Figuring The Odds Using Statistics With Technology

Mary Jefferson

INTRODUCTION

Community Services School in the Houston Independent School District offers an alternative school program for qualifying students from early childhood to age twenty-one who are unable to attend a regular educational program due to a physical, mental, emotional need and are placed on the program by a court or a doctor. It has three components: Hospital, Homebound, and Agency. I teach in the Homebound division. Our students come from various schools across the Houston School District, other school districts, states, and countries. Actually, we service an international student population. HISD is the district a student attends when hospitalized regardless of place of origin. Students serviced this year in our Hospital program came from as far away as China, Africa, and Saudi Arabia and as close as or nearest neighbor Mexico. Out of the 2195 students enrolled in Community Services School Program for the year 2000-2001, approximately 25% were serviced by Homebound teachers.

Many of our students could be described as "at-risk." They suffer from prolonged illnesses. Their medications often lead to additional learning problems. Therefore, we must adapt our instruction for students preoccupied with their illnesses.

We are responsible for teaching students of various grade levels (6-12). Also, we must teach all content areas (English, History, Science, Math, etc.) for each student. Our problems are compounded by having a limited amount of time to spend with each student. Usually one hour per day four days per week. This is the minimum requirement according to TEA (Texas Education Agency). Therefore, we are unable to spend as much time on each subject as one would in a normal classroom. However, we have some advantages. All our instruction is done on a one on one basis. This provides each student with immediate feedback and numerous opportunities for individual participation. All homebound teachers have a Lap Top Computer and access to the TI 82 or 83 Calculators.

The study of probability and statistics is emphasized in the 8th grade Math classroom. I wish to create a self-paced module that will introduce students to the 8th grade TEKS (Texas Essential Knowledge and Skills) for probability and statistics. The unit will be designed for primary use in 8th grade Math classes, and Algebra classes. This unit will contain a wide variety of strategies and activities. Upon completion of the unit, students will have gained a better understanding of how statistics and probability impact their lives. The TEKS objectives for this unit are as follows:

(8.12) Probability and statistics. The student uses statistical procedures to describe data. The student is expected to:

(A) select the appropriate measure of central tendency to describe a set of data for a particular purpose;
(B) draw conclusions and make predictions by analyzing trends in scatter plots; and
(C) construct circle graphs, bar graphs, and histograms, with and without technology.

(8.13) Probability and statistics. The students evaluates predictions and conclusions based on statistical data. The student is expected to:
(A) evaluate methods of sampling to determine validity of an inference made from a set of data; and
(B) recognize misuses of graphical or numerical information and evaluate predictions and conclusions based on data analysis.

BACKGROUND

This unit focuses on the 8th grade TEKS (Texas Essential Knowledge and Skills) for statistics objectives (8.12). The student uses statistical procedures to describe data and (8.13). The student evaluates predictions and conclusions based on data analysis. This unit is designed for but not limited to 8th grade Math classes. It can be modified and used in Science, English, Social Study and other Mathematics classes.

Statistics is an integral part in the teaching of Mathematics. It explains the connections between real life occurrences and the world of numbers. The concept of statistics may be found both vertically and horizontally across the curriculum-from early childhood classes to Calculus-from Science to Economics. Since the study of statistics lends itself so easily to predicting and explaining both theoretical and real life situations, everyone should have some understanding of the subject.

The National Standards for Mathematics mandates statistics should be incorporated into the curriculum as early as possible. What three year old child could not infer after observing repeatedly being served a fruit and milk after naptime, could not predict that fruit and milk will be offered upon wakening from his nap? Or a 5th grader that could not predict from observing a repeating pattern of Blue and Red Balls (BBBR) could not predict the color of the 16th ball in a row of a 100 balls? Or a 10th grader that could not predict that when asked to divide a region into a maximum amount of cuts or sections could not predict the number of cuts or sections generated after 1, 3, 7, 16 cuts, etc.? Or an Economic student, that could not calculate how long it would take a municipality to spend $4,000,000,000, the amount of money Tropical Storm Allison havocked on the Houston area, June 2001? What I am saying is that we, as educators, must recognize that our students will be confronted with uncertainties in life and must have adequate knowledge, tools, and skills to make decisions that will yield the best possible outcomes with the minimum amount of consequences.

