

Bases throughout history

Different cultures have used different base systems throughout history. Many of these different bases have left their marks on our present day culture.

Base 10: The decimal system has become our base of choice. It more than likely evolved from counting using the ten fingers (including thumbs) that we have on our hands. We see with our number system, the metric measuring systems, our decimal currency system, and words such as decade, decimal point, century, and even forty, fifty, twenty, and teens. The word forty-seven for instance might have evolved from four tens and seven, to four t's and seven, to forty-seven. Likewise fifty-three, might have been five tens and three, to five t's and three, to fifty-three, to fifty-three. Also twenty-six, might have been two tens and six, then two t's and six, to twenty-six, to twenty-six. Finally, the teens. Eighteen might have been eight and ten, then eight-ten, then eighteen.

Base 12: In some cultures, counting was done by using the thumb on one hand to point to the three finger joints on each of the other four fingers. This would give you a count of 12 using one hand. I have tried this, but my poor little short hands (I've been playing short-handed all my life!!) have trouble reaching all the joints in the other four fingers. However my wife says that she remembers her father, who was East Indian and raised in the Punjab, counting this way. We see the base 12 system, duodecimal, in such things as 12 inches to the foot, 12 hours on a clock, 12 buns in a dozen buns, 12 dozens in a gross, and 12 old British pence in a shilling.

Base 20: The base 20 system (vigesimal) was used in the Maya culture, and also in the languages of central and western Africa. It might have evolved by the use of the ten fingers plus the ten toes, hence areas where shoes were not worn. In any case we do see remnants of this system in many areas such as the French names for the numbers from 60 through 99. For example, sixty-five is soixante-cinq, (sixty and five), while seventy-five is soixante-quinze (sixty and fifteen). For more examples please refer to Wikipedia.org.

Base 60: The sexagesimal system was used by the Sumerians and the Mesopotamians. I urge readers to read the book "Urial's Machine" by Christopher Knight & Robert Lomas to get some more background in this. Their theory is that the Megalithic builders of Europe, such as those who built Stonehenge, used a 366 day year and 366 degree circle broken up into 60 and then 6 parts. I have a theory that using the finger joints as described above in base 12, the other hand could easily keep track of five of these groups of twelve to make 60. We see many remnants of this system in the way we break up the hour into 60 minutes, and the minutes into 60 seconds. Likewise we break up the degree into into 60 minutes, and the minutes into 60 seconds. Wikipedia says that base 60 may have originated through the merging of base-10 and base-12 systems.

Base 2, and Base 16: (the binary and the hexadecimal systems). These two systems were described on my session from Wednesday, March 18, 2009. More on the uses of base 2 in tomorrow's session.

Base 8: The base 8 system (octal) was used by the Yuke tribe in Northern California. They used the spaces between the fingers to count. Again, Wikipedia has more information on this.