



WARREN EASTON SENIOR HIGH SCHOOL

3019 Canal Street, New Orleans, Louisiana 70119

Advanced Placement® Statistics

INSTRUCTOR: Ms. M. C. Williams

COURSE SECTION: _____

OFFICE: Room 200

MEETING PLACE: Room 200

OFFICE HOURS: 3:30 – 5:00 Tues/Thurs

OFFICE PHONE: 504-324-7435

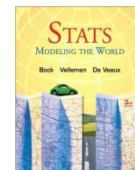
E-MAIL ADDRESS:

Statistics is the art of *thinking* about a problem, *showing* the math of the statistics, and *telling* what the results are. Communication of the results is just as important as accurate calculation of the results. As such, there will be a great deal of writing in this course.

Calculator: A calculator with statistical capability is **required** for this course. It is strongly recommended you have a TI 84+ calculator (but if you already have a TI 83, that’s ok). The book will teach you how to use a TI-83+/84 calculator to assist you in your statistical endeavors.

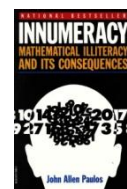


Textbook: Bock, David E., Paul F. Velleman and Richard D. DeVeaux. *Stats: Modeling the World (3rd Edition* Boston: Pearson/Addison-Wesley, 2010



Students have access to a classroom set of Dell laptop computers to complete statistics computer assignments. MyStatLab, and StudyIsland are the computer programs used to complete computer practice assignments. Various applets on the internet will be used throughout the course.

Summer Reading: Innumeracy by John Allen Paulos – Students are instructed to read this book with a short answer and essay question assignment which is due on the first day of class.



Introduction

AP Statistics is a very dynamic class. It changes one’s view of the world on a daily basis. Be forewarned, however...statistics will invade your life! If you do not want to think about statistics at the most inopportune moments for at least the next five years, don’t take this class! Statistics are everywhere in our culture: newspaper and magazine articles, election polls, engineering, bags of M & M’s, medical studies, and the practice of law. Assignments are always tied to real world data, and class time often includes interactive experiments and activities. The goal of the class is to teach you to collect data and analyze data in a meaningful way. As statisticians, we get to play in everyone else’s sandbox! As

students, you are encouraged to explore statistics in class and in the world, and discuss your findings with your classmates and teacher.

Student Evaluation

In order to help students and the instructor keep a vision focused on student learning of each unit of study, all assessment is sorted by unit. A typical grade break-down is:

<u>First Semester</u>		<u>Second Semester</u>	
20%	Unit I	20%	Unit V
20%	Unit II	20%	Unit VI
20%	Unit III	20%	Unit VII
20%	Unit IV	20%	Final Project
20%	Exam	20%	Exam
100%	TOTAL	100%	TOTAL

Students are highly encouraged to take the AP exam. Given the high quality of the test, students are encouraged to immerse themselves in old test questions and to give the exam a good effort. Students are also reminded that high-stakes exams are common in college, so taking an AP exam is a good way to practice for important cumulative exams.

Students are assigned and expected to complete required reading in the textbook. Classroom lessons will be regularly supplemented with activities, investigations, discussion, demonstrations, presentations, and analysis of written and verbal communication regarding statistical analysis. To demonstrate proficiency with respect to accuracy and communication of statistical concepts, students will be required on ALL course submissions, to effectively communicate how methods, results, and interpretation of data for any given experiment is valid. Writing complete responses using appropriate assumptions, methodologies, statistical terminology and vocabulary, interpretations, and justifications are an essential component of ALL course submissions. Form and technical accuracy are enforced; students are expected to demonstrate critical connections between analysis and conclusions of all statistical design experiments. This applies to all homework assignments, activity write-ups, investigations and experiments, projects, reports and exams as well as verbal communication in the context of class discussion.

