

Mathematics in Play: The Throw Sticks Game

Some think that mathematics is only a course of study in school, but people use mathematical concepts every day in their practical, artistic, and recreational pursuits. For example, in strategizing about their moves in a game, players often consider the likelihood that a certain event in the game will occur. This likelihood, or probability, often determines the accumulation of points or the advancement of a player's position in a game. We can see this in a game known as the **Throw Sticks Game**, created by the Apache tribe of the United States Southwest.

In this game, the playing area is a circle 5 feet in diameter. In its center there is a flat, round rock 8 to 10 inches in diameter, and around its circumference, four sets of ten small stones are arranged, as shown in the Activities. These stones are called counters. Each of the game's four players has three staves, which are about 12 inches long. One half of a staff is shaved flat, and the other half is rounded. The staves are painted yellow, with a green band on their flat sides. The players start the game by positioning themselves where the four sets of counters are arranged. They each place a distinctive marker, usually a colored stick, by their counters. In turn, each player throws his or her staves, one at a time, at the center rock so that they bounce off it. Here's how the game goes.

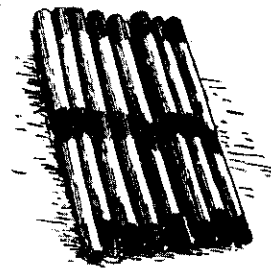
- A player earns points according to how the staves land inside the circle.

3 round sides up	= 10 points
3 flat sides up	= 5 points
1 round side up and 2 flat sides up	= 3 points
2 round sides up and 1 flat side up	= 1 point

- If any of the staves misses the rock or bounces outside the circle, the player forfeits his turn and earns no points.
- A player moves her marker around the circle according to the number of points she earns. When she reaches or passes her starting point, she removes one of her counters. If her marker lands at a position containing the marker of another player, that player must move his marker back to his starting position.
- The winner is the first player to get around the circle ten times (the first to remove all of his counting stones).

For more on American Indian mathematics, see vignettes 3, 6, 24, 32, 40, 59, and 104. For more on games and probability, see vignettes 44, 46, 49, 86, 93, and 99. ★

Stick game.—A common guessing game of the tribes of California and the N. Pacific coast, one that extends entirely across the continent to Canada and the Atlantic.



STICK GAME

The sticks, probably originally arrow shaftments, are shuffled and divided, the object being to guess in which bundle either the odd or a particularly marked stick is concealed. (See *Straw game*, below.)

Stick dice game.—A widely distributed game in which several 2-faced lots are tossed in the air like dice, the counts being kept on a diagram or with sticks. The number of the dice ranges from 3 upward, 4 being the most common.



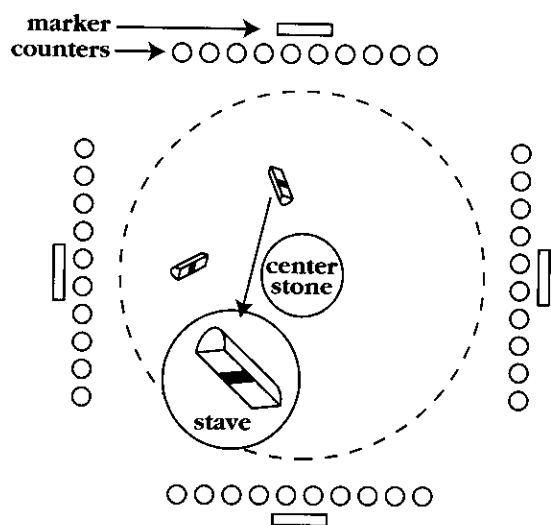
STICK DICE GAME

Stilts.—Stilt-walking is a children's sport among the Hopi and Shoshoni, and from its existence in Mexico is probably indigenous among the Indians.

Straw, game of.—The name given by early writers to a guessing game played by Huron and other tribes of the Atlantic slope. The implements consisted of fine splints or reeds, and the object of the game was to guess the number, odd or even, when the bundle was divided at random.

Illustrations of some American Indian games. From Ferdinand Hodge's Handbook of American Indians North of Mexico (Washington, DC, 1912).

Activities



1. Construct staves similar to those used in the Throw Sticks Game (see vignette).

- As described in the rules of the game, throw the staves one at a time at a rock. Do this several times and record the number of cases in which the round side comes up and the number of cases in which the flat side comes up.
- Calculate the empirical probability that the stave will come to rest with the round side up and that the stave will come to rest with the flat side up.

- If p represents the probability that the stave comes to rest with the round side up, what is the probability that when three staves are thrown, all three will fall round side up? All three will fall flat side up? One will fall round side up and two will fall flat side up? Two will fall round side up and one will fall flat side up?

2. A game known as *Asbbii* is played by Navajo women and children. How is it played?

Related Reading

Castillo, Toby T. *Apache Mathematics. Past and Present*. Whiteriver, AZ: Whiteriver Middle School Press, 1994.

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