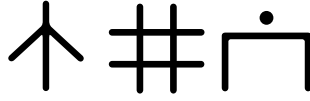# Power-based number system

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V 0.27 α

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1 Power-based number system for toki pona

Written by jan loje with the help of jan Tamalu and Shaevor (mistakes are mine only)

This system should be:

1. based on power-of-10 notation, a.k.a. scientific notation,

2. easy to understand, learn, and use,

3. suitable for *toki pona*.

NOTES: < >: *read as*

2 Vocabulary

1	wan	㇀	one
2	tu	‖	two
3	sin	-'-	three [3 lines]
4	lipu	□	four [4 sides]
5	luka	⌒	five [toki pona hand]
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	‖㇀	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 [toki pona subtract]
.	sike	◎	separator for decimal part
№	nanpa	＃	number prefix (ordinal)*
#	mute	‖‖	number prefix (cardinal)

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

3   Rationale

This system might be a way to *read* numbers and dates written with the digits (0-9) in *toki pona* text. Additional meanings could be added to some already existing *toki pona* words.

4   Use

4.1   Prefixes (when needed)

Ordinal and cardinal numbers

nanpa ♯: ordinal number
mute |||: cardinal number

◯❭♯5 *<ona li nanpa luka>* it's the 5th (ordinal)
◯❭|||5 *<ona li mute luka>* it's 5 (cardinal)

4.2   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>*

4.3   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 suli*

◯❭☺≫\$1,000,000,000 *<jan li jo e mani Mewika pi mute sewi suli>*

4.4   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>*

4.5   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 suli en wan tu>*

4.6   Numbers with fractional parts

Number with a fractional part separated by a decimal point.

3.14 *<sin sike wan lipu>*

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

4.7 Numbers with negative exponents

Negative exponents are prefixed by *weka*.

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

4.8 Dates

ISO 8601 system

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

5-12)○〉∧⊷ *<tenpo mun luka en tenpo suno wan tu la ona li kama lon ale>* His birthday is May 12th