

## A THANKSGIVING SURVEY

### OUTCOMES

Students will be able to design and conduct a survey and translate that information into a basic bar graph.

### GED DESCRIPTORS

Language Arts-Reading  
Social Studies  
 Science  
Mathematics  
 Language Arts-Writing

### ROLES

Family    Worker    Community

### PROGRAM TYPE

<u>ABE</u>	<u>Urban</u>
<u>GED</u>	<u>Rural</u>
<u>ESOL</u>	Homeless
<u>Family Literacy</u>	Institutional
<u>Workforce</u>	<u>Corrections</u>

### LEARNER LEVEL

2-4

### KEYWORDS

**754: Math**  
**417: Math** > graphs  
**33: Celebration** > holidays > Thanksgiving

### LESSON DESIGNER NAME

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### TECHNOLOGY INTEGRATION

### STANDARD Use Math to Solve Problems and Communicate

COPS	ACTIVITY ADDRESSES COMPONENTS
Understand, interpret, and work with pictures, numbers, and symbolic information.	Students will understand the one-to-one correlation between one person and one vote
Apply knowledge of mathematical concepts and procedures to figure out how to answer a question, solve a problem, make a prediction, or carry out a task that has a mathematical dimension.	Students will be able to use the information gained from the survey to help plan a typical Thanksgiving dinner for our last day of class.
Define and select data to be used in solving the problem.	Class will design a questionnaire to be given to their classmates and others in the building who will be invited to attend our party.
Determine the degree of precision required by the situation.	The graph must accurately correspond to the data gathered during the interviews. Students are working with whole numbers and can only vote for one item.
Solve problem using appropriate quantitative procedures and verify that the results are reasonable.	The problem will be solved by using addition and comparison of answers given to determine the highest number.
Communicate results using a variety of mathematical representations, including graphs, chart, tables, and algebraic models.	Students will display their results in the form of a bar graph and plan a Thanksgiving dinner of the most popular foods from the survey.

## A THANKSGIVING SURVEY

<p><b>OUTCOMES</b> Students will be able to design and conduct a survey and translate that information into a basic bar graph.</p>	<p><b>STUDENT GOALS</b> Students wanted to have a Thanksgiving dinner in class. The teacher used this opportunity to incorporate math into the party planning.</p>	<p><b>MATERIALS</b> <i>Seven Immortal Principles of Surveys</i> Overhead Paper, pen or pencil, graph paper and colored markers</p> <p><b>NRS EFL 2-4</b> TIME FRAME 3 hrs and a party time</p>
<p><b>STANDARD</b> <i>Use Math to Solve Problems and Communicate</i></p>	<p>LEARNER PRIOR KNOWLEDGE Students are familiar with tally marks and how to create a bar graph. Some experience with survey design and samples.</p>	
<p><b>COPS</b> Understand, interpret, and work with pictures, numbers, and symbolic information.</p> <p>Apply knowledge of mathematical concepts and procedures to figure out how to answer a question, solve a problem, make a prediction, or carry out a task that has a mathematical dimension.</p> <p>Define and select data to be used in solving the problem.</p> <p>Determine the degree of precision required by the situation.</p> <p>Solve problem using appropriate quantitative procedures and verify that the results are reasonable.</p> <p>Communicate results using a variety of mathematical representations, including graphs, chart, tables, and algebraic models.</p>	<p><b>ACTIVITIES/CURRICULAR RESOURCES [REAL-LIFE APPLICATIONS]</b></p> <p>Step 1 – Most adults have experienced taking a survey. Take some time to brainstorm with students what kind of surveys they have taken, what kinds of questions they were asked, and what makes a good survey. List their ideas on the board or chart paper. Use the <i>Seven Immortal Principles of Surveys</i> Overhead to compare lists.</p> <p>Step 2 - First, have the group consider the goal or what they want to learn from the survey. As students design their questionnaire, they will need to know their own favorite foods from Thanksgiving dinners in the past or what they think others would enjoy. Then determine the sample or who they will interview. They will also need to consider how they will design the survey or the interviewing methodology. Now, begin to create the questionnaire – determine what questions will be asked.</p> <ul style="list-style-type: none"> <li>• Everyone should have all the questions on their sheet. In this scenario everyone could ask people the same questions. If they did this they would have to be sure the same person was not interviewed twice or their data would not be accurate. Discuss importance of reliability when collecting data.</li> <li>• Another way would be to have each student take a different category of food and only interview people about that particular food. Would this be a better choice? Why?</li> </ul> <p>The survey can be completed on the computer using a word processing software or questions can be entered into Survey Monkey <a href="http://www.surveymonkey.com/">http://www.surveymonkey.com/</a> if Internet access is available.</p> <p>Step 3 - After they have designed their questionnaire, they need to begin to</p>	<p><b>ASSESSMENT/EVIDENCE</b> Teacher observation Questionnaire Collected data Completed bar graphs Completed menu Successful party</p>