Teaching Strategies

- Students shall complete outlines of each chapter to encourage the reading and help them draw meaning.
- Every other week, students read current news articles that contain statistics and/or statistical issues and summarize them. These summaries are discussed in class.
- Data is frequently collected from the class. On the first day of class, students fill out a short questionnaire. The data collected is used throughout the first unit. Many topics are introduced by asking students to provide simple data about themselves and this data is used to open the day's lesson.
- Students use graphing calculators throughout the course. The TI Presenter is used to assist students in learning the calculator.
- The final project after the exam.
- When learning inference, students will do confidence intervals and hypothesis tests on a template sheet. This sheet will walk them through the steps for inference: name, hypotheses (tests only), check of conditions, formulas and math work, and conclusion. Students use this template throughout the inference units and even on many of assessments. During review time for the exam, students are weaned from the template, but by this time the steps for inference are automatic.
- Bock, Velleman, and DeVaux includes many exercises which the student is expected to complete as homework.
- *Activity Based Statistics* shall be used for cooperative group work.
- Students will complete many Investigative Tasks which utilize the concepts from the coursework. These tasks will help them synthesize their learning and apply them to a particular data set.
- Participation cards are used in class to encourage active learning. When students participate in any class activity (answer questions, offering solutions, doing work on the board, etc.) that student (along with any student that helped them with the answer!) hands me a card with their name on it. These cards are then tabulated as a part of the students' grade.
- Free Response questions from past AP Exams will be used liberally so the student is accustomed to the types of questions asked and the nature of the analyses they will be making.
- Saturday test preparation sessions are held from January through May.

Course Resources

This course will cover the AP Statistics course description primarily through the use of these resources:

Bock, David E., Craine, William B. III. *Printed Test Bank and Resource Guide*. Boston: Pearson/Addison-Wesley, 2007

Bock, David E., Paul F. Velleman and Richard D. DeVeaux. *Stats: Modeling the World 3E*. Boston: Pearson/Addison-Wesley, 2010. Replacement Cost: \$105

College Board. *AP Statistics Free Response Problems*. New Jersey: College Board, 2006.

Peck, Roxy, Chris Olsen and Jay Devore. *Introduction to Statistics and Data Analysis*. Belmont: Brooks/Cole—Thomson Learning, 2004.

Scheaffer, Richard L., Ann Watkins, Mrudulla Gnanadesikan and Jeffrey A. Witmer. *Activity Based Statistics*. New York: Springer-Verlag, 1996.

Sternstein, Martin. *AP Statistics – 6th Edition*. Happague: Barron's Educational Series, Inc. 2012

Sternstein, Martin. *AP Statistics Flash Cards*. Happague: Barron's Educational Series, Inc. 2010

Yates, Daniel S., David S. Moore and Daren S. Starnes. *The Practice of Statistics*. New York: W. H. Freeman, 2003.

Additional Resources used by the Instructor

Web Sites Used:

- Guess my correlation applet:
<http://istics.net/stat/correlations/>
- Least squares regression demonstration:
http://www.dynamicgeometry.com/javasketchpad/gallery/pages/least_squares.php
- Linear regression influential point applet
<http://www.math.csusb.edu/faculty/stanton/m262/regress/regress.html>
- Type I and II and power applet:
http://wise.cgu.edu/power/power_applet.html
- Exploring Data
<http://exploringdata.cqu.edu.au/>
- MyStatLab
<http://www.coursecompass.com>

Rules and Policies

Policies:

- All school rules apply! This includes dress code, wearing your ID, and conducting yourself appropriately.
- If you are absent, it is YOUR responsibility to find out what you missed from the web or from your classmates.
- Late work WILL NOT BE ACCEPTED.
- If you are absent, you have 2 calendar days, not 2 class periods, to make up your missing work, including exams. After that, the assignment remains a zero. It is your responsibility to make arrangements: do not delay!

Rules:

1. **Work hard**. Practice is the key to success in mathematics of all types. Always try. You learn more by making mistakes than you do by skipping it altogether. Don't make excuses.
2. **Be nice** in all possible ways. Be respectful to others and to yourself. Don't gossip. If it isn't yours, don't touch it. Keep your hands to yourself. Understand that each individual is unique, and just because you don't agree with it, that doesn't mean it's wrong. If you aren't going to pay attention, don't disturb others. Don't make excuses.
3. **Be On Time**. Passing period exists so you can get to your next class and be ready at the bell. It is not intended to be a social event. Make good choices – if there isn't enough time to go to your locker and take care of your personal business, then take your supplies to your previous class and skip the locker. Don't make excuses.
4. **Say what you mean**. You are on the verge of entering the working world on a full-time basis. Practice governing your speech NOW. If you don't agree with something, say you don't agree with it. Don't say "that's stupid" or "that's gay." Don't make excuses.
5. **Absolutely no passes out of class**. Take care of your personal business before you get here. Your boss at your job is not going to allow you to take care of your personal business like breakfast, reading the paper, makeup, and socializing with your friends once you have punched in on the time clock. Don't make excuses.
6. **Don't Make Excuses**.

