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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.

PROBABILITY AND STATISTICS IN WISCONSIN

Has the recent emphasis on teaching more probability and statistics at the secondary level had any impact on present school practices? The answer to this question is definitely no if information gathered from Wisconsin Secondary schools is at all representative.

In 1975 a survey of mathematics programs in junior-senior high schools contained the following question: "Time allotted for probability and statistics in total junior high school program." The identical question was asked again in the senior high school section of the survey with senior replacing junior. The results for 1975 from 340 high schools and 200 junior high schools are listed below. This survey of mathematics programs in Wisconsin was repeated in 1983 with some of the questions replicated from the previous survey. The same question was asked at both junior and senior high school levels about probability and statistics. (In 1983 the words total junior (senior) high school programs are underlined.) The results are reported below. In 1983, 201 junior high schools and 351 senior high schools responded.

Table with columns: Probability (1975, 1983), TIME ALLOTTED IN TOTAL PROGRAM, Statistics (1975, 1983). Rows include Senior High School and Junior High School with categories: None, Less than 3 wks., 3-6 weeks, More than 6 wks., No answer.

I was certainly surprised, and disappointed, by the trend indicated by these results. They seem to suggest that we have a long way to go before probability and/or statistics become an important part of the secondary curriculum.

- Bruce Williamson
Univ. of Wisconsin-River Falls

PROBABILITY AND STATISTICS ON THE SCHOLASTIC APTITUDE TEST

Standardized tests, such as the Scholastic Aptitude Test (SAT), indicate the extent to which certain mathematical topics are taught in secondary schools. Many questions on the SAT require specific facts and formulas from arithmetic, algebra, and geometry. How many probability and statistics questions now appear on the SAT? Does the SAT contain questions requiring specific knowledge of statistics and probability?

James Braswell, Examiner in Mathematics at the Educational Testing Service in Princeton, writes, "There are no formal specifications that require the inclusion of a specific number of probability and statistics questions. The probability questions that appear on the SAT are generally intuitive in nature and do not require formal training. The statistics questions deal primarily with the concept of the average (arithmetic mean). A typical test will contain at most one probability question and two or three questions that test the concept of the average."

He encloses a copy of "Taking the SAT," which contains a sample SAT with 60 mathematics questions. The sample questions concerning probability and statistics are:

- 1. If the average of v and w is p and the average of x, y, and z is q, what is the average of v, w, x, y, and z in terms of p and q?

## IDEAS FOR TEACHING STATISTICS TO 16-18 YEAR OLDS

Jim Swift has compiled a list of ideas from participants in the workshops on "Teaching Statistics to 16-18 Year Olds" at the First International Conference on Teaching Statistics held in Sheffield, England, in August, 1982. Some examples follow.

- (A)  $p + q$
- (B)  $\frac{p + q}{2}$
- (C)  $2p + 3q$
- (D)  $\frac{2p + 3q}{5}$
- (E)  $\frac{3p + 2q}{5}$

2. The sum of 10 numbers is what percent of the average of the 10 numbers?

- (A) 0.001%
- (B) 2%
- (C) 10%
- (D) 200%
- (E) 1,000%

3. Ted picks a number at random between 1 and 100. Sam guesses 37 and Mike guesses 42. The rest of the question asks if Sam will probably be closer to Ted's number, Mike will probably be closer to Ted's number, the above probabilities are the same, or the relationship cannot be determined from the information given.

Braswell continues, "Not every SAT contains questions with the same frequency as those found on this test. Students who have had a little background in probability and statistics should find their skills useful on these types of problems. However, since the SAT is taken by many students with absolutely no exposure to formal probability and statistics, we attempt to pose questions that do not disadvantage students who have not been exposed to these areas of study."

The College Board also offers two Achievement Tests in Mathematics. The Level I test usually does not test probability, but the harder Level II test may include probability and statistics. A sample question from the booklet "About the Achievement Tests 1982-1983" follows.

