

2007 CIEP 475: TEACHING WITH PRIMARY SOURCES CLASS FINAL PROJECT

Using Graphs to Display Data

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Using Graphs to Display Data

Lesson Overview:	<p>As a part of an introductory unit on graphing and statistics, this lesson will introduce the real-world purpose of graphs to students. By reviewing a variety of graphs, students will begin to examine the different ways data is displayed. They will reflect on how the different forms of graphs serve different purposes for different audiences. This concept will be developed through small group analysis of documents and be reinforced through a class discussion; making connections to the data that they may see in their everyday lives.</p> <p>This lesson can easily be adapted for a high school statistics course. The lesson would reinforce the idea that sample size and population should be considered when evaluating statistical findings. It would also serve as an introduction to the purpose behind statistics. The activities in this lesson would lead to many rich topics of learning within statistics.</p>
Objectives:	<p>Using a variety of primary sources, students will critically examine the author, purpose, and audience of different graphs, tables, and charts.</p> <p>Students will form hypotheses of the effectiveness of different displays of data and support these hypotheses with information from the data and their own experiences.</p> <p>Students will demonstrate their understanding of the importance and effectiveness of displaying data by developing their own graph for a specific purpose and evaluating those graphs developed by other students.</p>
Time Required:	90 minutes
Grade Level(s):	Grade 8, can be adapted for High School statistics (Grade 12)
Topic(s):	Displaying data for specific purposes in statistics
Era/ Time Period	n/a
Format(s) of Primary Sources Used:	The primary sources used in this lesson vary between posters and printed material. All sources were produced for a specific audience and published.

Standards Addressed:	<p>Mathematics:</p> <p>10.A.3a Construct read and interpret tables, graphs and charts to organize and represent data</p> <p>10.A.3c Test the reasonableness of an argument based on data and communicate their findings</p> <p>Language Arts:</p> <p>4.B.3b Design and produce reports and multi-media compositions that represent group projects.</p> <p>5.B.3a Choose and analyze information sources for individual, academic and functional purposes.</p> <p>5.B.3b Identify, evaluate and cite primary sources.</p>
Preparation: -Materials Used -Resources Used	<ul style="list-style-type: none"> • Analysis worksheet (for each student, for each document) • Poster from Iowa Safety Council • Packet of documents for each student pair <ul style="list-style-type: none"> ○ Absentee graph ○ Cancer chart ○ Magazine advertising article ○ Climate table <p>“Which magazines reach the greatest percentage of possible consumers of your product?” <i>J. Walter Thompson Company</i> 13 September 1922. <i>Emergence of advertising in America 1850 – 1920. American memory.</i> Library of Congress 21 July 2006. http://scriptorium.lib.duke.edu/eaajwt/J01/J0148-01-72dpi.html</p> <p>“Can you stop.” Illustration. <i>Can you stop?</i> By the people, for the people, posters from the WPA, 1936-1943. <i>American memory,</i> Library of Congress 21 July 2006. http://memory.loc.gov/service/pnp/cph/3f00000/3f05000/3f05200/3f05254v.jpg</p> <p>“Summary of winds and weather from January 1.” <i>Report of the commissioner of Indian affairs</i> 1986. <i>University of Washington digital libraries. American memory.</i> Library of Congress 16 July 2006. http://content.lib.washington.edu/cgi-bin/docviewer.exe?CISOROOT=/lctext&CISOPTR=538</p> <p>“Uterine cancer rates in South Dakota, by county, 1953-1987.” <i>National cancer institute</i> 1987. <i>American Woman’s History. American memory.</i> Library of Congress 16 July 2006. http://memory.loc.gov/cgi-bin/query/r?ammem/awhbib:@field(DOCID+@lit(awh00004))</p>

