

### **Project 1: The Mathematics of Board Games (MA 328)**

You may work with a partner or you make work independently on this project.

Choose a favorite board game (video games and card games using a standard deck are off limits) and investigate the discrete mathematics of the game. Questions worth investigating include:

- How many ways are there to configure the playing surface of the board game? (e.g. Settles of Catan or Carcassonne)
- How can you leverage discrete mathematics to improve strategy? Are there algorithms to help you play efficiently? (e.g. finding a set in the game of SET)
- How unlikely are certain situations? (e.g. never rolling above a 3)

You are encouraged to consider both mathematical equations and computer algorithms as solution strategies within your project. On Monday Oct 17<sup>th</sup> you will present a 5 minute Powerpoint of the progress you have made on your board game investigation. The final product for this project will be a poster presentation (Poster Due Oct 31<sup>st</sup>). The best poster presentations will be nominated for SURF (Student Undergraduate Research Festival) and will receive 5 bonus points toward the course.

Both your Powerpoint and your final Poster should focus on explaining the mathematics of your chosen board game to an audience of math and computer science students who may not have taken this course.

Games that were analyzed in the 2016 course included

- Connect Four
- Battleship
- Stratego
- Exploding Kittens
- Settlers of Catan
- Clue
- Dominoes
- Fluxx

The project was launched after the unit on combinatorics and most of the posters focused on counting problems.