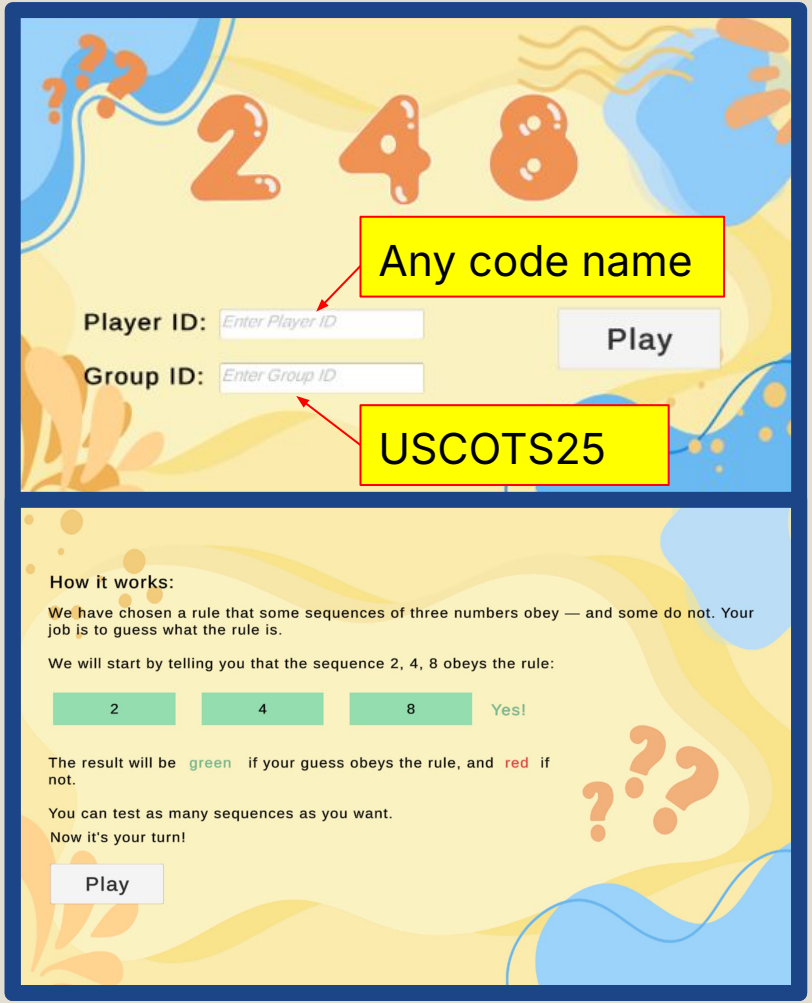
Welcome!

Games that Help Students use Models to Make Decisions

Slides: https://bit.ly/44BMg6j

Play the 2_4_8 game:

Click on this link:
https://www.stat2games.sites.grinnell.edu/games/2-4-8.html



The results

Confirmation Bias: “Not only are people more likely to believe information that fits their pre-existing beliefs, but they’re also more likely to go looking for such information.” [1]

[1] Rosenthal, S. (2015, July 3). A quick puzzle to test your problem-solving. *The New York Times*. https://www.nytimes.com/interactive/2015/07/03/upshot/a-quick-puzzle-to-test-your-problem-solving.html (retrieved on 7/11/2025)

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How is this important for statistics class (statistical models)?

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Why Play Games?

Collecting their own student data: moves the concept from an abstract fact to an important idea that influences their lives in many ways.

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Collecting their own student data: moves the concept from an abstract fact to an important idea that influences their lives in many ways.

> Most people think “other” people will make biased decisions, but not me.

TwoFourEight - Posit Connect

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Making mistakes improves learning. Try catching students at the moment of uncertainty. Timely feedback is critical.

