

## 1. Original Requirements

<https://docs.google.com/document/d/1FFPzWgP16sT8EJZaowIFBTMQHiHAcS7MGcieizaaXLA/edit>

### General:

Pls provide something like below from a biz perspective:

#	Use case	Actor (role)	Input to contract	Return from contract	What is done by contract? (logic)
1	This row is only for explain the content that should be filled per column		What is passed into contracts?	What is returned as a result of calling contract functions?	What is the business logic executed by contracts?
2	Initialize	someone	Init settings		Lot of logic here
3	stake	staker	<ul style="list-style-type: none"><li>● Wallet address</li><li>● Solmate address</li><li>● time_length</li></ul>		Staked Solmate cant be transfered

4	unstake	staker	Wallet address		Send Solmate back to stakers' wallet
5	Refresh_rewards	Off-chain scheduled job	none		After calculation, transfer \$CIETY to all stakers
6	Retrieve APY	Staker	Wallet address	APY	
7	Something more...				

- Role is very important, in Solana contract, assets can be transferred only by owners, account data can be modified only by owners

*I need specs, I see 2 contracts, one is the staking contract, the other one is the \$CIETY token contract, for the staking, each nft id will have the same APY? what happens when user stake/unstake, if they stake multiple NFT will the APY compounded? etc. \$CIETY I need total supply, emission schedule, reward schedule to the Solmate staking contract etc.*

Q0: Is Somate the NFT name?

Q1: I didn't see a strong reason for developing two contracts, using one contract will be a little bit easier, agree with using one contract?

## NFT Stake lock spec

### Staking contract

- All NFTs are equal in terms of APY, rarity does not affect the APY
- When a user stakes, they will also need to provide a length of time they are willing to stake between 1 week and 1 year
- Q2:
- by day? Meaning  $365 \geq \text{time\_length} \geq 7$
- or by week?  $52 \geq \text{time\_length} \geq 1$

Q3: Staking more than one Somate is allowed?

- User can only unstake if the lock period has elapsed, otherwise tx will fail
- Q4: No TX during staked, meaning no transferring, but in 'Min Spec' section below, it mentions Once staked, owners can still "play" with their NFTs (see below), could you please detail this? If necessary. Seemingly it requires some kind of interactions with contracts.
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- Each NFT is treated separately from each other. The APY calculation is independent of other NFTs that the user stakes. Just treat as if another user stakes into the contract

Q5: I assume APY is based on received \$CIETY.

- Calculation steps
  1. Convert NFT to virtual balance where 1 NFT staked for 1 year is equal to 1 veNFT, whereas 1 NFT staked for 1 week is equal to 0.02 veNFT (vote-escrowed). Linearly proportional
  2. Amount of veNFT degrades linearly such that at time  $t=0$  you will start out with X veNFT where X is determined by 1. above and by the time you reach the end of the lock period you end up with 0 veNFT. Linearly proportional.

Q6: Confusing about the start amount of veNFT, all 1? Or determined by time length? Say,  
Time\_length = 2 weeks, and 1 year = 52 weeks

Then, start amount of veNFT is  $1 * (2/52)$

Finally use this start amount to linearly degrade over the time\_length.

Can we make this clear?

Q6.1 What is the degrade time unit? Week? Day? Hour?....

3. The calculation for how much \$CIETY a user receives is according to the equation
  - a. Number tokens of user per block =  $(\text{veNFT}_{\text{user}} / \text{veNFT}_{\text{total}}) * \text{block reward}$
4. Block reward is the (emission rate per day) / (number of blocks per day)

Q7: What is the number of decimals of \$CIETY?

Q8: Simulation

Block time = 400ms, num\_blocks\_day =  $24*60*60*1000/400 = 216000$

Emit\_rate\_day = 100000 \$CIETY

Block\_reward =  $100000/216000 = 0.46$

Say the veNFT degrade time unit is day, and a person p1

On day\_1 stake 1 Solmate\_1 with time\_length = 30 days

10 days later on day\_2 stake 1 Solmate\_2 with time\_length = 60 days

On day\_2 + 5:

- $\text{veNFT}_{\text{total}} = 10$ , including other stakers not only p1
- $\text{Solmate\_1\_veNFT}_{\text{p1}} = (30 - 10 - 5)/30 = 0.5$
- $\text{Solmate\_2\_veNFT}_{\text{p1}} = (60 - 5)/60 = 0.92$
- $\text{P1\_receive\_\$CIETY\_day} = (\text{Solmate\_1\_veNFT}_{\text{p1}} + \text{Solmate\_2\_veNFT}_{\text{p1}}) * \text{Block\_reward} * \text{num\_blocks\_day} = (0.5 + 0.92)*0.46*216000 = 141091$

So, p1\_apy on day day\_2+5 =  $141091 * 365 = 51498215$  \$CIETY

Here I just simply assume `Emit_rate_day` is a constant, that's fine

Is this correct? In Dex, like UniSwap,  $\text{percentage} = \text{trading\_volum} / \text{balance\_in\_pool}$  per day, based on that both APY and APR can be worked out. In this case I don't know take what as the capital to produce a percentage.

#### \$CIETY token contract

- 1 Billion total supply
- 20% distributed to community treasury
- 5% distributed to team
- 75% is emitted in stake lock rewards
- Emission starts at 100000 \$CIETY/day and drops to 0 after 4 years. Linear decrease.
- Leftover dust amount can just be left in the contract

Q8: say degrade time unit is day, say on some day someone triggers the initialization(see use case in the begin), then 10 days later,  $\text{Emit\_rate\_day} = 100000 * (4*365 - 10) / (4*365)$ , right?

