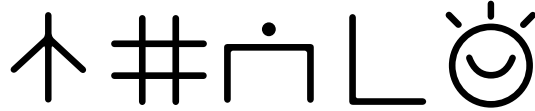


Power-based number system for toki pona



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1 Toki pona power-based number system

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

This system should be as far as possible:

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

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 like 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	┐	2×10
30	sin sewi	┌┐┐	3×10
100	sewi tu	┐	10^2
300	sin sewi tu	┌┐┐	3×10^2
1000	sewi sin	┐┌┐	10^3
+	en	+	addition
-	weka	×	negative [subtract]
.	sike	⊙	separator for decimal part
№	nanpa	#	number prefix (ordinal)*
#	mute		number prefix (cardinal)

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

3 Use

3.1 Prefixes (when needed)

Ordinal and cardinal numbers.

nanpa #: ordinal number

mute |||: cardinal number

ona li nanpa luka = it's the 5th (ordinal)

ona li mute luka = it's 5 (cardinal)

3.2 Positional digits

The values of digits are *positional* (common usage)

That is $212 = 2 \times 10^2 + 1 \times 10^1 + 2 \times 10^0$

12 = *wan tu*

2024 = *tu ala tu lipu*

3.3 Numbers as powers of 10

***sewi* is the base 10 for all powers.**

$1000 = 10^3 = \textit{sewi sin}$

$10\,000 = 10^4 = \textit{sewi lipu}$

...

$1\,000\,000\,000 = 10^9 = \textit{sewi sul}$

jan li jo e \$1,000,000,000

reading: *jan li jo e mani Mewika pi mute sewi sul*

3.4 Very large (or small) numbers

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

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

or

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

3.5 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*.

$4\,000\,000\,012 = 4 \times 10^9 + 12 = \textit{lipu sewi sul en wan tu}$

3.6 Numbers with fractional parts

Number with a fractional part separated by a decimal point.

$3.14 = \textit{sin sike wan lipu}$

$3.14 = 314 \times 10^{-2} = \textit{sin wan lipu sewi weka tu}$

3.7 Numbers with negative exponents

Negative exponents are prefixed by *weka*.

$$6.62 \times 10^{-34} = \text{pipi sike pipi tu sewi weka sin lipu}$$

3.8 Dates

ISO 8601 system

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

05-12 *ona li kama lon* = His birthday is May 12th

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

⌚Ⓜ5+⌚⊙12)⊙>∧÷

3.9 Conflict with the current system

In order to reduce the conflict with the current system, the numbers could be written with the usual digits (0-9), i.e. not "spelled-out" in Toki Pona

Ex. 3: 4-3 *ona li kama lon* = His birthday is April 3rd

reading: *tenpo mun lipu en tenpo suno sin la ona li kama lon*

⌚Ⓜ4+⌚⊙3)⊙>∧÷