ENHANCING STATISTICS TEACHER EDUCATION WITH E-MODULES

Mod A: Part 1
A.1.f. Investigating Schoolopoly

In this data experience, you will consider whether data is generated from a process using a certain probability model and consider how simulation can be used to collect data in CODAP that is based on some unknown probability distribution.

The Task: Schoolopoly

A local school in your district is planning to create a board game similar to Monopoly that uses 6-sided color dice, rather than a regular die with 1-6. The game, called Schoolopoly, will be sold as part of a fundraiser. Each side of a die is a different color: black, blue, green, yellow, white, or red. Several companies are competing to produce the color dice that will be used in the board game. There is a rumor that one or more of the companies have been selling poor quality dice. If these rumors are indeed true, these companies should be avoided to ensure that the dice used for the game are “fair”. The school board is trying to decide which company should receive the contract for supplying the dice.

Three companies have provided a simulation of a sample of die from their factory.

- Dice R' Us
- Pips and Dots
- High Rollers Inc.

Your Assignment

Investigate whether or not the dice model obtained from each company is fair. You will use three separate CODAP documents to conduct simulations of rolling a die from each company using the Sampler (see below). Your goal is to make a recommendation (i.e., a claim) as to whether dice should be purchased from each of the companies.

Your recommendation should be in the form of a letter to the school board. In the letter, you need to support your recommendation by explicitly including the following information about each of the three die companies:

1. Evidence as to whether each die company produces "fair" or "unfair" dice. This can include screenshots from your work in CODAP.
2. A description of your model for the probability distribution of the six possible outcomes of a die roll from each of the three companies (i.e., estimated probability of each possible outcome occurring for each die company).

Lee, H. & Mojica, G. (2019). Enhancing Statistics Teacher Education with E-Modules. Retrieved from: https://fi-esteem.s3.amazonaws.com/module_a/part1/esteem_moda_part1_schoolopoly_investigation.pdf

Technology to Use

You will collect data using the Sampler, a simulation tool, in CODAP to complete this assignment. Examine the behavior of the die in the simulations that contain a model of each company's die to infer whether the six outcomes are equally likely. Click on the name for each company to open a corresponding CODAP document:

- Dice R' Us
- Pips and Dots
- High Rollers Inc.

You can also download the CODAP documents to save for later. Remember you have to open CODAP in a web browser and either drag a .codap file into the window or use the Open Document option to actually use an existing .codap file.

Vote: Which company do you recommend?

After you have completed the investigation, use the Google form to share your recommendation, based on your investigation of Schoolopoly, which company do you recommend?

- Dice R' Us
- Pips and Dots
- High Roller Inc.

You will receive an email indicating how you voted. Your instructor may want you to forward the email confirmation so that he or she can see the results for your class.

Task adapted from: Tarr, J. E., Lee, H. S., & Rider, R. L. (2006). When data and chance collide: Drawing inferences from empirical data. In G. F. Burrill & P. C. Elliott (Eds.), *Thinking and reasoning with data and chance: Sixty-eighth yearbook* (pp. 139 - 150). Reston, VA: NCTM.

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