

Ideas for the Classroom

σ **Randomized Response Trials**

Students will flip a coin twice: once to decide if they will answer the question truthfully, and again (depending on the first flip) if they should answer A or B. The true probabilities will then be recovered without true individual responses being divulged.

σ **Type I (and Type II) Errors**

Each given a unique sample, students will construct a confidence interval in response to a null hypothesis. The true population parameter will then be shared and students will share if their interval resulted in a Type I error. The empirical proportion of students will then be compared to the alpha level.

σ **Bar Graphs**

Results from a Plickers question can be quickly exported as a Microsoft Excel file or general .csv file and used to create Bar Graphs and other appropriate forms of visualization.

USING PLICKERS TO TEACH STATISTICAL CONCEPTS

Nicholas Mandarano  
The Ohio State University

Which of the following is NOT true about a Normal distribution? 38%

STAT 1350 (1:50)

Wednesday 22 February 1:55 PM

**A** The mean is always the same as the median. 11

9 Amy 25 Caroline 20 Libby 7 Reilly  
14 Anthony 28 Daesung 15 Madison 22 Zoe  
6 Brooke 12 Justus 18 Matthew

**B** The distribution can be skewed. 9

10 Adam 17 Daley 11 Lena  
3 Anna 29 Emma 16 Marisa  
4 Claire 2 Lauren 27 Samantha

**C** The area under the curve is always equal to 1 (or 100%). 3

13 Devyn 19 Mackenzie  
26 Jazmine

**D** The curve is always symmetric. 1

1 Haley

Missing 5

8 Alexis 5 Sarah 23 Travis  
24 Lexie 21 Terrel


At a significance level of  $\alpha = 0.05$ , our significance test returns a p-value of  $p = 0.08$ . We have...


- A** ...strong evidence against the null hypothesis.
- B** ...strong evidence for the null hypothesis.
- C** ...not enough strong evidence against the null hypothesis.
- D** More information is needed.

February

Name ^	Total	Chapters ...	Chapters 7 and 10		Chapters 11 and 12		Chapter 13
		Which of the following is NOT one of	Where will you be watching the Super	Who are you rooting for on Sunday?	In a distribution of a quantitative	On which day does your midterm open?	Which of the following is NOT true
Class Average	54%	31%	43%	Survey	38%	96%	60%
Abigail	1/3	-	D	D	C	B	-
Ajah	2/3	C	-	-	B	B	-
Alexa	3/5	A	A	C	A	B	B
Ally	1/5	C	C	A	D	B	A
Brianna	0/2	A	C	B	-	-	-
Caroline	4/5	D	A	C	B	B	B
Chelsea	3/5	B	A	A	D	B	A
Elizabeth	3/4	-	C	C	B	B	B
Evan	3/5	B	C	A	B	B	A
Faith	2/5	B	B	A	A	B	A
Grace	5/5	B	A	C	B	B	B
Gracy	3/5	B	A	D	D	B	D
Hannah S	2/5	D	B	C	A	B	B
Hannah Z	2/5	C	A	C	A	B	C
Jacob	4/5	B	B	A	B	B	B
Jordan	1/4	A	-	-	A	B	C
Kaylee	3/4	C	-	-	B	B	B
Kris	2/5	D	D	C	B	C	B
Lauren	5/5	B	A	A	B	B	B
Lili	1/4	A	-	-	A	B	A
Lilli	3/5	A	A	A	A	B	B
Lydia	2/5	C	C	D	A	B	B
Mallory	3/5	C	A	C	D	B	B
Maria	2/5	A	A	C	D	B	C
Mia	1/5	D	D	D	A	B	A
Robbie	2/5	A	C	A	A	B	B
Tami	3/5	C	C	C	B	B	B
Taylor	1/1	B	-	-	-	-	-
Zach	1/1	-	-	-	-	-	B

Did you have fun this semester?

 **A**

 **B**



Ideas for the Classroom

σ **Randomization**

Students will "randomly" select A, B, C, or D. The results should show that humans are not inherently random, supporting the use of random number generators.

σ **Variance**

Split students into large groups and assign a value to each of A, B, C, and D. Ask students to work as a team and respond in a way that produces the largest variance among answers.

σ **Binomial Probabilities**

Provide only A and B as answer choices to a binary question. Take responses in increments of five students at a time and ask students to observe what changes they see in  $p$ , in  $(1-p)$ , and in the margin of error as the sample size increases.

σ **Learn Names and Take Attendance**



CONTACT ME

 Mandarano.4@osu.edu