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Discrete Math Lesson

**Standard**

6.4.1.4- Calculate experimental probabilities from experiments; represent them as percents, fractions and decimals between 0 and 1 inclusive. Use experimental probabilities to make predictions when actual probabilities are unknown.

**Learning Objectives**

Students will work with the concept of probability.

Students will work in small groups in order to arrive at a method for calculating the probability of winning a game where blocks are pulled out of a bag.

Students should be able to explain, and justify, how they arrived at this method to the rest of the class.

**Problem Statement**

Most people have watched the game show, ["The Price is Right."](http://www.cbs.com/daytime/price/) One of the games that is played to win a car is the "Three Strikes and You're out" game. In the game four blocks with numbers on them and three blocks with strikes on them are put into a bag. The player selects a block. If the block is a number, the player chooses a position in the amount of the price of a car that he thinks is correct. If he is correct, the number is place in the proper position and he selects another number. If he is incorrect, the number goes back into the bag. If the player pulls out a strike block, record is taken. Players continue to draw blocks until they have found the correct price or they have selected the three strikes and they are out of the game.

We will simplify the game to eliminate the part about the position of the number. You will be a winner if you choose the four number blocks before you choose the three strikes. Come up with a probability for winning the game and analyze these probabilities.

**Instructor Suggestions**

For an intro watch a youtube video of the price is right, three strikes game. Set the stage by discussing the "Problem Statement" (see above) with your students. Then distribute the "Three Strikes and You're Out?" activity sheet and allow the students to individually read the activity. Have the students form small-groups and complete the questions on the activity sheet. When the small groups are finished, have a spokesperson for each group share the group answers for specific parts of the activity and explain their method and reasoning involved in arriving at their probability. Discuss the students work as it relates to probability.

**Materials**

["Three Strikes and You're Out"](http://www.colorado.edu/education/DMP/activities/discrete_prob/ddghnd05.html) activity sheet, blocks and bags for each group

**This one**

In the game show, "The Price is Right." One of the games that is played to win a car is the "Three Strikes and You're out" game. In the game four blocks with numbers on them and three blocks with strikes on them are put into a bag. The player selects a block. If the block is a number, the player chooses a position in the amount of the price of a car that he thinks is correct. If he is correct, the number is place in the proper position and he selects another number. If he is incorrect, the number goes back into the bag. If the player pulls out a strike block, record is taken. Players continue to draw blocks until they have found the correct price or they have selected the three strikes and they are out of the game. We will simplify the game.

 You will be a winner if you choose the four number blocks before you choose the three strikes. Come up with a probability for winning the game.

 Now assume the numbers in the bag are 1,2,3,4 and that you must choose the higher number first from the remaining numbers. If you choose the wrong number, you must put that number back in the bag and choose again. How does this change the probability? Is this the same probability is you had to choose them in the order - 2,1,4,3 ?

 Are there conditions that assure your success in this game?

Choose a spokesperson from your group. This person will go to the board and give your explanation and justification for how your group came up with the answers you did.

**Assessment**

Walk around and observe students playing the game. Record what students present and question them on understanding.