



# THE STATISTICS TEACHER NETWORK



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*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.*

## SUMMER INSTITUTES IN STATISTICS FOR HIGH SCHOOL TEACHERS

A series of week-long institutes on statistics will be held for teachers of high school mathematics during the summer of 1985 at several different sites across the United States. The institutes will be presented by teachers Gail Burrill, Chris Olson and Murray Siegel, who attended the Woodrow Wilson National Fellowship Foundation 1984 Institute on Statistics held at Princeton University. The 1985 workshops are being organized by Woodrow Wilson to continue promoting statistics education by using materials developed in the 1984 Institute.

The main focus of each institute will be on statistics in society. The topics will include exploratory data analysis, sampling and experimental design, probability and simulation, statistical inference, and problem solving as it applies to statistics. One area of concentration will be on ways to incorporate statistics into the secondary school curriculum. The institutes are open to all qualified teachers who are assured of a teaching position for the 1985-86 school year.

The institute sites and the local coordinators are:

- 6/24-28 George Mason University  
Fairfax, VA Dr. Klaus Fischer  
(703) 323-2955
- 7/8-12 State University of New York  
Purchase, NY Ms. Marjorie Erf  
(914) 253-5155
- 7/15-19 Grand Valley State College  
Allendale, MI Dr. Charles Knop  
(616) 895-3546
- 7/22-26 Boston Science Museum  
Boston, MA Dr. Charles Howarth  
(617) 723-2500

- 8/5-9 Trinity University  
San Antonio, TX Ms. Gloria Richter  
(512) 736-7316

For information about tuition, how to enroll, college credit, and local arrangements, contact the coordinators.

— Gail Burrill  
Whitnall High School  
Greenfield, WI 53228

## VLP LAUNCHES HIGH SCHOOL EXPERIMENT

The Visiting Lecturer Program in Statistics, sponsored by the leading statistical societies in Canada and the United States, has started to include high school visits as part of its program. This is being done on a limited, experimental basis to test its popularity and effectiveness.

The first visit was by Professor Mary Ellen Bock of Purdue University to Columbus North and Columbus East Senior High Schools in Columbus, Indiana. She discussed topics ranging from the central limit theorem to careers in statistics with classes on probability and statistics and received an enthusiastic reception.

About 75 high schools have been identified as likely to benefit from a VLP visit and special invitations have been sent to them to participate in the experiment. Other schools are welcome to apply. Contact Jon R. Kettenring, Bell Communications Research, Room 2A-331, 435 South Street, Morristown, NJ 07960-1961 for more information.

— Jon R. Kettenring  
Bell Communications Research  
Morristown, NJ 07960-1961

## APPLIED STATISTICS COMPETITION IN BRITAIN

Statistics is a practical subject, and pupils need opportunities to discover the scope and power of statistical reasoning in real situations.

Two hallmarks of a good statistician are the abilities to work as a member of a team, and to apply familiar techniques in unfamiliar contexts.

To encourage and stimulate this kind of approach to statistics and its applications, an Annual Statistics Competition was established last year. The idea arose from my hearing at the First International Conference on Teaching Statistics (Sheffield, 1982) of a similar, highly successful initiative by the Hungarian Statistical Office. The U.K. Competition was made possible by collaboration between the Department of Mathematics, Statistics and Computing at the London University Institute of Education and the Central Statistical Office. Support and prize-money for the Competition were given by the Institute of Statisticians and the Royal Statistical Society. Prizes of microcomputers were kindly donated by Sinclair Research Ltd.

More than sixty teams registered as competitors. Each team was required to undertake an applied statistics project, preferably based on cross-disciplinary work. The research could incorporate either primary or secondary data, and although computing facilities were not considered to be an essential prerequisite, their use was welcomed. Several schools did in fact incorporate computing in their projects. Competition entries were submitted in the form of research reports and were judged in two age-groups, "Up to 16 years" and "16 to 19 years".

The adjudicators, Sir John Boreham, Anne Hawkins, Peter Holmes and Professor Peter Moore, were looking for projects which showed careful planning and teamwork, sensible choice of methods appropriate to the study undertaken, understanding of the implications and practical applications of the findings, skills in presentation and statistical competence.

