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## Abstract

Principles of Microeconomics students are introduced to various economics concepts including incomplete information, market behavior, market strategy, and game theory through the card game **Spades**.

Spades is an engaging way for students to learn about collusion, competition, and reactions to incomplete information through team-based bidding and strategy, bidding against opponents, bidding against yourself, and sandbagging.

Playing during class encouraged student engagement and peer interaction, while also increasing their understanding of strategic decision-making under incomplete information and competition. Throughout game play students participate in a multi-round contest where they don't know how their team member will act and must engage in critical, strategic thinking to determine how to react or initiate play.

## Introduction

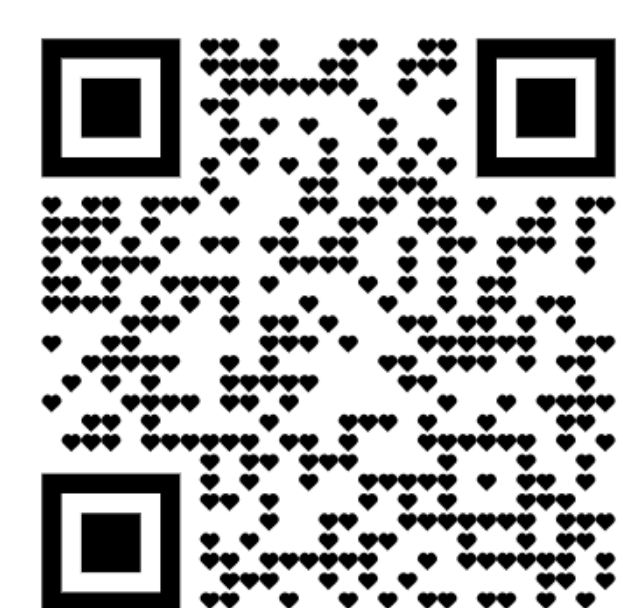
It has been observed that students often struggle with understanding game theory and business decision making under uncertainty. In addition, they have been seen to struggle with critical thinking skills. To address these challenges, the card game **Spades** is introduced prior to discussing market structures and game theory through either a phone app, an online version, or actual cards depending on the class size and set up.

The use of the card game promotes active learning, which has been shown to improve student outcomes (See for example, Freeman, et. al., 2014). In addition, cognitive science literature notes there are a number of mental and social benefits of card games, including their engagement in a variety of cognitive skills, such as concentration, attention, and critical thinking (6 Surprising Mental and Social Benefits of Card Games, 2023). While the 6 Surprising Mental and Social Benefits article specifically refers to seniors, the concepts apply to all ages and developing critical thinking skills along with assisting in better understanding game theory and strategic decision-making.

## The Rules/Playing the Game

Students play the game following the standard rules. **Spades** is a 4-player, 2 team card game where players bid, without talking to each other, on the number of tricks (hands) they believe they will win. All 52 cards are dealt.

Tricks are won based on the highest card played; however, Spades are always the trump suit. That is, if a player does not have a card in the suit that is led for that hand, they can play a Spade, and the player who played the highest Spade wins that hand. Teams receive points for meeting their bid (10 points per trick bid and taken) plus additional points for additional tricks taken (1 per trick). If a team fails to make its bid, it loses points (10 points per trick bid). In addition, every time a team takes 10 extra tricks within the game, there is a 100-point penalty. Thus, students must think strategically about how many tricks they think they can take, the number they think their partner will take and then must consider when it is beneficial to take extra tricks and when it is harmful. A game consists of multiple hands where students observe if their partner is consistently underbidding or overbidding, both of which incur penalties.



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Online Version



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provided by Online  
Version with link to  
Video copy