UNIT I: Exploring and Understanding Data

Using real data sets, you will analyze center and spread. The center of the data gives us information about how something *usually* is. The spread tells us just how ‘off the mark’ things can get. For example, the average and median grades for an exam can tell teachers whether the exam is too easy or too hard. If the spread is very large, however, it can tell teachers that perhaps the teaching process itself was ineffective.

UNIT II: Exploring Relationships between Variables

Using real data sets, you will determine whether the relationship between variables indicates an associative or causal relationship. For example, does smoking *cause* lung cancer, or is there merely a higher incidence rate among smokers due to some other common factor?

UNIT III: Gathering Data

You will analyze the techniques used to gather data, and judge whether they are “fair” or “biased”. This section will include a hands-on project where you will design and administer a survey. We will analyze the results throughout the rest of the year.

UNIT IV: Randomness and Probability

One thing is certain: in life, *something* will happen. We often rely upon the “Law of Averages” to determine just how often. In this section, you will prove there is *no* “Law of Averages.” Instead, you will determine the statistical probability that a particular event will happen. The results may surprise you!

UNIT V: From the Data at Hand to the World at Large: aka Inference

You’ve got the data and you’ve analyzed for center and spread. Now what? Using real data sets, you will learn how to apply your results to the world at large. What do those numbers really *mean*? How can I use this information to make decisions?

SEMESTER ONE

Unit I: Exploring and Understanding Data

BVD Chapters: 1-6

Time Frame: First 5 weeks of school

College Board Topics Covered: IA, IB, IC, IE, IIIC

Week 1

BVD Chapter	Topic	Activities/Assessment
1	Stats Starts Here	Getting to Know the Class <i>ABS</i> M&M Dot Plots (color frequency analysis) Race and the Death Penalty
2	Data	
3	Displaying and Describing Categorical Data	
3	Independence: more than just a day in July	

Week 2

BVD Chapter	Topic	Activities/Assessment
4	Displaying and Describing Quantitative Data (Use the statistical features of Microsoft Excel and the TI-84 to create graphs of Getting to Know the Class surveys)	Getting to Know the Class <i>ABS</i> V is for Variation <i>ABS</i> Quiz on Chapter 4

Week 3

BVD Chapter	Topic	Activities/Assessment
5	Understanding and Comparing Distributions	Matching Statistics to Plots <i>ABS</i> (use TI-84 to create boxplots) Quiz on outlier rule and describing/comparing quantitative data <i>RG</i> Investigative Task: Auto Safety <i>RG</i> Free Response problems: 1997 #1, 2000 #3, 2001 #1, 2002 Form B #5, 2004 #1, 2006 #1, 2007 Form B #1, 2008 #1, 2009 Form B #1, 2011 #1 & 2
5	Outliers	

Week 4

BVD Chapter	Topic	Activities/Assessment
6	The normal distribution (Use TI-84 to calculate Normal percentages)	Playing the percentages: what do a z-score, percentile score, and data value have in common?
6	The effect of linear transformations to data sets on summary statistics	Lost in Translation: using your TI-84 to translate between z-scores, percentiles, and data values. Area under the "Normal" curve

Week 5

BVD Chapter	Topic	Activities/Assessment
1 - 6	Review and assessment of Unit I	Unit one vocabulary crossword Project One: Collect data, graph it and describe it (details following Course Planner) Unit I Assessment

Unit II: Regression

BVD Chapters: 7-10

Time Frame: Weeks 6-9

College Board Topics Covered: ID

Week 6

BVD Chapter	Topic	Activities/Assessment
7	Displaying and describing scatter plots	Matching Descriptions to Scatter plots <i>ABS</i>
7	Analyzing two-variable quantitative data using correlation and the coefficient of determination	Guess my correlation applet. Using TI-84 to create scatterplots Quiz on describing scatter plots <i>RG</i>

Week 7

BVD Chapter	Topic	Activities/Assessment
8	Analyzing two-variable quantitative data using least-squares regression	Models, Models, Models... <i>ABS</i> (use TI-84 calculators and computers to write equations of curves that best model data) Smoking: Cigarette Consumption and Coronary Heart Disease
8	Slope and y-intercept of a regression line	

