



Using the Game in Classrooms to Promote Math, Probability
and Risk-Taking Skills

Lesson Plans

Recommended Grade Levels: 2nd grade and up

Subjects Enhanced by Play: Math

Applicable Concepts, Skills and Strategies: Probability, Computation,
Risk-Taking

Objectives:

To understand the concept of probability, work cooperatively and
understand the concept of chance vs. strategy

Components:

- Classroom lessons

Materials needed:

- *Farkle* games
- Paper and pencils

Activities:

1. Observation and Analysis

Have students work individually or in small groups. Each individual or group will need one of the *Farkle* dice and paper and pencils. Instruct the students to look carefully at their die and write down what they observe. Then ask the students to write down their predictions about what most likely will happen when a die is rolled. Hold a group discussion to share the observations and predictions.

Through this discussion, the students will note that each die has six sides with a different number on each side. Each number has the same likelihood of being seen when a die is rolled. Introduce the term probability as you talk about what most likely or least likely will happen when the die is rolled. Ask the students to think about how they could show the probability of the different numbers on the die being rolled. This discussion should lead to the use of different graphing types: pie, bar, pictorial, line. After the whole group discussion, ask the students or groups to design a graph to show the probability of each number on the die being rolled. Share the graphs.

2. Probability Play

Give each student or small group one die and make sure they have a piece of paper and pencil. Ask them to roll the die 10 times and mark a tally under that number on a piece of paper each time it is rolled. Then, do it again with 100 rolls. After the 100 rolls, ask them to add both the tallies and discuss which number was rolled the most. Write the totals on the board so everyone can see. Discuss and model ways to write these results as percentages, fractions or in decimal form. Using the totals from each group, have the students add up the numbers in each column. They can then divide by the number of groups to find the averages. Compare these averages with the probability graphs. Discuss the effect of having greater numbers to compare (10 vs. 100 rolls). Does this lead to a more accurate relationship between the results and the known probability of shaking one of the numbers? Take time to talk about how this knowledge might be applied in other situations.

3. Get Your Game On

Familiarize students with the *Farkle* game play by explaining the rules and scoring. Write the scoring combinations on the board in the front of the class, or make copies of it from the rules. Break the class into two groups, and student in the groups should take turns rolling the dice. Point out that when rolling the dice, students can be more conservative, taking smaller scores and not risking a *Farkle* to get a higher number, but some students may want to take the risk for a greater reward. Point out to students how they have choices on how to score. It's not just about 1s and 5s and three-of-a-kinds. If they look hard, they may see other patterns and other combinations that may lead them to higher scores. Keep track of the scores on the board, asking students to help add the numbers.

Note: for larger groups, you may want to alter the rules to ensure each student gets a turn to roll by saying the winning team is the one with the highest score after everyone on the teams has had a turn.

4. The Post Game

After playing a game of *Farkle*, open the discussion about which strategy seemed to produce the higher scores—conservative rolling or risk-taking? Is *Farkle* a game of skill, chance, or both? Discuss how often students rolled larger scoring combinations (5 of a kind, straights, etc.) vs. 3-of-a-kinds or single ones and fives. Why is it more difficult to roll the higher scoring combinations? Play the game again, with students paying attention to how often higher scoring combinations are rolled. Do riskier players roll them more often? Does it seem all up to chance?

At-Home Activity:

Encourage students to play *Farkle* at home with their families. Have the students make a list of the games they like to play at home with their families. Encourage the students to think about how strategy and chance play a part in the games they play. You might also ask the students to bring in a favorite game and have a game day at school.