First Prize in the younger age-group was awarded to a team of six 14 and 15 year olds from the Bishop of Llandaff High School in Cardiff. Their project, "A study of the Afon Kenfig", was a careful piece of work, examining various descriptive hypotheses about a river, testing them with measurements and relatively simple statistical techniques. The project presentation was elegant and comprised a report of very extensive, scientific work. There could have been more emphasis on appraisal, but in all other respects this was a very pleasing and practical project.

Second Prize in this age-group went to a team of four 12 and 13 year olds from Penryn School in Cornwall for "A statistical study of the school drink machine". This was a simple, practical,

cost-effective and clear piece of work, with a strong logical progression. It started with a survey of buying patterns and preferences with respect to the drinks machine. As a result of the survey, decisions were taken to change the menu of available drinks. A second survey was then undertaken to evaluate the changes in buying patterns that resulted, leading to the conclusions that more drinks were now being sold and that the new menu was more attractive than the old. The statistical methods, although simple, were appropriate to the task undertaken, and the final project was a coherent and useful study.

A team of two 17 year olds from Churchdown School in Gloucester won First Prize in the older age-group category. Their project, "What price an exposed existence?", was a well-presented and comprehensible scientific application of statistical methods to the question of whether wheiks living on a sheltered shore differed physically from those living on an exposed shore. Again, the adjudicators were impressed by the logical progression from hypothesis to conclusions. More information on the sampling techniques would have been useful, but otherwise this was an extremely thorough project.

Second Prize in the older age-group was awarded to a team of thirteen 16 to 18 year olds from Stourport-on-Severn High School in Worcestershire, for their project on "Smarties". This project emphasized cross-disciplinary approaches to the study of "Smarties" and related consumer issues. Historical and economic data on Rowntree Mackintosh were presented. A local survey of sales and purchasing patterns was conducted. Chromatographic analyses of the dye content of the sugar coatings were carried out and reported in probabilistic terms. A range of other studies relating to the product characteristics and purchaser preferences were also reported. A particular feature of this project was that the team appeared to have used this as an opportunity to collaborate and to find out how statistical concepts feature across the school curriculum.

Representatives of the winning teams were invited to the prize-giving ceremony at the Central Statistical Office. The prizes were presented by Mr. Robert Dunn, MP (Parliamentary Under-Secretary of State for Education and Science). Mr. Bill Nichols spoke on behalf of Sinclair Research Ltd., and representatives of the Institute of Statisticians and the Royal Statistical Society were also present. Schools winning First Prizes each received a Sinclair 48K Spectrum Microcomputer plus peripherals and software, together with \$130 (donated jointly by the Institute of Statisticians

and the Royal Statistical Society). The Second Prize in each age-group was a Sinclair 48K microcomputer plus \$65. The winning project reports have been incorporated into the library of the Regional Centre for Statistical Education in the Department of Mathematics, Statistics and Computing at the London University Institute of Education.

The competition entries confirmed that the undertaking of such applied statistics projects was extremely worthwhile in educational terms. Experiencing the kind of work undertaken by many practicing statisticians should improve the quality of future recruits to the profession, as well as raise general levels of statistical and computer "literacy".

— Anne S. Hawkins  
London University Institute of Education,  
20 Bedford Way  
London WC1H 0AL

Is there any interest in a similar competition in the United States? — Ed.

#### INTERNATIONAL STUDY GROUP ON PROBABILITY AND STATISTICS CONCEPTS

An International Study Group on Probability and Statistics Concepts has been organized and now has about thirty members from a dozen countries. The aims of the group are: to promote the exchange of information between members; encourage research activity by members; develop probability and statistics concepts testing instruments; improve the teaching of probability and statistics by dissemination and interpretation of research findings to educators; and to organize meetings.

Those interested in joining the group should send their name to

— Dr. David R. Green  
University of Technology  
Loughborough, Leicestershire LE11 3TU  
United Kingdom.

David would also like a list of your relevant publications and a list of any other papers that you know of in the area of the development of probability and statistics concepts.

