Plinko Board Lesson Plan

Standards Addressed:

3rd Grade: Draw a picture graph and a bar graph (with single-unit scale) to represent a data set with up to four categories.

4th Grade: Draw a scaled picture graph and a scaled bar graph to represent a data set with several categories.

Solve one- and two-step "how many more" and "how many less" problems using information presented in scaled bar graphs.

8th Grade: Demonstrate that a set of data collected to answer a statistical question has a distribution which can be described by its center, spread, and overall shape.

Objective: To introduce the topic of probability, and to demonstrate chance and random occurrence.

Materials:

- Enough coins (quarters, pennies, etc.) for each student in the classroom.
    - Using coins of the same size is best, but not required.
- Plinko board and Plinko balls.

Procedure:

1. Begin by asking students what they know about probability.
2. Ask the students what they think will happen if you flip a coin 5 times (the exact number of times is unimportant, just be consistant). Have them explain their answers.
3. Flip a coin 5 times and discuss your results.
4. Relate each pin hit on the Plinko board to a hypothetical coin flip. As the ball moves through the board, at each pin it can go left or right, just like a coin can land heads or tails.
    a. This is a Bernoulli Trial, a trial with two possible outcomes.
5. When the ball is dropped from the middle, there are more paths that lead to a middle slot. This represents a normal distribution (ie. bell curve).
6. Drop the balls in the middle of the Plinko board.
7. Now have each student flip a coin 10 times, and record their results.
8. Graph the results of the students coin flips for the whole class on a graph with an X axis that goes from All Heads to 50% Heads/50% Tails to All Tails.
9. Compare the results of the coin flip to the results of the Plinko board.
10. Depending on grade level, you may also want to discuss skew. If you were to drop the balls from either side of the board, there would be more paths leading to that side. This represents skew.

Example Table and Graph:

Heads	Tails	Frequency
10	0	0
9	1	1
8	2	5
7	3	12
6	4	21
5	5	25
4	6	21
3	7	12
2	8	5
1	9	1
0	10	0