent to the square containing N. Figure 2: Example of adjacent squares We don't need to define what an adjacent square means for squares on the edge of the board for reasons that 1 will become clear when you read the rules.

The rules of the game

1. The player's token starts on a specified white square not on the edge of the board.
2. If, at the start of a turn, the player's token is on a square that is not on the edge of the board then the token moves at random to one of the adjacent squares. This move counts as one turn.
3. If, at the start of a turn, the token is on a square that is on the edge of the board then the token 'moves' at random to one of the 64 squares on the board (these 64 squares include the square that the token is currently on, so it is possible that the token does not move). This 'move' counts as one turn.
4. If the token lands on a white square the player can choose whether to add the letter to their collection or not. Letters on white squares cannot be swapped with a letter in their collection, they can only be added. Note that letters are not removed from squares, but a copy of the letter can be collected. The player can never have more than five letters in their collection
5. If a token lands on a green square then exactly one of the following two events must happen (i.e. they are mutually exclusive and exhaustive events)
 - with probability p , the letters in their collection are replaced with the letters F, F, H and K (regardless of the number of letters currently in their collection).
 - with probability $1-p$, all copies of the letter shown on the square are removed from their collection. For example if the green square shows the letter A, then they would remove all copies of the letter A from their collection with probability $1 - p$.
6. When a player adds a letter to their collection they check whether they can form a five-letter palindrome (they can rearrange the letters in their collection in any order).
7. The game ends when they have formed a five-letter palindrome.

The aim of the game

The aim of the game is to finish the game in the fewest possible moves. The player has to implement their own strategy (set of rules) about whether they pick up letters on squares that their token lands

on. Because the player can not pick up more than 5 letters, the rules that the player implements must guarantee that they will have a palindrome once they have 5 letters in their collection.