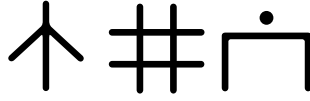


# Power-based number system



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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,
4. suitable for *toki pona*.

NOTES: < >: read as

## 2 Vocabulary

1	wan	1	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 <sup>2</sup>
300	sin sewi tu	┌┐┐	three × ten <sup>2</sup>
1000	sewi sin	┐┌┐	10 <sup>3</sup>
+	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*>

...

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

○>Ⓔ\$1,000,000,000 <*jan li jo e mani Mewika pi mute sewi sul*>

### 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 sul 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*.

$6.62 \times 10^{-34}$  <*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)  $\bigcirc \triangleright \wedge \dot{\div}$  <*tenpo mun luka en tenpo suno wan tu la ona li kama lon ale*> His birthday is May 12th