



Training Manual

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Contact Information

Harry Morris
806.252.6963
Info@LuckyGamesLLC.com

Overview

Dicey 21™ combines variations of *Blackjack* and *Chuck-a-Luck* in a single game. Players may play either game or both games simultaneously. Six decks of regular playing cards and three six-sided dice housed in a Pai Gow cup are used to play the game on a standard blackjack table with six player spaces. All bets are played against a pay table.

Players use one or more cards and two of three community dice to make their '21' scores. They use the same roll with all three dice *plus* the first card dealt to play 'Chuck-a-Luck PLUS,' a simple number matching game. The cards count the same as in *Blackjack*. The dice count their face values. All bets are settled at the end of the game when the dice are revealed.

21 Rules (*Dicey Blackjack*)

1. Players make a wager on the ante betting spot (labeled '1' on the layout).
2. The dealer gives each player one card face up.
3. At this point, players may raise one or two times their ante (double or triple). Wagers should be placed on the raise betting spot (labeled '2').
4. After making the raise decision, each player in turn gives the dealer either a STAND (play with the first card only) or HIT (draw additional cards) signal in the normal blackjack fashion.
5. The dealer places all hit cards, if any, on the table face up in front of the player just below the first card dealt.
6. The dealer shakes the dice cup and removes its cover to reveal the outcome of the roll.
7. The dealer calculates each player's score by adding the dice total to the total of the player's card(s).
8. Players win and are paid 2 to 1 if they get a blackjack, defined as any score of 21 made with a single card and roll. Players win and are paid 6 to 5 for any other score of 21. They win and are paid 1 to 1 if they score 18, 19 or 20. They push their wager(s) if they score 17. Players lose if they score lower than 17 or higher than 21. All payouts apply to both the ante and raise bets.

Chuck-a-Luck PLUS Rules

1. Players place one to three wagers on the field of six betting spots representing each side of a single die. Multiple bets may be of equal or unequal amounts.
2. Following the dice roll, players win if any of the dice match any number bet; otherwise, they lose.
3. Winning bets are paid according to the Chuck-a-Luck pay table posted on the layout.

Recommended Dealing Procedures

1. Shuffle six decks of cards and place them in a shoe. Cut at a point that will allow approximately five decks to be dealt before reshuffling.
2. Make sure that all bets are placed correctly. Players may place a wager on (a) the '21' ante spot (labeled '1' on the layout), (b) one to three of the six Chuck-a-Luck betting spots, or (c) wagers on both games. All bets must be within the posted table minimum and maximum.
3. Working from left to right, deal one card face up to each player. For players who are playing both bets or Chuck-a-Luck PLUS only, deal the first card laterally above the player space and any hit cards vertically in the normal fashion. This clearly identifies the card used for the Chuck-a-Luck bet, and is the only card dealt to Chuck-a-Luck only players. For players who are not playing Chuck-a-Luck, deal all cards in the normal fashion.
4. From left to right, prompt players in turn to make their *raise* and *stand/hit* decisions.
 - Players may raise their ante wager by up to 2 times the original amount (double or triple). The wager should be placed on the raise betting spot (labeled '2').
 - After making their raise decisions, players signal their stand or hit decisions in the normal blackjack fashion. Players may hit until their cards reach a hard total of 19 or over.
5. Turn and shake at least three times the Pai Gow cup (shaker) containing the three community dice. Then place the shaker down near the center of the table and remove its cover to reveal the outcome of the roll.
6. Announce the count of each die and the total count of the two matching colored dice.
7. Working from right to left, settle all bets with each player in turn as described below. Take losing bets first; then pay winning bets.
 - Pay winning Chuck-a-Luck PLUS bets according to its pay table posted on the layout.
 - Calculate the player's '21' score by adding together the total of the player's card(s) and the two community dice that match in color. 'Take or pay' bets according to the '21' pay table. Odds apply equally to both the ant and raise wagers.
 - Place the used card(s) in the discard tray facedown.
8. Cover the shaker to end the round.

Exceptions

In jurisdictions where a skill game is required, the '21' ante wager is required and Chuck-a-Luck PLUS may be played as a side bet.