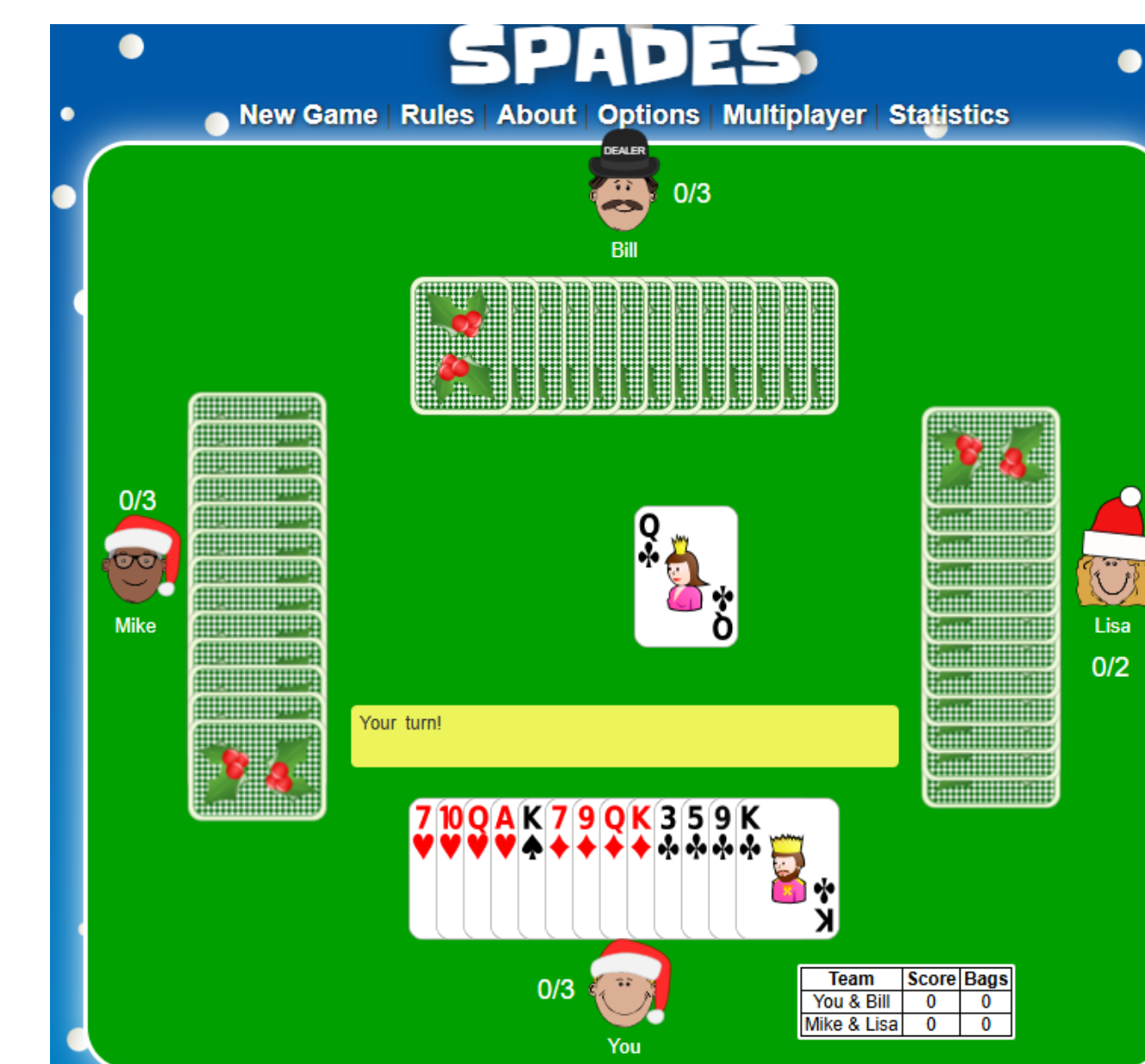
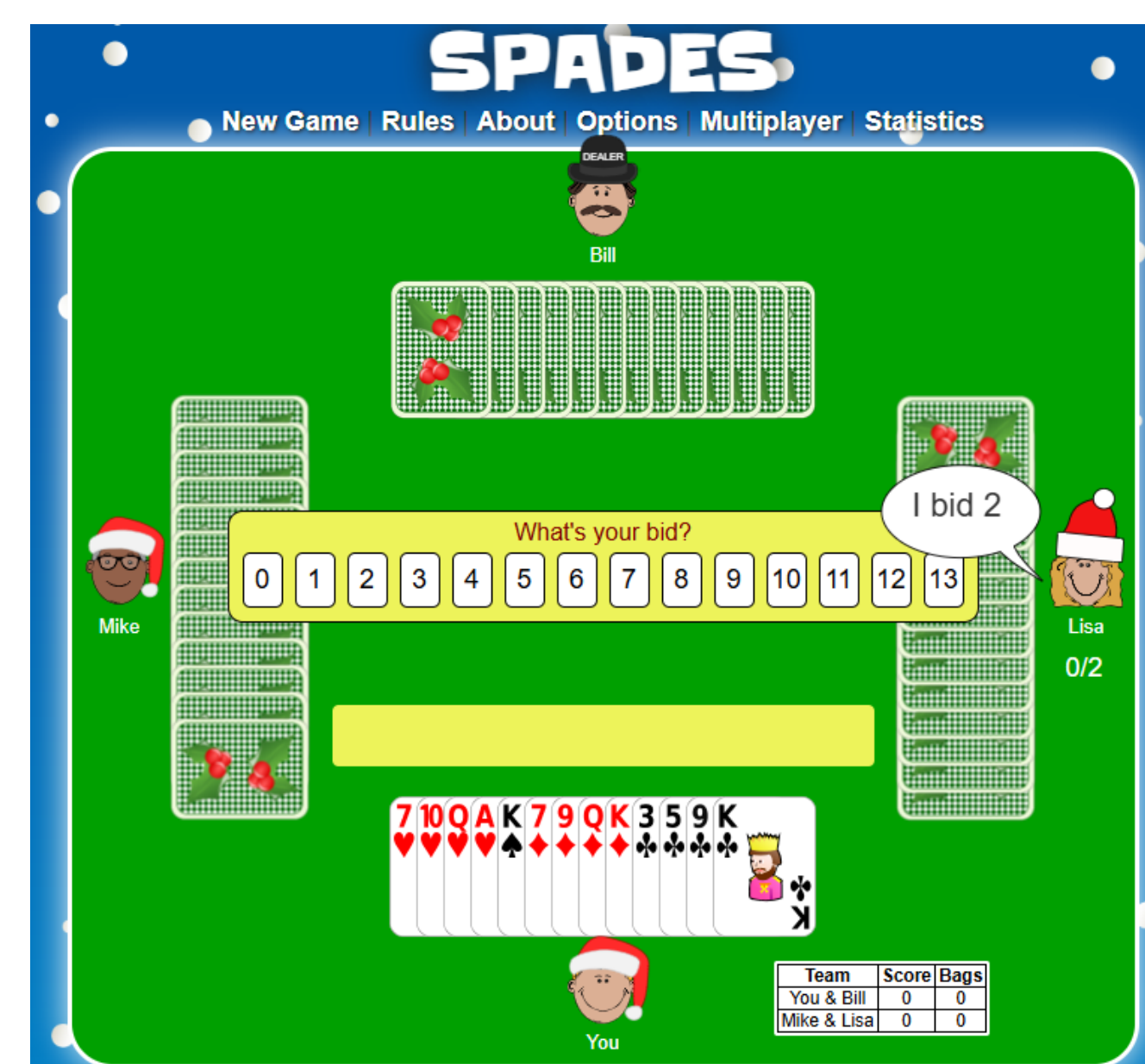
Example of phone  
version

