



Native American Stick Game

Challenge your family and friends to a traditional stick game. Test your luck and refine your strategy as you explore probability and play this simple but exciting game with craft sticks!

TEKS:

MATH 5.1 A: The student is expected to apply mathematics to problems arising in everyday life, society, and the workplace.

MATH 7.6 D: The student is expected to make predictions and determine solutions using theoretical probability for simple and compound events.

MATH 7.6 E: The student is expected to find the probabilities of a simple event and its complement and describe the relationship between the two.

Materials:

- 6 craft sticks
- Markers
- 10 small items (coins, beans, washers, etc.)

How To:

**This game can be played with 2 or more players.*

1. Use markers to decorate one side of each craft stick. Gather 10 small items and place them in the middle of the playing area. You are ready to play!
2. The first player should pick up all six craft sticks, bunched together vertically in one hand. They should place their hand approximately one foot away from the ground/table and drop the sticks.
3. Sticks that land with their decorated side showing are facing "up," and sticks that land without their decorated side showing are facing "down."
4. If all six sticks land facing up, this player takes three items.

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5. If all six sticks land facing down, this player takes two items.
6. If three sticks land facing up, and three sticks land facing down, this player takes one item.
7. If any other combination happens, this player takes no items.
8. It is now the next player's turn! They should drop the six craft sticks in the same method as player one and take either three, two, one, or zero items, depending on how the sticks land.
9. Continue this process until all players have gone, and then start over with player one!
10. You will eventually run out of items from the middle. When this happens, players can take items from any of their opponents. The first player to get seven* items wins!

*This number can be modified to make the game easier or more difficult to win.

STEM Explanation:

An important and exciting tradition found in many Native American tribes revolved around playing games. Native Americans played games for ceremonial reasons to bring rain, cure illness, or please their gods, and they played games just to have fun! These games were educational and were sometimes used to teach children how to think critically and be a successful adult. One common game played by many different tribes was the "stick game." A stick game could have many different rules and typically required players to have both luck and skill to win.

In the stick game you just played, skill, or strategy, was important when deciding who to take items from. You probably realized that a good strategy was to take items from the player with the most items once the items in the middle ran out. Luck, or chance, came into play when you dropped the six sticks. Because all of the sticks weighed the same, and you had to drop them all at the same time, you did not have much control over how they landed. However, you *can* calculate the probability of how likely each up/down stick combination is. Read the list below to see all of the different outcomes for how the six sticks could land:

1. All six up
2. Five up, one down
3. Four up, two down
4. Three up, three down
5. Two up, four down
6. One up, five down
7. All six down

There are seven different options for how the sticks can land! This means that there is a $1/7$ probability that each outcome occurs. So, each time you drop the six sticks, there is a $1/7$ chance that you will get 3 items, a $1/7$ chance that you will get 2 items, a $1/7$ chance that you will get 1 item, and a $4/7$ chance that you will get no items. Can you calculate the probability of the sticks landing in an outcome that results in you getting to take *any* number of items?

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Career Connection:

Mathematicians do research to develop and understand mathematical principles. They are concerned with numbers, data, quantity, structure, space, models, and change. They analyze all kinds of measurements and types of data and use mathematical techniques to help solve problems in the world. They often work with teams of scientists and engineers.

Resources:

<https://www.cindyderosier.com/2014/06/native-american-stick-game.html>

<https://windsorhistoricalsociety.org/home/education/learning-at-home/native-american-stick-game/>

<https://prod.wp.cdn.aws.wfu.edu/sites/88/2012/04/Fun-and-Games-Teachers-Guide.pdf>

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