

AFRICAN NUMBER SYSTEMS AND SYMBOLISM

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Africa, with its multitude of peoples and languages, is a rich source of number history. Certain cultures followed traditions based on number symbolism, and many ancient African empires required extensive systems of numeration to accommodate their thriving markets. Among these empires were Ghana, which traded in gold; Kush, with its iron-working city of Meroë; and areas of Kenya and South Africa that prospered in cattle herding.

The role economics played in the development of many African number systems is evident in the language of Nigeria's Yoruba culture. In this language, the word for the number 1 is *okan*, for the number 3 is *eta*, and for the number 5 is *arun*. The fact that the Yoruba used cowrie shells as currency is reflected in the counting forms of these words: The word *ookan* represents one object, *eeta* represents three, and *aarun* represents five. In these extended forms, *oo*, *ee*, and *aa* are the contracted forms of the word *owo*, meaning "cowrie" or "money." Economics also influenced the learning of this number system—Yoruba children learned how to count and figure by observing their parents buying and selling in the marketplace.

Cultural traditions also affected the way Africans used numbers to count, and people often relied upon a variety of intellectual skills to solve number-related problems. For example, in many African cultures, there is a strong taboo against counting living things—doing so can cause harm to what is counted. However, empires needed accurate information about who and what to tax, so they devised innovative, indirect ways to count. Using the concept of one-to-one correspondence, they counted shells that represented livestock or food that represented the number of people in a village. Children were taught to avoid counting by cultivating their powers of observation. Thus, when a boy was taught to watch over his family's cattle, he was required not simply to know their number, but instead to recognize each animal's markings, size, color, and so on. In this way, when he brought the herd home from grazing at the end of the day, he would know by sight if an animal were missing.

As in many other cultures around the world, some numbers have held special significance in Africa. For example, speaking the names of certain numbers was considered taboo among certain groups. In the Ga language of Ghana, 7 was a particularly ominous number and was always represented in the spoken word as $6 + 1$. The number 5, however, is still considered a protective number in many parts of North Africa. It appears in the form of a human hand, often woven into banners and painted over doorways to avert evil.

For more on African and African American mathematics, see vignettes 8, 50, 54, 57, 66, and 102. For more on counting, number systems, and significant numbers, see vignettes 1, 12, 21, 31-34, 44, 52, 54, 59, 83, 84, and 97. ★

Finger Counting in Kenya

A variety of number systems have been used in Africa, many based on the numbers 5, 6, 10, and 20. Among certain groups, number systems developed from finger or gesture counting. A gesture system used by the Taita people of Kenya to count cattle or other commodities is shown below.

- 1 = right hand, forefinger extended
- 2 = right hand, first two fingers
- 3 = right hand, three fingers
- 4 = right hand, four fingers
- 5 = closed right fist
- 6 = right fist, left thumb
- 7 = right fist, left thumb and forefinger
- 8 = eight fingers (no thumbs)
- 9 = clasp left fingers in right hand
- 10 = both fists closed

These gestures were accompanied by words that represented large numbers. For instance, making the gesture for 7 and saying the word for 20 indicated 27.

ACTIVITIES

1. Read about the counting, number, and record-keeping systems that have been used by a particular cultural group in Africa. Prepare a visual presentation of what you learn and share it with your class.
2. Although the number 5 is a protective number in certain areas of North Africa, it has been considered unlucky by the Asante people of Ghana. What is the symbolism that has been associated with other numbers in African cultures? How do these associations compare with those of other cultures around the world?
3. The Yoruba were not the only people in Africa to use cowrie shells as money. Explore the use of this material for currency in other African cultures. How was it used? What other materials have been used for currency in Africa?

RELATED READING

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