



Math of Games

Grand Haven High School



Course Number:

Grade Level: Juniors, Seniors

Credits : 0.5

Prerequisite Courses : Algebra 2A, Algebra 2B

Course Description

Students in this course will investigate the mathematical components of various traditional games (dice games, card games, board games, multicultural games, lotteries, television games, casino games, Rubik's cube, Sudoku, Scrabble, pool, miniature golf and more.) Concepts from Algebra, Geometry, and Discrete Math will be implemented to determine outcomes, probabilities, and most effective strategies.

Course Objectives

The class goal is to find correlations between different games and the mathematical or strategies behind them. Students should be able to analyze and evaluate games to predict outcomes and find ways of improving game play.

Student Expectations

- Be Nice!
- I expect to be able to teach without interference.
- I will do my best to role model courteous and respectful treatment of students.
- I expect students to treat me, and each other, with courtesy and respect.
- Work Hard!

Communication

Students, parents, guardians, and teachers may communicate through email, phone, individual teach blogs or websites, or Remind101.

Grading Policy

- | | |
|------------------------------------|-----|
| • Homework/Classwork/Participation | 20% |
| • Quizzes/Projects/Presentations | 40% |
| • Cumulative Tests | 40% |

Building Behavioral Expectations

TEAM GH ... One Team, One Family, One Grand Haven. Be Kind. Always.

It is our expectation that ALL GHHS students, staff and parents will ... always give their best **EFFORT** in everything that they do, work hard to be **INCLUSIVE** of each other, show **RESPONSIBILITY** in class, the hallways, cafeteria and at events, and **WORK TOGETHER** at all times!

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Scope and Sequence

Unit 1: Algebra Applications: Battleship Polar Battle Ship Sink the Battle Ship Sum of 15 Game Tower of Hanoi Geometric Series in Historical Context

Unit 2: Geometry Applications: Bridge and Pixel Problem Euler's Problem (Networks, Konigsberg Bridges) Face It - The Game of Vanishing Faces Matchstick Manipulations Round Robin Tournaments Tree Game (topology) Billiards/Putt-Putt

Unit 3: Logic Applications Sudoku Ken-Ken Logic Puzzles Kakuro Mastermind

Unit 4: Group Project #1. Requirements for design and manufacture of project 2: Oral presentations of projects

Unit 5: Probability Applications Blackjack Keno Sports Gambling Craps Roulette Lotteries Coin Tossing Coin Triplets In-Between March Madness Scrabble Deal or No Deal

Unit 6: Strategy Games Creating a Checkerboard Pattern Hex Intersection Lines Through Dots Magic Squares Mastermind TacTix Othello Mancala Abalone Nim

Unit 7: Random Stuff 1. Montey Hall Problem 2. Discrete Applications 3. Math in the Movies

Unit 8: Final Project 1: Requirements for research of project 2: Oral and written presentations of projects

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