POLLS

Conducting and Analyzing a Scientific Poll

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ISBN# 1-57336-379-0

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The nationwide movement for high standards has not only determined what students should learn, but also has mandated that students demonstrate what they know. POLLS is a standards-based program addressing National Mathematics, Language Arts, and Social Studies Standards. POLLS provides many opportunities for performance assessments when students apply their math skills and creativity in a true-to-life situation—designing, conducting, and analyzing a poll. The cooperation, peer-teaching, and group decision-making required throughout POLLS address Applied Learning Standards.

National Standards for School Mathematics

Data Analysis and Probability Standard

- Formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them.
- Select and use appropriate statistical methods to analyze data.
- Develop and evaluate inferences and predictions that are based on data.

Number and Operations Standard

- Understand numbers, ways of representing numbers, relationships among numbers, and number systems.
- Compute fluently and make reasonable estimates.

Communication Standard

- Communicate their mathematical thinking coherently and clearly to peers, teachers, and others.

Representation Standard

- Use representations to model and interpret physical, social, and mathematical phenomena.

NCTE Standards for the English Language Arts

Standard 4: Students adjust their use of spoken, written, and visual language (e.g., conventions, style, vocabulary) to communicate with different audiences for a variety of purposes.

Standard 5: Students employ a wide range of strategies as they write and use different writing process elements appropriately to communicate with different audiences for a variety of purposes.

Standard 6: Students apply knowledge of language structure, language conventions (e.g., spelling and punctuation), media techniques, figurative language, and genre to create, critique, and discuss print and non-print texts.

Standard 7: Students conduct research on issues and interests by generating ideas and questions, and by posing problems. They gather, evaluate, and synthesize data from a variety of sources (e.g. print and non-print texts, artifacts, people) to communicate their discoveries in ways that suit their purpose and audience.

STANDARDS

Standard 12: Students use spoken, written, and visual language to accomplish their own purposes (e.g., for learning, enjoyment, persuasion, and the exchange of information).

NCSS Curriculum Standards for Social Studies

Strand 10: Civic Ideals & Practices

The learner can:

- Practice forms of civic discussion and participation consistent with the ideals of citizens in a democratic republic
- Explain and analyze various forms of citizen action that influence public policy decisions
- Analyze the influence of diverse forms of public opinion on the development of public policy and decision-making

California Applied Learning Standards

Standard 2. Students will understand how to solve problems through planning and organization. Students will plan an activity.

Standard 3. Students will understand how to solve problems through teaching and learning. Students will develop and implement a teaching-learning program.

Standard 6. Students will understand how to apply communication skills and techniques. Students will demonstrate ability to communicate orally and in writing.

Standard 8. Students will understand the importance of teamwork. Students will work on teams to achieve project objectives.

Standard 9. Students will understand personal skill development and its impact on their employability and success. Students will exhibit self-confidence, honesty, perseverance, self-discipline, and personal hygiene.

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The quest for knowledge is an ongoing process and doing research is a method of gaining information. An important tool of research is conducting a poll, also called a survey.

In POLLS students will conduct a scientific opinion poll. They will first learn about polls, then develop a questionnaire, conduct their poll, compute the results, and analyze their findings. When finished, students will present these findings in a variety of ways.

POLLS is easy to use, encompasses many different thinking skills, and is standards-based. It is flexible since it can be used as an individual student contract, a small group project, or a whole class activity. It can be integrated within several subject areas and can be used by students and teachers in grades four through twelve. The class can complete this unit within several class periods, or it can be expanded to cover a longer period of time. The Teacher Guide and Student Guide provide activities and instructions, plus other useful information.

Through their work in POLLS your students will understand and experience the following:

Knowledge

- Learn about polls and surveys
- Learn the vocabulary of polls and polling

Skills

- Assume the roles of pollster and researcher
- Develop valid questions for a poll
- Conduct a poll
- Tally the results of a poll and convert raw data into percentages
- Analyze and form conclusions from polling results
- Share polling results in several different ways
- Read and interpret results of polls conducted by others
- Recognize bias

Attitudes

- Appreciate the opportunity to engage in genuine research
- Appreciate that the results of a poll can serve as a springboard for further action or activities
- Appreciate the importance of creating a clear list of questions
- Appreciate that poll results can be biased
- Appreciate the value of polling in a democratic society

PURPOSE

OVERVIEW

POLLS is organized into three phases. First students learn about polls and polling, then they design and conduct a poll, and finally they analyze their polling results and share what they have learned.

