The Statistics Teacher Network

Number 41 — ASA/NCTM Joint Committee on the Curriculum in Statistics and Probability — Winter 1996

Statistics in the Classroom

Tag and Recapture with Live Prey

Seekers Summer Science Camps is a National Science Foundation sponsored program of four week-long resident camps for 50 middle school minority students. In the greater Clemson, South Carolina area, the first three camps were held at 4-H centers and dealt with Aerospace, Ecology, and Electricity. The fourth week was held at Clemson University and dealt with Quantitative Literacy.

One highlight of the week was the tag and recapture section. After showing the *Challenge of the Unknown* videotape on the counting of sharks, we did the typical capture-recapture experiment of filling lunch bags with cheddar cheese fish crackers, removing some and replacing them with pretzel fish crackers. From the result, we took many samples from which we estimated the total population of fish. While this went over well with the campers, we felt that a more meaningful activity would be actually tagging and recapturing fish in a "natural" setting.

After discussions with the Aquaculture, Fisheries, and Wildlife Department faculty, we decided to go to nearby Lake Isaqueena to seine some fish, tag, and later recapture them. Graduate students from Fisheries and Wildlife whose master's thesis involved tag and recapture methods were scheduled to accompany us and discuss career options with the campers. Early in the week, the graduate students visited the camp to observe the campers. Even though Lake Isaqueena was shallow due to use as a practice bombing facility in World War II (many many bags of sand were dropped into the lake from planes), some of the campers were so short that the graduate students expressed concern that they might drown as they entered the water to seine the fish. So, they were able to come up with a unique alternative that still involved real fish.

First, we purchased a six foot wading pool. After filling it with water, we placed rocks throughout the pool. We arranged to purchase 200 goldfish for ten cents each from a local pet store. We placed the fish in the pool and gave them several hours to settle. We also purchased five-inch rectangular nets to use in tagging and recapturing the fish.

Several hours later the campers descended upon the pool. The graduate students gave a short talk on how they use tag and recapture in their research in Lake Marion. One student stressed how it took her over one year working all day both days in each weekend to tag enough fish to make the tag and recapture method reasonable. The 50 campers were divided into ten groups of five campers each.

Next we proceeded to tag the fish. Ten students were selected (one from each group) to be taggers. They were blindfolded and given a net. After being placed at the edge of the pool, each tagger ran the net through the pool in a wide arc and lifted it to give to a partner. All of the campers could see how the fish could hide under the rocks or rush away from the net. (The blindfolding was used to simulate the fact that when catching fish in the wild, we usually cannot see the fish under water.) The partner took each fish (if any) from the net and cut a small piece from the tail fin and replaced the fish in the water.

Also In this Issue...

The number of tagged fish was recorded. This procedure was repeated by each of the other taggers. The campers could note how some of the tagged fish were recaptured in the tagging process. Previously tagged fish were not counted in the number tagged when recaptured.

We next let the fish settle for a half-hour while the campers reviewed the tag and recapture formulas with the teachers. We then selected a different camper from each group who would recapture fish. They were blindfolded and ran the net through the pool in a wide arc in an attempt to capture fish. The number of fish caught and the number of those caught and tagged were tabulated for each camper. Each group estimated the fish population from their sample as well as estimating the population from the total of the ten samples.

We saw that the estimates varied widely. We gave a prize to the group with the best estimate. This led to a discussion of whether it was "fair" to give a prize to only one team. After all, the goodness of the estimate was, in large part, luck, since it depended on the number of fish recaptured and this, in turn, depended on how well the fish hid, whether the tagged fish huddled together in the same area, etc. We pointed out to the campers that this situation was very similar to what happens in the wild.

Promising the campers a pizza party removed the disappointment of not winning the prize. The journal entries of the campers showed that they really enjoyed the activity and understood at a "gut" level the difficulties with the accuracy of this method. They saw how the tag and recapture method is a very practical and cost effective way to gather data. They also appreciated what wildlife biologists in the field do and how mathematics helps them in their job.