Week 8

BVD Chapter	Topic	Activities/Assessment
8	Residuals and residual plots regression (Use TI-84 plot regression lines and residual plots)	Mega-quiz: regression (after chapter 8) The Wandering Point <i>RG</i> Unit two vocabulary crossword Free Response problems: 1998 #4, 1999 #1, 2002 #4, 2002 Form B #1, 2003 Form B #1, 2005 #3, 2007 Form B #4
9	Outliers and influential points	

Week 9

BVD Chapter	Topic	Activities/Assessment
10	Transformations to achieve linearity	Free Response problems: 1997 #6, 2004 Form B #1 Unit II Assessment
7 – 10	Review of Scatter plots and Regression	

Unit III: Collecting Data

BVD Chapters: 12-13

Time Frame: Weeks 10-13

College Board Topics Covered: IIA, IIB, IIC, IID

Week 10

BVD Chapter	Topic	Activities/Assessment
11	Simulations and Random Numbers	Do iPods really shuffle randomly? Free Response Problems: 1998 #6 a,b,c, 2001 #3
BVD Chapter	Topic	Activities/Assessment
12	Transformations to achieve linearity	How to Ask Questions: Designing a Survey <i>ABS</i> Project Two: Bias Project (details following Course Planner)
12	Bias in Surveys	
12	Randomization and representative samples	

Week 11

BVD Chapter	Topic	Activities/Assessment
13	Observational studies, including longitudinal, prospective, retrospective	Random Rectangles <i>ABS</i> Stringing Students Along <i>ABS</i>
13	Experimental design, including random assignment of treatment, control, placebo & blinding, replication	Investigative Task: Backhoes & Forklifts <i>RG</i>

Week 12

BVD Chapter	Topic	Activities/Assessment
13	Confounding and lurking variables	Unit three vocabulary crossword
	Intro to Statistically Significant Difference	Free Response problems: 1997 #2, 1999#3, 2001 #4, 2002 #2, 2002 Form B #3, 2003 #4
11 - 13	Review of Collecting Data	Group Project: TBA Unit III Assessment

Unit IV: Probability

BVD Chapters: 14-18

Time Frame: Weeks 13-16, and the first two weeks of second semester

College Board Topics Covered: IIIA, IIIB, IIIC

Week 13

BVD Chapter	Topic	Activities/Assessment
14	Basic probability principles including complement, independence and mutually exclusive	Home-made dice and the data they produce: the law of large numbers The Law of Averages <i>ABS</i>

Week 14

BVD Chapter	Topic	Activities/Assessment
15	Addition, multiplication and conditional probability	Free Response problem: 1999 #5, 2003 Form B #2, 2004 #3, What is Random Behavior? <i>ABS</i> Probability Quiz

Week 15

BVD Chapter	Topic	Activities/Assessment
16	Random variables	The Lazy Student <i>ABS</i>
16	Expected Value and Standard Deviation	Unit four vocabulary crossword
16	Transforming and Combining Random Variables	Scrambled probability worksheets Free Response problems: 2001 #2, 2002 Form B #2, 2004 #4, 2005 Form B #2, 2008 #3 Assessment of Probability (Ch 14-16)

Week 16

BVD Chapter	Topic	Activities/Assessment
16	Simulating probability scenarios	Group Project Presentations Investigative Task: ESP _{RG} Free Response problems: 2001 #3, 2004 #4, 2008 #3

Week 17

BVD Chapter	Topic	Activities/Assessment
17	Bernoulli Trials	Waiting for Sammy Sosa _{ABS}
17	Geometric Distributions	Counting Successes _{ABS}
17	Binomial Distributions	Streaky Behavior _{ABS} (students will use TI-84 calculator to learn to use PDF and CDF functions to develop conditions for the normal approximation to the binomial distribution) Quiz

Week 18:

BVD Chapter	Topic	Activities/Assessment
1-17	Sampling Distributions	Review for Semester Exam
1-17	The Course So Far	Summative Assessment

SEMESTER TWO

Unit V: Inference for Proportions

BVD Chapters: 18-22

Time Frame: Weeks 1-5

College Board Topics Covered: IID (1, 3, 4, 6), IVA (1-5), IVB (1-3)

Week 1

BVD Chapter	Topic	Activities/Assessment
18	Sampling Distributions and the Central Limit Theorem	Spinning Pennies <i>ABS</i> Investigative Task: Simulated Coins <i>RG</i> Assessment on Sampling Distributions (Students will use TI-84 to develop rules for mean and variance of independent random variables and probability distributions)

