

Name(s) _____

Group _____

Welcome to Casino Royale!

You have recently been hired to design a new casino game.

You must:

- 1) Analyze the most popular game in Casino Royale (A Love Connection) to understand what makes it so popular by answering the questions.
- 2) Design a new game with a similar mathematical structure by completing the Game Planner.
- 3) Create a poster advertising your game using the information in your Game Planner.
- 4) When students are playing your game, track the number of times your game is played and compare experimental and theoretical probabilities using the Tracking Sheet.
- 5) Analyze the results by answering the final questions.

Love Connection

Cost to Play: \$3

Game Play: First, the player spins a spinner with 4 equal regions denoted by color (red, green, blue, purple). Second, the player randomly selects a card from a standard deck of cards.

How to win:

- 1) A player wins \$150 if the spinner lands on purple and they select a Jack of hearts, Queen of hearts, or King of hearts.
- 2) A player wins \$5 if they select an Ace (it does not matter what the spinner lands on).

Analyze the Game:

Determine the following:

$P(\text{win } \\$150)$	$P(\text{win } \\$5)$	$P(\text{lose})$
<i>Expected Gain</i>		
<i>Odds for winning \$150</i>	<i>Odds against winning \$5</i>	

Game Planner

It's time to create your own game. But there are some rules!

- 1) The cost to play the game cannot exceed \$10.
- 2) There must be two different ways to win this game (see example in Love Connection).
- 3) This game must be to the advantage of the dealer but not so much that people will not want to play. To accomplish this, your expected gain must be between -0.5 and -3.

Fill in the following information:

Cost to Play:

Game Play:

How to win (and amount won):

1)

2)

Analyze the Game:

Determine the following:

<i>P(win 1)</i>	<i>P(win 2)</i>	<i>P(lose)</i>
<i>Expected Gain</i>		
<i>Odds for winning 1</i>	<i>Odds against winning 2</i>	

Tracking Sheet

Track every result on game day.

Number of times won (option 1)	Number of times won (option 2)	Number of times lost
Total number of times won (option 1)	Total number of times won (option 2)	Total number of times lost
$P(\text{win } 1)$	$P(\text{win } 2)$	$P(\text{lose})$
Odds for (1)		Odds against (2)

Analyze Results

- 1) How do your theoretical probabilities and your experimental probabilities compare? Remember that we would expect the experimental probabilities to approach the theoretical probabilities the more times a game is played. Were your results close or not?
- 2) How much money did you expect to make (multiply the expected gain by the number of times the game was played)? How much money did you actually make (compare the number of each type of winner with the amount they won and the amount everyone had to pay to play)?
- 3) What would you change about this game if you had the chance?