<p>Procedure</p>	<ol style="list-style-type: none"> 1) Show students the overhead of the poster from the Iowa Safety Council. Ask students to develop a list of questions they may have about the poster. Use probing questions to lead them in the direction of considering the audience, purpose, and author of the poster. 2) Discuss with students the different reasons that data would be displayed for the public. Record their brainstorming on the board. Ask them what situations would be appropriate to use given data. What different forms can data be presented in? Why would you choose one form over another? 3) Hand out the document packet to each pair of students. Assign each pair a different page to begin on. Inform students that they are to become the “expert” on this document before they move on. Students should, at the very least, examine each document, even if they do not have time to analyze it. 4) Give students the worksheets they will need. Ask them to fill out a worksheet on as many documents as they can. They should, however, spend enough time on each one to thoughtfully consider each question. Assure students that they may not be able to come up with a clear answer to each question for all the documents. 5) Allow students time to work in their pairs. They should have 25 minutes to work, but give time reminders to move on to another document after 10 minutes, after they have become an “expert”. 6) After student pairs have had time to review all of the documents, bring the class back together. Ask students what kind of trends or overall observations they made. Lead the class in a discussion about how the author, audience and purpose influenced the presentation of the data. Discuss specific documents as the students bring them up in discussion. 7) Discuss the effectiveness of the way different data was displayed. Help the students make connections to the reasons they brainstormed earlier to display data. 8) Allowing the students at least 20 minutes to work within their pair, ask them to choose one of the reasons for displaying data that the class brainstormed. Have them use fictional data to come up with, and create, a graph or other presentation of data. 9) Ask students to share their display and describe why they chose to present their data in that way. Classmates will critique the effectiveness of each other’s display.
<p>Evaluation</p>	<p>After examining many different types of documents that display data in different forms, students should have a solid understanding of the different reasons some authors may display data for a particular audience and how to do this effectively. Using the list of reasons to display data that the class brainstorms, students will</p>

	attempts to create their own effective display of data, putting themselves in the “author’s” shoes and writing for a specific audience. Students will present their display and their reasoning while creating the graph. Each student will critique their classmates using the attached rubric, also used by the teacher to evaluate the objectives.
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Name: _____ Date: _____

Displaying Data
Peer Rubric

Be sure to add comments justifying your score for each criteria

Presenter Names:

Topic:

	4	3	2	1
Data is displayed accurately as a graph, chart, or table				
The purpose of the data is clear				
The presentation of data is effective for a given audience and purpose				
The data is presented neatly and clearly				
The presentation is creative and engaging				

Name: _____ Date: _____

Examine each document. For each separate document, reflect on the following questions with your partner. You should use these worksheets to record your thoughts, observations and conversations.

- 1) What is your first impression of this document?

- 2) What is the main topic of this document?

- 3) In what form is the data presented? Be specific.

- 4) Why do you think the data was presented in this way?

- 5) Who do you think is the audience for this document?

- 6) What can you learn from the information presented?

- 7) What do you think the purpose of displaying this data was?

- 8) Do you think this document would fulfill this purpose?

CAN YOU STOP?

SPEED AND STOPPING DISTANCE

MILES FEET
PER HOUR PER SECOND

20	29	22 Ft.	18 Ft.	40 Ft.
30	44	33 Ft.	40 Ft.	73 Ft.
40	59	44 Ft.	71 Ft.	115 Ft.
50	74	55 Ft.	111 Ft.	166 Ft.
60	88	66 Ft.	160 Ft.	226 Ft.
70	103	77 Ft.	218 Ft.	295 Ft.

↑
THINKING DISTANCE

↑
BRAKING DISTANCE



IOWA STATE SAFETY COUNCIL

DESIGNED & PRODUCED BY IOWA ART PROGRAM

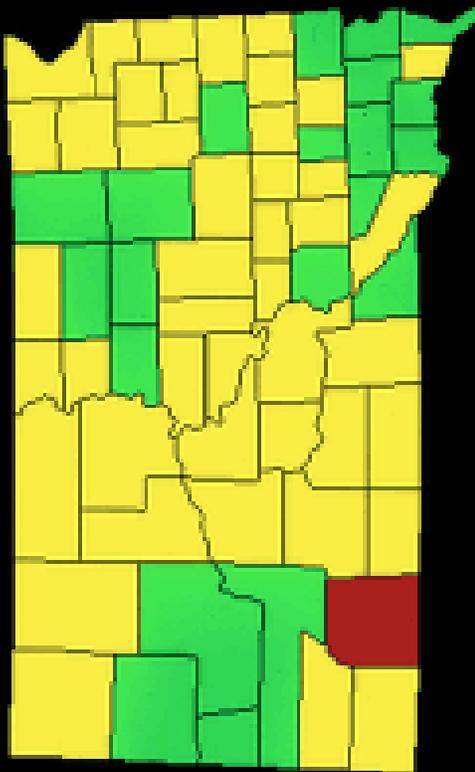
AT RISK
 DEATHS
 ADJ RATE
 1.96 StdErr

SOUTH DAKOTA
 119-00185
 545
 4.36
 0.37

TOTAL U.S.
 2830850496
 233842
 6.02
 0.02

F1 = LOCATE A NAMED COUNTY
 F2 = NAME COUNTY AT CURSOR
 F3 = PRINT SUMMARY REPORT
 F4 = CREATE SUMMARY FILE
 F10: Quit, "Honsa": Recycle