Week 2

BVD Chapter	Topic	Activities/Assessment
19	Confidence Intervals for One Proportion	How Accurate are the Polls? <i>ABS</i> Interpreting confidence intervals in print media. Quiz on confidence intervals

Week 3

BVD Chapter	Topic	Activities/Assessment
20	Hypothesis Testing for One Proportion	Quiz on tests and intervals
20	Interpreting the results: The view from the grassy null.	Project: TBA

Week 4

BVD Chapter	Topic	Activities/Assessment
21	Type I and II errors	Investigative Task: Life after High School <i>RG</i>
21	Power.	Using Type I and Type II power applet Quiz on sampling distributions for proportions, one-proportion hypothesis testing Free Response Problems: 2003 #2, 2009 #5

Week 5

BVD Chapter	Topic	Activities/Assessment
22	Intervals and Hypotheses testing for two proportions: POOLING!	Unit V vocabulary crossword
		Unit V Assessment

Unit VI: Inference for Means

BVD Chapters: 23-25

Time Frame: Weeks 6-8

Week 6

BVD Chapter	Topic	Activities/Assessment
23	Confidence intervals and hypothesis tests for one mean	Investigative Task: SAT Performance <i>RG</i> Quiz on t-procedures Free Response Problems: 2007 #3

Week 7

BVD Chapter	Topic	Activities/Assessment
24	Confidence intervals and hypothesis testing for two means	Unit six vocabulary crossword Free Response Problems:

Week 8

BVD Chapter	Topic	Activities/Assessment
25	Confidence intervals and hypothesis testing for matched pairs means	Investigative Task: SAT Performance (Part II) <i>RG</i> Free Response Problems: 2000 #4, 2001 #5, Cumulative Unit VI exam

Unit VII: Inference for Counts and Slope

BVD Chapters: 26-27

Time Frame: Weeks 9-10

Week 9

BVD Chapter	Topic	Activities/Assessment
26	Chi-square goodness-of-fit	Investigative Task: 1997 AP Statistics Scores <i>RG</i>
26	Chi-square for homogeneity and for independence	

Week 10

BVD Chapter	Topic	Activities/Assessment
27	Confidence interval for slope	Unit seven vocabulary crossword
27	Hypothesis testing for slope	Unit VII exam (will include regression review questions)

Review for the Exam

Time Frame: Weeks 12-14

Assignments:

- Various book exercises
- Practice Free Response problems will be used extensively

Assessment:

- As we review the course, free response questions will be given as quizzes. Your free response scores will be accumulated to make a practice test score.
- A practice exam will be given on a **Saturday** prior to the AP Exam to prepare you for the environment. This exam will be scored similarly to the AP Exam to help prepare you for the real thing.

Cumulative Project

Time Frame: Weeks 15-18, after the AP Exam

Project One: Exploring Data

Objective: to describe data and graphs, as well as begin to think about data collection and sources of bias.

Page 1

1st paragraph: How and where you collected your data (collect at least 25 data points, data must be quantitative)

2nd paragraph: Do you think your data represents the population you were studying? Why or why not? What sources of bias do you think may have been present in your data collection?

3rd paragraph: By studying graphs of the data, what relationships can be observed? What do the graphs show? What conclusions can be drawn?

Page 1 must be typed.

Page 2 +

Graph your data.

- By hand, neatly, is fine. You may explore the statistical functions of Excel, as well.
- Make TWO different types of graphs for the quantitative data—histogram, boxplot, stemplot and/or dotplot

Project Two: Bias in Surveys

Purpose: To investigate how much different forms of bias can affect the results of a survey.

Project:

The project must be done in groups of one to four. You will turn in one poster per group. A brief oral presentation and poster will be required for each group. NO REPORT NEEDED!

Due Dates:

Proposal: The second week of November, exact date to be determined.

Poster: On your presentation date, between December 4th and December 15th.

Your group will be randomly assigned a presentation date. If your group is not ready and/or does not have 100% attendance on that date, you will be moved to a different date and receive a 20% penalty on your presentation grade.

Topic:

You will design a survey on an interesting topic of your choice, but you must design it so you can address ONE of the following questions:

- Is it possible to word a question in two different ways that are logically equivalent, but have much different responses?
- Do the characteristics of the interviewer affect responses?
- Does anonymity change the responses to sensitive questions?
- Does providing extra information affect the responses?

NOTE: You may choose another form of bias if you get special approval from the teacher.

