

Day 3**Prob & Stats**

Standards	PS.SPMD.2: Calculate the expected value of a random variable as the mean of its probability distribution. Find expected values by assigning probabilities to payoff values. Use expected values to evaluate and compare strategies in real-world scenarios.
Learning Targets/I Can Statements	I can determine the expected value of real life experiences
Essential Question(s)	How do you calculate the expected value?
Resources	https://www.khanacademy.org/math/statistics-probability/random-variables-stats-library/random-variables-discrete/v/expected-value-of-a-discrete-random-variable https://www.khanacademy.org/math/statistics-probability/random-variables-stats-library/random-variables-discrete/e/expected_value
Learning Activities or Experiences	1 st : Recall questions (attached) 2 nd : Khanacademy a. Mean (Expected Value) 3 rd : Khanacademy (Expected Value Practice) 4 th : Assignment (Game Design)

Expected Value Activities

Game 1: Coins

You will flip a coin four times. Here are the payoffs your friend offers:

- If all four coins are tails, you pay her \$50.
- If three are tails and one is heads, you pay her \$10.
- If there are two of each, you pay her \$5.
- If three are heads and one is tails, she pays you \$10.
- If all four are heads, she pays you \$50.

You are actually pretty good at flipping coins, and have practiced a method which allows you to get heads 55% of the time.

Which game should you play?

Explain how you got your answer.

Game Design Challenge

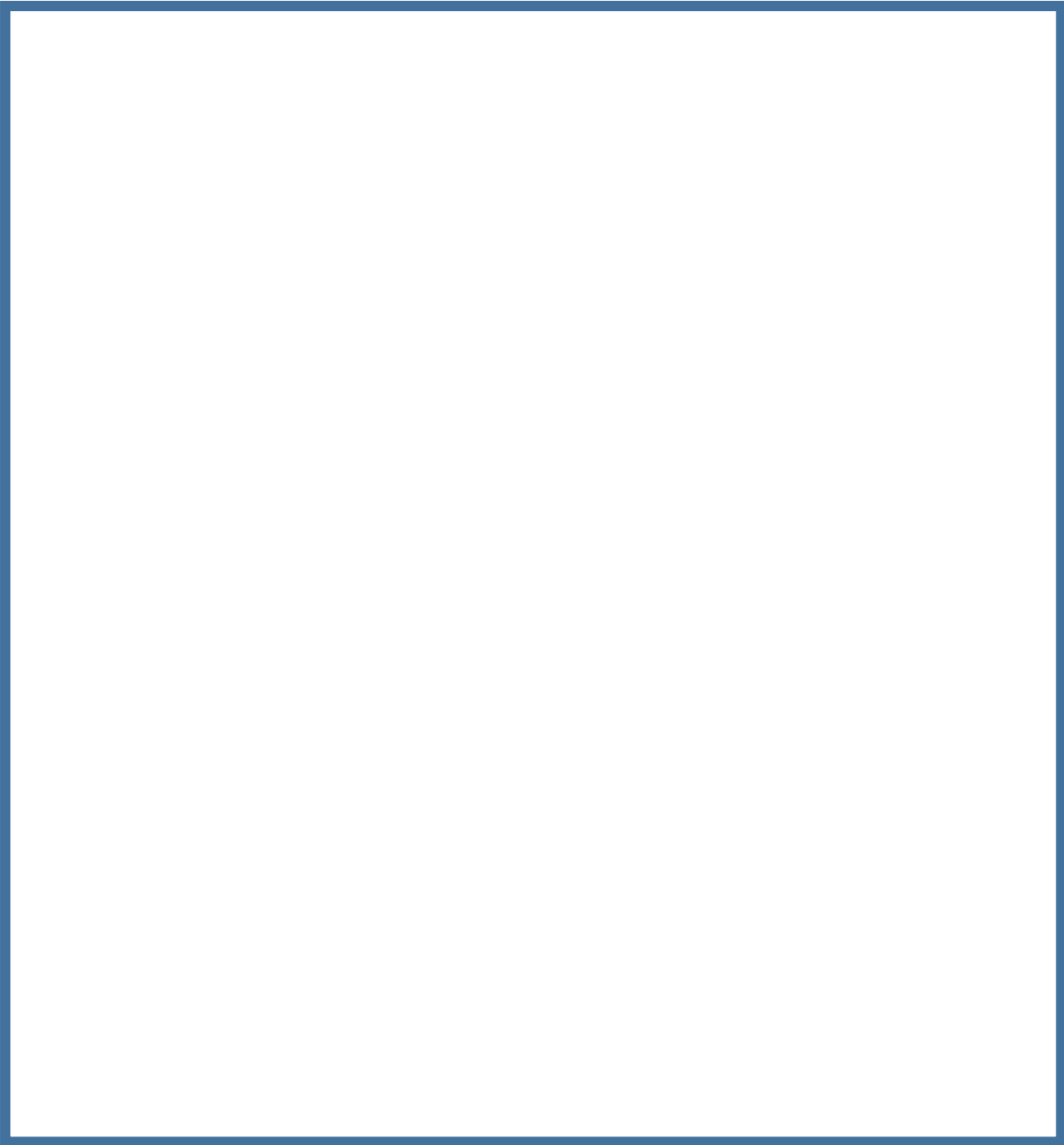
I am considering hiring your group to design a game for my casino.

There are only three requirements for the game:

- It must be legal and safe to do within a casino setting.
- It must be fun, i.e. people must want to play it.
- It must have an expected value that is profitable for the casino.

Use the rest of this paper to describe your game and demonstrate that it will be profitable for my casino

Game description (use below or drawings as necessary):

A large, empty rectangular box with a solid blue border, occupying the central portion of the page. It is intended for a user to provide a game description or a drawing as necessary.