Statistics is a collection of procedures and principles for gaining and processing information. It is the collection, organization and interpretation of data. Statistics is found in many newspaper and magazine articles, advertisements, and in the media. Data is the driving force behind statistics. Without data, without numbers, there would be little need for statistics. Data is a group of numbers that gives information about a subject. In statistics, it refers to a collection of numbers or other pieces of information to which meaning has been attached. Two pieces of information are often taken on each subject (sample) such as length of ones arm span and the height of that person. Data is around us, for example, your height, weight, age, a city's population, its budget, and the number of accidents on highways, or at certain intersections. Data may be represented by percents, fractions, and ratios. Students will practice using all three methods by making statements about the data. For example, out of 284 students surveyed, 47% of them agreed that the length of the school day should be shortened. This survey's result was reported using percents. Conversions of fractions to decimals and percents will be reviewed. Students also need to know how to order and compare numbers. The size of a number is irrelevant until it is compared to another. Then it becomes small or large. Whenever in doubt about how to represent data, use rates because rates are actually two numbers – a number compared to another number as stated in Frechette's work.

Our students use data all the time to analyze situations and to make decisions in figuring the odds when faced with many uncertainties of life. Do I attend this university? Will I get the best education if I attend a magnet school or a traditional one? Should I date this guy? What if I don't take Pre-Calculus? To make the best decisions, students must have adequate and accurate information. In this unit, students will be given opportunity to collect data as well as to analyze and interpret data provided from various resources such as downloading information from the Internet, linking from calculators. Students will put the collected, tallied data into a form that is easy for people to understand. In this unit, students will use different models to organize and display data. The view screens on the TI-83's, monitors on computers, and the CBR will be used to display data during class discussions. Tables and Charts, Graphs, Pie Charts, Scatter Plots, Stem and Leaf Diagrams, and Histogram will be part of student activities for this teaching unit. Some of which will be discussed in the background section, others in the lesson activities.

The three most common ways to describe data are mean, median, and mode. The mean is the average of a set of data. It is found by adding all the numbers in the data set (sum) and dividing the sum by the total number of data points. The median is the middle number or number that has half of the points located above it and half of the points located below it. If the data set contains an even set of numbers, take the average of the two data points (numbers) in the middle to find the median. If the data set contains an odd number of data points, take the middle number as the median. However, the numbers must be ordered prior to finding the median. If one of more data points are far removed from the rest of the data points, then they are called outliers. Outliers can skew data results which can lead to erroneous conclusions, especially in research reporting. There is no universal

rule to determine what qualifies as outliers. Student activities should include opportunities to work with outliers. The third measure of central tendency, the mode, is occasionally useful. It is the value that appears most often in a list of data and there could be more than one mode in any given set of data. The mode is most useful when working with discrete (discontinuous) or categorical data. For example, if I would survey all the students in Community Services Alternative School for their preference of soft drinks and code them as Coke =1, Sprite = 2, Pepsi =3, Root Beer =4, Strawberry = 5, then the mode would be more practical in reporting the result of this survey than either the mean or the median.

In some of the lesson units, we will look at the variability of data. Variability addresses how spread out or close together the data points are. Are they clumped together? Are there any outliers? We will revisit the mean to see what impact outliers may have. The range is the value of the number that results by finding the difference between the smallest and the largest number. For example, if a set of data includes scores from 50 to 90, then the range is 40. The third kind of useful information about a set of data is known as its shape. From a graph of unorganized data, the shape can answer questions such as: What was the initial investment? Is the function increasing or decreasing? Does it appear to be linear, quadratic, or exponential? Is the data clumped together? Is the data skewed? Are there any outliers? At a glance, shapes can provide much useful information about data.