## Contact

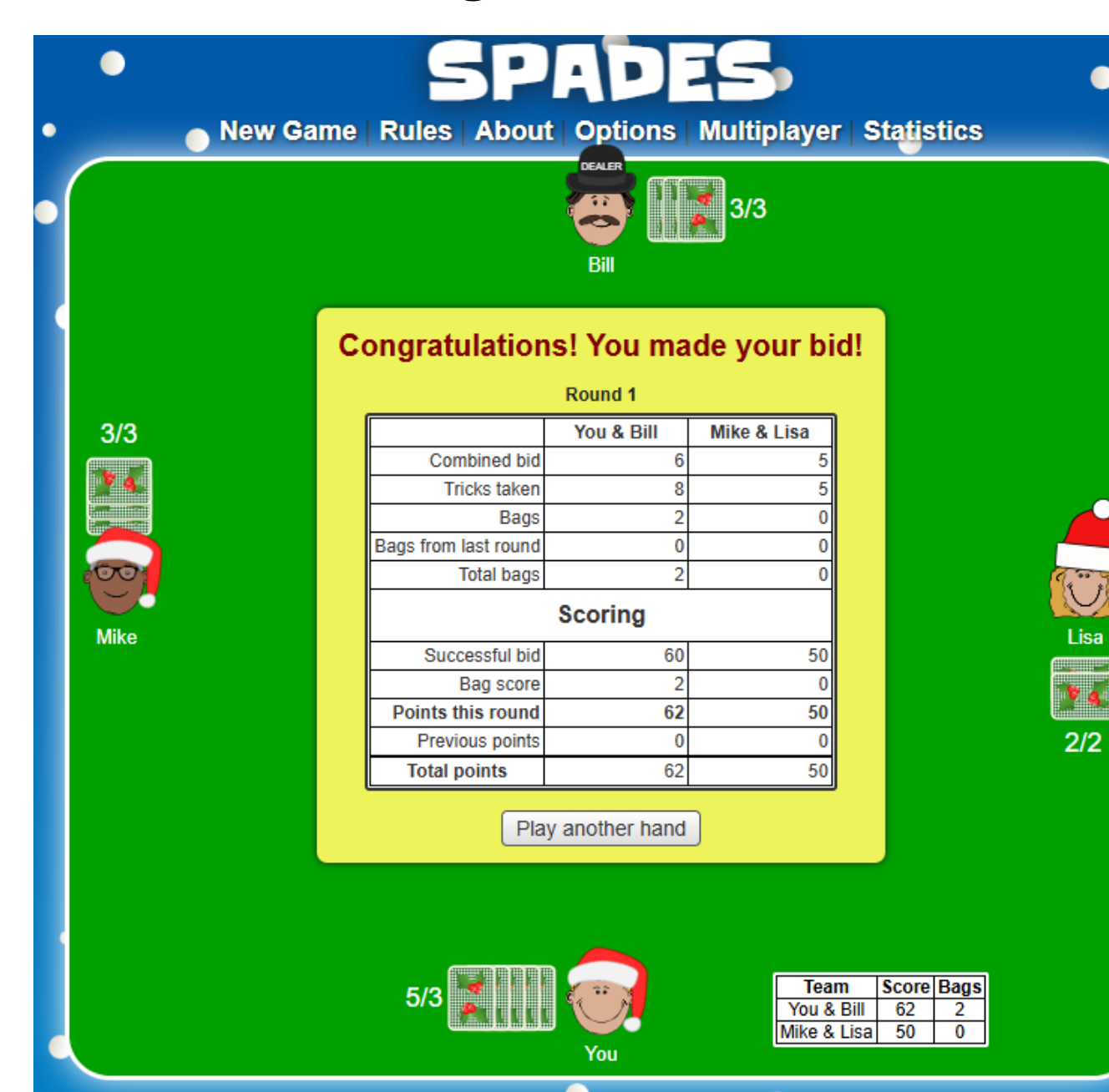
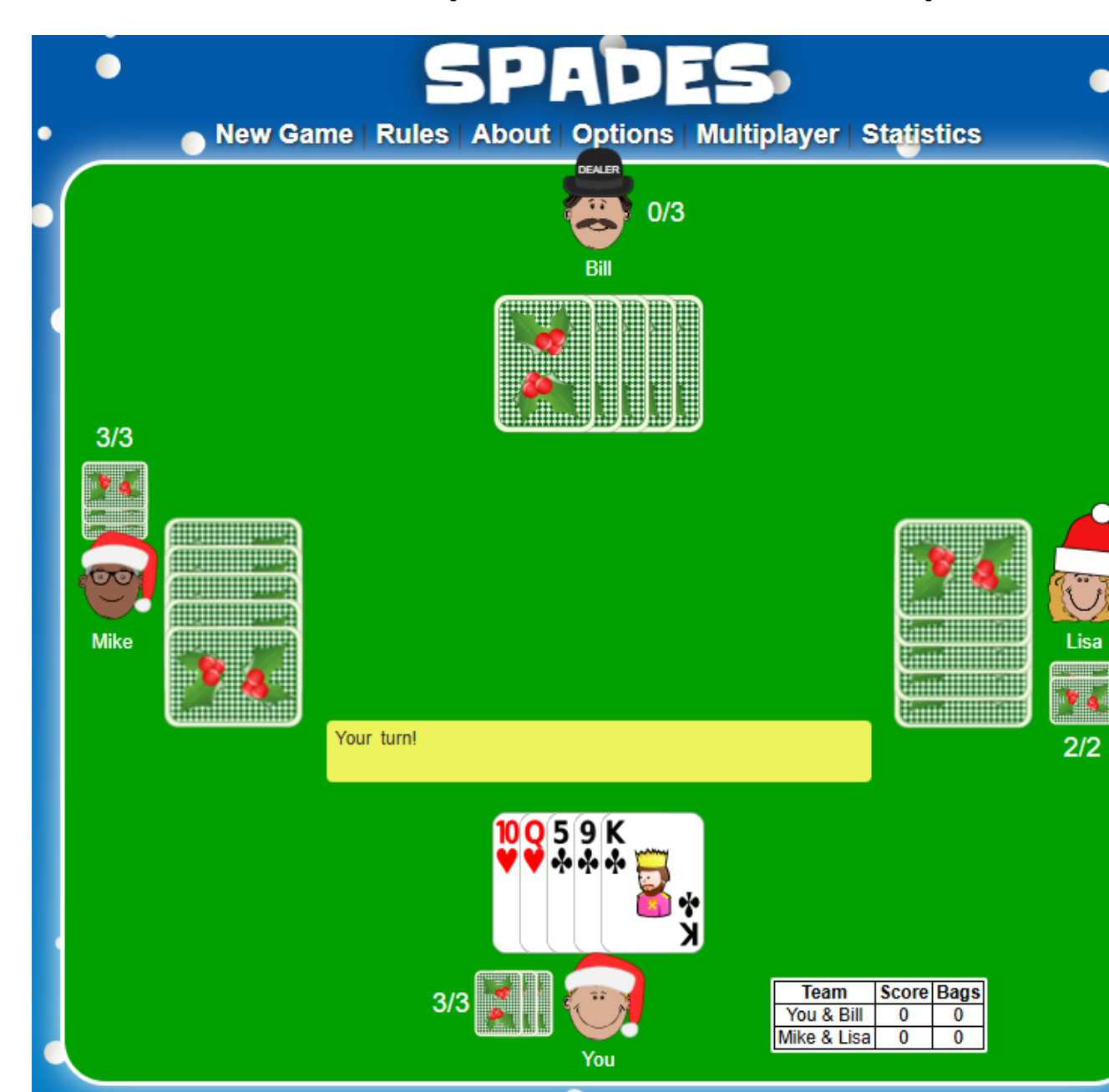
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## Classroom Procedure

