How to Count to 1,023 on Your Fingers

When counting on our fingers, we instinctually count in decimal or base ten. After all, we have ten fingers. In actuality, however, there are many different ways to count on your fingers, and most other methods allow you to count much higher than ten. Read on to learn how to count on your fingers beyond 10, 100, or even 1,000. The secret is to use different numerical bases other than ten. For more information on the mathematics of counting, visit Intuitor's [Hexadecimal Headquarters](#).

Learning to Count

To learn how to actually count in other bases, try following this easy demonstration[applet](#). You can select the base you want to count in (binary, base six, decimal, BCD, or hex), enter a number to represent on the fingers, and press enter. Or, use the "+" and "-" buttons to increment and decrement the number being displayed. For a discussion of each base used in the applet, read the sections below.

Base Ten

You are undoubtedly already familiar with counting on your fingers in base ten, which is also called decimal. In this manner of counting, each finger simply represents a quantity of one. Every raised finger contributes to the total sum, which is at most ten.

Base Six

Counting in base six is a little different. Only six numerals (0 through 5) are needed to represent a number in base six. Thus, we let each hand represent one digit of a base-six number. The right hand can be the unit's place (6^0), and the left hand can be the six's place (6^1). In this manner of counting, it is possible to count up to 55_6, which is 35 in base ten.

Binary

Counting in binary (or base two) is truly a skill to master. Representing a number in binary only requires two numerals (0 and 1). Therefore, we can let each finger represent one digit of a binary number. A raised finger represents a one (1), and a lowered finger represents a zero (0). In this fashion, it is possible to count on your fingers up to 1,023 ($2^9 + 2^8 + 2^7 + 2^6 + 2^5 + 2^4 + 2^3 + 2^2 + 2^1 + 2^0$). However, caution is advised as the number four is prone to offend onlookers.

Binary Coded Decimal

Binary Coded Decimal (BCD) is a type of numerical representation wherein each digit of a decimal number is represented by a four-digit binary number. Four binary digits are more than sufficient for representing quantities of zero (0000_2) through nine (1001_2). So by letting four fingers on each hand represent a binary encoding of a decimal digit, it is possible to count up to 99.

Hexadecimal

Counting in base sixteen or hexadecimal is similar to counting in binary coded decimal. The only difference is that hex requires sixteen numerals. Since 2^4 equals 16, four binary digits are sufficient to represent quantities from zero (0000_2) through fifteen (1111_2). Therefore, we let four fingers on each hand represent a binary encoding of a hexadecimal digit. In this manner, it is possible to count up to FF_{16}, which is 255 in base ten.