Utts suggests a "five-number summary" to summarize any long list of numbers. This set of five-numbers include the median, the upper and lower quartiles, and the lowest and highest data points. A useful summary of all data points are provided by using just these five numbers. They give some idea of the middle, the spread, and whether of not the values are clumped at one end or the other. It can be determined whether the numbers are spread about the center or skewed to the left or to he right.

Students will be collecting, organizing, and summarizing data using concrete, pictorial, graphical, and symbolic representation. They will predict outcomes about data sets and determine whether a correlation exist between data sets. Is the correlation positive or negative? Using the graphing calculations to look at regression lines will help impact the understanding of ±correlations. Unorganized data is often cumbersome and useless in explaining real life experiences. Numbers hold a wealth of information, but unless they are organized, summarized and reported in some statistical form, they remain as useful as a flat tire on a car in the midst of a blazing desert without a spare. To help my students make sense out of raw data, they will be given opportunities to model ways to present useful information about a set of given or collected data. The Stem and Leaf Plot and the Histogram will be discussed to show how simple data can be displayed.

A stemplot is a quick way of putting a list of numbers into order while getting a picture of their shape. A good visual aid for seeing development of a stemplot is the video statistic presented by Houston School District Rice School Project. It can be viewed as a teacher development resource and the section on stemplots can be shown to students.

Setting the stem is somewhat analogous to setting a window on a calculator. The first step is to create the stem. For example, a set of data from 11,200 to 18,900 could be represented by thousands. So the stem could be 11,12,13…18. The key is to use the first two digits to represent the stems. Second, attach a leaf to represent data points. To do this, choose the next digit in the number and drop the remaining digits. For example, the stemplot which begins with the data point 11200 would be represented as; stem=11, leaf=2. Once there is a picture of the stemplot, observations can be easily made. What is the range? What is the highest value? What is the lowest value? Is there a cluster of values? If so, where? Finally look for extreme outliers.

There are times when data sets are very large and do not lend themselves to stemplots. So histograms are used because they do not list every data value. To create a histogram, divide the range of the data into intervals similarly to the way the stemplots are done. Bars are used to represent the height proportional to the total count that fall in that interval. The TI-83 calculators will be utilized to draw histograms in the student activity titled "Looking at Your Age" in lesson 1 of this teaching unit.

Any type of research, surveys, polls, studies, scientific experiments and the like requires some type of sampling to select participants (samples) from a stated population. I will discuss sampling in detail with students. Random sampling gives validity to studies. The study below, released in 1988, is included in my teaching unit because it shows "what is right" and "what is wrong" with many surveys. This study was done by the Steering Committee of Physicians' Health Study Research Group. It was a 5-year experiment conducted using 22,071 male physicians between ages of 40 and 84. The physicians had been randomly assigned to two groups – one group took an aspirin every day; the other group took a placebo – a pill that looked like an aspirin but with no active ingredients.

Does Aspirin Prevent Heart Attacks?

Table 1.1 The Effect of Aspirin on Heart Attacks

Condition	Heart Attack	No Heart Attack	Attacks per 1000
Aspirin	104	10,933	9.42
Placebo	189	10,842	17.13

According to Utts, the data in Table 1.1 supported the conclusion that aspirin does indeed help reduce the risk of having a heart attack. The rate of heart attacks in the group taking aspirin was only 55% of the rate of heart attacks in the placebo group. Because the men were randomly assigned to the two groups, other factors such as the amount of exercise should have been similar for both groups…because the participants were all male physician, the conclusions may not apply to the general population of men. They may not apply to women at all since no women were included in the study. Utts further explained that in order to conduct a study properly, one must get a representative sample, get a

large enough sample, and decide whether the study should be an observational study or an experiment.