One final remark. The cutting of the tail fin of the fish does not hurt the fish. If using this activity in a classroom setting, the fish can be recycled to be used by the science teacher, in an aquarium for the classroom, or given to a local agency as food fish for larger fish. Just be sure the students cut only a piece of the tail off. Some get excited and take off the whole tail resulting in the death of the fish.

The South Carolina teachers who worked on this project were: Parrie Hook, North Central High School in Kershaw; Diedre Hutson, West Hardeesville Elementary School; Beth Kennerly, Bowman High School; and, Delores Wilson, Marion High School.

John K. Luedeman
Clemson University
Clemson, South Carolina

Statistics in the Classroom

A Budget, Salt Usage, and Anti-Skid Usage Analysis

The following is my thesis abstract, a summary of a study I completed for the Pennsylvania Department of Transportation Engineering District 10-0. I close by suggesting a project to implement part of the study in the mathematics classroom.

The Pennsylvania Department of Transportation Engineering District 10-0, located in Indiana, Pennsylvania, is responsible for maintaining roads and highways in Srmstron, Butler, Clarion, Indiana, and Jefferson Counties. Within the past six fiscal years, each county has budgeted between $300,000 and $590,000 annually for winter materials. This money has been used to purchase salt and anti-skid to keep the 6,870 snow lane miles safe and passable in the five-county roadway system .

Using six years of fiscal data, I analyzed the winter materials budget, salt usage, and anti-skid usage of each county,as well as weather characteristics using their daily snowfall amounts. From the latter, it was possible to predict the approximate number of winter storms and their magnitudes within a fiscal year. With all of this information, I wrote a a simulation model to realistically create ten winter seasons and each county's salt usage during this time.

The results of the statistical analysis indicated that several counties within Engineering District 10-0 exceeded their salt budget, anti-skid budget, and total winter materials budget. Also, every county with the exception of Indiana County, used too large of a percentage of salt and too small of a percentage of anti-skid over the past six fiscal years. The analysis of each county's salt usage through the use of the simulation showed that by increasing the salt reorder point from 1/3 of maximum salt storage capacity to 1/2 of maximum salt storage capacity, the chance of any county running out of salt decreases greatly and the number of times each county reorders salt increases only slightly.

Due to the confidentiality of this study, I am not permitted to release data regarding salt and anti-skid budgets or usages. However, since snowfall amounts are published and released to the public, I suggest that the following project be tried in mathematics classes.

Step 1: Gather snowfall data. Climatological Reports are monthly reports created (for Pennsylvania) by the National Climatic Data Center in Asheville, North Carolina. Each report contains the amount of snowfall that was received each day for the given month. Assign each student a different month and as homework, have them gather the snowfall data to bring to class. Climatological Reports should be available in public libraries.

Step 2: Determine averages. Using the snowfall data, have each student calculate the average number of days that it snows each month and the average amount of snow that falls each month.

Step 3: Determine probabilities. Again using the snowfall data, have each student calculate the probability that it will snow on any given day of their month and if it snows, calculate the probability of a specific magnitude of snowfall. For example, given that it snows, what is the probability that less than 1.0 inch will occur?

Step 4: Graph the results. Combining each students' average and probability results, create graphs, analyze, and interpret each. Some suggestions for graphs are the average number of days it snows per month versus each month of the study; the average amount of snow that is received each month versus each month of the study; and the probability that it will snow on any day of the month versus each day of the study.

Christine Shuma
Indiana, Pennsylvania

Book Review

Exploring Statistics with the TI-82 Graphics Calculator

by Dr. Brendan Kelly
Burlington, Ontario:
Brendan Kelly Publishing Inc., 1994.
64 pages, paperback.

I began my review of *Exploring Statistics with the TI-82* wondering whether more emphasis would be placed on the statistical content or on details of working the TI-82 calculator. In my own experience leading a workshop on statistics for teachers, I found that teachers who were familiar with the technology wanted more statistical content, while others needed a basic introduction to a calculator such as the TI-82. I was curious to know what audience would be the target of this book, which could be used in a high school or college classroom.