	<p>survey people according to the guidelines the class has set. Discuss how to approach people and how to record their answers with tally marks.</p> <p>Step 4 - After all the data have been collected, they need to develop a system to tally the responses on chart paper and decide how best to display this information on a bar graph. Analyze the data as a group and then form pairs or triads to create bar graphs.</p> <p>Review parts of a bar graph (axis, scale, title) as demonstrated by student's prior knowledge and experience with graphs. Teacher may need to step out of the lesson to teach these concepts to the group.</p> <p>Step 5 - Students will use the information on their bar graphs to determine the menu for the party.</p> <p>Step 6 - Party!</p> <p><b>READING/WRITING EXTENSION</b> Discussions centered on bias during the development of the surveys may prompt additional research on this topic. The information outlined in <i>Biases Commonly Found in Surveys</i> can act as a springboard for further study.</p>	
<p>REFLECTION/EVALUATION</p> <p><i>This was a class that met 4 days a week in a community center. They were a particularly close group of people and liked to find excuses to party.</i></p> <p><i>It was amazing and very interesting to see how the conversation developed during this project as they began to realize and understand that data can be manipulated.</i></p> <p>NEXT STEPS</p> <p>Because of the awareness created, we looked at different political polls and had students look closely at how the data were collected, sample size, etc.</p>	<p>PURPOSEFUL &amp; TRANSPARENT</p> <p>It was a very purposeful and transparent lesson because the students knew exactly why they were doing the tasks. It was also during elections so we could transfer what we were learning to other "real-life" situations.</p> <p>CONTEXTUAL</p> <p>The lesson was contextual because it arose out of a classroom conversation and helped to plan their Thanksgiving party.</p> <p>BUILDING EXPERTISE</p> <p>This task helped to build expertise in math computation, comparison, understanding graphing and enlarging their world view.</p>	

# Seven Immortal Principles of Surveys

<http://www.emich.edu/public/geo/557book/e112.survey.html>

## Basic principles of good surveys

1. Brevity
  - Avoid long introductions.
  - Try to simplify the grammar used throughout.
  - If a question and its answers are too long, there is a bias for respondents to answer the last answer presented.
2. Clarity
  - Use very common, unambiguous terms.
  - Avoid questions with double meanings.  
(e.g., "Have you stopped beating your wife? o Yes o No" )
  - If an uncommon term is used, make sure to define it in the survey form.
  - Do not use technical or specialty jargon.
  - Be careful using the word "you"; it can be singular or plural.
3. Reality
  - What people say and how they respond doesn't always represent how they will behave; assume natural biases in their responses.
  - For the general public, do not rely on hypothetical questions.  
(e.g., "If such and such, then would you...?")
4. Unidimensionality
  - Don't combine two questions in one.  
(e.g., "Do you shop downtown or do you shop at malls?")
5. Completeness
  - If multiple alternative responses are included, they should be mutually exclusive. Also, they should include all possibilities.
  - Try to avoid questions that can be answered "I don't know."
6. Evenhandedness
  - Avoid leading questions, "loaded" words, and authoritative statements.
  - Questions should ask for opinions, rather than fact.  
(e.g., Don't ask, "Is downtown a dangerous place at night?"  
Instead, ask, "Do you think downtown is dangerous at night?")
7. Dignity
  - Take respondents and their answers seriously.
  - Avoid condescending slang.
  - Don't present challenging questions.  
(e.g., "Why don't you go back to school?")

## Biases commonly found in surveys

It is common for surveys to have biases. These should be thought of beforehand, and methods found for minimizing their impact. If such biases are too great, the legitimacy of the survey findings could be called into question. Three of the most common types of biases are the following,

### **Hawthorne Effect**

One bias commonly found in survey research is the Hawthorne Effect, which says that respondents tend to respond differently simply because they have been selected for a survey. Because of the special recognition which has been given them, it is sometimes found the respondents tend to answer in the way which will most please the researcher. To minimize this bias, the questioner should be as neutral as possible in presenting the survey.

### **"Self-lifting" bias**

Closely associated with the Hawthorne Effect, the "self-lifting" bias recognizes respondents want to make themselves appear in a positive light, and will respond accordingly. This bias can be minimized by positioning personal questions about respondents at the end of the questionnaire, where they would tend not to affect other, more substantive responses.

### **The "Habit" bias**

If given a series of similar questions, respondents will fall into a habit of answering them similarly without considering each on its merit. This bias can be minimized by changing the format of questions throughout the questionnaire. The format may range from simple "check the box" questions to one-word responses to open-ended responses to completing information on simple graphs and maps. Through these variations, each question is given its own personality, avoiding the "habit" response.

### **Non-respondent bias**

One type of bias often found in surveys is based on the assumption that individuals who haven't responded in a survey tend to feel the same as those who have responded. However, studies have found that non-respondents generally have a more negative outlook, which may not be otherwise represented in the collected data.

### **Stopping Rule**

A bias sometimes found in survey research is based on the fact that the survey procedure is terminated when a researcher has obtained the desired results, and the amount of data collected is determined by results. This was avoided by establishing survey parameters beforehand.