

Statistics Through the Year

Reporting Category	Probability and Statistics
Topic	Exploring data collection and graphing
Primary SOL	3.17 The student will a) collect and organize data, using observations, measurements, surveys, or experiments.
Related SOL	3.17b, c

Materials

- Chart paper
- Photos of students
- Egg cartons
- Pom-poms
- Clear plastic cups
- Popsicle sticks
- Linking cubes
- Pushpins

Vocabulary

data, categories, survey, poll, bar graph, data point, increments, picture graph, scale, horizontal axis, vertical axis, key, title, labels, line plot, x axis, y axis

Student/Teacher Actions (what students and teachers should be doing to facilitate learning)

1. Engage students in a variety of data-collection activities based on real life. The beginning of the school year presents opportunities to collect data about students as they get to know each other. Have students suggest questions that they would like to ask to find out information about their classmates. Typical information that could be collected through a survey includes favorite TV shows, favorite vacation spot, number of pets, types of pets, favorite number, bus number, hours of sleep per night, bed time, number of teeth lost, lunch counts, attendance numbers, measures of height, measures of long jump distance, and number of letters in first name. Record students' questions.
2. Each day, post one of the questions in a prominent place with answer options shown below. As students enter the classroom, have them answer the question by placing a marker in the appropriate place among the answers.
3. Have students represent the data gathered from the surveys by constructing graphs. Ideas for graphing include the following:
 - Chart paper marked with a grid for a bar graph; student photos for identifying the bars
 - Egg cartons stacked and labeled; pom-poms labeled with student names for recording data
 - Clear plastic cups labeled; popsicle sticks labeled with student names for recording data placed in the cups
 - Linking cubes placed on the bars of a graph to record individual counts of data

Note: The graphing process can be applied in all subject areas, particularly in science and history and social science. Use opportunities in other areas to reinforce the graphing process.

Assessment

- **Questions**
 - Which category has the greatest number? Which has the smallest number?
 - Are there more students with ____ or with ____?
 - Are there fewer students with ____ or with ____?
 - Are there any categories that have the same number?
 - How many ____ and ____ are they together?
 - How many more (or fewer) ____ are there than ____?
- **Journal/Writing Prompts**
 - Write about the process of collecting data in a survey, including reasons you might want to collect such data.
 - Write about the process of constructing a graph, including the type of information that can be determined from a graph.
 - Write at least one statement that analyzes the data shown on a graph you have constructed.

Strategies for Differentiation

- **Technology**
 - Have students graph the survey results on the computer.
 - Have students graph the survey results on graph paper.
- **Multisensory**
 - Have students respond to survey questions, using tactile methods, such as wooden sticks on paper cups.
- **Community Connections**
 - Invite a meteorologist to visit the class to discuss weather patterns and graphs of weather data.
 - Take a field trip to a television station to learn how statistics influence programming and how graphs are used.
- **Small-Group Learning**
 - Have students develop survey questions and elicit responses from classmates.
 - Have students develop three to five questions to use in interviewing each other, and have them graph the results.
- **Vocabulary**
 - Key vocabulary may vary depending on the survey questions and responses, but students need to know the following: *graph, vacation, weather, favorite, survey*.
 - Have students create a word wall with the words above and any other vocabulary words that are used during this lesson.
- **Student Organization of Content**
 - Have students keep binders or folders with their individual graphs and the results of the classroom surveys.