Conclusion:

Upon completing this Statistic Unit on Figuring the Odds, students will be able to read a variety of studies from various sources and from media to determine whether the results are accurate and unbiased. They will learn how to formulate questions on surveys to elicit untainted responses. Students will study the seven steps utilized in reading and analyzing studies. The mastery of these steps is the key to determining whether the results of a study are reliable enough to influence them to change their lifestyles, attitudes, or beliefs. Knowledge is the power that will ultimately place them in a greater positive position to win the odd.

Each student will display a piece of work he or she has developed as a result of doing this unit. Teachers using any part of this unit are encouraged to submit student products via the internet to be displayed along with my students products. The underlying intent of this unit is to instill and or heighten the students desire to see research and its possibility in everyday encounters and to appreciate the beauty of data. As students move towards this level of understanding, they will grasp the relevance and usefulness of the subject.

LESSON PLANS

LESSON 1: GATHERING AND DISPLAYING DATA

Overview: Activity 1.1 *Looking at Your Age* and Activity 1.2 *Stem and Leaf Plot.* are exercises that permit students to download data from Web Sites, to organize and display data, and to find the basic measures of central tendency. An extension of this lesson can involve looking at sets of data other than ages-for example, height, salaries, or number of years playing professional ball. Any combination of teams can be used. The same hold true for the types of sports. All activity sheets are found in the appendix.

Objective: To find the measures of central tendency over two sets of data. To compare the data of the two sets.

Terms: Mean, Median, Mode, Range, Outliers, Stem Leaf Plot.

Materials: Computer with On-Line service or access to Library, Pen, Paper, Colored Pencils, Graphing Calculator.

Procedure: Work in small groups or per individual. Go On-Line and secure ages of the Houston Rockets and Chicago Bulls for the 2000-2001 Basketball Season. Fill in the T-chart on Looking At Your Age. Calculate the mean, median, mode. Identify the range

and any outliers. Now create a Stem and Leaf Plot using the same data. Use an increment of 2. Complete activity sheet 1.2.

LESSON 2: LINEAR FUNCTIONS

Background

Linear parent function y=x is introduced in middle school and is the pivoting point for all Mathematics courses there after. The Parent Function is used extensively in statistical procedures. Scatter plots are interpreted in light of the parent function y=x. In these student activities, students will enjoy being challenged in statistical analysis and in using the graphing calculator with capability of a TI-83. Use the graph link to transfer the ACT scores to student calculators. These activities in this lesson permit students to use a set of provided data to identify and sketch the general forms of y=x. Modifications have been made on these selected Texteams Activities. The Age Estimates Student Activity- How Old? should include names of people that are appealing to your students, for example, 12 year old Haley Joel Osment, star of the AI movie and President George Bush. Students will also develop and or strengthen their skills in the use of calculators.

Overview: Activity 2.1 *Generating the Rule* helps students recognize functional relationships. Recognizing functional relationships is the key to interpreting statistical related activities. After completing this exercise, students should fine the rule is y=5n. The Houston School District Curriculum Department provides many activities for student to model pattern building to determine equations of functions. This exercise can be modified and extended from elementary through high school. Finite differences are not necessary at this point in the development of Algebraic thinking.

Objective: To collect data and to generate a rule for a functional relationship.

Term: Rule

Materials: Paper, Pen, Graphing Calculator

Procedure: Use cubes or tiles to build the pattern in *Generating the Rule* student activity sheet 2.1. Predict the shape of the graph. Graph the points using the calculator. Verify the rule and shape of graph. Students should complete ordered pairs for all data points. It is not necessary to build all patterns if students determine the rule earlier. (1, 5), (2, 10), (3, 15), (4, 20) …. (10, 50), (n, 5n). Rule is y=5n. When the output is 60, students must find the input x; (x, 60). Y= 5n, 60= 5n, n=12

Overview: Activity 2.2 *ACT Scores* will explore the parent function, y=x, through the comparison of ACT Scores. Students will discover the positive relationship between the Mathematics score and those of the other subjects. Other sets of data may be used to explore the parent function y=x. This activity is aimed at data manipulation using the

graphing calculator and the computer. Texas Instrument has a WEB site that is useful to one desiring to wed the calculator and computer.