In addition, he is organizing the sessions on "Principles of Learning Probability and Statistics" at the second International Conference on Teaching Statistics to be held in Victoria, B.C. 11-16 August 1986. Write him immediately if you would like to contribute or have suggestions for him.

#### MATHEMATICS EDUCATION IN AMERICAN HIGH SCHOOLS: RESULTS FROM THE HIGH SCHOOL AND BEYOND STUDY

David Sweet has sent a copy of the National Center for Education Statistics *Bulletin* of May 1984. In it results are reported from a recent analysis of about 12,000 high school transcripts of 1982 graduates. Except for Algebra I, which was taken by 63.1 percent of the students, mathematics courses generally enrolled only a moderate or small percentage of the students. Geometry was taken by 48.2 percent, Algebra II by 31.2 percent, trig by 7.4 percent, other advanced math by 13.4 percent, calculus by 5.6 percent, and statistics by only 1.2 percent.

For further information or to get a copy of the report, write

— David A. Sweet  
National Center for Education Statistics  
Brown Building Room 609  
400 Maryland Avenue S.W.  
Washington, D.C. 20202

#### LETTERS

If you have any information or advice for an industrial statistician working with local junior high school math teachers, it would be appreciated. They are presently trying to order the Hoffer material "Statistics and Information Organization." We are hoping that this will give us some material to use in the classroom.

— Jerry Langley  
Hewlett Packard  
Loveland Instrument Division  
P.O. Box 301A  
Loveland, Colorado 80537

#### NEW PUBLICATIONS

Hollander, Myles and Frank Proschan. *The Statistical Exorcist: Dispelling Statistics Anxiety*. New York: Marcel Dekker, 1984.

This entertaining 247 page book consists of 26 vignettes on making decisions, sampling, learning from data, and estimating probabilities. Its purpose is to teach statistics using examples rather than formulas. It contains wonderful material for a high school teacher but would be rather hard reading for most students. Many of the examples are very well known (the *Literary Digest* pool, the birthday problem, the 1970 draft lottery), but the authors endow them with new life, and provide exercises and references about each. Topics include statistical control charts, capture-recapture, estimating survival probabilities, monitoring a nuclear reactor, gambling at roulette, and the dowry problem.

What is the dowry problem? Here is the authors' explanation:

A bachelor is given the (enviable?) task of trying to choose the girl with the largest dowry among four girls. Rather than being told the values of the four dowries, he is presented in random order four slips of paper, each with a different dowry written on it. When he is presented a slip, he must either choose it or reject it. Once rejected, the slip cannot be chosen later. If the bachelor chooses the slip with the largest dowry, he gets the dowry and the girl corresponding to the dowry; otherwise he gets nothing! We assume that the bachelor does not know anything about the distribution of possible dowries. What is the optimal strategy for the bachelor?

*Sets, Probability, and Statistics: The Mathematics of Life Insurance.* Order from Order Fulfillment, American Council of Life Insurance, 1850 K Street, N. W. Washington, D. C. 20006-2284. \$50.

This was originally developed as a thirty-five page booklet to show students how the mathematical concepts of probability and statistics are used in the life insurance business in mortality tables, compound interest, and figuring the premium. The material in the booklet now has been adapted for the computer by James M. King of the University of Georgia. Written in Apple PILOT, the package contains four disks, a Guide with supplementary activities and information on the use and reproduction of the disks, and a Student Workbook and Answer Key.

The programs are easy to use and correspond closely to the lessons in the original booklet. Students can perform the computations needed using a built-in calculator.

Permission is given for instructors to duplicate the disks for classroom use.

Even if you do not have an Apple computer, you will want to write and request a copy of the original booklet.

## CALENDAR

The NCTM Annual meeting will be held in San Antonio on April 17 through April 20. As usual, the Joint Committee will have a booth in the commercial exhibit hall. Come by and tell us what you are doing and how we can help you. Check your program booklets for the probability and statistics sessions #9, 19, 65, 80, 105, 243, 274, 291, 295, 318, 409, 417, 425, 445 and 458.

## WHERE TO WRITE

To order to get on the mailing list for this newsletter, or to submit items for publication, write the editor,

— Ann Watkins  
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