MAP 4CI – CLA with business focus on statistics

<u>Day 3 – What to do with Primary Data</u>

<u>Minds On</u>
Class case study – Have the students read the case on pg. 224 "Women in the Workforce" Go through the questions on pg. 223 together as a class to look at issues discussed the previous day. Let the students respond to the reflection questions at the bottom of the page to hand in on their own.

<u>Lesson</u>
The Goal
- Once research is collected
- Analyze to find patterns
- Analyze to find connections (Correlations)
- Find the cause of these correlations (causality)

Finding patterns
- Create a list of each respondents answers
- Database
- Use Excel
- Number off possible choices for each question
- Categorize open ended questions
- Categorize observed responses

- Compare the answers in different categories using "countif" statements or putting the data filter on
- One variable analysis can be used to find averages or percents or totals.

- Compare the correlation between different categories (you will need questions that have numerical value)

- Two or more variable analysis can be done using the chart wizard icon and the skills learned previously in the course. Remember to use pg. 166 in the text as a guide for entering data and creating a scatter plot.

What is correlation?
- indicates the strength and direction of a linear relationship between two random variables
- Do the two variables appear to have a relationship or an effect on each other? Eg. As one variable increases does the other also increase or decrease?
- Eg. Grade vs. Average total spent on lunch

Correlation vs. Causality
- Correlation does NOT mean causality
- Causality is the cause of an event
- Just because B happened after A does not mean A caused B to happen

Example of false causality
- Example
- Hot weather may cause both crime and ice-cream purchases.
- Therefore crime is correlated with ice-cream purchases.
- But crime does not cause ice-cream purchases
- ice-cream purchases do not cause crime

How do we find causality?

- More advanced statistical analysis
- Well designed and probing research
- Secondary research
- Multiple primary studies
- Educated guesses – can be wrong a lot

Pitfalls and Traps in Stats
- Errors in method
- Sample too small
- Sample too large
- Lack of replication

Problems with interpretation
- Accuracy/precision
- Universality
- Assumptions
- Interpreters bias
- False causation
- Lack of causation

Graphing
- Visual representation of the results
- Pie graphs – one variable
- Shows percentages that make up a total – one variable
- Bar graphs – one variable
- Line graph – one variable
- Scatter plots – two variable

To try…

Super quick survey
1. Are you ___ male ___ female?

2. How tall are you? _____

3. Do you enjoy watching soap operas?
 ___ Yes   ___ No

4. What religion are you? _____

5. Do you think violence in sports is appropriate?
___ Always   ___ Sometimes ___ Rarely   ___ Never

6. What would you rather do on a Saturday night?
___ movie   ___ club   ___ house party ___ stay at home with friend(s)

7. How many fruits and/or vegetables do you eat in a day usually?
___0 ___1 ___2 ___3 ___4   ___5 ___6 ___7 ___8 ___9

E-mail your answers to your teacher!

Demonstrate how to use a "countif" and data filters using excel with excel demonstration page.

__Consolidation__
On the sample survey, identify all of the biased questions and rewrite them to eliminate any bias. Identify two questions that could be used to see if there is a correlation and predict what the correlation might be.