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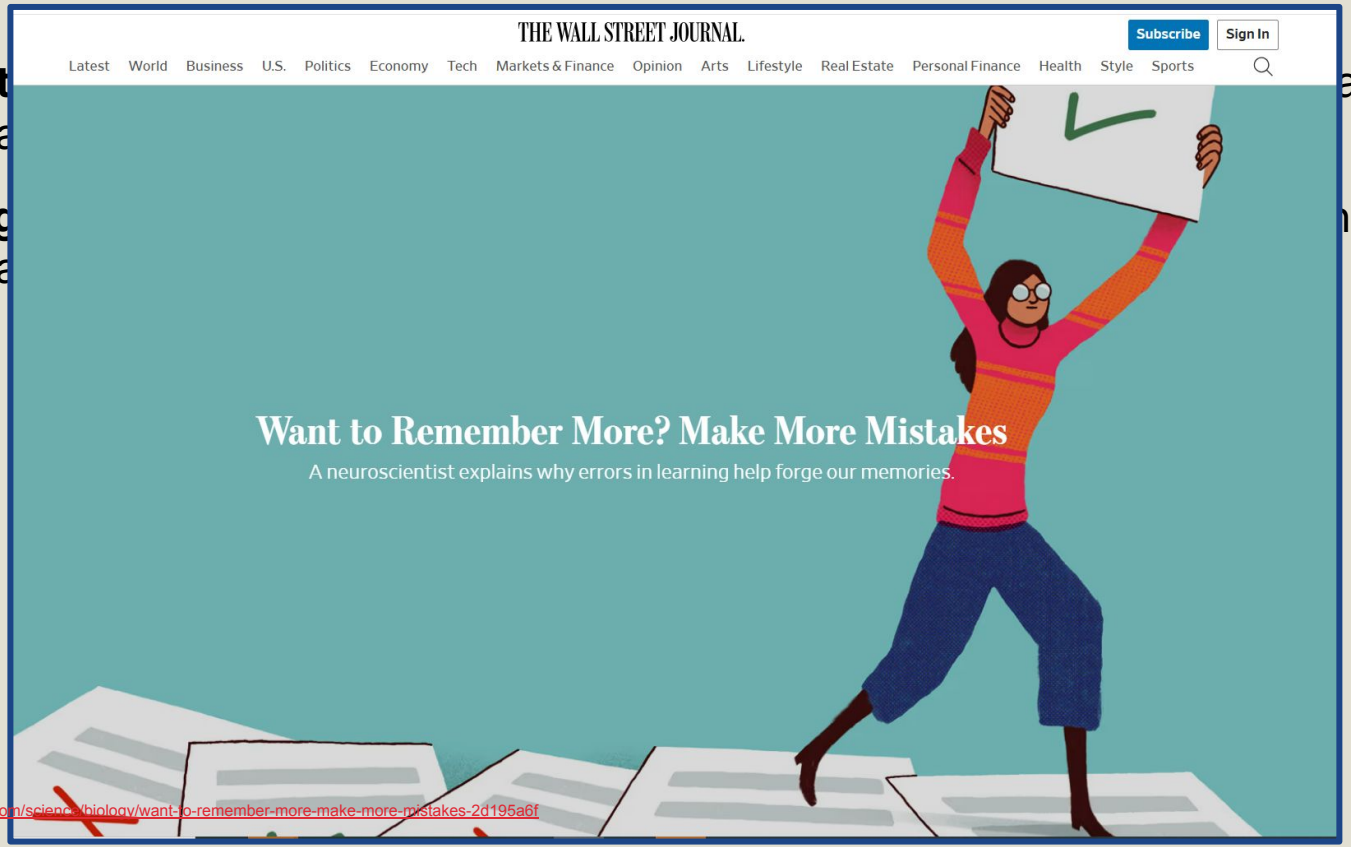
Why Play Games?

Collect ...act to an importa...

Making ...nt of uncerta...



https://www.wsj.com/science/biology/want-to-remember-more-make-more-mistakes-2d195a6f

Roediger, H. L., III, & Finn, B. (2010, March 1). The pluses of getting it wrong: New research makes the case for difficult tests in schools and suggests an unusual technique that anyone

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Boosts Engagement & Motivation[1] [2]

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[2] https://www.wired.com/story/how-to-keep-kids-engaged-in-school-with-games/

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Promotes Active Learning & Critical Thinking

