

NAME: _____

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Feedback #5 Two Player Games

The following game is called Side-by-Side Nim. How to play: Place 7 counters as shown. Players take turns removing counters. On your turn you may remove any single counter or any two counters provided that they are side-by-side. This means two counters cannot be removed on a turn if there is a counter or empty space between them. There is one exception; the 1st player cannot start the game by taking the single counter in the middle leaving two piles of three counters. The player that picks up the last counter wins the game. State the player that can always win.



Represent a state of this game by a list of numbers. As the game is played, the counters become separated into groups of counters that are side-by-side. Each number in the list will represent how many counters remain in each group. By symmetry, write the larger numbers on the left. This means the game starts in the state 7. With this representation the following portion of the state diagram represents all of the game openings. In the seven states below indicate if a player is in a winning position or a losing position. Write the letter “W” beside the state if the player is in a winning position and the letter “L” beside the state if the player is in a losing position. Finally indicate who can always win this game the 1st player or the 2nd player.

Solution: The first player can always win due to the following winning and losing positions

