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Coin Toss

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Agent Sheets Lesson Plan

Name: Renee Gambino
Grade level(s)/Subject taught: 9 th Grade Algebra
Objectives: <ul style="list-style-type: none">• The students will know how to go about measuring how likely something is to happen with the use of the probability ratio.• They will then apply their knowledge of probability using a computer model of tossing a coin.• They will be able to manipulate the percent of probability, and make educated guesses about the change that occurs.

1. Write the Mathematical Concept or “key idea” that modeling will be used to teach: (e.g. Students use mathematical modeling/ multiple representation to provide a means of presenting, interpreting, communicating, and connecting mathematical information and relationships)

Experimental Probability and Simulations

- Determine the number of possible outcomes for a compound event by using the fundamental counting principle and use this to determine the probabilities of events when the outcomes have equal probability

Materials: Laptop, LCD projector, calculator, pen or pencil, pennies, and paper.

“...a rich **one-page, single-spaced**, description or a *vision* of your best thinking...”

This lesson will be used for an introduction to our probability unit. Since most of the students have already seen and worked with experimental probability I will do a quick warm-up with the students with a penny. Each student will receive a penny, and be asked to flip the penny ten times, and record how many heads and tails they tossed. We will then together go through re-introducing the probability ratio by finding the probability of how many heads and tails each student flipped. When the students felt comfortable with that we will talk a little about what would happen if we were able to control the probability of flipping a heads or tail. After hearing their responses and thoughts on what they think would happen I would then introduce the computer model that a colleague and I developed, that introduces this concept of manipulating the probability. We will begin by simply flipping the coin with the percent for heads and tails at an equal 50-50. From there we will talk about what would happen if I increased or decreased either of the probabilities. As the students make their educated guesses on the effect of the percent change, we will together test different percents to see if our hypothesis was correct or not. After this lesson it is my hope that my students walk away with concrete knowledge of probability, as well understand how we use and change probability to measure how likely something is to happen.

Probability and Simulation

CATEGORY	4	3	2	1
Mathematical Concepts	Explanation shows complete understanding of the mathematical concepts used to solve the problem(s).	Explanation shows substantial understanding of the mathematical concepts used to solve the problem(s).	Explanation shows some understanding of the mathematical concepts needed to solve the problem(s).	Explanation shows very limited understanding of the underlying concepts needed to solve the problem(s) OR is not written.
Mathematical Reasoning	Uses complex and refined mathematical reasoning.	Uses effective mathematical reasoning	Some evidence of mathematical reasoning.	Little evidence of mathematical reasoning.
Strategy/Procedures	Typically, uses an efficient and effective strategy to solve the problem(s).	Typically, uses an effective strategy to solve the problem(s).	Sometimes uses an effective strategy to solve problems, but does not do it consistently.	Rarely uses an effective strategy to solve problems.