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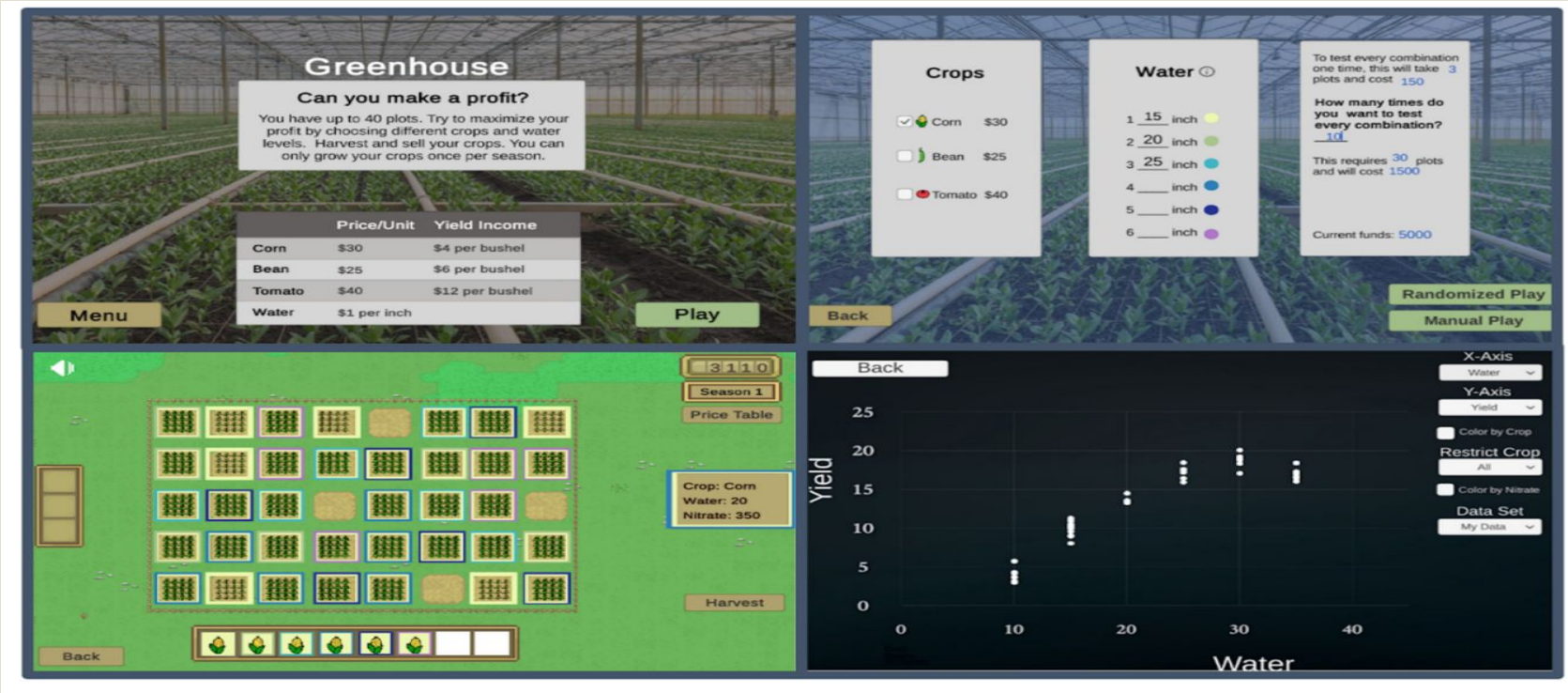
Greenhouse Game

click on https://www.stat2games.sites.grinnell.edu/



Greenhouse Game

- Analyze crop growth using statistical modeling
- Labs and instructor resources
- For more info on class-testing results, check out our JSDSE article

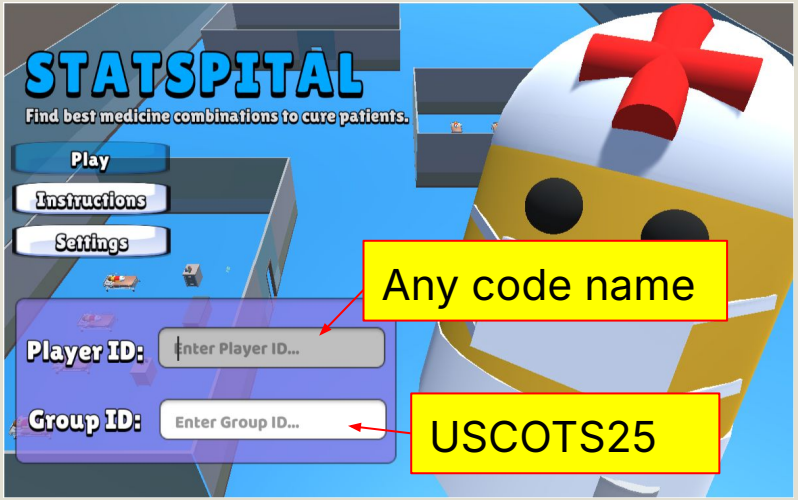
The Greenhouse Effect: Using Student-Generated Agricultural Data to Warm Up Students for Data-Based Decision Making

