

Statistics Activity 1

Name _____

Class/Period _____

Date _____

Objectives: Students will be able to:

- 1) Describe and practice data collection methods
- 2) Understand difference between sample and population.
- 3) Understand the effect of sample size on confidence of prediction for population statistic.
- 4) Understand that it is more appropriate to predict a population statistic falls within a range of values than is one fixed value.
- 5) Practice displaying results on a dot plot/bar graph.

Materials:

Colored Bingo Chips
Paper Bags
Graph Paper
SPSS/Excel/ or other statistical program

Directions:

- 1) Have students/participants work in pairs. Each pair will be handed a bag filled with a collection of 30 bingo chips. Each bag will contain exactly 6 red chips and 24 chips of a different color. In each pair, one person will draw chips and one person will record the results.
- 2) Pairs will be asked to draw 10 chips from the bag and record the number of the red chips that are drawn and record the number on their response sheet.

ASK Pairs: What PERCENT of the chips in the bag do you think are red? How sure are you of this? What would make you more sure? [[Students should have different responses, but note that drawing more times would make them more sure or confident in their response]]

- 3) Ask pairs to repeat the step above for 14 more trials and record their results in the table given.
- 4) After everyone has completed the activity, a discussion will follow.

Questions to ask: What percentage of chips in the bag do you think are red?

Comment [DW1]: Somewhere around 15-20%

Are you completely confident it is 20% and not 19%?

Comment [DW2]: Elicit from students that a range is more appropriate than an exact value.

Would this method work if I opened the bag and only picked no red chips every time? What about our method of collecting data made us more confident in our result?

Comment [DW3]: Random selection

Now tell students that each bag contains chips randomly selected from a larger population of chips. Have one student in the group graph a dot plot of their results on the paper given and one person come up to enter their results in the statistical program projected in the front of the room which should display a bar graph of all of the results.

Are you more confident about the prediction made from the results of your sampling or from what you see shown on the computer?

Comment [DW4]: Should be more confident about their prediction

Key points to come out of the discussion:

1. One can make conclusions from the sample of 15 trials, however there are most likely outliers which make one question the results. Having all x trials shown together show a distribution which peaks at likely population parameter.
2. This activity worked because all bags had a representative sample of chips. If the chips in each bag were not representative, then the results would not be accurate.
3. One is never sure about the actual value for the population, we can only make estimates based on what we know from sampling.

Note: DO NOT encourage people to count how many chips are in the bag. One is rarely sure of population size in actual application.

Group # _____

Names _____

Date _____

Statistics Activity 1

- 1) Choose a role from the list below and place your name next to the responsibility.

Task	Name
Draw Chips/ Create Dot Plot	
Recorder	

- 2) Draw 10 chips and record the number of them that are red in the "Number of Red Chips" column.

Draw Number	Number of Red Chips
1	

- 3) What percentage of chips in the bag do you think are red? Why?

- 4) Repeat the above activity 14 more trials. Record the results in the table below.

Draw Number	Number of Red Chips
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	

5) What percentage of chips in the bag do you think are red? Why?

6) Draw a dot plot which represents your results with the horizontal axis representing the number of red chips and the vertical axis representing the frequency.