

Year	Development	Grade	Overview
2003	How High Will Your Ball Bounce?	Grades 9-12	The students will investigate, create and analyze data using the TI-83 plus calculators. Students will enter real-world data into lists, then graph and analyze the data. Students will also do an experiment that will produce approximately linear data. Students will do a linear regression and make predictions using their regression equations. If time permits, they will test out their predictions.
2003	Modeling for Prediction	Grades 10-12, AP Statistics	In this lesson section, the class is going to be exploring data through linear regression while making use of four technology packages. Students will organize, represent, and interpret data on given sets of data. They will make predictions and explore the appropriateness of models connected with the data. Students will calculate descriptive statistics, draw plots, and obtain different regression models using statistical software. Within this packet, there are step-by-step instructions for the use of four statistical technologies; Excel, Minitab, TI-83/TI-83+, and Fathom.
2003	Teaching Regression with Technology	Algebra I	Students will conduct an investigation incorporating and analyzing simple random sampling, measures and representations of central tendency, and lines/curves of best fit to make informed conclusions.
2002	If Data Could Talk - "What Regression Model Would The Statistics Represent?"	Grades 9-12 , Algebra, Algebra I and II, Pre-Calculus, AP Statistics	The students will investigate and create data to analyze with the TI-83 plus calculator. Students will use real-world data to discover what regression model will best fit the data. The unit will proceed from the linear regression, to the exponential regression, and then on to the logistic.
2002	Investigating Population Growth	Lesson 1: Grades 7-12; Introduction to Algebra or higher;	Students will collect, organize, represent and interpret data on population size. They will make predictions based on these data and compare exponential and logistic population growth statistical models. Students will calculate descriptive statistics, draw graphs, and obtain regression models using the TI-83 calculator.
2002	The STEG Project (Statistics, Technology, Evaluation, and Graphing)	Algebra I or higher	Students will conduct an investigation incorporating and analyzing simple random sampling, measures and representations of central tendency, and lines/curves of best fit to make informed conclusions.

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2000	Probability and Simulation	Grades 8-12, Algebra I	This learning unit will review the basic concepts of theoretical and experimental probability and simulations. Students will compare and contrast the two types of probability as a writing component. This writing component will be based on an in-class activity in which students will collect and analyze data. Two classroom activities will involve students in performing two different simulations, one using a student created spinner and one using the randINT function on the TI-83 calculator. This learning unit is structured in three separate modules that may be used independently.
1999	Measure for Measure	Grades 9-12	This unit will combine statistics and measurement using the graphing calculator. The students will find height and other measurements and use the graphing calculator and statistical concepts to organize and analyze data using box plots.
1999	Probability, Statistics, and M&Ms	Grades 7-12	Mars, Inc. publishes data concerning the frequency of the colors of M&Ms contained in a package of the candy. In this experiment, students will gather their own data on the frequency of the colors, and compare their values with the expected values according to Mars, Inc.'s data. This unit is designed to enhance students' understanding of basic probabilistic and statistical concepts, such as expected value. It also can be used for more advanced work in a statistics course by having students perform a Chi-squared goodness-of-fit test.
1999	Simulations Using the Random Number Table	Grades 9-12, Algebra I, Algebra II, Statistics, Discrete Mathematics, AP Statistics	The unit will introduce the Random Number Table for performing simulations in Probability. Each simulation will follow the five (5) steps of: stating the problem, stating the assumptions, assigning the digits, simulating the experiment, and stating the conclusions. Emphasis is placed on using the procedure, using the Random Number Table to simulate the experiment, and presenting the results.
1999	Sizing from Head to Toe	Grades 9-10	In this learning unit, students will collect data by measuring their height, foot length, and wrist and ankle circumference. Analysis of the data will include measures of central tendency and variation, graphical interpretation, and correlation.
1999	Take a B.R.E.A.T.H. with Us!...	Grades 7-12, Algebra I, Algebra II, Statistics, AP Statistics	The lesson introduces the concepts of line of best-fit (linear regression) and residuals. Data relating the time it takes a balloon to fall from a given height will be collected, a line of best-fit will be graphed, and the residuals will be calculated. A linear regression will be run on the TI-83 to compare the student-predicted equation with the computergenerated result.

