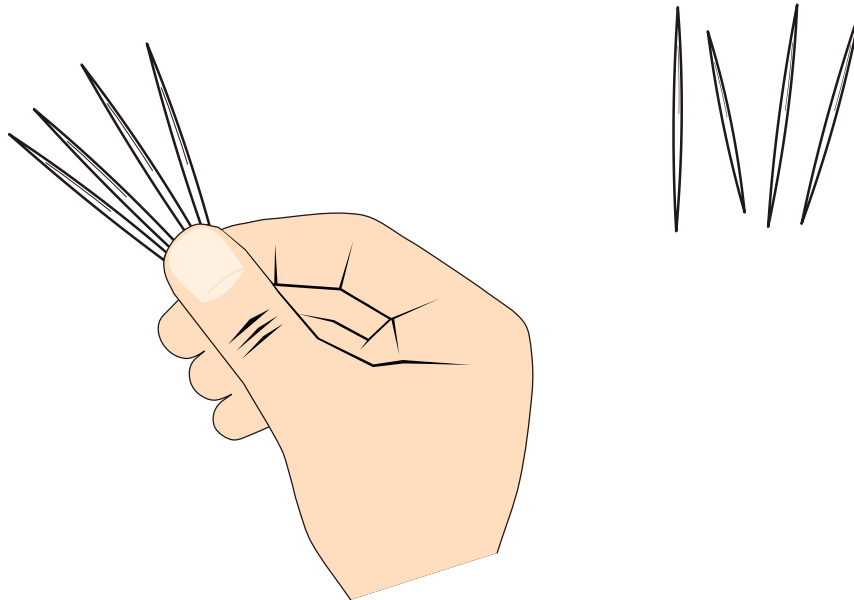


## *The 4P Toothpick Challenge*

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by Serhiy Grabarchuk Jr.



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Patrick, Paul, Peter and Phillip were drawing toothpicks. The rules of the draw were as follows. One of the boys is holding four toothpicks in his hand without revealing which one is the shortest. One of the other three boys draws a toothpick without revealing it. Then the next one draws a toothpick among the remaining three, again without revealing his pick, then the third one draws the toothpick among the remaining two, and finally the boy holding the toothpicks keeps the remaining one in his hand for himself. After each boy has a toothpick, their picks are simultaneously revealed. The one who has the shortest toothpick is “selected” for an action.

Just like in any such company, there are always folks who want to be selected the most and folks who want to be selected the least. This time Patrick wanted to be selected the least, while Peter wanted to be selected the most.

Thus, the question is: what should be Patrick’s optimal strategy in order his odds to draw the shortest toothpick are the lowest possible? I.e., should he draw as the first one, the second, or the third, or it’s better for him to hold the toothpicks at all?

The similar question concerns the one who wants to be selected: what should be Peter’s optimal strategy in order his odds to draw the shortest toothpick are the highest possible?