How to Win at Rock-Paper-Scissors

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Rock-Paper-Scissors is a two-player competitive game, which may be played in any number of independent rounds. A round consists of the players quickly and simultaneously displaying hand signs that represent either rock or paper or scissors. If both players show the same sign, the round is a draw. If the players show different signs, this rule determines the winner: scissors wins over paper, paper wins over rock, and rock wins over scissors.

Is there a strategy for winning the game?

This table shows all possible combinations of signs in the game. In each box, player A's result (win, lose, or draw) is shown at the top left and player B's result is shown at the bottom right.

		PLAYER B		
		ROCK	**PAPER**	**SCISSORS**

P L A Y E R A	**ROCK**	D
		    D
			L
			    W
				W
				    L

	PAPER	W
		    L
			D
			    D
				L
				    W

	SCISSORS	L
		    W
			W
			    L
				D
				    D

What happens to **A** if **A** chooses rock? **A** has a 1-in-3 chance of winning, a 1-in-3 chance of drawing, and a 1-in-3 chance of losing. If **A** chooses paper the results are the same. If **A** chooses scissors the results are the same. No choice gives **A** any advantage.

What happens to **B** if **B** chooses rock? Or paper? Or scissors? The same things. Neither player gains any advantage by any choice, so there is no winning strategy. Both players should choose hand signs at random.

Then how can you win this game, or at least improve your chances of winning? By watching your opponent. If your opponent chooses one sign more often than others, you should choose the sign that wins over that choice - and do that equally often. But if your opponent notices what you choose more often, he or she might choose the sign that defeats your sign more often, turning your winning strategy into a losing one. If your opponent uses a sequence more often, your strategy should be this: choose randomly until you see the first sign in that sequence, then make your next sign the one that defeats the one your opponent is more likely to use next. As before, this increases your chance of winning until the opponent realizes what you are doing.

But watching your opponent has no value if you are playing against a computer. Programmers know the game has no winning strategy, so in entry-level programs they use algorithms that choose the three hand signals randomly. So there is no pattern for you to notice and exploit. If a programmer knows that the opponent should be watched, a high-level program will record all your choices. Then a random-choice algorithm will be used until your habits are discovered, after which the program will exploit what it discovered about you. So, if you are playing against a computer, avoid patterns in your choices.

There is no strategy for beating the game, but there is a strategy for beating a human opponent - until your strategy is noticed.