Objective: To link data from calculators, to investigate the graph of y=x, and to analyze which subjects students do best in nationwide

Terms: Parent function, input, output.

Materials: Graphing calculators, colored pencils, Program ACTSCRS (or ACT Scores for each state), computer.

Procedures: Run the ACTSCRS Program. This program stores the data (ACT Scores) for the 50 states into five lists: L1 (English), L2, (Math), L3 (Reading), L4 (Science Reasoning), L5 (Composite). Link the scores into the students calculators. Now have them use L1 (x) and L2 (y) to create a scatter plot to generalize a statement about the correlation between English and Math. For example, a statement could be ' Most states have a higher English score than Mathematics.' Continue by comparing Reading and Math, etc. Make statements on how most states did in reference to Mathematics. Students will be able to infer the correlation: the higher the Mathematics scores, the higher the other subject scores. Complete activity sheet 2.2.

Overview: Activity 2.3 *How Old?*, Activity2.4 *WAW Demolition Expenditures*, and Activity 2.5 *Freedom*. The first activity – *How Old?* – will estimate ages of the "famous" and perhaps the "not so famous" as an approach to exploring the parent function y=x. Students will classify themselves as an under guesser if most of their data points were above y=x, an over guesser if most data points are below y=x, and a perfect guesser if all data points were on y=x. They will be good guessers if the data points hovered around or near y=x. they will be able to determine that trend lines follow a set of data, that is they behave more like a line of best-fit and are useful for determining trends, such as what color is hot for the coming school year. The second activity *WAW Demolition Expenditures* will focus on predicting trends and setting windows on graphing calculators. The final activity focuses on figuring the odds using a computer program generated by Dr. Field.

Objective: To sketch the general form of y=x, to set viewing windows, to predict trends.

Terms: Trend line, regression line, line of best fit.

Materials: Graphing calculator, colored pencils, pieces of flat spaghetti, computer.

Procedures: Prepare a list of twenty names and birthdates prior to this lesson. For example:

Oprah Winfrey	01-29-1954
Bill Cosby	07-12-1937

Have students fill in the chart on "How Old" by guessing the person's age as you read off about 10 or 12 of the names. After students have completed the chart, ask questions such as: Do you think you were a good guesser? Over guesser? Under guesser? How can we determine how well you did?

Now have the student plot the data on a grid. Label the axis x=guess, and y=actual. Also label several of the data points using colored pencils. With the spaghetti draw a trend line using the same color as the data point. Now have the students draw the perfect guess line using a different color. (Hint, y=x, or Guess (G)= Actual (A)). Discuss the graphs.

Next have students use calculators to draw scatter plots and y=x of the age-data. Have calculator shade above line y=x. Have students recognize data points above this line as under guessing. Repeat procedures labeling the data points under the parent function as over guessing. Always have students note the window(s) used. Now do activity sheet 2.3 found in the appendix. For Activity 2.4 and 2.5 have student complete the worksheet. Discuss the outcome. Display student products for each activity,

LESSON 3: HURRICANES AND TROPICAL STORMS

Introducing the Hurricane Lessons

Since we live in the Gulf Coast area, hurricanes are of particular interest to our students. Sooner than later, each of them will experience the wrath of a hurricane to some degree. Students need to know about hurricanes. When and where are they most likely to strike? How are they formed? How are they named? How are they tracked? The more knowledge students have of hurricanes, the more prepared they are to respond to an approaching storm. Therefore, this teaching unit attempts to address tropical storms with spinning winds. Hopefully, this unit will serve to impress our young people on how important it is to take hurricane warnings seriously. At the writing of this unit, we are in the midst of Tropical Storm Allison. Thus, our students will identify with this unit more readily than students who do not live on the coast. This storm teaching lesson provides many opportunities for student creativity. For example, they may design portfolios depicting some aspects of the storm. They may write poetry, songs, letters, essays, or news releases. They are limited only by their imagination.