CERVIX Uteri
 (Cancer Mortality)
 All Females
 AGE: 00-100
 DATA YEARS 1953-87
 U.S. 1970 STANDARD



AGE ADJUSTED RATE IS:

- HIGHER THAN EXPECTED
↓ RATE ≥ U.S. + 2SD
- HIGHER THAN EXPECTED
↓ RATE ≥ U.S. + 1SD
- NOT SIGNIFICANT
- LOWER THAN EXPECTED

National Cancer Institute &
 Centers for Disease Control
 Release 8.4

APPENDIX I.

Summary of winds and weather from January 1, 1868, to August 31, 1869, at Territory.

Months.	Warmest days.			Coldest days.			Amount of rain.	Number days cloudy.	Number days fair.
1868.									
January	36	46	39	14	30	17	7.00	12.33	18.66
February	50	51	45	11	28	12	4.35	20.00	9.00
March	45	53	49	32	35	32	5.72	26.33	4.66
April	51	60	44	32	49	36	1.37	21.33	8.66
May	58	64	48	35	41	36	7.55	22.00	9.00
June	60	71	59	50	54	49	1.93	18.33	11.66
July	62	68	57	52	54	50	4.20	28.00	3.00
August	58	61	61	52	51	52	4.01	24.33	6.66
September	57	60	60	38	57	46	6.81	20.00	10.00
October	58	59	59	38	42	36	7.27	27.66	3.33
November	52	52	48	25	31	26	9.38	25.00	5.00
December	48	53	47	20	34	22	6.69	20.00	11.00
								275.31	100.63
1869.									
January	47	41	51	29	32	37	10.14	28.66	2.33
February	43	47	59	24	40	25	14.80	24.33	3.66
March	48	53	45	29	37	41	6.30	21.66	9.33
April	48	56	51	39	38	36	8.99	24.33	5.66
May	58	70	54	41	49	40	6.87	25.66	5.33
June	56	69	55	47	50	45	4.99	24.33	5.66
July	57	69	61	48	53	49	3.20	24.66	6.33
August	56	68	57	52	57	50	3.84	22.33	8.66

APPENDIX L.

General Davis's account of the Kake war.

The following is General Davis's account of the same affair. He says of the 5th of January last:

"The Indians within the last few days have exhibited some signs of rebellion, but I think I have succeeded in checkmating them in their designs for the present. The principal chief of the Chilkahs has been here for some party on a trading visit. He is a very haughty and imperious man, and accustomed to having things his own way heretofore, wherever he went, the whites and Indians. This is his second visit here, during both of which he has been treated with kindness and consideration; but this kind of treatment have evidently misconstrued into fear or timidity on our part, and became more prominent from day to day, until New Year's day, when he and a minor chief disarmed the sentinel at the main entrance into the Indian village. I ordered an officer, to follow him into the village and arrest him and his party, assisted by opening a fire upon the guard. The guard returned it, but finding themselves too strong for them retreated back into the garrison. As the chief reported probably killed in the melee, and the whole tribe of Sitkas, among whom he was staying, was thrown into a great state of excitement, I thought it best to order a strong guard out for the night, and to take no further action until the night was very dark, thus giving them time to reflect.

"I called the principal Sitka chiefs together and they disclaimed any

Which magazines

reach the greatest percentage
of possible consumers of
your product?



IN one of our large middle-western cities an intensive analysis of the readers of forty-four leading magazines has been completed by the J. Walter Thompson Company.

The purpose of this investigation was two-fold—to determine, so far as possible, the quality of circulation supplied by individual magazines and also the percentage of duplication among them.

The scene of the investigation was Cincinnati, its suburbs, and the adjacent cities—enclosing within their boundaries over 500,000 people—selected as typical of the country at large—an area large enough to be indicative yet not too large for thorough treatment.

The method pursued was simple—but direct and accurate. Up-to-date circulation lists were furnished by the magazines; and a staff of checkers checked the name and address of every subscriber to the forty-four magazines against the latest city directories.