I am pleased to report that Brendan Kelly has achieved an entertaining balance of statistical content and TI-82 calculator details. The calculator is clearly relegated to the role of a tool to be used to solve interesting and fairly complicated problems.

Exploring Statistics guides students through fourteen "Explorations" of statistical issues. Within the "Explorations" are plenty of "Worked Examples," "Exercises," and more open ended "Investigations." Kelly has also included a number of "Challenge" exercises that assess students' understanding of the statistical issues by asking them to solve slightly more difficult exercises.

One of my favorite "Explorations" is number 7, titled "Will Females Outrun Males in the 21st Century?" Using data from the Summer Olympics, Kelly leads the reader to fit median-median lines for male and female sprinters in the 100 meter dash. Although many details of the calculations of the lines are mentioned in the book and could be brought out in class, the emphasis is clearly placed on interpreting the analysis and on the conclusions that can be reached.

Nearly all of the "Worked Examples" contain keystroke sequences for the TI-82 calculator. The concise presentations of the keystrokes imply that some familiarity with the TI-82 is assumed before starting the book. In places, Kelly makes reference to the two other books accompanying "Exploring Statistics" in a series of three. The others are *Exploring Functions with the TI-82 Graphics Calculator* and *Programming and Programs for the TI-82 Graphics Calculator.* A reference is made to the *Programming and Programs* book whenever a program is encountered in *Exploring Statistics.*

It is not the case that the reader needs to be an expert on the TI-82, or even that he or she should own the other books in Kelly's series. However, it is important to have either the manual for the TI-82 handy, or to have a teacher or colleague who can answer relatively minor detailed questions about syntax and keystrokes as one progresses through the book.

The fourteen "Explorations" are divided into two parts, "Statistics" and "Probability." The first part guides students through a number of real-world datasets while introducing the concepts of measuring center and spread, and examining trends in scatterplots.

After a brief introduction to counting outcomes, the "Probability" section uses calculator-based simulation to introduce fundamental concepts of probability. Connections are made between basic simulation programs such as COINTOSS and DIETOSS, and more realistic situations that can be modeled by simple analogy. For example, in a "Challenge" item the reader is asked to use the COINTOSS program to estimate the "probability" that four boys will be born in a family of seven children. Using the calculator and the notion of simulation to connect simple models to more realistic contexts is a valuable asset of Kelly's book.

At the end of the book are answers to the exercises and hints for the investigations. The solutions and hints do not contain calculator keystroke sequences, but instead focus on using the calculator as a tool in the solution of real statistical problems.

The closest thing to a weakness I could find in *Exploring Statistics* is that the book stops short of addressing traditional topics in inference such as confidence intervals and tests of significance. It essentially covers the basics of summarizing data and probability based on simulation. Hopefully students will see how inference links exploratory statistics and probability in an AP statistics class or in a college statistics course. If this book is used in a high school class, the students will certainly receive a solid foundation in both statistical concepts and in the appropriate use of technology, but it is not a self-contained statistics text per se.

In conclusion, I think *Exploring Statistics with the TI-82* would make a terrific supplement for a unit on statistics during a TI-82 calculator based semester. The presentation is active and entertaining, the examples and exercises are interesting, and the statistical content is valuable and accurate.

Reviewed By
Tom Short
Villanova University

Book Review

Statistics, Graphing & Probability

by Catherine W. Johnson 1994, CD-7418, Carson-Dellosa Publishing, Greensboro, NC 27425

How long is the average foot? What's in your cereal? These are just two of the questions that can be explored in this book. *Statistics, Graphing & Probability* is a thin book (32 pages) but has a bundle of good ideas written for grades 3-6+. It is divided into three sections: "Counting and Sorting," "Statistics and Graphing," and "Probability." Each section has several interesting activities to use with students. Every activity includes a title, a well defined purpose, a list of materials and easy to follow directions. Several activities also include charts and recording sheets for duplication.