As a Homebound teacher, I have the opportunity to cross-curriculum teach. I will draw activities from the English-Social Studies disciplines as well as from the Sciences and Mathematics. We will read short stories and poetry about Hurricanes in English. We will personify the hurricane as it approaches land. We will use the five senses to describe the hurricane. What does it feel like? Slippery as an eel? Or rough as steel wool? What does it taste like? Salty as the sea or sweet as wine? We will compile a list of adjectives and run a statistical analysis on the words used most. We will also share a list of developed metaphors and similes -resulting from discussions of various readings. At this point, I will introduce several poems written about hurricanes. Look at the title. What is predicted

about the storm? Compare the rhythm of the poem to the surge of the storm. Have students create a graph by using the CBR to simulate the movement of the storm and the beat of the poem. Is there a correlation between the two graphs? Now, do the student activities located in the Lesson Unit on Hurricanes and Storms. In working with students over the years, I have noticed that they enjoy working units on "big winds" from the powerful tornadoes to the sullen monsoons.

Overview: Activities 3.1 *What's In a Name?* And 3.2 *You Say! We Say!* are used as vocabulary assessments. These activities will follow the ones mentioned in the background section. All student activity sheets are found in the appendix.

Materials: Computers, Internet, Map on Globe, Color pencils.

Procedures: Give students list of vocabulary and their meanings. Discuss them. Have students research how storms are formed, named, and retired. Have them contrast names given storms that form in different parts of the world. Once vocabulary has been developed, administer Activity 3. 1. Then follow with Activity 3.2. When students have completed Activity3.1 and Activity 3.2 extend the lessons by having student write a weather related statistical question to "Hey, Mr. Weatherman"(Channel 2 NBC station affiliate). If the student's question is answered on television, then he/she will receive recognition and a gift will be given to the school.

Overview: We have all heard of the "rainmaker". Activity 3.3 *The Storm Maker* and 3.4 *The Storm Maker Research Center* allow the student to play the role of a storm maker. Students will use the random generating function on the calculator to predict the locations of storms in various regions of the world for the following year.

Objective: To collect and organize data in order to predict storms.

Materials: World map, stickers, colored pencils, graphing calculator, calendar.

Procedure: Label places where storms usually originate with a number, for example, Pacific Ocean = 1, Atlantic Ocean = 2, Caribbean's = 3, Gulf of Mexico = 4, and etc. Be creative and imaginative. Select three different ways to display the data. For example, you may use the map, Stem-Leaf Plots, Scatter Plots, etc. Create at least ten storms using the random generating function. After you have determined the birth of the storm, give it a name according to way storms are named. After you have compiled and displayed your data complete the Storm Maker Activity Sheet. Using a calendar, select a time interval for the birth of each storm. Then complete Activity sheet 3.4.

APPENDIX

LOOKING AT YOUR AGE
Activity 1.1

Ages of Chicago Bulls Players	Ages of Houston Rockets Players

T (Total/Age) =
N- (Number of Players) =

Mean= _____
Median=_____
Mode=_____
Range=_____
Outliers=_____

T (Total/Age) =
N (Number of Players) =

Mean=_____
Median=_____
Mode=_____
Range=_____
Outliers=_____

STEM AND LEAF PLOT
Activity 1.2

Ages

Bulls *Rockets*

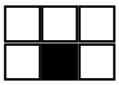
Leaf	*Stem*	*Leaf*

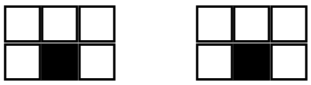
Discuss the Stem & Leaf Plot.

