

Use 6 or 36 Instead of 10 for a Base

- the number system being used now is Base 10 decimal, but for fun I propose using Base 6 or Base 36
- repeating digits after the decimal point can be represented by being enclosed in [square brackets]
- Z=Integers, R=Real Numbers, Y=for all, B=there is, C=subset of, E=belongs to, ~=therefore, Z=sum
- below are number charts in digits and words for Bases 10,12,6,36
- the left chart is a times table up to 11
- the right chart is: count 0 to 36, inverse to 36⁻¹, multiplication to 11·11, power to 10¹¹ and 6⁶⁶⁶

Pros and Cons for Bases 10,12,6,36

Base 12 (uses 0,1,...,9)

pros:

- count to 25 on fingers of both hands
- $\forall k \in \mathbb{N}, 3a_1a_2...=1,2,5 \rightarrow k/(a_1a_2...)$ is simple to do
- $\exists \text{ } \neq 0 [3], 3 \neq 0 [1], 11 \neq 0 [09]$
- $\forall k \in \mathbb{Z}, 3h \neq 2(\text{digits of } k) \rightarrow h/3 \neq k/2$
- $\forall k \in \mathbb{Z}, 3h \neq 2(\text{digits of } k) \rightarrow h/3 \neq k/2$

cons:

- 1/7=0.1[42857] and $\forall k \in \mathbb{N}, 33,3',11E(a_1a_2...) \neq k \rightarrow k/(a_1a_2...)$ often has repeating digits
- Base 12 (uses 0,1,...,9,X,E : 2210=1x)

pros:

- count to (2²·3)²·2²·3 on index to pinky finger segments, of both hands with 2nd hand on 10s
- $\forall k \in \mathbb{N}, 3a_1a_2...=1,2,3 \rightarrow k/(a_1a_2...)$ is simple to do
- $\exists \text{ } \neq 0 [3], 3 \neq 0 [1], 11 \neq 0 [09]$
- $\forall k \in \mathbb{Z}, 3h \neq 2(\text{digits of } k) \rightarrow h/3 \neq k/2$

cons:

- counting on finger segments is hard to see from far away
- 5¹=0.1[2497], 7¹=0.1[68x35], (2·5)¹=0.1[2497], and $\forall k \in \mathbb{N}, 3E,11E(a_1a_2...) \neq k \rightarrow k/(a_1a_2...)$ often has repeating digits
- Base 6 (uses 0,1,...,5 : 2910=45)

pros:

- count to (2·3)·2²·3 on fingers of both hands with 2nd hand on 10s
- $\forall k \in \mathbb{N}, 3a_1a_2...=1,2,3 \rightarrow k/(a_1a_2...)$ is simple to do
- $\exists \text{ } \neq 0 [3], 3 \neq 0 [1], 11 \neq 0 [05], (2·5) \neq 0 [3], (2·11) \neq 0 [23], (3·5) \neq 0 [2], (3·11) \neq 0 [14], (2^2·5) \neq 0 [14], (3·11) \neq 0 [14]$
- $\forall k \in \mathbb{Z}, 3h \neq 2(\text{digits of } k) \rightarrow h/3 \neq k/2$
- $\forall k \in \mathbb{Z}, 3h \neq 2(\text{digits of } k) \rightarrow h/3 \neq k/2$

cons:

- less digits to work with
- 15¹=0.0[313452421], 21¹=0.0[24340531215], and $\forall k \in \mathbb{N}, 35,11E(a_1a_2...) \neq k \rightarrow k/(a_1a_2...)$ often has repeating digits
- Base 36 (uses 0,1,...,9,a,...,z or 0,1,...,9,a,...,z or 0,1,...,9,a,...,z or 0,1,...,9,a,...,z)

pros:

- same pros as Base 6 except every 2 digits are collapsed into 1
- $\forall k \in \mathbb{Z}, 3h \neq 2(\text{digits of } k) \rightarrow h/3 \neq k/2$

cons:

- same cons as Base 6 except every 2 digits are collapsed into 1
- many new symbols are needed

Comparing Bases

- base 12 and 6 and 36 all allow for easy division by 3 which is more useful than division by 5 for base 10
- counting on finger segments goes to 156 for base 12 with a 10s hand, but it is hard to see from far away
- finger counting can be seen from far away, and goes to 35 for base 6 or base 36 with a 10s hand
- prime numbers over 5 in base 6 only have last digit 1 or 5
- for integer inverses with long repeating digit sequences, base 6 and base 36 have fewer starting at 11⁻¹, than base 12 starting at 5⁻¹, and base 10 starting at 7⁻¹
- switching between base 6 and base 36 is simple, and they are more flexible than base 10 or base 12

Constructing Base 6 and Base 36

- O=nil, A=[1,2,3,4,5]=[words:wun,tuu,tre,fer,fav], B=[0,A], Z=[prefix:k,tu,t,f,w], Y=[prefix:ya,tat,ra,fa,va]
- base 6 has 46⁺=[suffix:nym,t,nou,nou,nou], while base 36 has 46·6·6·6=[word:18] and 36⁺=[suffix:hund] and while both have 46⁺⁺=[suffix:2.zan] and 46⁺⁺⁺=[suffix:2.lian]
- base 36 needs symbols for 0,1,...,35 as: 0=square, 0a,b,c=vertical bar with 0 to 3 spokes each side, to the left for B, and right for B, closer to 0 has lower spokes, alternate symbols are 0,1,...,9,a,b,...,z

base: All

operation: All

		Select all	10or2·5	12or2·2·3	6or2·3	36or2·2·3·3	Select all	counting	power	inverse	multiplication		First text	6or2·3	First voice		First text	36or2·2·3·3	First voice
		base operation	First text	10or2·5		First voice		First text		12or2·2·3	First voice		First text	6or2·3	First voice		First text	36or2·2·3·3	First voice
pros:																			
• count to (2·3)-1 on fingers of both hands with 2nd hand on 10s																			
• $\forall k \in \mathbb{Z}, 3k+1 \rightarrow 12, 3 \rightarrow k(a, a_1 \dots a_n)$ is simple to do																			
• $5^k+0, 11^k+0, [05], (2\cdot5)^k+0, 0[3], (2\cdot11)^k+0, 0[23], (3\cdot5)^k+0, 0[4], (3\cdot11)^k+0, 0[14]$																			
• $\forall k \in \mathbb{Z}, 3k+1 \rightarrow k/5 \rightarrow k/5 \rightarrow k/5$																			
• $\forall k \in \mathbb{Z}, 3k+1 \rightarrow k/15 \Rightarrow 2, 3, 5, k$ is not prime																			
cons:																			
• less digits to work with																			
• $15^k+0, [0313452421], 21^k+0, [024340531215]$, and $\forall k \in \mathbb{Z}, 35, 11 \rightarrow k(a_1, a_2 \dots a_n) \rightarrow k(a_1, a_2 \dots a_n)$ often has repeating digits																			
Base 36 (uses 0,1,...,9,a,...,z or 0,1,...,9,f,...,t → 110=0,f)																			
pros: same cons as Base 6 except every 2 digits are collapsed into 1																			
• $\forall k \in \mathbb{Z}, 3k+1 \rightarrow k/5 \rightarrow k/5 \rightarrow k/5$																			
cons: same cons as Base 6 except every 2 digits are collapsed into 1																			
• many new symbols are needed																			
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