The first section, "Counting and Sorting," has four stimulating activities. One simple but effective activity involves watching TV and making a collage of newspaper articles and graphs that use statistics. I used the newspaper collage in my class and I found it was an enjoyable way to draw my students' attention to statistics and heighten their awareness of statistics in their daily lives. This activity can be done with all grades from third on up.

The second section, titled "Statistics and Graphing," has ten motivating activities. As I was perusing this section searching for something to use with my seventh grade class, I noticed an activity about cereal. Since most children like cereal, I decided to try the activity entitled "What's in Your Cereal?". The purpose of this activity is to compare data collected from cereal box labels and represent it graphically. The directions were clearly written and easily adaptable to meet the needs of my seventh grade students. Two worksheets are included with this activity. One worksheet is used to record data and the other worksheet is used to graph data. I divided my class into groups as suggested in the given directions but I didn't have them bring in cereal boxes as stated. I required each student to bring in the side panel of the cereal box with the consumer label. After we looked at a sample of the consumer label together, the children worked cooperatively in their groups to record the necessary data: name of cereal, serving size, number of calories per serving, amount of sodium, and amount of sugar per serving. Once the data were recorded on their first worksheet, the children proceeded to find the average number of calories and the average amount of sugar in their cereals. From this point I veered away from the given directions and I had my students find the mean, median, mode, and range for the sugar content in all the represented cereals. After determining these amounts, we then went back to the given directions and graphed the sugar content of each cereal from highest to lowest rather than listing them on the blackboard from highest to lowest as suggested in the written directions. Each child became involved in this activity by contributing their data specific to their own cereal. My students had fun with this activity and became more aware of statistics in their everyday lives.

While working through a unit on metric measurement with another group of children, I was able to incorporate several more of Catherine Johnson's activities. My students had a great time with "How Long is the Average Foot." This is a good activity to introduce the term "average." Each member of our class traced their right foot onto construction paper, cut it out and taped them together and then made predictions as to which person's foot would be the same as our average foot. The book suggests giving each child a strip of paper that will be cut to the exact length of his or her foot. I thought taping feet together would be fun for the class. Next, we measured this strip of taped feet and divided the total measure to determine the average foot length. The directions stated that you should cut the strip into equal parts representing the average foot length, with each child receiving a foot length strip. (This is of course one important reason for using the arithmetic average; the average foot length is the length of the foot if all of the measured feet were of equal length.) We did something a little different. We drew a separate foot to fit the number we found to be our average foot size. Next, we discussed the fact that our class should have approximately as many of our feet above the average as below the average foot length since the average is often found near the middle of the data. (This allows for discussion of the difference and similarities between the mean and the median as measures of center.) I found that using a cut-out of the children's feet was a motivational force and left us with a nice display of footprints on our hallway wall.

Another measurement activity (in centimeters) that I tried was "Predicting Your Adult Height." I used this with my eighth grade class as we were reviewing multiplication with decimals. A page of teacher directions is given along with a second page containing a chart. The chart includes specific mixed numbers for boys and girls at a given age to multiply by their own age to determine their approximate adult height. Should you wish an answer in feet, a formula is given to convert your centimeter answer into feet. (The book divides by 30, but if you are doing a unit on decimals, divide by 30.5 as that is closer to the number of centimeters in a foot.) After completing the activity as described in the book, we graphed our actual heights and our approximate adult heights using the spreadsheet option on ClarisWorks. We originally made a double bar graph. Then we alternated between a bar graph, a pie graph, a line plot and a scatter plot to determine which graph most clearly represented our data. This was an effective way to incorporate a spreadsheet activity into the lesson.