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1998	Calorie Count	Grades 9-12	Students will record their guess and group members' guesses of calorie counts on a given list of food items. They will then graph a scatter plot, find the line of best fit of its equation, and use these to evaluate new data.
1998	Elemental Monte Carlo Methods...	Grades 10-12	This unit will introduce computer science students to the use of Monte Carlo methods to evaluate mathematical problems and models. Statistical simulations will be used to determine the value of π , to integrate a continuous function, and to determine probabilities. C++ will be the programming language referred to throughout this unit, but it could be adapted to use other programming languages or spreadsheets. Alternative solutions using a spreadsheet are provided for two of the labs.
1998	Insulation Times Three	Grades 9-12	Students will use temperature probes and the TI-83 Graphing Calculator in conjunction with CBL units to test insulation properties of various materials. They will test the rate of cooling of containers made of styrofoam, glass, and metal.
1998	Is Your Town Cool or Hot?	Grades 9-12	The students will determine the correlation between the latitude of a U.S. city and its average high temperature in July. They will also determine a relationship between the distance of a U.S. city from the coast and the variation of temperature between winter and summer. Data will be collected from the Internet and a U.S. map. The results will be organized, graphed, and interpreted by using spreadsheets.
1998	Log On to the Exponential Regression Function	Grades 9-12	The students will derive an exponential regression function from linear regression on $(x, \log y)$. They will use the correlation coefficient, residuals, and related linear regressions to determine if a linear or an exponential regression is a better fit for the given set of data.
1998	Probabilistic Factoring	Grades 11-12	Every integer is a product of powers of prime numbers. We are interested in the probability that a relatively large positive random integer has a factor in a random set of relatively small primes which is determined by the flipping of a fair virtual coin. In this simulation activity, students are given the opportunity to investigate and apply varied mathematical concepts through the construction of their own solution algorithm. The activity and related mathematics are not computer language dependent. The emphasis has been placed on problem solving and the related mathematics rather than on a specific programming language.

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1998	R & R - Residuals and Regression	Grades 9-12, Algebra II, Pre -Calculus, Statistics	Students will experiment with different values of the slope of a regression line to find a "best line" using the concept of minimizing the sum of the squares of the residuals. They then will use a calculator to find the best-fit line and verify that it produces a least sum of squares of the residuals.
1998	Should I Watch Television, Go to Work,...	Grades 8-12	Students will collect data over a five week period for number of hours spent daily on studying (includes time spent doing homework), on watching television, and on working at their part-time job. Each week the student will use the graphing calculator to analyze their data. At the end of the five weeks, each student will compile their data and find the average amount of time spent per week on each activity. The teacher will then put those average times and student's grade for that five-week period on a summary sheet. Each student will then enter that information for the class into the lists of their calculators for analysis.
1997	All Averages Are Not Created Equal	Grades 7-10, Algebra	Students will calculate the mean, median, and mode and select the most appropriate characteristic for a given problem context or data set.
1997	Glued to the Tube or Hooked to the Books?	Grades 7-10	Students will collect data on their study and TV viewing time over a determined period of time. Students will use a graphing calculator to find measures of central tendency, construct a box and whiskers graph, construct a scatter plot of class collected data, and examine a line of best fit. The students will use this information to complete worksheets and a performance based assessment.
1997	Do You Measure Up?	Grades 8-10	Students will use a graphing calculator to model linear equations for a set of real-life data. The students will collect, organize, and analyze the data to determine if a linear correlation exists between the variables. Students will then summarize their findings in an oral and written report.
1997	Heating UP and Cooling DOWN	Algebra I or higher	Students will use the CBL with the temperature probe to measure the amount of time it takes the probe to return to room temperature when removed from a container of water. They will record the data and enter it into the statistical lists on the TI-82/83, then observe the graph. They will then use the TI-82/83 to do a regression, getting the "best-fitting curve."
1997	Ring Around the Classroom	Grades 9-12, Algebra and Statistics	In this activity students will use a graphing calculator and statistical concepts to analyze the relationship between holding hands at arm's length and the distance covered. Students will use the equation of the median-median line and the least squares line to make predictions.
1997	This Will Take Your Breath Away	Algebra I, Algebra II, Trigonometry, Pre-Calculus	The students will use the CBL, TI-82/83 graphics calculator, and the respiration monitor to determine patterns and generalizations from data and graphs of respiration.

