|  |  |
| --- | --- |
| NAME: \_\_\_\_\_\_\_\_\_\_\_\_\_ | **Stats** |
| Sample Size | **DATE: Friday, March 24, 2017** |

Article:

What percent of voters do you think:

* Approve of Obama?
* Who do you think supports Obama more – Males or Females?
* How many people do you think you would need to ask (sample size) so that you could know pretty close to what the entire country thinks about Obama?

Read article online:

1. What percent of voters approve of Obama? Using the margin of error - what is the window that this is likely in?
2. Break it down by race, age, other things - what are some interesting insights (list 3).
3. How was this survey conducted and how many people did they ask?

The population of the US is 319 million and this survey was 1000 people – do you think this is a realistic estimate of the whole country. It would be nice, but obviously impossible to actually ask every single voter. Luckily with the practice of statistics, we don’t need to. We just need to survey a small number of them.

The bag is full of over 20,000 beans and kernels. The beans represent AntiTrump view, the kernels represent ProTrump view.

With a partner, take a handful of beans and kernels. And count the number of each. We want you to survey around 200 people. Keep track of your count below:

|  |  |
| --- | --- |
| Anti-Trump supporters (beans) | Pro Trump supporters(kernels) |
|  |  |

1. Based on your survey:

|  |  |  |  |
| --- | --- | --- | --- |
|  | Anti | Pro | Total |
| Supporters |  |  |  |
| Percentages |  |  |  |

2. Team up with 1 other group, total your results and put that below:

|  |  |  |  |
| --- | --- | --- | --- |
|  | Anti | Pro | Total |
| Supporters |  |  |  |
| Percentages |  |  |  |

3. As a class, lets find the total and put that below:

|  |  |  |  |
| --- | --- | --- | --- |
|  | Anti | Pro | Total |
| Supporters |  |  |  |
| Percentages |  |  |  |

### FORMULAS TO CALCULATE SAMPLE SIZE AND CONFIDENCE INTERVAL

* **Z** is the Z-Score (A number based on how confident in our answer we want to be. Z scores you need to know:
  + 90% confident = 1.64
  + 95% confident = 1.96
  + 99% confident = 2.57

|  |  |
| --- | --- |
| To find how large a sample you need to survey: | To find confidence interval after survey: |
| Find Sample Size(n).   |  | | --- | | For large populations | |  |   Where:   * **E** is the margin of error. It’s the plus-or-minus figure you see in newspapers to give yourself some room where the exact answer is. (So if we want to be within 5% of the correct answer, E is .05) | Find Confidence Interval(E).   |  | | --- | | For large populations | |  |   Where:   * **p** is the proportion in your survey who said one result * **n** is the sample size. This is the size of your sample. |

Activities:1. Find the sample size necessary for the following and show work:

|  |  |
| --- | --- |
| We want to be 95% confident that we are within 3% of the actual result. How many people should we survey? | We want to be 99% confident that we are within 3% of the actual result; our population is really large. How many people should we survey? |
| We want to survey Deering HS. We want to be 90% accurate and be within 7%. How many people should we survey? | We want to survey voters in Portland, Maine. We want to be 95% accurate and be within 5%. How many people should we survey? |

2. Find the confidence interval:

|  |  |
| --- | --- |
| We took a survey of the USA. Our survey was 1200 people. We asked if they approve of Obama –54% said they did. We want to be 95% sure of what the entire country thinks: What is our margin of error? | We took a survey in Portland. Our survey was 2000 . We asked if they like Deering, 72% said yes. We want to be 99% sure of what the entire city thinks – create a window below. |
| We surveyed Deering by asking 150 kids if they liked Mr Borland. 85% said they did not like him. We want to be 95% sure of what the entire school thinks: What is our margin of error? | We surveyed Deering HS by asking 150 kids if they want better food in cafeteria. 91% said yes. We want to be 90% accurate of what the entire school thinks – create a window below. |