NAVAJO NATION MATH CIRCLES PROJECT

The Game of Thirteen Chips

STORY: A divine gambler named Nohoilpi (He Who Wins Men) descended among the Pueblos from the heavens and taught his gambling games to the various tribes. But he soon abused his power by besting them at all his games of chance and collecting his winnings by enslaving people to build a city at Chaco Canyon to mark his glory. The Navajos had been merely spectators of the games and never took part. But the Navajo deities saw what was happening and decided to right the wrongs. One day the beneficial god Hasteyalti (Talking God) appeared at the door of the hut of a young Navajo couple. The gods endowed the young Navajo man with superior abilities at gambling and sent him to challenge Nohoilpi. The stakes were all the people Nohoilpi had enslaved as well as other prizes that Nohoilpi had won from the people. The Navajo man bested Nohoilpi at the game of thirteen chips, the game of the hoop and the game of pressing on wood. After collecting all his winnings he threw the defeated Nohoilpi up into the sky to live with the moon god Klehanoai who eventually created the Mexican people for Nohoilpi to rule over.

MATERIALS: The game is played with 13 flat pieces of wood colored black on one side and white on the other side.

RULES: All the chips are simultaneously thrown upwards. The player whose chips land with more white sides up wins.

QUESTIONS AND VARIATIONS:

1. What is the probability that the second player wins?

2. In the original story, when the Navajo tossed the chips into the air, Bat, who had hidden himself in the ceiling, grasped them and tossed down 13 chips that were white on both sides. What was the probability that the Navajo wins?

3. Suppose that out of 13 chips that Bat tossed down only 10 were white on both sides. What is the probability that the Navajo wins?

4. Suppose that 1 (or 2, or 3) chips has a cross mark on the white side. Each white side without a cross counts as 1 point, and each white side with a cross counts as 3 points. The winner is a player who scores more points. What is the probability that the second player wins?

5. Suppose that 2 chips have a cross mark on the white side, and 3 others have two crosses. A white side with no marks counts as 1 point; one cross counts as 3 points; two crosses count as 5 points. What is the probability that the second player wins?

6. Invent your own variation(s) of the game, and ask your own questions!