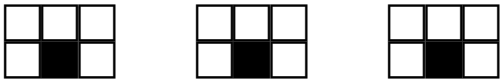
1. Which age group(s) tend to have more players? _____
2. Which is the age range of the youngest player(s)? _____ The oldest players? _____
3. Make a statistical statement about the data sets.

GENERATING A RULE
Activity Sheet 2.1

I. Build Patterns







II. Record/T-Chart

List 1 (x) # of Doors	**List 2 (y)** # of Cubes
0	0
1	5
2	
3	
4	
5	
10	
n	
	60

III. Record/Ordered Pairs **IV. State the Rule_____**

(0, 0)
(1, 5)
(2,)
(3,)
(,)
(,)
(,)
(,)
(,)

ACT SCORES
Activity 2.2

1. Make Scatter Plots for each of the following using the graphing calculator and the graph-link. Print out the plots from the computer.

   A. English Versus Mathematics
   B. Reading Versus Mathematics
   C. Science Reasoning Versus Mathematics
   D. Composite Versus Mathematics

2. Show your window(s) used

Window

3. Sketch in y=x on each scatter plot. Print the scatter plots with the parent function. Make a statement about each graph.

4. Investigate the advantages of taking the SAT and the ACT. Which test do you plan to take and why?

HOW OLD?
Activity Sheet 2.3

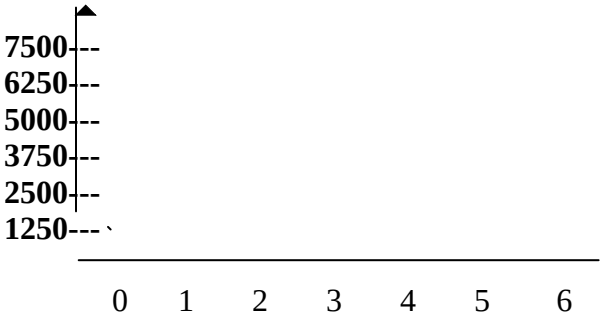
Guess the age of the person as his or her name is read.

Names	**Guess**	**Actual**

1. I am a(n) _____ guesser.
   (over, under, good, perfect)

2. Justify your answer_____.

WAW DEMOLITION EXPENDITURES FOR MISSILANEOUS REPAIRS
Activity 2.4



The scatter plot shows the year to date expenditures for miscellaneous repairs for WAW Demolition Company which has a budget of $14,068.00 in this account for year 2000. What is the best estimate for the expenditure at the end of the second month? _____ The fourth month? _____ Is there a trend? _____ If so, what is it? _____.

Predict the expenditures for the six months (July – December) by completing the chart below:

WAW Expenditures for Miscellaneous Repairs

Month	**Amount of Expenditures**
July	
August	
September	
October	
November	
December	

1. Did WAW Demolition Company over spend or under spend its budget? _____. If so, by what amount? _____.

2. Set a good viewing window for this scatter plot.

Window	
Xmin=	**Ymin=**
Xmax=	**Ymax=**
Xscl=	**Yscl=**
	Xres=

3. Predict the shape of the graph. _____.

Using the TI-83, test your prediction. Sketch the graph.

FREEDOM
Activity 2.5

Using the CD Rom "Figuring the Odds" by Dr. M. Field, University of Houston, tries various programs. Select one of your favorites and present a creative summary of the work. Have fun. Enjoy.

WHAT'S IN A NAME?
Activity 3.1

Vocabulary Review

Match the Name of the Storm with its place of origin.

1. Hurricanes_____	A. Pacific Ocean, West of the International Dateline
2. Cyclones_____	B. Australia
3. Typhoons_____	C. North Atlantic or Caribbean Sea
4. Willy-Willies_____	D. Indian Ocean
	E. Pacific Ocean, East of International Dateline

YOU SAY! WE SAY!
Activity 3.2

Identify the country with how storms are described.

