Spinning Nickels

Subject: Math

Grade Level: 1st-2nd, 3rd-4th grades

Summary: Students will make predictions about the probability of a spun nickel landing on either heads or tails. Students will then test their predictions through experimentation.

BIG QUESTION

How do I make a graph to see patterns and test predictions?

TIMING

46 to 90 minutes

LEARNING OBJECTIVES

- Students will make predictions and test their predictions.
- Students will record their predictions and represent them graphically.
- Students will write conclusions from their experiment.

MATERIALS

- 1 nickel per student
- Spreadsheet program like Excel (optional)
- Graph paper to record data

PROCEDURE

1. Distribute one nickel to every student. Ask them to make some simple observations about the nickel.
2. Ask the students the following questions to get them thinking about the experiment they will perform.
    - Where do they use a coin toss to make a decision?
    - Do you think a coin toss is fair?
    - What type of coin do they usually use in a coin toss?

- Do you think tossing a nickel would be a fair way to make a decision?
- Do you think spinning a nickel would give the same results?

3. Tell the students that they will each be spinning a nickel 50 times to see if spinning a nickel is a fair way to make a decision. They will first write down their predictions. Do they expect to be close to 50% heads and 50% tails?
4. Have the students perform their experiment and record their results with a simple chart on graph paper. Try to ensure that each student has ample room to spin their nickels, so they fall naturally without hitting objects while spinning.
5. Have each student record on a class chart the number of times their coin fell on the “heads" side. Make sure the chart is large so the entire class can see it.
6. Have each student record the combined class data next to their own data on their own charts.
7. Have the students create a graph showing the frequency for the number of heads. With a range of 0 to 50, 0 and 50 should have a very low frequency and 25 should have a very high frequency.
8. Have the students write their conclusions based on the frequency chart they created. Make sure they include whether they think spinning a nickel is a fair way to make a decision.

ASSESSMENT

Evaluate the students' predictions, data, graph and conclusions to see whether they have met the lesson objectives.

DIFFERENTIATE

- Have students use a spreadsheet to record their results.
- Create a class spreadsheet in advance and allow students to enter their data and the results can be calculated immediately.
- Allow students to use the graphing features of the spreadsheet program to create their graphs.

RELATED

- U.S. Mint Coin Classroom circulating coin information: https://kids.usmint.gov/about-the-mint
- U.S. Mint Coin Classroom free online game Coin Flip: https://kids.usmint.gov/games/coin-flip

STANDARDS

CCSS.Math.Content.1.MD.C.4

Organize, represent, and interpret data with up to three categories; ask and answer questions about

the total number of data points, how many in each category, and how many more or less are in one category than in another.

CCSS.Math.Content.2.MD.D.10
Draw a picture graph and a bar graph (with single-unit scale) to represent a data set with up to four categories. Solve simple put-together, take-apart, and compare problems[1] using information presented in a bar graph.