These directories are published annually, and give not only the names and addresses of the citizens of Cincinnati and adjacent cities, but also

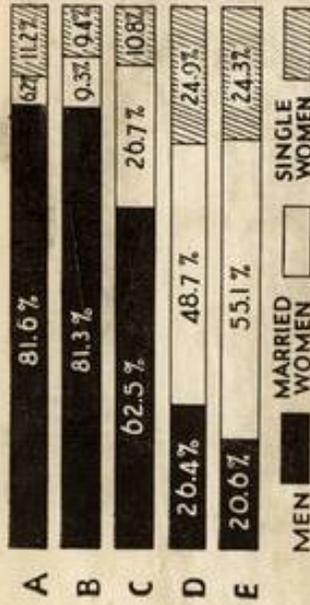


CHART 1. Showing the relative proportion of men, married women, and single women among the subscribers of each of five general magazines.

their occupations—if in business, the kind of position held. The directories list, too, in most cases, the relationship between members of a family.

Against these directories a check was made of the sex of each reader; the occupation—and position when in a company—of the reader or principal members of the reader's family; and finally, the women were checked as single or married.

When this was completed—when each subscriber on the lists of the forty-four magazines was checked—then came the work of counting and classifying the names of the readers—78,933 in number.

Classifications were made that gave for each magazine:

The percentage of subscriptions addressed to men

The percentage of subscriptions addressed to married women

The percentage of subscriptions addressed to single women

The percentage of subscriptions addressed to institutions

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Next was made an intensive classification by occupation; each subscriber to each magazine was recorded under the proper sub-division in one of the following groups:

- | | |
|----------------------|-----------------------------|
| GROUP I | GROUP III |
| Executives | Laborers |
| Professionals | Transportation employees |
| Merchants | Teamsters, Chauffeurs, etc. |
| Commercial Travelers | Personal Service employees |
| | Dressmakers |
| GROUP II | Public Service employees |
| Clerical workers | |
| Skilled workmen | GROUP IV |
| | Institutions |

These several classifications of readers served to answer the first purpose of the investigation: to determine the quality of circulation supplied by each of the forty-four magazines in this area. It gave the proportion of men to women readers—

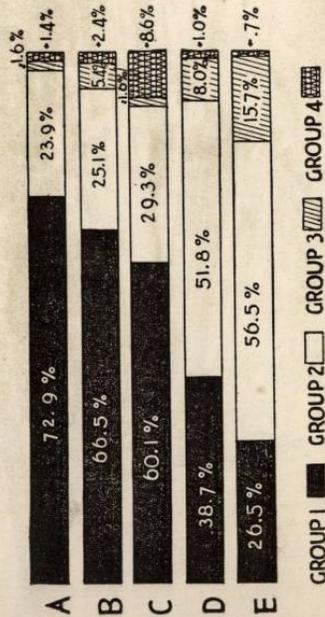


CHART 2. Here the readers of five general magazines have been separated by occupation into four groups—showing the relative proportion of readers in each group of each magazine.

Group 1 includes executives, professionals, merchants, commercial travelers
 Group 2 includes clerical workers and skilled workmen
 Group 3 includes semi-skilled and unskilled laborers
 Group 4 includes institutional circulation
 (Where the subscribers are women, they have been grouped either by their own occupation or the occupation of the principal member of their family)

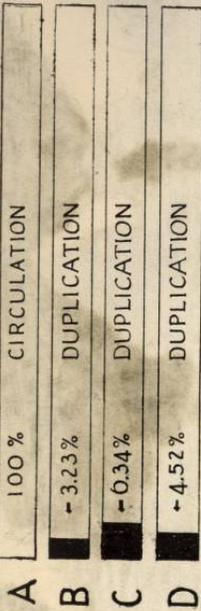


CHART 3. Showing the low percentage of circulation of one woman's magazine duplicated by each of three other women's magazines of a similar nature.

the proportion of married women to single—the proportion of readers in each occupational group to the readers in the remaining groups.

Finally, the forty-four magazines were grouped according to editorial policies. Readers of one magazine were checked against the names of readers of other magazines in the same group; the subscription lists of magazines in one group were checked against the lists of magazines in other groups.

This check served to answer the second purpose—to determine the percentage of duplication between magazines and between groups of magazines.

The data resulting from this investigation have been reduced to charts similar to the three reproduced here. From these charts may readily be selected the magazines which reach the greatest percentage of possible consumers of your product in this typical area.

A booklet fully explaining this analysis of magazine circulation is being issued by the J. Walter Thompson Company. A copy will gladly be sent to you upon request.

J. WALTER THOMPSON COMPANY

Advertising

NEW YORK CLEVELAND CHICAGO BOSTON SAN FRANCISCO LONDON CINCINNATI

September 13, 1923