In "Probability," the third and final section of the book, there are six activities, most of which can be used with fifth grade and up. Third and fourth graders will enjoy the activity "What's in the Can." The purpose is to explore probability by using a sample to predict the number of beads of each color in a can. In this activity they shake ten beads out of a can and tally their colors on a chart. After they record their tallies, and answer a few questions, they will be able to predict how many of each color bead they might have if they had 100 beads in the can. The word *ratio* is also used in this activity. So, with teacher guidance, most third grade students will be able to enjoy this activity.

Throughout this book there are many eye catching black and white cartoon-like illustrations that will arouse the curiosity of any child. The younger students will even want to color the illustrations.

Johnson has truly made logical learning fun. All activities can be used just as they appear in the book or you can readily adapt any to fit the needs of your students. This is a great book to start your collection or add to a collection of resource books on statistics and probability.

Reviewed by
Caroline Brennen
JoannaYantosh
Drexel Hill School of the Holy Child
Drexel Hill, Pennsylvania

Letter to the Editor

G'day,

My name is Rex Boggs. I am the Head of the Mathematics Department at Glenmore High School in Rockhampton, Queensland, Australia. I am a displaced American who came out to Australia 24 years ago, just after graduating from the University of Wyoming. I rather liked the place, so I stayed and stayed, and, well, here I am still.

Some of you may be interested in how statistics is taught in Queensland high schools. Here is a very brief summary. In Australia, we have a spiralling curriculum, so statistics is taught in each year level. In the junior school (years eight to 10), we introduce simple statistics-gathering data, and organizing data into frequency tables, histograms, etc. We teach displaying data—bar picture, pie graphs, etc. We do some simple summarizing of data—mean, median, mode, range, maybe standard deviation. Students learn some probability—up to multiplication principle and tree diagrams.

Most senior students (years 11 and 12) will learn about box-and-whisker plots, stem-and-leaf plots, and the uniform and binomial probability distributions. They also learn about sampling, and hypothesis testing on discrete data using the binomial distribution. The emphasis is on understanding and applying statistics in real-world situations, and not just on doing the calculations.

Students doing the more academic streams in senior maths also study the normal distribution. They learn about hypothesis, first using the sign test, and then on continuous data using z scores. These students also have an optional topic on further hypothesis testing, confidence intervals, and the Poisson and t-distributions.

These topics are part of the new syllabi in the senior school. We as teachers are struggling with some of this content, especially the hypothesis testing. I will be interested to find out the content of the AP-Stats course.

Cheers,

Rex Boggs
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Editor's Note: Rex sent the letter to the edstat-l network. I thought that others may find it interesting; he granted permission to reproduce it here.

Project Competition Update

Regarding the Project Competition

The annual American Statistics Project Competition, started in 1987, is sponsored by the ASA's Center for Statistical Education (CSE) and is overseen by the ASA/NCTM Joint Committee on Curriculum in Probability and Statistics. I am the current coordinator of the competition.

The project competition is an excellent activity for students as it allows them to become intensely involved in doing, and requires them to integrate concepts and use skills across several subjects. It is similar to the poster competition in that students pose a question, collect data to answer the question, analyze the data, and interpret the results. The data may be collected by the students or taken from the literature. Unlike the poster competition, students must work in groups. The report generally consists of five to ten pages of written material plus tables and graphs. Some excellent projects have been less than five pages.

I am writing to clarify a few points that hopefully will encourage interest in the competition and enhance project quality. This year we were not able to award prizes in all categories as you can see from the list published elsewhere in this issue. I hope that my comments will avoid future misconceptions.

First, a project is focused on collecting, analyzing, and interpreting data as a means to answer a question. This year, two good projects were submitted that posed statistical questions and used Monte Carlo simulation or graphics to help answer the question. These projects were disqualified because no data were collected either by the student or from the literature. The ASA/NCTM committee felt that to have allowed simulated data to constitute original data would have encouraged future entries to focus on computer-generated information to answer theoretical questions. Although there are reasons to allow simulated data, there is much more to be gained at this level of student investigation of research questions to use real data.