Shonda Kuiper, Abhishek Chakraborty, Tyler George, Lisa W. Kay, Lawrence M. Lesser, Ginger Rowell, Dennis Pearl, Scott Crawford & Anna Olsen

Slides: bit.ly/44BMg6j

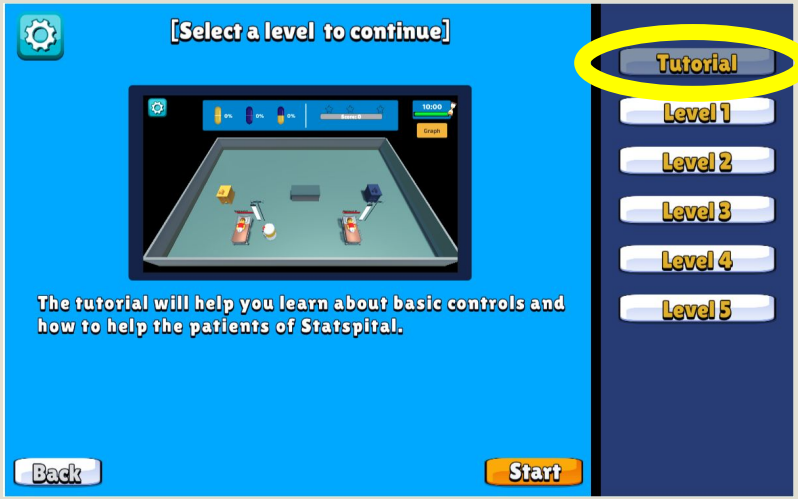
Statspital

Click on this link:
https://www.stat2games.sites.grinnell.edu/games/statspital.html



Controls:

- Use `Arrow Keys` or `WASD` to control the movement of the doctor.
- Use `Space` to pick up and give medicine to the patients.
- Use `Enter` to mix two different medicines at the mixing table.



Statspital

Level 1 data:

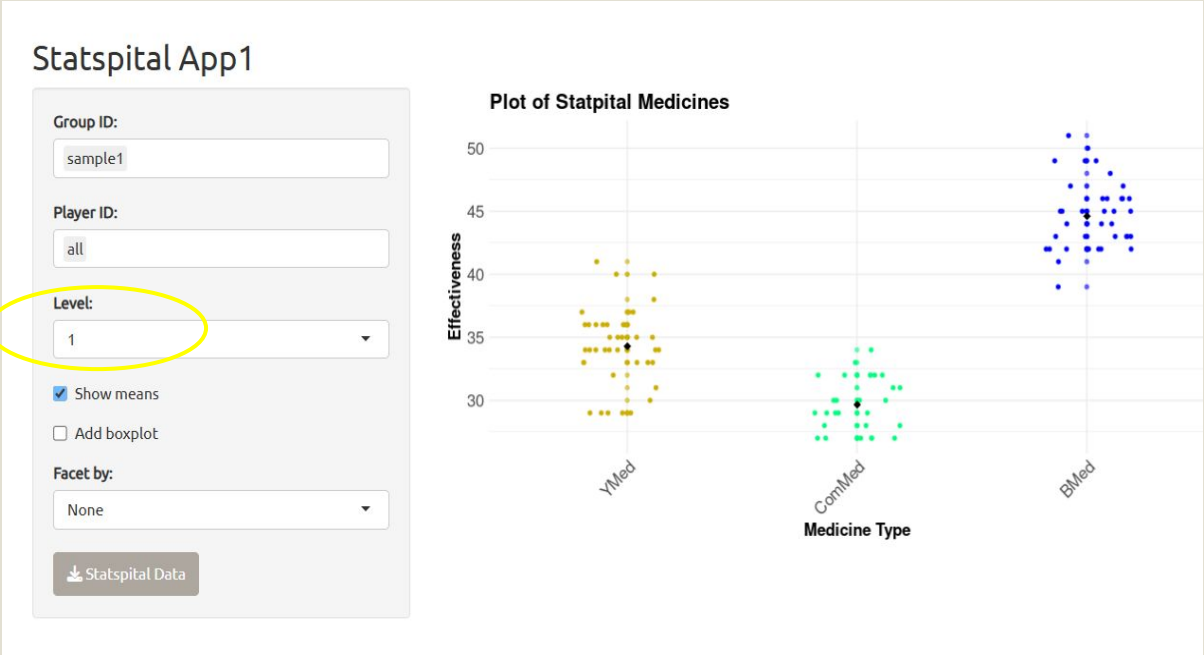
What is the best strategy to win?

