

Power-based number system for toki pona



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0.1 Toki pona power-based number system

with the help of jan Tamalu (mistakes are mine only)

This system should be:

1. based on the common decimal system and digits,
2. unambiguous,
3. easy to understand, learn, and use for all common non-scientific and non-mathematical purposes,
4. suitable for *toki pona*.

0.2 Vocabulary

The ideas for the choice of the names are indicated between square brackets []

1	wan	1	one
2	tu		two
3	sin	┌┐	three [3 lines]
4	lipu	□	four [4 sides]
5	luka	┌┐└└	five
6	pipi	⌘	six [6 elements]
7	len	┌┐┌┐	seven [4 sides + 3 lines]
8	musi	∞	eight; two circles look a kind of 8
9	suli	∇	nine [the "big" digit]
10	sewi	┌┐┌┐┌┐	10 (base) followed by integer powers (1 is implicit): 2, 3, 4,... [raise]
20	tu sewi	┌┐	two × ten
30	sin sewi	┌┐┌┐┌┐	three × ten
100	sewi tu	┌┐	10 ²
300	sin sewi tu	┌┐┌┐	three × ten ²
1000	sewi sin	┌┐┌┐┌┐	10 ³
+	en	+	addition
-	weka	×	negative [subtract]
.	sike	⊙	separator for decimal part
Nº	nanpa	#	number prefix (ordinal)*
#	mute		number prefix (cardinal)

*NOTE: compare Philipino ika- or pang-, Malay or Indonesian ke-

0.2.1 Prefixes (when needed)

Ordinal and cardinal numbers

nanpa #: ordinal number

mute |||: cardinal number

0.2.2 Non-additive numbers

Numbers are *non-additive*

120 = *wan tu ala*

2024 = *tu ala tu lipu*

0.2.3 Numbers as powers of 10

sewi is the base 10 for all powers

1000 = 10^3 = *sewi sin*

10 000 = 10^4 = *sewi lipu*

...

1 000 000 000 = 10^9 = *sewi sul*

Ex. 1: *jan li jo \$1,000,000,000*

jan li jo e mani Mewika pi mute sewi sul

0.2.4 Very large (or small) numbers

Very large (or small) numbers can be expressed easily.

a googol = 10^{100}

10^{100} = *sewi wan ala ala*

or

10^{10^2} = *sewi sewi tu*

0.2.5 Composed numbers

Numbers with multiplicative and additive values

The number to the left of *sewi* has multiplicative value.

The additive value of a number (sequence) is stated explicitly with *en*.

4 000 000 012 = $4 \times 10^9 + 12$ = *lipu sewi sul en wan tu*

0.2.6 Numbers with fractional parts

Number with a fractional part separated by a decimal point

3.14 = *sin sike wan lipu*

3.14 = 314×10^{-2} = *sin wan lipu sewi weka tu*

0.2.7 Numbers with negative exponents

6.62×10^{-34} = *pipi sike pipi tu sewi weka sin lipu*

0.2.8 Dates

ISO 8601 system

2024-05-12 = *tenpo sike tu ala tu lipu en tenpo mun luka en tenpo suno wan tu*

Ex. 2: *05-12 ona li kama lon* = His birthday is May 12th

tenpo mun luka en tenpo suno wan tu la ona li kama lon

⊙ⓓ∩+⊕⊕1||)⊙>∧÷