The probability of obtaining more heads than tails in five tosses of a fair coin is

- (A) 5/16 (B) 2/5 (C) 1/2 (D) 3/5 (E) 5/8

In summary, the SAT currently requires far less knowledge of probability or statistics than it does of, say, geometry. "Statistics" questions are limited to the concept of the average. If we would like higher level questions about probability and statistics to appear on the SAT, then we must promote the teaching of these topics until it can be assumed that all students are familiar with them.

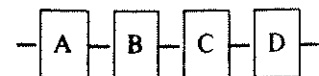
B.L.G.P. Hildebrand of the Netherlands suggested that a classroom with, say, 30 seats can be used to show the difference between permutations and combinations. The teacher presents two questions. (1) Twenty students enter the classroom. Everyone is free to choose a seat. In how many ways can they be seated? (2) The teacher wants to distribute 20 identical tests before the students enter. In how many ways can this be done?

Professor T. Nemetz of Budapest suggested a statistics project. The student is to determine the number of pages that should be allotted to each letter in an address book of a given size. The teacher may suggest checking a telephone directory to determine the frequency of initials.

Jim Swift, R. R. #3, Site E, Nanaimo B.C. Canada V9R 5K3, will have a statistical package using Waterloo MicroAPL on a Commodore Superpet available this fall. The package will put the information from each member of a sample of a random access file. A conversational program can be used to set up menus that describe the data and select subsamples. It will provide programs for exploratory data analysis that access these data files. Jim would like this system to provide a means of exchanging disks of data that are interesting and motivating to high school students. (It should not be difficult to transfer the package to an IBMPC or other micro using the Waterloo languages.)

Ken Sharpe of the University of Melbourne, Australia, suggests collecting data on the interval between birth dates for children in the same family. He believes that the interval between the last and second to last child tends to be longer than that between other children.

David Roseveare of BBC Television in London claims that if four aircraft components A, B, C, and D are in series



and that the probability that component A will fail in unit time is  $P(A)$ , and similarly for B, C, and D, then aircraft designers legitimately

$$P(A) + P(B) + P(C) + P(D)$$

as the probability that the system will fail. Investigate!

## SPECIAL ISSUE ON STATISTICS AND PROBABILITY IN THE ELEMENTARY SCHOOL

The *Statistics Teacher Network Newsletter* will have a special issue on statistics and probability in the elementary school. All contributions are welcome. We are especially interested in publishing plans of successful lessons, worksheets, descriptions of new programs, and recent research concerning the elementary school child and the learning of probability and statistics.

### NEW PROGRAMS

Calling All Mathematics Supervisors:

What is going on in your state in the area of statistics and probability? One of the objectives of this newsletter is to identify and share state curriculum and teaching ideas. Please take a moment to write to tell us about

- (1) your state's statistics and probability requirements or recommendations,
- (2) the work of local school districts in statistics and probability, and
- (3) elementary or secondary teachers who are doing interesting things in statistics or probability.

We would like this information as soon as possible, so that we can print it in the next few issues of this newsletter.

— Claire Newman  
Queens College, CUNY  
Flushing, NY

### LETTERS

I was interested to see the first issue of *The Statistics Teacher Network*, and should be grateful if you could arrange for me to be sent future issues.

Some of your readers may be interested to know that we are preparing several new courses in statistics at the Open University. These include audio and video-tapes, and range from a basic introductory course on "citizen arming" to more advanced courses in statistical methods and in probability.

The "citizen arming" course will be out in 1983, and includes exploratory data analysis, inference via nonparametric methods, statistics in public policy, and plenty more besides.

I will be glad to provide further details of these courses on request.