Table Layout



Pay Tables

21

Player score equals card plus matching dice totals

Score	Pays
Blackjack	2 to 1
21 other	6 to 5
18 - 20	1 to 1
17	Push

Raise Option

Player may double or triple ante after 1st card

All hits after raise decision

Chuck-a-Luck PLUS

For Each Number Bet Dice ONLY Matches Pay

Triple	9 to 1
Double	2 to 1
Single	1 to 1

Triple PLUS Matches Pay

Quad	40 to 1
Royal	20 to 1

Quad is Triple plus matching Card
Royal is Triple plus King or Queen PLUS Match with 1st card only

Layout Close-up

Dicey Blackjack

- and -

Chuck-a-Luck PLUS

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Appendix – Math Supplement

The 21 bet:

Summary of House Edge Calculation						Return Table			
1st Card	p	EV	Value	Raise	BS Value	Result (EV)	p	p * EV	Volatility
A:	0.07692	0.22222	0.01709	2	0.051282	Lose 3 units	0.2342	-0.7026	2.1077
2:	0.07692	0.01600	0.00123	2	0.003692	Lose 1 unit	0.2591	-0.2591	0.2591
3:	0.07692	0.01861	0.00143	2	0.004296	Push	0.1137	0.0000	0.0000
4:	0.07692	-0.01177	-0.00091	0	-0.000905	Win 1 unit	0.1240	0.1240	0.1240
5:	0.07692	-0.07762	-0.00597	0	-0.005971	Win 1.2 units	0.0397	0.0476	0.0571
6:	0.07692	-0.15699	-0.01208	0	-0.012076	Win 2 units	0.0021	0.0043	0.0085
7:	0.07692	-0.24135	-0.01857	0	-0.018566	Win 3 units	0.1880	0.5640	1.6920
8:	0.07692	-0.31538	-0.02426	0	-0.02426	Win 3.6 units	0.0158	0.0569	0.2048
9:	0.07692	-0.27778	-0.02137	0	-0.021368	Win 6 units	0.0235	0.1408	0.8450
X:	0.30769	0.00000	0.00000	2	0		1	-0.0241	5.30 Variance
TOTALS	1	Return:	-6.34%	1.077	-2.39%				2.30 Std Dev

Average wager: 2.08 units
 Element of risk: 1.16%
 Average # cards per player: 2.17

As shown in the tables above, the house will win, on average, an amount equal to 2.41% of the initial amount wagered, and 1.16% of the total amount wagered, assuming optimal play and raise strategy.

NOTE: The house edge calculation of 2.39% is a theoretical based on an infinite deck spreadsheet model; the return table reflecting a 2.41% edge is based on a simulation run of one billion rounds of play assuming six decks.

Player odds are:

Win even money - 31.2%; Win 6:5 – 5.5%; Win 2:1 – 2.6%; Push – 11.4%; Lose – 49.3%

Basic Strategy:

Optimal strategy for playing the '21' bet is as follows:

- ❖ Players have an advantage when they draw a first card Ace, 2, or 3 and should raise the maximum amount. Basic strategy is neutral with respect to a ten card draw, in which case the odds are even.
- ❖ Players should always hit on hard card totals 8 and lower and stand on hard totals 9 and higher.
- ❖ Players should always hit on soft card totals of 15, 16, 17 and 18, and stand on all other soft counts. (A soft count, or total, is one that includes an Ace that can be counted as 11 or 1.)

The Chuck-a-Luck PLUS bet:*Chuck-a-Luck PLUS Math Table*

<u>Result</u>	<u>Occurs</u>	<u>P(Occur)</u>	<u>Payout</u>	<u>Value</u>	<u>Volatility</u>	
No Match	125	0.578703704	-1	-0.578704	0.102714	
Single	75	0.347222222	1	0.347222	0.147958	
Double	15	0.069444444	2	0.138889	0.240537	
Triple(*)	1	0.00462963	13.1	0.060541	0.784381	
SUM	216	1		-3.21%	1.28	Variance
				Edge	1.13	Std Dev

(*) Calculations for value of "Triple Matches"

.. When player's card is:

<u>Result</u>	<u>Occurs</u>	<u>P(Occur)</u>	<u>Payout</u>	<u>Value</u>
Royal	48	0.153846154	20	3.076923
Quad	24	0.076923077	40	3.076923
Other	240	0.769230769	9	6.923077
SUM	312	1		13.076923

Alternate paytables available.

As shown in the table above, the house will win, on average, an amount equal to 3.21% of the amount wagered. Alternate pay tables are available.

On average, players will get at least one match every 2.4 rolls. The chances of getting a Triple match or better are one out of every 216 rolls. For the Triple PLUS matches, the Royal will occur about once every 700 rolls and the Quad once every 1,400 rolls.