

COVER SHEET

(“Using R&R to Teach Mathematics” for a unit on Probability)

To fulfill the requirements for the workshop by using R&R to teach a concept, I used the book **G is for Googol: A Math Alphabet Book**, by **David M Schwartz** to teach probability. Because it is a math alphabet book, I needed only pp.32-35. This is a humorous book as well as a book of information you can use to teach several different topics throughout the year.

G is for Googol: A Math Alphabet Book

Author: David M. Schwartz

Publisher: Tricycle Press

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5th – 6th Grade Math

“Using R & R to Teach Mathematics” – Probability

Literature Used: **G is for Googol: A Math Alphabet Book**, by David M. Schwartz

Objectives:

5th

Standard 5.2a. – The student will determine the probability of events occurring in familiar contexts or experiments and express probabilities as fractions.

6th

There are no pass objectives at the 6th grade level for probability. However, from the test scores I discovered the 6th graders did not have a good handle on probability. So, my goal was the same as the 5th graders. However, I got to talk and teach them on a higher level. One such area is that we combined the data from all groups and looked at this data at a deeper level using percentages and proportions.

Instruction:

- 1. Introduction:** We began the class talking about real life ways that probability is used. Meteorology is a classic and understandable way to talk probability and what does it mean when a meteorologist says there is a 70% chance of rain today. I made it clear that probability is a fraction, not a percent. It can, however, be easily turned into a percent. I also asked them how much of a chance is there that it will not rain.
- 2. Instructional Process:** Then I pulled out the book, **G is for Googol: A Math Alphabet Book**, by David M. Schwartz and turned to p. 32. I read pp. 32-33 and used the activities on pp. 34-35 plus some others. I used the book to teach and understand probability. I used our textbook to teach the ratio of **chosen outcome/possible outcomes**. I used a coin to demonstrate this. I then divided the students into groups of 2 or 3. They had 3 activities they needed to accomplish and each student had to record his/her tallies and outcomes on tables similar to the following. Our objective was to experiment or test to see how close we came to getting the expected probabilities.

20 Flips of a Coin

| Possible Outcomes | Tally | Probability | Our Outcomes |
|-------------------|-------|---------------|--------------|
| HEADS | | $\frac{1}{2}$ | |
| TAILS | | $\frac{1}{2}$ | |

Roll a Die 36 Times

| Possible Outcomes | Tally | Probability | Our Outcomes |
|-------------------|-------|-------------|--------------|
| 1 | | 1/6 | |
| 2 | | 1/6 | |
| 3 | | 1/6 | |
| 4 | | 1/6 | |
| 5 | | 1/6 | |
| 6 | | 1/6 | |

Pull a Colored Golf Tee out of a Bag (with replacement) 30 Times
of Colored Tees in the Bag (Blue-14, Red-5, White-9, Tan-2)

| Possible Outcomes | Tally | Probability | Our Outcomes |
|-------------------|-------|----------------------|--------------|
| Blue | | 14/30 or 7/15 | |
| Red | | 5/30 or 1/6 | |
| White | | 9/30 or 3/10 | |
| Tan | | 2/30 or 1/15 | |

We took our results and shared them with the class. It was fun to see how close our answers came to the actual probabilities.

- Closure:** In closing, and into the next day, we took all results and totaled them to see the total outcomes of our experiment. It was fun, especially with the golf tee experiment, to see how close our outcomes were with the expected outcomes.

Assessment:

I used the table as an assessment as they learned how to fill out the probability column and as they figured out their own outcomes after their experiments. A couple of weeks down the road, we again talked about probability more in real life situations. They had to know what they were doing in order to understand the problems. One such problem dealt with a classroom full of boys and girls who all had their names in a hat. The question asked, "What is the probability that a certain name would be drawn?" I quickly assessed before beginning this problem if they remembered how to find probability. From here on out, the students will be quizzed and tested over probability. So it is imperative that they know how to find it.

Modifications/Accommodations:

I would let special needs kids work right along beside all other students, being careful as to which group I would put them in. They will need help and lots of review in the days ahead.

Reflection:

This activity was fun for the students and different than the normal routine. They enjoyed getting on the floor and flipping a coin, rolling a die, and pulling tees from a bag. There were so many comments and play-by-play during the whole process. They couldn't wait to see the results of their peers.

I was able to do a little more with the 6th grade than the 5th grade. We had just done basic percentages and so we got to turn some of these into percentages and look at the results. We had also studied proportions. So, one of the things we did before tallying up the total of all groups, was figure out how many we should expect from our experiment. Such as, on our "tee" activity, we set up the proportion for the blue tees as $14/30=x/270$. If you look above, you will see that there were 14 blue tees with a total of 30 tees in the bag. 270 is how many total draws there were from all groups. We found out that we should have drawn 126 blue tees altogether. Our result was 120. (Pretty close!) We calculated that we should have only drawn 18 tan tees. However, the total tally on the tan tees came up to be 30. (Way off!) One group shared how they drew 7 tan tees out of their final 10 draws. (Shouldn't happen!) So, I got to use this as a teaching moment of what probability is all about. Probabilities are only possibilities of what might happen or what the chances are that something might happen. We went way over our mark this time with the tan tees, but next time we could come out way over, right on, or under again. Probability helps us with predictions.

As I stated earlier, a couple of weeks down the road, we put probability into action with some real life problems. I was amazed to see how well they held on to the concept. I think this was due to the hands-on activities.