10-29-2004

Probability introduction

John Haag
The College at Brockport

John Haag
7th- 8th grade math
TI lesson

Probability introduction

A. Goals and Objectives

Affective:

- ❑ Students will appreciate the math that goes into games of chance
- ❑ Students will understand the difference between theoretical and experimental probabilities
- ❑ Students will show confidence in predicting what will happen in a game

Cognitive:

- ❑ Skill: Students will use mathematical reasoning to become more successful at a game
- ❑ Concept: Students will be able to understand why an event is likely to happen
- ❑ Application: By playing a game with no directions, then playing it a second time knowing more than the first, they will be able to play the game more successfully

Mathematical Concepts:

- ❑ Students will use mathematical analysis, to pose questions, seek answers and develop solutions.
- ❑ Students will understand mathematics and become mathematically confident by communicating and reasoning mathematically, by applying mathematics in real-world settings, and by solving problems through probability.
- ❑ Students will apply the knowledge and thinking skills of mathematics to address real-life problems and make informed decisions.

B. Materials:

- ❑ TI 84 graphing calculator with a probability simulator
- ❑ Overhead view screen
- ❑ Game sheet
- ❑ Smarties

C. Lesson Procedure:

Using the probability simulator on the TI 84 calculator I will introduce students to probability with a fun game. The game will be played two times, the first with minimal knowledge of how the game works and a second time so students can develop a strategy from seeing how the first game was played.

The class will begin with a whole class discussion about how games of chance work. I might show them the probability of winning the lottery so they can relate it to a real-world situation. After this discussion one of the students will hand out a game sheet (attached) and two packs of smarties to each student.

To begin the first game I will instruct the students to place individual smarties, from one pack, on any number on the game sheet in any order and as many as they want on any number. Then I will set up the probability simulator, on the view screen, to roll two die. After the die are rolled the students should sum the numbers and if they have a smartie on that number they can eat it. The game will go on in this way until a student or students have no smarties left. I will then have the students look at the frequency histogram and ask them to make any observations.

At this point in the lesson I will bring up the ideas of theoretical and experimental probability. The students should be able to understand the difference between the two and brainstorm other real-world situations that might use theoretical and experimental probabilities.

After the discussion we will begin game two. This game should go much faster because the students know what to expect in the game because of their knowledge of theoretical probability. Most of the students realize that, 5, 6, 7, 8, and 9, are the sums that appear the most and they will put the majority of their smarties on these numbers.

With game two complete and time permitting I will have the student make a chart with all the sums of the two die. Some of the connections the students should make are, there are 36 total possible outcomes and that out of all the possible outcomes, theoretically 7 should appear the most.

The students really enjoy this lesson and pick up on the basic concept of probability. To assess this lesson I use a class participation rubric that will be scored by each individual student and the teacher. I will make observations around the room also to see who is on task and ask questions to make sure students understand the main concept.

CLASS PARTICIPATION RUBRIC

4	Student always takes voluntary and active role. They consistently demonstrate a desire to learn and willingly help other students understand the activity. These students are always well prepared and ready to contribute. They hold a high regard for learning.
3	Students take an active role in their own learning. They help others when asked or instructed to do so. They contribute to the class discussion when asked. They make the most out of class time.
2	Student sometime takes an active role. They reluctantly ask for help of the teacher or other students. They may be prepared to answer questions when called upon. They may need reminders to stay on task
1	Student rarely takes an active role in his or her own learning. They often need reminders to stay on task and to leave other student alone. They are seldom prepared for class and often can not answer questions when called upon

STUDENT SCORE

TEACHER SCORE