— John Bibby  
Faculty of Mathematics  
The Open University  
Walton Hall,  
Milton Keynes,  
MK7 6AA United Kingdom

### NEW PUBLICATIONS AND PRODUCTS

#### *Proceedings of the First International Conference on Teaching Statistics*

The proceedings of the first International Conference on Teaching Statistics held in Sheffield, England, in August 1982 are now available. The two volumes contain the invited talks and the plenary talks by L. Rade, C. R. Rao, and J. Gani. Typical titles of talks include:

- " Two Examples of Statistics Activities for Elementary School Classes,"
- " The Teaching of Statistics in French Secondary Schools,"
- " Building Bridges Between the Academic and Real Worlds,"
- " Children's Choice Behavior in Probabilistic Situations,"
- " The Case for Using Computers in Teaching Statistics."

To order, write to:

ICOTS Secretary  
Dept. of Probability & Statistics  
University of Sheffield  
Sheffield S3 7RH, United Kingdom

The price, including postage is £10.50. Make checks payable to "Teaching Statistics."

#### *What is a Survey?*

American Statistical Assn.  
806 15th Street, N.W.  
Washington, D. C. 20005

This 32-page booklet is written for the nonstatistician and can be read by high school students. It contains information on types and characteristics of surveys, designing and conducting a survey, sources of errors, and using the results of a survey. *What is a Survey?* would be interesting reading for a teacher or student before starting a statistics project.

Single copies are free. Additional copies cost 50 cents each. Requests should be accompanied by a self-addressed label for mailing.

## HELP!

In reference to the *Statistics Teacher Network* Issue #1, September, 1982, are the materials used in the leadership conference in Williamsburg, Virginia, now available for student and teacher use?

I am referring to the four booklets: *Exploring Data, Probability, Simulation, and Information from Samples*. If they are now available, where can they be purchased?

— David R. Johnson  
Chairman, Mathematics Dept.  
Nicolet High School  
Glendale, WI

(These booklets contain student worksheets and teacher notes. They are aimed at the junior high school student. The four booklets have been revised during the summer and will be available after field testing. If you would like to field test one of the booklets, send your name to:

Richard L. Scheaffer  
Department of Statistics  
University of Florida  
Gainesville, FL 32611

Dick says he especially needs elementary school teachers. — Ed.)

I would like any booklet or other relevant information concerning the use of computers in schools in connection with teaching statistics.

— George Papas  
2 Tanatalidou Str.  
Athens (902) Greece

## CALENDAR

### ICME 5

The Second Announcement for the Fifth International Congress on Mathematical Education is available from

ICME 5 Travel Planners  
P. O. Box 32366  
San Antonio, TX 78216.

The Congress will be held in Adelaide, Australia, August 24-30, 1984. There is reduced registration for early registrants. Participants are invited to submit proposals for short communications in the form of a poster for wall display or a 15 minute talk. The deadline to submit a proposal for a talk is December 31. "The Teaching of Statistics" is one of the major topic areas.

Many social events are planned, as well as excursions in the Adelaide area and tours of Australia. Inexpensive accommodation is available in university and secondary school housing.

### NCTM Regional Conference Programming

Here is a list of upcoming NCTM Regional Conferences.

Winnipeg, Manitoba  
18-20 October 1984

Memphis, Tennessee  
1-3 November 1984

Biloxi, Mississippi  
8-10 November 1984

Tulsa, Oklahoma  
8-10 November 1984

San Diego, California  
31 January - 2 February 1985

Cedar Rapids, Iowa  
14-16 February 1985

Yakima, Washington  
14-16 March 1985

Parsippany, New Jersey  
21-23 March 1985

To get on the program at an NCTM Regional Conference, it is necessary to be recommended 13 months in advance. If you would like to speak to teachers on probability or statistics at one of the above conferences, write to the editor and we will try to arrange a recommendation for you.

## WHERE TO WRITE

Address all letters, announcements, questions, and requests to get on the mailing list for the newsletter to the editor,

Ann Watkins  
Department of Mathematics  
Los Angeles Pierce College  
6201 Winnetka Avenue  
Woodland Hills, CA 91371

Please share this newsletter with other teachers interested in statistics. You may photocopy anything in it you wish.