Puget Sound Chapter of American Statistical Association

Announces

The 2005 Statistical Poster Contest

Open to students, grades 7 – 12

2 categories 7-9, and 10-12

Prizes awarded to first, second, third and honorable mention in each category

($100 prize to first place team, $75 for second place team, $50 for third place team, $25 for honorable mention)

Contest Schedule

- Register for poster contest by February 7, 2005. (send application (on PSASA) to Bruce Peterson, Ph.D., TeraStat, Inc., 22904 NE 51st , Redmond, WA 98053; bapeters@terastat.com, 425-466-7344, fax: 206-350-3685) [Note: application is available on PSASA web site http://depts.washington.edu/psasa or from Bruce Peterson 425 466 7344 or email at bapeters@terastat.com).]
- Submit poster for Judging by May 6,2005 (location(s) to be decided)
- Prizes Awarded by early June

Rules

- Posters will measure between 18 and 24 inches high and 24 and 30 inches wide.
- Any weight of paper is permitted. Posters will be transported for judging, and the winners will be displayed at various venues. The best way to submit the poster is flat between taped sheets of cardboard.
- Any layers of paper on posters must be affixed securely.
- Posters must be the original design and creation of the entrants themselves. Computer graphics may be used.
- Subject matter is the choice of the participant(s) or their classmates. An example of the original data, brief descriptions of method of collection and purpose of the experiment must be taped to the back of the poster. (Cite references for published data.)
- **Paper clip the entry form to the front of the poster**. Be sure the poster itself gives no information that identifies the team or school.
- Students may work individually or in teams. The maximum number of students per team is four. For teams with members from different grade levels, the highest grade determines the entry category.

Evaluation:

Teachers and statisticians, whose decisions are final, will judge the posters for:

- **Overall impact** of the display for eye-catching appeal and visual attractiveness; for its ability to draw in the viewer to investigate the individual graphs (more than one graph is required).
- **Clarity** of the message's demonstration of important relationships and patterns, obvious conclusions, and ability to stand alone, even without the explanatory paragraph on the back.
- **Appropriateness** of the graphics for the data.
- **Creativity.**

Note: The statistics poster contest provides students with a fun and rewarding method of demonstrating achievement of the Washington State Essential Academic Learning Requirements for mathematics.

Note: copy URLs from PDF and paste into web browser

Teacher Resources

http://www.k12.wa.us/CurriculumInstruct/mathematics

http://depts.washington.edu/psasa

http://www.amstat.org/education/index.cfm?fuseaction=k12material

http://www.amstat.org/education/index.cfm?fuseaction=poster1

Poster Examples

http://www.amstat.org/education/2004competition/index.cfm

http://renoir.vill.edu/~short/posters/2000/

http://www.math.yorku.ca/SCS/Gallery/

WHAT IS A STATISTICAL POSTER?

DEFINITION AND PURPOSE

There are many excellent references on the basics of developing a good data-based graphic. This article describes a few basic guidelines for constructing *a statistical poster.*

A *statistical poster* is a display containing two or more related graphics that summarize a set of data, that look at the data from different points of view, and that answer some specific questions about the data.

Tukey (*Statistical Science,* 1990, Vol 5, No.3, 327-339) states that "Much of what we want to know about the world is naturally expressed as *phenomena,* as potentially interesting things that can be described in nonnumeric words." We collect data to describe and answer questions about phenomena. We present data to communicate our ideas to others. The purpose of a statistical poster, then, is to *visually tell a story, from the data, about some phenomena,* revealing to the viewer the conclusions that can be drawn. A poster has one major disadvantage, however. Because there is no narrator to neither tell the story, nor an accompanying report to discuss the data, the poster must be able to stand alone; it should not have to be explained. For this reason, special care must be taken to present ideas clearly. Not only must the viewers understand the individual graphics, but they must also understand the relationships among the graphics, and how the graphics address the question(s) being studied.

DATA-BASED PROBLEM SOLVING

Data are everywhere. Teachers may assist students by suggesting topics of interest, but students should have little trouble generating or collecting data, about themselves, about their schools, about their neighborhoods--about interesting phenomena in their world. The level of reasoning and the complexity of the problems will differ greatly with the maturity of the student(s); but even in the lower grades, formulating and solving problems based on data should be the primary goals. The poster, then, becomes a communications tool, a tool for the graphical presentation of data. In the upper grades, the poster can be used not only for data presentation, but also as a graphical problem-solving tool. The poster should demonstrate that the scientific method of solving a problem has been used. Keep in mind the following questions:

Was there a carefully focused question or questions? (Washington EALR, #2.1, #2.2)

Were appropriate data collected? (Washington EALR, #1.1, #1.2, #1.4, #2.1, #3.1)

Were the data analyzed intelligently? (Washington EALR, #1.4, #1.5, #2.2, #3.1, #3.2, #3.3)

Were the correct conclusions drawn? (Washington EALR, #3.1, #3.2, #3.3)

Is the presentation clear, complete and readily understood? (Washington EALR BM3, #4.1, #4.2, #4.3, #5.1, #5.2, #5.3)

BASIC GUIDELINES

While constructing a poster, it is important to keep in mind that the central idea of the study should be the most prominent feature of the poster. To bring the main idea into focus, questions such as the following should be asked. "What is the purpose for displaying this information?" "What comparisons should be made?" "Which trends should be shown?" Questions should be asked until the central idea of the study becomes clear. This then, becomes the focal point of the poster. The poster must reveal what the data have to say. It must allow the viewer to see the data, that is, to see the variation in the data, the structure of the data, the important patterns in the data (or lack thereof), the data points that do not fit the pattern, and the conclusions that can be drawn from the data. Further, each graphic on the poster should convey new information about the data--a pattern or structure, for example, that cannot be seen in the other graphics.

The poster title should be informative to reduce the need for additional explanatory text. For example, the title can indicate the questions addressed by the graphics or can even convey the major conclusion to be drawn from the data.

Each graphic's legend should be positioned so that there is no question which graphic and which legend go together. Further, each graphic and its legend should stand alone. If the graphics need to be viewed in a certain sequence, however, then the viewer's eyes must be guided in the right sequence.

Try to eliminate trivial and extraneous information, linework, or lettering. In particular, redundancy in titles and legends should be omitted. Only explanations that are needed to make the conclusions clear and obvious should be included. Data tables should not be shown on the poster; reading off numbers is not the point of the display. [Data tables can, however, help display the structure of the data. So not totally discouraged.]

Choose a few harmonious colors that are easily visible. The key to using colors effectively is restraint; the colors should not distract the viewer, but should enhance recognition of the structure of the data and of the conclusions. [Keep in mind others may be color blind, use of both pattern and color is encouraged]

Tufte (*The Visual Display of Quantative Information,* 1983, 13) stated that graphics may "...reveal the data at several levels of detail, from a broad overview to the fine structure." In a similar sense, a poster may do the same. At a distance, perhaps only a broad overview of the poster and the data is possible; main titles are visible and overall outlines of the data as revealed by the graphics can be seen. On a closer inspection, however, aspects such as individual data labels and legends can be seen more clearly.

A FINAL NOTE

The NCTM *Standards for Curriculum and Evaluation in School Mathematics* presents the vision that problem solving is a main goal of mathematics instruction at all levels, and calls for student involvement in statistical activities at all grade levels. The *Standards* indicates that statistical thinking should start in the primary grades with the creation of student data from class activities. In upper grades, the emphasis is on collecting, organizing, summarizing, and interpreting data from other school disciplines such as the physical or the social sciences, as well as outside interests of the students. Graphical displays are exceptionally powerful tools for data presentation and for data analysis.