Phase One — Learning about Polls
Students learn what a poll is and the basic vocabulary of polling. They will choose a topic to investigate and a population to poll. FIRST POLL, the first activity, allows students to participate in a poll. It also determines the students' prior knowledge of polls. (Recognizing students' prior knowledge helps teachers know which areas to emphasize during the simulation. Re-administering this poll at the end of the unit provides an assessment of the class' overall progress.)

Phase Two — Designing and Conducting a Poll
Students learn the purpose of random sampling and strategies to create a poll without bias. In teams students learn how to write clear polling questions so that the poll provides the information they need. They will also learn how poorly worded questions invalidate polling results because of confusion or bias. The students conduct their poll using good polling techniques. They carefully and fairly record the results of the poll.

Phase Three — Analyzing and Presenting Poll Results
Students convert the raw data from their poll to percentages in order to analyze and interpret the results of their poll. They learn how to present these results in a variety of ways including charts and graphs. Students share with their classmates their polls, polling results, and analysis of these results.

Optional Activities
There are many optional activities that students may pursue at the end of Phase Three. They may participate in a culminating event (*The Results Are In*) and present their results before invited guests. Students can retake FIRST POLL and using their analysis skills determine how much the class has learned since taking the poll on Day 1. The students can also learn about mode, median, and mean, and how these are used in polling. Depending on your classroom situation, students may take additional action based on the results of their poll, including writing letters or making a presentation to an interested party such as the school board/committee or town council.

Differentiated Instruction
Like all Interact units, POLLS provides differentiated instruction through its various learning opportunities. Students learn and experience the knowledge, skills, and attitudes through all domains of language (reading, writing, speaking, and listening). Adjust the level of difficulty to best fit the needs of your students. Assist special needs students in selecting activities that utilize their strengths and allow them to succeed. Work together with the Resource Specialist teacher, Gifted and Talented teacher, or other specialist to coordinate instruction.

UNIT TIME CHART

PHASE ONE		PHASE TWO
DAY 1	**DAY 2**	**DAY 3**
• Pre-unit discussion • Introduce unit • Form and name teams, assume roles • Student Guide, pages 1–3 • FIRST POLL • COOPERATIVE GROUP WORK RUBRIC	• Review FIRST POLL results • Begin vocabulary study and review • Learn how to choose a polling topic • Student Guide, page 7 • HOW TO TEACH AND LEARN VOCABULARY • FLASHCARDS • CHOOSING A POLLING TOPIC • SAMPLE POLL	• Recognize *bias in population selection* • Choose a topic and population to poll • Choose sampling technique and number to poll • Student Guide, page 4 • SAMPLING AND BIAS • BIAS ACTIVITY #1 **Teacher Reference** • **Sample Teacher Notice**
PHASE TWO		
DAY 4	**DAY 5**	**DAY 6**
• Expand understanding of *bias* • Begin developing poll questions • Student Guide, page 4 • OTHER SOURCES OF BIAS • QUESTION CORRECTION • QUESTION CORRECTION ANSWER KEY	• Recognize *bias in sampling* • Evaluate and polish questions and establish order • Student Guide, page 5 • BIAS ACTIVITY #2	• Recognize *bias in questions* • Finalize questionnaire • Choose how to conduct the poll • Student Guide, page 5 • Create and rehearse Class Polling Protocol • BIAS ACTIVITY #3 • POLLING PROTOCOL • POLLING SCRIPT • Form hypotheses of results (optional) • Field test questions (optional)
PHASE TWO	**PHASE THREE**	
DAY 7	**DAY 8**	**DAY 9**
• Conduct the poll • Report polling experience • Student Guide, page 5	• Recognize *bias in procedure* • Tally raw scores and convert to percentages • Create master list of polling results • Student Guide, page 6 • BIAS ACTIVITY #4	• Distinguish straw polls from scientific polls • Understand *margin of error* • Graph polling results • STRAW POLLS, SCIENTIFIC POLLS AND THE MARGIN OF ERROR • GRAPH ASSIGNMENT AND RUBRIC • Convert percentages into degrees of a circle for a pie graph (optional)