Give Yellow Medicine

Give Blue Medicine

Give Combined Medicine

Other



Statspital

Level 2 data:

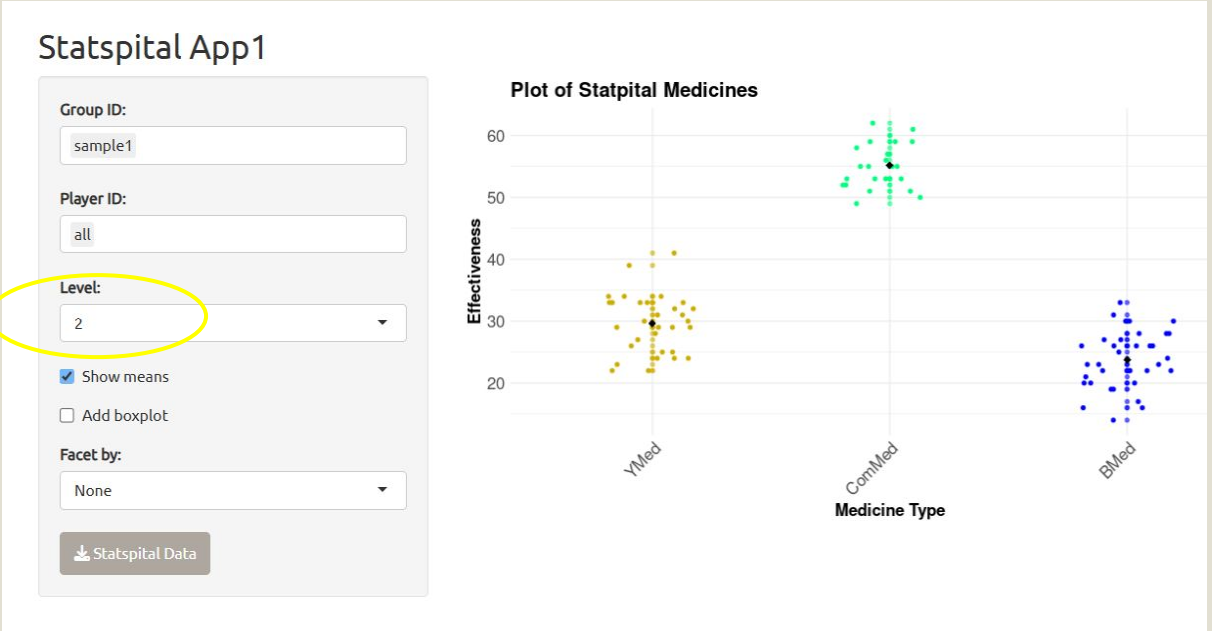
What is the best strategy to win?

Give Yellow Medicine

Give Blue Medicine

Give Combined Medicine

Other



Statspital

Level 3 data:

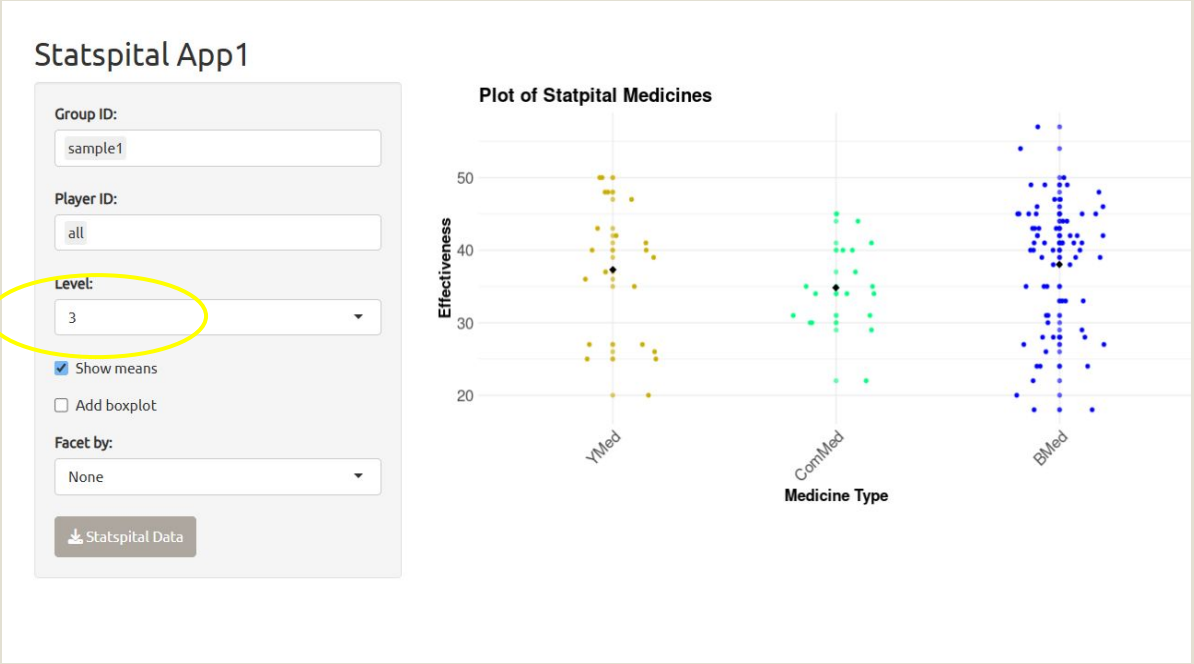
What is the best strategy to win?

