

# Graphing Native American Demographics in the School

by Doug Ruhman

**Grade level** 4

**Time required**

Two 45 minute class periods

**Materials/Technology**

Note paper  
.5" grid graph paper  
Drawing compass  
Calculator  
Graphing software (optional)

**Summary**

In this activity, students will design a survey and collect data on the tribal demographics within their school's population. They will then tabulate their results and graph their findings.

**Objectives**

The student will:

- 1) design a survey form for collecting data about tribal demographics in their school.
- 2) conduct the demographics survey.
- 3) tabulate and analyze the data from the survey.
- 4) create a graph that accurately represents the results of their survey.

**Montana Math standard addressed**

The students demonstrate understanding of and an ability to use data analysis, probability, and statistics.

**Assessment**

- 1) Evaluate the students' finished graphs, especially for the accuracy of the data, clarity of presentation and the inclusion of all necessary elements (e.g., title, scales, etc.).
- 2) Evaluate students by observing them as they work in groups throughout the activity.

**Procedure**

1. This lesson assumes that some previous experience has been provided in studying and making bar, circle, and line graphs. This may be an excellent application of graphing skills in a meaningful context, but may be too complex as an introduction to graphing. Begin this lesson by visiting with the entire class about their knowledge base regarding the variety of tribal groups represented in the school's population. Students often have little idea of how many different groups are represented. Ask students to work in small groups to fashion a survey form which can tally the listed tribal affiliations. The class then might review all the surveys, and select one that they feel best records the data. Next, explore with students how to gather the data. Several possibilities for securing the data may arise, such as:

- School secretary records
- Parent questionnaire

- Student survey
- District office records

Several methods might be used, with each small group graphing their results. The teacher may prefer to stick with one set of data, to simplify and align the results. However, the steps of the research process may be valuable to students, as they assess how and where to gather the most reliable information.

2. Following the gathering of information on tribes represented in the school population, initiate a class discussion about which kind of graph might best represent the data. Line graphs may not be the best to show comparative data; they serve to show changes over time, not to compare results. Bar and circle graphs and tables, however, are excellent choices for representing this kind of data.
3. Begin the graphing by establishing the physical constraints of the graph, including the numerical (vertical) scale (in the case of bar graphs) and various of tribes represented horizontal). The numerical scale's increments will be important to focus on; 4<sup>th</sup> graders sometimes experience difficulty in the physical set-up of graphs. Following this, allow students to construct the graphs in their groups or with partners. In the case of circle, or "pie" graphs, have the students use a compass to create a circle, and draw a line of radius (from the center to the outer edge of the circle). To calculate the portion of the pie that represents each tribe's population in the survey, multiply 360 times the number of students of a specific tribe and divide this by the total number of students in the survey. Students then continue this procedure for the other tribes. For either the bar or pie graph, students may want to color the different "tribes" to enhance the visual effect of their graphs (see the enclosed example).
4. Students may share their findings and their graphs with other groups or the whole class. Evaluate the process students used, and review how graphing helps us compare and better represent the data we compile. Ask students how these graphs could be useful, and to whom they might be important (school board, parent groups, curriculum planners, etc.).

### **Extension**

1. Research and graph a similar set of data regarding other cultural groups.
2. Recreate graphs using a spreadsheet, draw program, or multimedia software program such as HyperCard, HyperStudio, or Powerpoint.
3. Present graphs at a school board or other such meeting.
4. Have different groups evaluate each other's graphs for accuracy and quality of presentation.

### **Further information**

For further information about this activity, contact the author at:

Doug Ruhman  
[ruhman@ronan.net](mailto:ruhman@ronan.net)  
 K. William Harvey Elementary School  
 Drawer R  
 Ronan, MT 59864  
 (406) 676-3390 ext.3358

Example:

***Numbers of Students in Various Tribal Groups  
1999***