1. Spanish	A. Big Wind
2. Greek	B. Coil
3. Chinese	C. Great Winds
4. Hawaiian	D. Sharp/Piercing

THE STORM MAKER
Activity 3.3

1. How many storms did you predict for the season?
   _____.

2. When do you think the next Big One will hit? _____.
   Where? _____.

3. Comparing Run 1 to Run 2 what difference did you notice?
   _____.

4. Did you notice a clumping of storms in certain areas?
   _____.

5. Compare your randomized list of storms to the 1999 list published by the Weather Research Center. _____.

6. Are there any other observations you would like to share?
   _____.

THE STORM MAKER RESEARCH CENTER
Activity 3.4

As the Storm Maker, use as a guide the "1999 Atlantic Tropical Storm hurricane Statistic and Summary" to create data for your storms.

2002 Around The World Storm/Hurricane Statistic and Summary

(I-10) Name	*Dates*	*Intensity*	*Max. Wind*	*Pressure*	*Deaths*

*Total Hurricanes*_____

*Total World Storms*_____

*Total Storms for 2002 Season*_____

To obtain wind speed in miles per hour (mph)…multiply the wind in knots by 1.15.

REFERENCES

Bibliography

Williams, J. The Weather Book, Vintage Books, Random House, Inc., New York, 1992.

Cited Work

Algebra I: 2000 and Beyond, TEXTEAM, Texas Education Agency, The University of Texas, Austin, Texas, 2000.

I cannot say enough about this newly acquired resource binder. The exercises on the ACT Scores and Guessing the Age are two activities I will have my students do. There are so many good activities in this binder dealing with both linear and non-linear functions that lend themselves to skill and concept development useful in any discipline. The CBR Activities were not cited in this teaching unit but will definitely be used during the teaching of this module.

Frechette, Ellen C., *Contemporary's Number Power 8 Analyzing Data*, Contemporary Books, Lincolnwood, Illinois, 1992.

Frechette has done an extraordinary job in bringing to the real world of adult math simple statistics in a powerful way. Her timely explanations of statistics, her well defined charts, tables, and graphs are easily understandable anywhere along the learning curve. The information is adaptable from middle school to adulthood. Her survey chart has been modified and is being included in this unit. I plan to acquire copies of the book for student use.

Project Clear Curriculum, Model Lesson Fifth Grade Mathematics, "Developing Algebraic Thinking with Patterns", Curriculum Department, Houston ISD.

The Houston School District provides its teachers with excellent on-going professional staff development, training, and curriculum lessons across grade

Utts, Jessica M., *Seeing Through Statistics 2nd Edition*, Duxbury Press, Public Grow, California, 1999

This book by Utts is an excellent source for the study of basic Statistics. It explains many difficult concepts, and terms. Most of the background discussion in this unit referenced Utts. The study on Aspirin's Effect on Heart Attack Reduction came from this source.

Weather Research Center, 1999 Atlantic Hurricane Summary, Weather Research Center, Houston, Texas.

I received a copy of this resource while attending a Harris County Science Meeting for Lead Teachers, Department Chairs, and Supervisors of Harris County Department of Education. I fell in love with this unique resource. The section in this teaching unit on Hurricanes cites this reference. A field trip to the Weather Center will be planned for the students that are able to attend. This is a wonderful resource.

Internet Resources

www.Newfieldmate.com (Understanding Math Probability)
www.duxbury.com/utts-Seeingthrustat
www.NBA.com
http://weather.unysis.com/surface
http:///riceinfo.rice.edu/armadillo/algebra/
http://www.act.org/news/data/199199data.html (Act Series)

Video

Statistics, Algebra Online, HISD, 1997

CD Rom

Dr. Mike Field, Figuring the Odds, May 2001
University of Houston: Houston Teachers Institute
Seminar Leader of Figuring the Odds.