Ideas of collection, analysis, and reporting

Remember: Descriptive statistics offer insight into society.

Asking A Statistical Question

* Identify Subgroups
* A Problem:
  + “I wonder if group “A” is different from group “B” from the data at the school census data base.”
  + I wonder if there is a difference between ,,,”
  + I wonder if there is a difference in cell phone use between ….
* The Population
  + Must be included in Question
* Identify Variables
  + From the available data set what variables will be used to answer the problem (eg. census at school)
* Data Types
  + Discrete and Continuous
* Census at School
  + Groups available | Variables available |

A Bad Question: How many apple trees are there in Syracuse NY?

A Bad Question: How many apple trees are over 150g in weight?

A Good Question: I wonder if there are differences in \_\_\_\_\_\_\_\_ between \_\_\_\_\_\_ and \_\_\_\_\_\_\_ from the \_\_(Source)\_\_\_?”

**Are the heights of Kasson Road boys, Grade 9, greater than the heights of Kasson Road, Grade 9, girls?'**

**'I wonder if heights of Kasson Road, Grade 9, boys tend to be greater than heights of Kasson Road, Grade 9, girls.'**

How to Write Your Statistical Question

Step 1: Choose a topic you want to survey people with.

Step 2: Create three different kinds of questions on your chosen topic

* What do you EXACTLY need to know
* What ADDITIONAL information do you need to know

Step 3: Keep it simple

* Yes or No (Behavior not Attitude)
* Rating Scale
* Open Ended (Quantities Information)

How To Analyze

1. Define the following (in **BOTH** words and numbers):
   1. Population
   2. Sample
   3. Parameter
   4. Statistic
2. How did you come up with your sample? How did you deal with sampling and non-sampling errors that we have discussed in class? Is this truly a “random sample?”
3. Summarize your survey responses in a way that is meaningful and informative.
4. This analysis report should include:
   1. 95% and 80% Confidence interval from the original sample, and the 95% Confidence interval based on the second sample.
   2. Do these intervals include the parameter? Why would they not?
   3. What happened as you changed the confidence?
   4. What happened as you changed the sample size?
   5. An interpretation of that interval.

Random Ideas that need to be written as a Statistics Question:

* Measure the amount of time it takes for a small birthday candle to burn. Graph height vs. time or weight vs. time.
* Collect shoe sizes from students and see if there is a relation between height and shoe size.
* Record the temperature as a function of time as some material cools or heats and graph temperature as a function of time.
* Take a super ball and bounce it from various heights and see how high it bounces back. Graph the bounce distance vs. drop height.
* Purchase several one and a half volt batteries and place a bulb in a circuit or use a flash light and record the voltage over time. Graph the results for various brands of batteries.
* Record the temperature during the day (or a 24 hr period) and graph it.
* Record your heart rate at rest, walking, running, etc. and graph it.
* Can the heartbeat of a cow, pig, dog, cat, bird, etc. be measured and graphed as a function of the size of the animal?
* Graph the shadow of a pole on a sunny day and record the shadow length as a function of time.
* Have a student take a bicycle on a track or sidewalk and place several students with stop watches at equal distances along the path the bicycle will take. Record the distance the bike moved and the time it takes the rider to pass each stop watch position and graph the results.
* Collect data from the almanac such as average speed of the Indy 500 over the years, or population growth, or defense spending, etc. Might make a pie chart of the school budget. Research could be done and a nice report could be generated.
* Could you determine how long a sucker will last? Ice-cream cone?
* Graph the momentum as a function of velocity. Momentum = Mass times Velocity
* Will there be a white Christmas this year?
* An attitude survey
* Would you rather
* Average Salaries
* Number of unmarried woman
* Winning Olympic times in a particular sporting event (Men and Woman)
* Number of items carrying on your person
* Number of letters in names
* Total number of consonants
* Number of words you can think of in 30 seconds (Scrabble tiles, tweek parameters)