Give Yellow Medicine

Give Blue Medicine

Give Combined Medicine

Other



Statspital

Level 3 data:

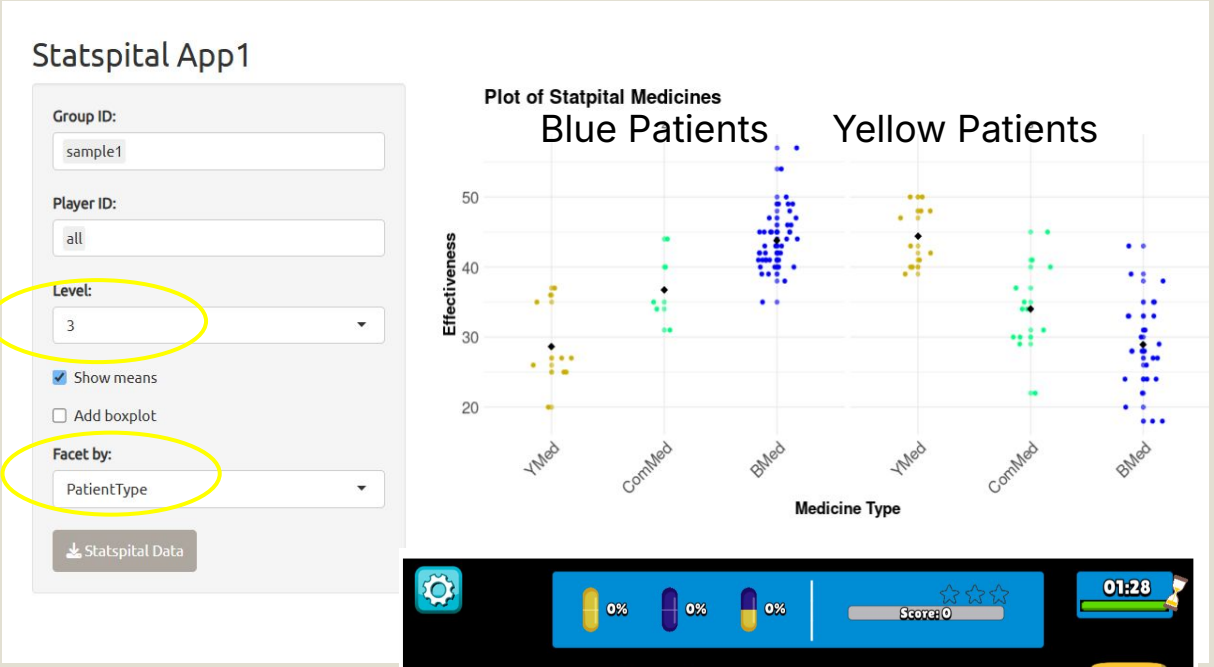
What is the best strategy to win?

