




## FREE CLICKERS!!! Using PollEverywhere for Formative Assessment in the Classroom



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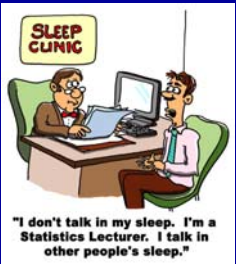
## What are "Clickers"?

- Personal Response Systems (PRS)
  - Manual 
  - "Clickers" 
  - Poll Everywhere 

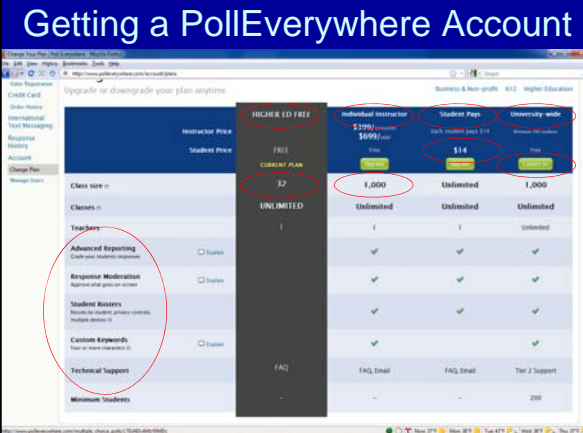
A
B
C
D

## PRS in the Classroom

- The best way to teach is...TO LECTURE
- I am a LEARNING FACILITATOR
- Benefits/Utility of PRS
  - Engaged students.....
  - "Just in Time Teaching"
  - Invest in Predictions
  - Summarize Simulations
  - Student Surveys
  - Formative Assessment



## Getting a PollEverywhere Account

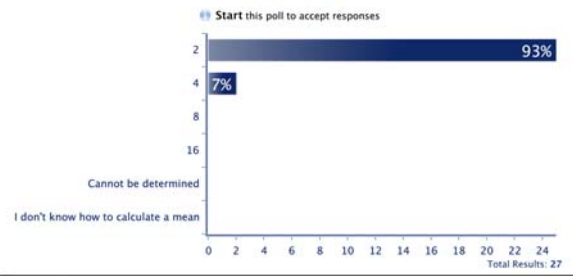


	HIGHER ED FREE	Individual Instructor	Student Pkg.	University-wide
Instructor Price	FREE	\$199/yr	\$14/yr	Free
Student Price	FREE	\$99/yr	\$14/yr	Free
Current Plan	37	1,000	Unlimited	1,000
Classes	UNLIMITED	Unlimited	Unlimited	Unlimited
Teachers	1	1	1	Unlimited
Advanced Reporting	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Responsive Moderation	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Student Browsers	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Custom Keywords	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Technical Support	FAQ	FAQ, Email	FAQ, Email	Tier 2 Support
Minimum Students	-	-	-	200

## Day One Questions

What is the mean of the following numbers?  
5, 6, -4, 1

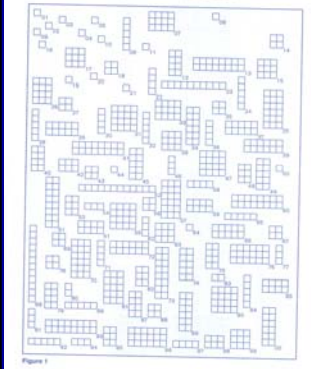
Start this poll to accept responses



Response	Percentage
Cannot be determined	93%
I don't know how to calculate a mean	7%

Total Results: 27

## Random Rectangles



What is the average area of the rectangles?

1. Best Guess
2. Representative 5
3. Random 5
4. Random 20

## Random Rectangles using PE

(Subset of Instruction Sheet)

Look at the following page for a few seconds. What is your best guess for the average area of the rectangles?

TEXT TO 22333 FOLLOWED BY YOUR ANSWER FROM THE TABLE BELOW:

Guess	<3	3-3.9	4-4.9	5-5.9	6-6.9	7-7.9	8-8.9	9-9.9	10-10.9	11-11.9	12-12.9	13-15.9	16+
Text	83913	83914	83915	83916	83917	97479	97480	97481	97547	97548	97549	97550	97551

## Random Rectangles - Results

What is your BEST GUESS for the average area of the rectangles?

