Birthday Paradox

Name: Michelle Turney

Subject: Statistics

This activity correlates to the NCTM Data Analysis and Probability Standards Grades 9-12, Develop and evaluate inferences and predictions that are based on data and use simulations to construct empirical probability distributions


Idea: Students will explore the Birthday Paradox using simulations on graphing calculators.

Use: This activity would be used in a more upper-level high school class such as a statistics class. Some prior experience with graphing calculators and basic probability would be necessary.

The activity would be launched by introducing the Birthday Paradox, that in a group of 23 randomly selected persons there is a greater than 50 percent chance that two of them share the same birthday. This can be introduced by trying it on the class. Most likely the students will not believe this to be true. They will think you would need 183 people for this to work. By using the graphing calculators they can simulate this paradox by creating lists of 23 birthdays and looking for matches. From there the students can do some graphical analysis of the birthday-problem function. Having the students write a conclusion about why the paradox works and how the simulations showed it would conclude the activity.

Assessment: Students will be assessed on their participation, by the data they produce and record as well as their graphical analysis and written conclusion about the paradox and activity.

Materials: For each student:

- Graphing calculator
- Paper
- Instructions for running the random birth date generation

Modifications:

1. For a lower level class such as an algebra two class, this same activity could be used to challenge their preconceived notions about probability. The students could learn about random number generating for simulations and collecting data in this way.