Care should also be taken to ensure that the data and subsequent analysis do in fact answer the stated question and not some other question. A few years ago, a student group posed questions related to advertising: Is one toothpaste, toothbrush, or chewing gum brand really better than another? Is one general pain reliever more effective than another? How much false advertising is involved in health supplies? A sample of 124 dentists and 124 doctors was taken. Dentists were asked what brand of toothpaste, toothbrush, and chewing gum they recommend to their patients. Doctors were asked what type of pain reliever they recommend. As you can see, the amount of work by these students was prodigious. However, could the data collected ever answer the questions? Chi-squared tests were used to determine whether the proportion of doctors recommending brands within each of the categories were equal to those that the students had initially guessed. Therefore, the analysis was answering whether the proportion of doctors making specific recommendations was equal to a set of predetermined values subjectively set by the students. Because the question answered was quite different from the ones posed, the judges did not award this project.

Third, when the data collected can answer the question, it is important that the proper statistical method be used correctly. This year, there was a project that compared two groups. The overall sample mean was taken as the population mean. (This is an error because the overall sample mean is only an estimate of the population mean.) Then, one-sample t-tests were used to determine whether each of the group means differed from that overall sample mean. I thought that perhaps this incorrect procedure was used because the students had not learned about two-sample t-tests yet, but one was used later in the same report. This project probably would have won had the proper test been conducted and the results interpreted correctly.

Several groups have submitted science fair projects. These have potential, but usually need revision to be applicable for the project competition. Typically, more emphasis has to be placed on data collection, analysis, and interpretation. Science fair projects tend to describe the scientific problem in detail and give relatively little attention to the statistical aspects of the problem.

To summarize, in judging the Project Competition, judges are first looking for an interesting question. Next, they evaluate the methods of data collection and ask whether the data that have been collected can be used to answer the question. Then, they determine whether the statistical methods used are appropriate for the question and data. Finally, they consider whether the students have used this information to answer the question. Because this is a learning process for the students, mistakes in the process will be made. A final section of the project allows students to reflect on the strengths and weaknesses of the work.

ASA Chapters are scattered throughout the United States and members of these Chapters are eager to help in both the poster and project competitions. If you would like to get such support and do not know whom to contact, you can call Cathy Crocker, ASA Director of Education (703-684-1221, ext. 146). She will help you get in touch with statisticians who are interested in these competitions.

I encourage schools to become involved in the Project Competition. Teachers and students seem reluctant to give it a try, but once they do, they become very enthusiastic. Keep the few points I have made in mind. The educational benefits of doing a project are enormous.

Linda Young
University of Nebraska, Lincoln

1995 Annual American Statistics Poster and Project Competition Winners

The contests are open to all public or private schools in the United States and Canada.

Sixth Poster Competition

There are four categories: grades K-3, 4-6, 7-9, and 10-12. Prizes totaling $200 are given in each category. Plaques are given to the schools of the winning entrants. Honorable Mention certificates are awarded as well.

Grades K-3—*Exercise and Pulse Rate*
Students: Miss Molyneaux's Class
Advisor: Camille V. Molyneaux
Paul S. Gardiner Elementary School, Chagrin Falls, Ohio

Grades 4-6—*When are Logarithmic Scales Better than Linear Scales*
Student: Timmy Greco
Advisor: Mrs. Heartman
Heim Middle School, Williamsville, New York

Grades 7-9—No Winner Selected

Grades 10-12—*Relating Vital Info and Geography*
Student: Stanley Hunter
Advisor: Fred Djang
Choate Rosemary Hall, Wallingford, Connecticut

Honorable Mention

Grades K-3—*U.S. Population Density*
Student: Ryan Miner
Advisor: Naomi Macari
St. Lawrence School, Huntington, Connecticut

Grades K-3—*Sweet Data*
Students: Doolittle School's First Grade Class
Advisor: Jo Fackler
Doolittle School, Cheshire, Connecticut

Grades K-3—*Wings that Soar In and Out the Door*
Students: Mrs. Thompson's Class
Advisors: Susan Thompson and Beth Newman
Hope Elementary School, Hope, Indiana