UNIT TIME CHART

PHASE THREE		
DAY 10	**DAY 11**	**DAY 12**
• Finish graphing poll results • Finalize invitations and arrangements for *The Results Are In* Presentation Day (optional)	• Analyze results question-by-question • Write analysis statements and summary paragraphs of results • Student Guide, page 6 • ANALYSIS ASSIGNMENT AND RUBRIC	• Class shares poll results using graphs and summary analyses • Prepare awards (optional)
PHASE THREE		
DAY 13	**DAY 14 +**	
• Objective Assessment • Debrief simulation • POSTTEST • Decide what to do with poll results (optional) • Distribute AWARDS (optional)	**Option 1** • *The Results Are In* Presentation Day **Option 2** • Re-administer FIRST POLL and analyze differences **Option 3** • Learn about *mode*, *median*, and *mean* • MODE, MEDIAN, AND MEAN	

PHASE ONE: DAY 1
DAILY DIRECTIONS

TEACHING TIP

These lesson plans are meant to guide, not to limit what happens in your classroom. Always consider the needs of your students and the limitations of your schedule and classroom. You may adapt POLLS to make it even more meaningful for your students. Please modify these suggestions to best suit your teaching style and your students.

Whole Class

This discussion and the FIRST POLL will give you some idea of the students' prior knowledge and also help you gauge how much new learning takes place by the end of the simulation.

Objectives

- Pre-unit discussion
- Introduce unit
- Form and name teams, assume roles
- Student Guide, pages 1–3

Materials

- FIRST POLL — *class set*
- COOPERATIVE GROUP WORK RUBRIC — *transparency + as needed*
- Chart paper (4' x 5') — *two* (*optional)*
- Team folders — *one per team*
  —Student Guides — *one per team member*

Procedure

1. Distribute FIRST POLL. Read the questions and have students write their answers. Collect and tally results for the eight questions. Change the raw data to percentages. Share on Day 2.

2. Having just experienced a poll, ask students what else they know about polls. Write their ideas and observations on the chalkboard or butcher paper. Keep to use during the debriefing on Day 13.

3. Announce team assignments (see **Setup Directions #7, Grouping Students** on page 5 for more information) and ask students to sit together as a team. Each day students should sit as a team unless you tell them otherwise.

4. Distribute the team folders and read **Welcome to POLLS** on page 1 of the Student Guide as a whole class activity.

5. Go over individual roles and team responsibilities as outlined in **Roles and Responsibilities**. The roles rotate in order; that is, the Leader becomes the Recorder who becomes the Peer-teacher, etc. Team members who are not in named roles today will enter the rotation on subsequent days.

6. Start roles today. Students will rotate through roles about 11 times. You may assign the opening roles, or allow students to determine the rotation. Each day the Leader is responsible for directing the group discussion and taking care of the team's folder. The Peer-teacher does not have any responsibilities today. **Option**: Consider assigning research tasks for the Peer-teacher. See **Setup Directions #7, Grouping Students** on page 5 for more information.

7. With the students turn to pages 2 and 3 Read with the students. **Phase One: Learning about Polls** is organized in a Q & A format. Words in *Italics* are **Vocabulary Words** found on page 8 of the Student Guide. Take extra time to explain the question/answers of **What other information can polls provide?** and **What is wrong with some polls?**

8. Direct teams to take a few minutes to name their polling team. The Leader conducts the discussion and the Recorder writes the choices and final choice. You might suggest that their names include a term from **Vocabulary Words** on page 8 of the Student Guide.

9. Because the team name-choosing activity is the first cooperative group decision, use the opportunity to discuss what you expect in cooperative group behavior. Using the transparency, share the COOPERATIVE GROUP WORK RUBRIC and tell students that this is an individual rubric. Remind them that this rubric is on page 8 of their Student Guides.

10. For homework, direct students to look in newspapers, magazines, and online for more examples of polls or reports of polling results. Ask students to bring in poll samples and post them on a bulletin board.

11. Prior to class on Day 2, prepare the results of FIRST POLL.
    a. Tally results to get raw data and convert data into percentages.
    b. If possible, create a pie or bar graph to demonstrate poll results.

Assure students that they will be learning more about bias as they go along.

Teams