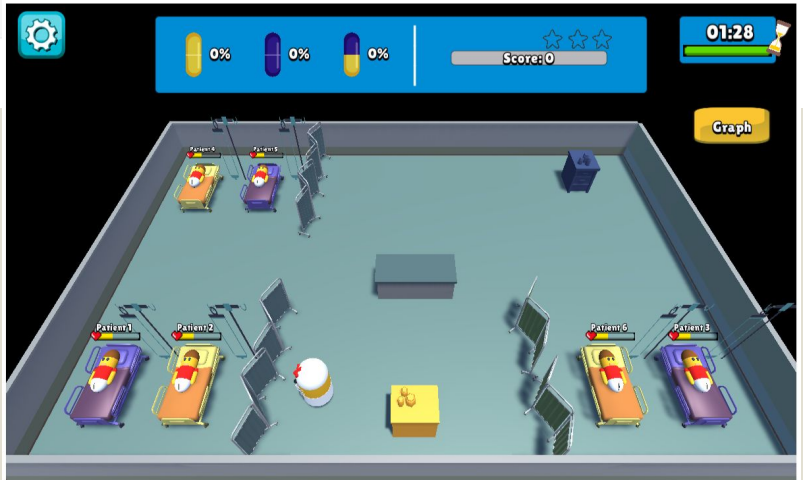
Give Yellow Medicine

Give Blue Medicine

Give Combined Medicine

Other

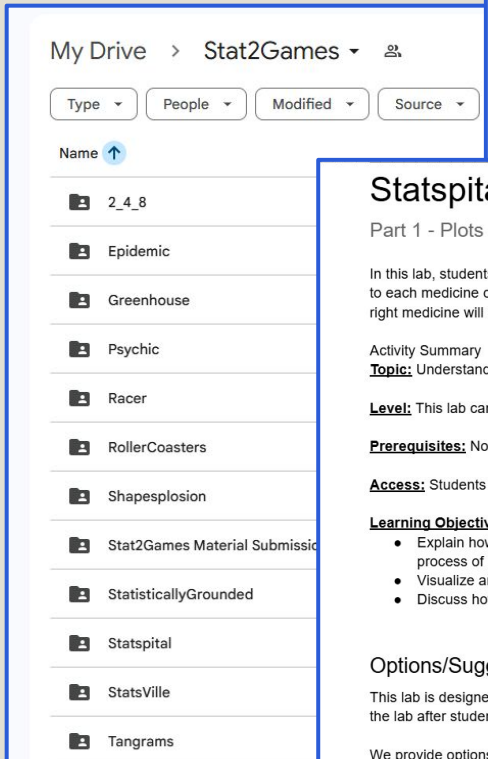


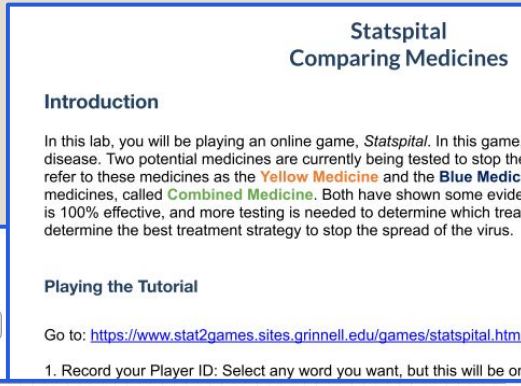


Statspital

Website: dataspace.sites.grinnell.edu

Handouts: bit.ly/44KGden




Statspital
Comparing Medicines

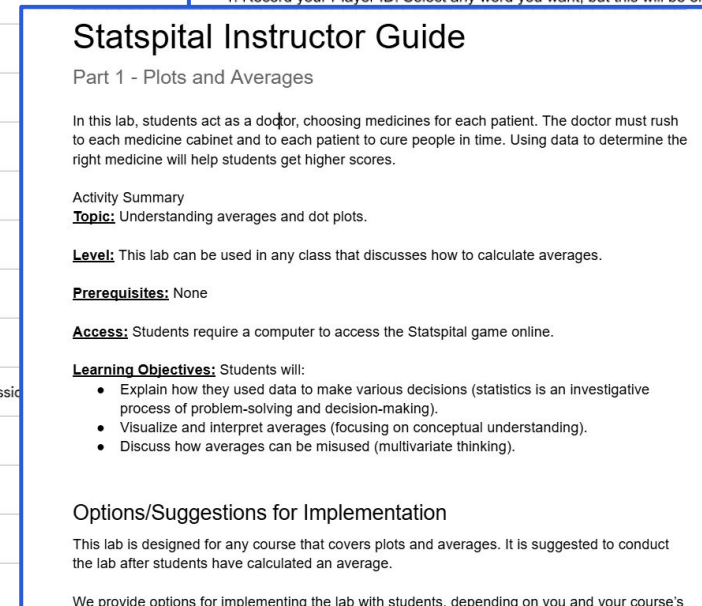
Introduction

In this lab, you will be playing an online game, *Statspital*. In this game disease. Two potential medicines are currently being tested to stop the refer to these medicines as the Yellow Medicine and the Blue Medic medicines, called Combined Medicine. Both have shown some evide is 100% effective, and more testing is needed to determine which trea determine the best treatment strategy to stop the spread of the virus.