Grades 4-6—*How Do USA, Norway, and Egypt Differ?*
Student: Birgit Hellesnes
Advisor: Mrs. S. Porter
Jack Jouett Middle School, Charlottesville, Virginia

Grades 7-9—*Fact or Fiction?*
Student: Brian Knees
Advisor: Ava Chervansky
Newtown High School, Sandy Hook, Connecticut

Grades 7-9—*M&M Mania*
Students: Susan Whittaker, Katie Princt, Cory Parker, and Deanna Bollnow
Advisor: Joanne Paonsha
Mentor Memorial Junior High School, Mentor, Ohio

Grades 7-9—*Musical Mathematics*
Students: Rachel Walker, Conor Evans, and Dan Beers
Advisor: Ava Chervansky
Newtown High School, Sandy Hook, Connecticut

Grades 10-12—*Number of Keys*
Student: Sharon Massey
Advisor: Sarah Miller
Mauldin High School, Mauldin, South Carolina

Grades 10-12—*Cancer*
Student: Chan Ping Shun
Advisor: Fred Djang
Choate Rosemary Hall, Wallingford, Connecticut

Ninth Project Competition

There are three categories: 4-6, 7-9, and 10-12. The winners in each category receive prizes totaling $300. Schools of the winning entrants receive plaques. Honorable mention certificates are also awarded.

Grades 4-6—*Cash to Mash the Problems of the World*
Students: Amanda Binder, Diana Bower, and Darla Woodring
Advisors: Winnifred G. Bolinsky
Fogelsville Elementary School, Allentown, Pennsylvania

Grades 7-9—No Winner Selected

Grades 10-12—No Winner Selected

Honorable Mention

Grades 4-6—*A Comparison of Allowances*
Students: Jared M. Glover and Kevin M. Kress
Advisor: Carolyn J. Glover
Chestnut Academy, Pittsburgh, Pennsylvania

Grades 7-9—*GPA Affected by Family Structure!??*
Students: Deborah Baker and Amy Hirstein
Advisor: Carol Daniels
F.L. Smart Intermediate School, Davenport, Iowa

Grades 10-12—*Journey Into the Real World*
Students: Susan Barbera, Michelle Crowley, and Shristina Dirienzo
Advisor: Richard Flyte
Somerset Area Senior High School, Somerset, Pennsylvania

QL in Science

SEAQL Workshops

Science Education And Quantitative Literacy (SEAQL) is a program that uses data analysis to make the science laboratory experience more interesting and useful in grades 6-12. SEAQL is sponsored by the American Statistical Association with support from NCTM and major funding from NSF. Two four-week long workshops will be held this summer: one from June 17-July 12, 1996, at John Carroll University in Cleveland, Ohio; the other from July 15-August 9, 1996, at San Jose State University, in San Jose, California. Any science teacher, grades 6-12, is eligible to apply. Knowledge of statistics is not necessary and is not presumed. Each workshop expects to enroll 45 science teachers. Participants will receive a stipend, meals, site lodging, and limited travel reimbursement. Application forms may be obtained from Cathy Crocker, ASA Director of Education, or Veronica Chambers, ASA Coordinator of Educational Programs at 703-684-1221; fax: 703-684-2037; or, seaql@amstat.org. Application deadline is February 1, 1996 (Applications referring to this article will be accepted through February 20). Please pass this information along to your science colleagues.

Keep Us Informed...

The Statistics Teacher Network is a newsletter published three times a year by the American Statistical Association—National Council of Teachers of Mathematics Joint Committee on the Curriculum in Statistics and Probability.

We need your letters, announcements, articles, and information about what is happening in statistics education! Please send hard copy, and, if possible, a disk written in standard ASCII text to the editor:

Jerry Moreno, Dept. of Mathematics, John Carroll University, University Heights, OH 44118

or **moreno@jcvaxa.jcu.edu**

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