You should compare at least 2 different groups. Usually this is a “control” question that is “normal” and unbiased and then a second group that is biased in a certain direction. Depending on your idea, you may choose to have 2 different biases—one that will tilt in one direction and one that will tilt in another direction. You will not be penalized if you do not succeed in creating a large bias.

Proposal:

1. -A definition of the population.
2. -A copy of your survey questions.
3. -A short description of how you will create bias and what direction you think the bias will swing.
4. -Where and how you will collect your data.

NOTE: Your sampling procedure should **not** be biased. Survey 50 people per question (50 unbiased, 50 for each bias)

Poster:

The poster should be completely summarize your project, yet be simple enough to be understood by a freshman. Remember the purpose of the project! It should be pleasing to the eye. It should include a one-page typed paper describing what you did. The colors on your graphs are crucial to communicating your bias: use a consistent color-key so the change can be easily spotted.

Points: 30 points: 10 for appearance, 10 for clear communication on graphs, 10 for report

Oral Presentation:

All group members need to participate equally. Your poster should be used as a visual aid. 5 minutes. To receive full credit for your presentation your group must speak clearly, with confidence and must do something to ENGAGE THE AUDIENCE. I leave it open-ended as to exactly what you tell us about what you did, but I absolutely insist that your presentation be clear, interesting and well-spoken (if you want full credit!). We do not have time for elaborate props/media set-up. Your task is to be engaging with your mouths, not by bringing in multi-media.

Points: 20 points: 10 for being engaging, 10 points for clear communication

CUMULATIVE PROJECT (five parts):

Report Proposal

- ❖ The question of investigation/curiosity:
- ❖ Population of interest:
- ❖ A brief description of how and where you are going to collect your data:

Difficulty/Interest Rating: _____ (to be completed by ME!)

I. Data Report (20 points)

This section should be a thorough explanation of how you collected your data and be a beautiful example of how much you've learned this year about the difficulties getting a representative sample. Examples of what you should include are:

- ❖ How you collected your data
- ❖ Why you are confident your sample matches your population
- ❖ Biases avoided and not avoided
- ❖ A copy of any survey that was filled out
- ❖ Your data: either in "Excel" format or in a table/matrix summary. You need at least 75 people/subjects for **each** group you want to compare. Your data should be broken up by any category you want to compare.

II. Exploring the Data (25 points)

- ❖ This section should be an outstanding example of exploratory data analysis (the first unit in our text). Graphs should show the comparisons between all relevant groups you are comparing. You should state any preliminary conclusions that can be drawn by using your eyeballs.
- ❖ Graphs of your data
- ❖ Statistics from your data
- ❖ Descriptions of the graphs and statistics.
- ❖ Extra Credit for using DataDesk!

III. Analyzing the Data (25 points)

Analyze your data using whatever method(s) is appropriate for your data. Your conclusion should be nicely written using all appropriate statistical support. Remember that confidence intervals can be a powerful method for comparing different groups.

- ❖ Hypothesis Test (with conditions checked) and/or
- ❖ Confidence Intervals (with conditions checked) and/or
- ❖ Regression
- ❖ Your Grand Conclusion!
- ❖ Extra Credit for DataDesk

IV. Presentation (20 points)

Must include:

- ❖ Clearly communicate your question and how you collected your data (5 pts.).
- ❖ Visually display graphs of your data—PowerPoint (if you must), overhead, poster, or video (5 pts.). I **do not** want a pretty poster that summarizes your whole project. I want you to make a visual aid that shows the class how your data came out. There should be only minimal text on your visual aid—titles and big numbers—not any explanations.
- ❖ Clearly communicate your conclusion (5 pts.).
- ❖ Be interesting to listen to and give us some sort of “hook” to inspire us to listen (5 pts.).
- ❖ Do **not** read off your visual aid—use note cards or your report. Be careful how you communicate numbers to the class—too many numbers at once is confusing, as is too many decimal places.

V. Success!? (15 points)

I will evaluate the overall success and difficulty of your project. More challenging data collection issues add to your score. Small sample sizes or an overly simple question will lower your score.

The Fine Print:

- ❖ Make your own copies of the data, etc. Once you turn in one part of your report, I need to keep it.
- ❖ Don't get lazy—this is to be the summation of what you've learned all year.
- ❖ Please type your paper. Hand-done work is acceptable for some graphs, etc if it is done very neatly.
- ❖ Your work should be thorough and nicely written. Bullet points can be used to delineate a list of observations. Clear communication and thorough analysis is necessary for full credit.