Q9:

It's ok to store info with a structure:

- `To_community: 0.2b`
- `To_team: 0.05b`
- `to_rewards: 0.75b`

but really important thing is, again, the 'General' section is really important, we need to be clear with every use case that updates these three states above.

Q10:

- The use case of stake/unstake only change to\_rewards, lack of use cases updating the other two, **or just ignore in my delivery?**
- Currently, roughly `solana_fee_per_tx = $0.00025`
- Genrally, no daemon processes inside contracts on a blockchain, meaning the execution of any on-chain logic has to be triggered by some components off-chain, outside contracts.so, QUESTIONS:
  - Rewarding frequency, **how often an off-chain scheduled job rewards stakers and updates all states?** Say 10000 times per day, that will cost \$2.5, but this is just a normal calcualtion. Say you got N stakers, that means the contract has to transfer \$CIETY N times each refreshing. Not sure how much it will cost? Because there is no exact formula to follow even on official site, but we can test. Certainly, this requency is not part of the contract logic, but worth considering.
  - If we want to do rewards to stakers fully on-chain, we have to store info with some model like below (just semantically, practically I make it much compact in order to reduce the SOLs required sitting there for rent-exemption). Solana has account data size limit though, i.e, 10MB, we can shard it with multiple accounts, one question, **how many stakers you have at most?**

■

```
var data =[
  {
    staker:"wallet address",
    staked:[
      {
        start_timestamp:9283023420,
        time_length_day:30,
      }
    ]
  }
]
```



Q11: Noticed that in section 'Mining' below, it mentions 'staking' at two places, irrelevant?

Hopefully we can make this requirement clear and complete soon, then I'll switch to design phase with goals:

- Secure
- Efficient
- Low cost

### Stake-lock and \$CIETY

- To enter the gaming element you must lock your Solmate into the gaming contract
- By existing in The Solciety you will earn \$CIETY tokens depending on the amount of time that you lock your Solmate for
- Minimum lock length is 1 week, maximum is 4 years
- The longer that you lock for, the greater your boost on \$CIETY rewards will be
- \$CIETY tokens will be distributed according to some diminishing curve over the 4 year period

### Overview

- Start off with some 64x64 **Genesis Map** grid with random distribution of resource deposits scattered across the lands
- There will be **Wood**, **Stone** and **Gold** initially as mineable resources
- Resources are required to craft things used to construct **The Solciety**
- Initial craftables will include things such as: **Primitive Axe**, 1 Level of upgrade for Primitive Axe, and a **Boat** which is used to travel to **Ponpu Island** which will be located off the shore of the Genesis Map
- To use the Boat players must *stake* their Boats in the **Water**, then *stake* their **Solmates** onto the Boat, then call `_paddle` daily to travel
- On the Genesis Map there will also be **Shrines** where users can *stake* their Solmates to pray

- Praying will give a probabilistic airdrop of **Amulets**
- Amulets can be consumed during the **Mating Games™** which provide modifiers such as improved breeding probabilities or improved chance for rare traits to be passed onto children
- Amulets can also be fused into super amulets and deconstructed into fine powders as ingredients for crafting recipes

## Spaceonomics and Travel

- The Genesis Map will consist of 64 x 64 grids
- Each grid can contain a maximum of 25 slots
- Solmates take up 1 slot so maximum of 25 Solmates can reside within 1 Grid
- Resource deposits are 1x1 to 4x4 in size and are randomly distributed across the map
- Resource deposits have a finite supply per slot, the rate of emission depends on the power of the tool used to mine the resource
- Solmates can only mine a resource if there is a free slot surrounding the deposit
- Traveling between grids takes time. Solmates can travel to any of the surrounding 8 grids that are adjacent to their current position, given there are no obstructions

## Tools

- General rule of thumb for tools is that any tool can be used to mine any type of resource
- Each resource deposit has a specific Tool Degradation Factor which degrades specific tools over time
- Some tools work best on certain types of resources with minimal degradation and maximum mining power
- Other tools will have less mining power and will degrade faster but is still able to mine resources
- Genesis Solmates will be airdropped 1x Genesis Wood Axe and 1x Genesis Pick Axe
- These will have some basic specs and can't be obtained ever again

## Mining

- Players can mine resources by **staking their Solmates onto objects** within the Genesis Map



- Apart from resource deposits, players can **also stake onto existing structures** such as work benches, boats, signposts to deconstruct these items
- Objects within the world will have a deconstruction efficiency factor
- This factor determines how much material you receive when you mine or deconstruct
- All objects have a number

### **Crafting**

- To craft items, players will first need access to a crafting bench
- Crafting benches take X hours to build and can be denconstructed back to raw materials with some % lost in the conversion
- Using the Crafting Bench, Players can craft a Boat, a Primitive Axe and a signpost
- Players can craft a signpost to write messages

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## Min spec

### **\$CIETY**

- Stake your NFT for a period between 1 week and 4 years
- **Once staked, owners can still "play" with their NFTs (see below)**
- Fixed supply, staggered emission rate drop off over 4 years

### **Genesis map**

- 64 x 64 locations on a map that Solmates can travel to
- No limit on Solmates per grid (pending contract req)
- No limit on how many Solmates can mine a single resource deposit (pending contract req)
- To move around the map you call `_travel` in the map/game contract

## **Resources**

- Only Wood, Stone and Amulets (whole, non-divisible. NFT or fungible?)
- 1 size for deposits
- Finite supply per deposit except for shrines which have infinite supply but slow emission

## **Tools**

- No Tool Degradation factor
- No cross resource mining capabilities - Wood axe only farms wood no stone etc
- Only Genesis Wood Axe and Genesis Pick Axe available as tools initially

## **Crafting**

- Only craft boat
- No requirement for crafting bench