Playing the Tutorial

Go to: https://www.stat2games.sites.grinnell.edu/games/statspital.htm

1. Record your Player ID: Select any word you want, but this will be or


Statspital Instructor Guide

Part 1 - Plots and Averages

In this lab, students act as a doctor, choosing medicines for each patient. The doctor must rush to each medicine cabinet and to each patient to cure people in time. Using data to determine the right medicine will help students get higher scores.

Activity Summary

Topic: Understanding averages and dot plots.

Level: This lab can be used in any class that discusses how to calculate averages.

Prerequisites: None

Access: Students require a computer to access the Statspital game online.

Learning Objectives: Students will:

- Explain how they used data to make various decisions (statistics is an investigative process of problem-solving and decision-making).
- Visualize and interpret averages (focusing on conceptual understanding).
- Discuss how averages can be misused (multivariate thinking).

Options/Suggestions for Implementation

This lab is designed for any course that covers plots and averages. It is suggested to conduct the lab after students have calculated an average.

We provide options for implementing the lab with students, depending on you and your course's

Statspital Assignment

M7 | Module 7 Discussion Board

This week you are going to play a game called "Statspital," which will generate some data. Complete the worksheet attached below. In your discussion board post, upload your completed worksheet and provide a brief summary of your experience with playing the game.

Statspital Worksheet--Word

Statspital Worksheet--pdf

Statspital Game Instructions

Slides: bit.ly/44BMg6j

Roller Coaster!!!

- Roller Coaster
- In progress

Game	Date	PlayerID	GroupID	Level	Eq1A	Eq1B	Eq1C	X1Max	Eq2A
517	6/8/2025 17:25	a	sample2	1	0	1	0	20	-20
486	5/2/2025 12:27	b	sample2	1	0	2	0.05	25	0
503	5/27/2025 15:29	c	sample2	1	0	1	0	1	0
442	4/30/2025 14:22	d	sample2	1	0	15	0.2	50	0

Name	Description
PlayerID	Any alpha-numeric term used for each player
Eq1A	y intercept for first equation
GraphC	Graph Counts: The number of times a player clicked the Graph button.
Score	The vertical distance travelled by the roller coaster (not counting the initial slope)
SuccessC	Success Count: The number of times a player clicked the Graph button and it was successful (no error messages).

- https://fud90k-tyler-george.shinyapps.io/coaster/

“Choose your Own Adventure”

Students observe data, establish a (simple) research question, and answer it with methods from introductory statistics

- Do math and statistics students perform differently?
- Does practice make perfect? Do Students Learn?
- Do the majority of students play the game more than once?
- Do Plays and Scores Align?
- 1 sample t-test: can the average student in your class score above 250?
- 2-sample t test: Are the means of the two samples (two classes the same?)
- 1 proportion test: Do we have evidence that the proportion of players is successful?
- 2 proportion tests/chi-square: does class1 or class2 have a higher proportion of successful
- Regression: is the number of clicks a successful predictor of score?

Roller Coaster and COVID-19 Class Testing

- Supported by a Faculty Career Enhancement Program (FaCE) grant from the Associated Colleges of the Midwest (ACM)
- Will be looking for class testers for the fall
  - Roller Coaster (stat1 or 2?)
  - COVID-19 (stat2, logistic?)
  - Activities for pre-calculus, calculus and differential equations
  - Stipends available!!!

- If you are interested, please email

  Tyler George: TGEORGE@CORNELLCOLLEGE.EDU

  Shonda Kuiper: KUIPERS@GRINNELLCOLLEGE.EDU

Game Time and Discussion

We are going to form groups based on which game you are most interested in

- Abhishek for Greenhouse Game
- Lisa for Statspital
- Tyler for Roller Coaster
- Shonda for other games or general questions

Discussion Questions

- How would you use it in class?
- what would need to be changed for your course?
- could be improved?

All games are at: **https://www.stat2games.sites.grinnell.edu/**

Feedback

We would greatly appreciate your feedback on the breakout session and these resources!

https://forms.gle/yVxFBA1DcDTGUyDM9