What is the average area of five (5) REPRESENTATIVE rectangles?

What is the average area of five (5) RANDOM rectangles?

What is the average area of ALL (15-20) RANDOM rectangles?

## Birthday Problem

How many people do you need to have a 99% chance of two having a birthday?

Start this poll to accept responses

Number of People	Percentage
23	4%
41	4%
57	17%
94	4%
122	4%
182	8%
260	13%
364	46%

Total Results: 24

## PPV - ELISA

ELISA: What is the Positive Predictive Value?

Start this poll to accept responses

PPV Value	Percentage
99%	6%
95%	28%
90%	50%
83%	17%
50%	0%
16%	0%

Total Results: 18

## Propose an Experiment

What experiment would you like to conduct?

Start this poll to accept responses

- "You could bring in a bunch of pizzas and then let everybody eat the pizzas and see who ate the most or whatever." 4 months ago
- "facebook friends and social status" 4 months ago
- "gpa of villanova undergrads who exercise regularly and those don't" 4 months ago
- "amount of sleep and gpa" 4 months ago
- "drinking and the effects it has on school work" 4 months ago

## Other Uses

- Surveys
  - Basketball game absence
  - Online homework preferences
  - Likelihood of taking second course
- CLT – proportion, uniform, geometric

## PE vs. Clickers: A Novice View

	Poll Everywhere	Clickers
Cost	Free for small classes, 1/3(?) large (univ), Texting cost? (stud)	\$10-55/unit (stud), hardware (univ)
Hardware	None	Required
Internet	Necessary	Not Necessary
Reception	Internet Deadspots	? Receiver Deadspots
#char/response	10	1-2
Access	% w/o cellphone?	% w/o clickers?
Cheating	Share cellphone?	Share clicker?
Record Q Result	PE Account	? Screenshot
Anonymity	Toggle Unknown	Toggle by Q
On The Fly....	Create Question	Questionless

## PE vs. Clickers: A Novice View II

	Poll Everywhere	Clickers
Question Types	Multiple Choice Open-ended	Multiple (5) Choice ? Some have more
Answer Types	Alphanumeric	? Clicker-dependent
Records Answers	Yes	? Yes
CMS Integration	Unknown	Supported
Results	Online or Powerpoint	<b>Barchart</b> in any Presentation
Proximity (online courses)	PolleVERYWHERE Twitter / Web Options	Satellite Polling web>clicker
Multiple Qs	Yes	? Some
Clicker Tests	Cumbersome	Some
???		?

## PE in My Classroom

- Student Reaction
  - Poll Everywhere *Enjoyment*: 4.8 / 5
  - Poll Everywhere *Learning*: 4.2 / 5
- Professor Reaction
  - Students loved using it...so I did too!
  - No startup cost/hardware was huge benefit
  - Was great for saving results of simulations
  - Want to experiment with integrating student records
  - Want to experiment with clickers

## Summary

- Poll Everywhere
  - Great tool to start learning about PRS
  - Good for occasional classroom use
  - Good for presentations
  - Useful for online courses
  - Less burden of cost on student
- Clickers
  - Useful for frequent use
  - Useful for student tracking
  - Burden of cost typically on student

## Resources

- Formative Assessment Theory
  - Black & William, *Inside the Black Box: Raising Standards Through Classroom Assessment*.
  - *Assessment Methods in Statistical Education: An International Perspective*. By Bidgood, Hunt, and Joliffe. Wiley.
- Databases in Clicker Questions
  - <http://mathquest.carroll.edu/resources.htm>
  - <http://www.ou.edu/statsclickers/clickerQuestions.htm>
    - Includes misconceptions
  - Publishers
- Effectiveness
  - Search ICOTS, IASE, JSE, SERJ
  - See providers websites



- This presentation will be posted on my website: <http://homepage.villanova.edu/michael.posner>
- If you have any feedback, please let me know
- **Conflict of Interest Disclaimer**: I have no financial or other affiliation with any of these companies