1. Introduction (5 minutes)
2. Time for opening computer/downloading onto phone (5 minutes)
3. Play Game (15 – 20 minutes)
4. Debrief (10 – 15 minutes)



Examples of different points in a hand and scoring for the hand



## Classroom Discussion Questions

1. What strategy did you follow in determining your bids?
2. How and why did that strategy change over time?
3. Given you couldn't talk, were there ways of signaling to your partner what cards you held?
4. How might we see similar activity on the part of businesses with a limited number of firms in the industry?

The discussion then provides an opportunity to debrief the activity and introduce the concepts of game theory, incomplete information, market strategies and how might we see this same type of decision-making process in businesses who are competing against each other, but do not have complete information about the other firms.

## Results

Students took a few hands to begin to understand how to play the game, but enjoyed it as they started to understand how to play.

Students appreciated being able to refer back to in when discussing Oligopoly and Game Theory as part of class discussions as additional follow-up occurred by referring back to the experience from the game during subsequent lectures.

Given the minor challenges with learning how the game works, a future iteration will involve having students play one additional time earlier in the semester.

## References

1. 6 Surprising mental and social benefits of card games. (2023, May 18). <https://www.seniorhelpers.com/va/springfield-manassas/resources/blogs/2023-05-18/#:~:text=Card%20games%20engage%20a%20variety,sharp%20and%20maintain%20mental%20health.>
2. Asarta, C. J., Chambers, R. G., & Harter, C. (2020). Teaching Methods in Undergraduate Introductory Economics Courses: Results From a Sixth National Quinquennial Survey. *The American Economist*, 66(1), 18-28. <https://doi.org/10.1177/0569434520974658> (Original work published 2021)
3. Freeman, S., Eddy, S. L., McDonough, M., Smith, M. K., Okoroafor, N., Jordt, H., & Wenderoth, M. P. (2014). Active learning increases student performance in science, engineering, and mathematics. *Proceedings of the National Academy of Sciences*, 111(23), 8410-8415. <https://doi.org/10.1073/pnas.1319030111>