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1997	Where Do Blue Widgets Grow?	Grades 11-12, Elementary Statistics	Working in groups, students will randomly sample the soil around the school grounds. They will collect and organize data on the pH of the soil to determine if the school would be a suitable place to grow a new plant species the "blue widget." They will plan and execute a statistical experiment which will result in a decision being made based on statistical outcomes. Students will be required to support their thinking throughout the process.
1996	As the Ball Bounces	Grades 10-12, Algebra II, Pre-Calculus	This unit is a group activity in which students use the TI-82/CBL system and an Ultra-sonic Motion Detector to track the height of a bouncing ball over time. The points formed by the maximum heights will be graphed and used to find the bestfitting curve.
1996	As the Ball Rolls	Grades 9-12, Algebra II, Calculus	Students will roll a ball up a ramp at various angles of incline. The CBL and the ultrasonic motion detector will measure the position of the ball relative to the detector at regular time intervals as it rolls up and then back down the ramp. After data collection, the TI-82 will be used for graphing the position and velocity of the ball. Students will analyze the graphs in relationship to each other, and fit each curve to a regression model.
1996	Electrolyte Diffusion...	Grades 9-10	This lesson will demonstrate the permeability of electrolytes through a semi-permeable membrane. The first lesson uses table salt solution and a conductivity meter to show the flow of the electrolyte (salt) through dialysis tubing. The data will be analyzed by using the calculator to find the line of best fit, through regression analysis. By finding the slope the student can then determine the rate of diffusion (rate of change). Further studies would use various beverages as test materials.
1996	Just a Typical American Student?	Grades 8-10	Working in groups, students will use a graphing calculator and the instructional activity sheets to gather data, calculate statistics, construct graphs, and make inferences. The students will complete several activity sheets and communicate their findings in a summary letter.
1996	Melts in Your Mouth	Grades 9-12	With the use of a statistical experiment involving M&M's, the student will compile information and explore the topics of mean, median, mode, standard deviation, and how they apply to the normal curve.

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1996	Running Into Statistics	Grades 9-12, Fast Math, General Math, Consumer Math, Basic Algebra, Algebra I, Algebra-Geometry, Algebra II	Since the 1996 Olympics took place close to home, they were a major topic of discussion all over the region. Students have traditionally been interested in sports and therefore it seems logical to relate sports to math to interest the students. In this activity, students will collect Olympic statistics from a timed event of their choice and determine various statistics.
1996	Scores on the Rise?!	Grades 9-12	These lessons will apply the use of TI-82 and statistics to summarize conclusions about the relationships between national and Virginia SAT scores and between the math and verbal SAT scores for the nation.
1996	Temperature/Distance Lab	Algebra II or higher	Students will use the CBL with a temperature probe to measure the air temperature at various distances from a heat source. They will record the data and enter it into the statistical lists on the TI-82, then observe the graph. They will then use the TI-82 to do a regression, getting the "best-fitting curve."
1995	Compound Your Way to a Million Bucks!	Grades 8-12, Consumer Math, Business Math, Pre-Algebra, Algebra I, Algebra II, Pre-Calculus, Pacesetter Mathematics: Pre-calculus through Modeling	Many people save and/or invest for their financial security. Students are often not aware of the strategy behind investing. This exercise will examine the question: "Is there a good, better, and best way to invest in an IRA?" The investment patterns of four people will be evaluated to determine if there is a 'best' way.
1995	Exploring the Binomial Probability Distribution	Grades 9-12	Students will simulate the binomial probability distribution using two methods: an exercise in coin-flipping and a TI-82 calculator program.