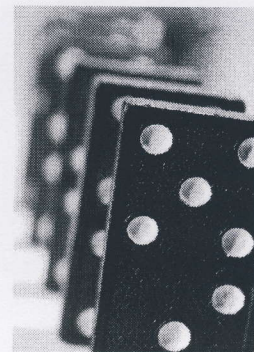


Games Fair



To apply what you have learned about permutations, combinations, probability, and discrete probability distributions we are going to have a Games Fair!

Your task is to create an original, interesting, easy-to-play, and profitable game involving dice, spinners, cards, or any other reasonable item that introduces an element of chance. The game will require the participant to pay one or two 'Data Dollars' and all prizes must be payable in full 'Data Dollars.'

The expected value is dependent on the cost to play as identified in the chart:

Cost to Play One Game	Expected Value Range
\$1	\$0.60–\$0.80
\$2	\$1.60–\$1.80

Operators

As an operator, create

- a tally chart for tracking all possible outcomes.
- A playing board of some kind
- All items required to play the game. (I have a selected number of decks of cards and dice)
- A sign to Promote your Game

If an operator no longer has enough 'Data Dollars' to award a prize or continue playing, bankruptcy is declared and \$30 is borrowed from the 'Data Bank.'

At the end of the Games Fair day the operator with the most 'Data Dollars' are declared "winners."

After the Games Fair, you submit a report that includes:

- playing instructions and items required to play
- the theoretical probability of all possible game outcomes
- a graph of the theoretical distribution of all possible game outcomes
- a player's theoretical Expected Value
- a tally chart with the collected experimental results
- the experimental probability of all possible game outcomes
- a graph of the experimental distribution of all possible game outcomes
- a player's experimental return per game

In the report, analyse, and provide reasons for differences between the experimental and theoretical results for all the components of your game; address and provide suggested modifications to make your game "better." Make connections between your Game Fair experience and real world contexts.

4.4.1: Games Fair Assessment

Problem Solving				
Criteria	Level 1	Level 2	Level 3	Level 4
Applying mathematical processes and procedures correctly to determine accurate theoretical and experimental results for the components of the game	– correctly applies some of the mathematical processes and procedures with major errors	– correctly applies many of the mathematical processes and procedures with some errors	– correctly applies the mathematical processes and procedures with few errors	– correctly applies the mathematical processes and procedures with precision and accuracy
Connecting				
Relating the mathematical ideas of the Games Fair to real contexts	– makes weak connections between experimental and theoretical results to real contexts	– makes simple connections between experimental and theoretical results to real contexts	– makes appropriate connections between experimental and theoretical results to real contexts	– makes strong connections between experimental and theoretical results to real contexts
Reasoning and Proving				
Interpreting the mathematical results from the Games Fair and making relevant statements	– misinterprets a major part of the results from the games fair, but carries on to make some otherwise reasonable statements	– misinterprets a minor part of the results from the games fair, but carries on to make some otherwise reasonable statements	– correctly interprets the results from the games fair and makes reasonable statements	– correctly interprets the results from the games fair and makes insightful statements
Making inferences, conclusions and justifications when comparing theoretical and experimental results	– differences between theoretical and experimental results are not justified	– some differences between theoretical and experimental results are justified	– differences between theoretical and experimental results are justified	– differences between theoretical and experimental results are highly justified
Reflecting				
Using metacognitive strategies to suggest improvements for a better game	– applies metacognitive strategies to suggest improvements for a better game with limited insightfulness	– applies metacognitive strategies to suggest improvements for a better game with some insightfulness	– applies metacognitive strategies to suggest improvements for a better game with insightfulness	– applies metacognitive strategies to suggest improvements for a better game with a high degree of insightfulness
Communicating				
Integrating narrative and mathematical forms of communication in the report	– either mathematical or narrative form is present in the report, but not both	– both mathematical and narrative forms are present in the report, but the forms are not integrated	– both mathematical and narrative forms are present and integrated in the report	– a variety of mathematical and narrative forms are present, integrated in the report, and well chosen

4.4.1: Games Fair Assessment (continued)

The report includes:

- playing instructions, items required to play, and peer critiques
- theoretical probability of each possible game outcome
- a graph of the theoretical distribution of all possible game outcomes
- a player's theoretical Expected Value (within range)
- a tally chart with collected experimental results
- experimental probability of each possible game outcome
- a graph of the experimental distribution of all possible game outcomes
- a player's experimental return per game
- suggestions to improve the game
- connecting between the Games Fair and real contexts