This document discusses the specific systems details of the game systems discussed in the Game Design Document.

Game Systems:

• Daily Cycle
• Resource Management
    ○ Farming
    ○ Crafting
• Inventory
• Restoration
• Weapons
• Enemy waves
• Combat

Game System Details:

Daily Cycle

• 1 day = 120 seconds
• 1 phase = 30 seconds

• The brightness of the background will change from lighter to darker as the day progresses to indicate time change.
• On-screen text will also display current day phase

Resource management

• Resources in game
    ○ All resources have 3 growth phases, - small, medium, fully grown(ready to be harvested)
    ○ Resources can only be harvested at full growth
    ○ Collected resources can be replanted.
    ○ Resources only grow in their designated areas

    ○ Energy crystals
        ‣ used to power machines and weapons
        ‣ 3 "wild" crystals grow during the phases 1,2,3 in a day
            • Wild ones will always grow every day in the crystal area
        ‣ Wild crystals can be planted to farm more crystals
            • must be planted in the available grid spaces
            • "Unaided" planted crystals will grow at a rate of 60 seconds per growth phase
                ○ total growth time 180seconds
            • Crystal growth can be "Aided" by crafted solar panels
                ○ 1 panel charges 4 crystals
                ○ Panel must be placed on top of crystals
                ○ Gives new growth rate of 30 seconds per growth phase
        ‣ 1 crystal gives 10 energy
        ‣ Collected crystals will be placed in inventory

    ○ Tech seeds
        ‣ used to craft machines and weapons
        ‣ 10 wild seeds grow during the phases 1,2,3 in a day
            • wild seeds always grow in seed area
            • Wild seeds can be planted to grow more seeds
                ○ 1 planted seed will yield 4 collectible seeds
                ○ Planted seeds take 120 seconds to reach full growth.
            • collected seeds will be placed in inventory

- ○ Hydro gel
  - ‣ used to craft machines
  - ‣ 3 wild pools of gel are available during phases 1,2,3,4
    - • Clicking on a pool will collect all the gel in it(3) and place it in the inventory
    - • The empty wild pools refill after 2 day phases have passed from the point of collection
    - • Collected gel can be planted in the available grid spaces to grow more gel
      - ○ 1 planted gel will yield 3 gel in total to be collected
      - ○ Planted gel will grow at a rate of 1 day phase, eg if 1 gel is planted in phase 1, then after the length of a phase has passed, the 3 new gels can be collected.

Farming:

- • 3 areas, 1 per resource
- • For each area, the player collects a resource, then places it in an available grid slot for the resource to grow. After the resource is grown, the player clicks on the resource to collect it, and it is placed in their inventory.
- • Resources can only be farmed in their designated areas
- • 3 grids per area, this cannot be changed or upgraded

Crafting:

The player accesses a crafting menu in their inventory display where they can craft different items.
The crafting menu will display all items that can be crafted and the number of resources required to craft an item. If the player has the required amount of items then they can click on the desired item and it will be crafted and placed in their inventory.

- • Items that can be crafted
  - ○ Machines
  - ○ Machines must be placed in the displayed slot next to their respective environment item. Machines cannot be placed anywhere else.
  - ○ Machines run on energy which is provided by the energy crystals. A UI energy level bar will appear above a placed machine indicating the energy remaining in it. The bar will decrease as energy is used. To refill energy, the player must click and place an energy crystal on the machine.
  - ○ Placed machines will immediately restore respective environment health. Environment will only stay restored if the machine remains in place and undamaged. A damaged machine will not work.
  - ○ Machines require a minimum of 30 energy to work. A maximum of 100 energy can be placed in the machine.Energy depletes at a rate of 10 energy per minute
    - ‣ Chlorophyll machine
      - • crafted with with seeds(10) and hydrogel(4)
      - • Used to restore dying plants
      - • Must be placed next to a dying plant
    - ‣ Moisture Machine
      - • crafted with seeds(3) and hydrogel(20)
      - • Used to restore dry/arid land
      - • Must be placed on dry sections of land
    - ‣ Force Field
      - • crafted with seeds(5) and crystals(7)
      - • Used to prevent enemies from entering the home base area
        - ○ can be placed anywhere in the base area
        - ○ Use diagram to explain
      - • Will break if enemies hit it 10 times
        - ○ Cannot be fixed, a new force field must be placed down if the player desires

- Solar Panels
    - crafted with seeds(10)
    - Used to increase planted energy crystal growth rate
    - Must be placed on top of planted crystals
    - 1 panel can be placed over 4 crystals
    - Panels will only increase growth rates in phases 1,2,3.
- Weapons
    - Melee Staff
        - Requires seeds(3) and crystals(3) to be crafted
    - Melee Staff Upgrade 1
        - Requires seeds(9) and crystals(9) to be crafted
    - Melee Staff Upgrade 3
        - Requires seeds(18) and crystals(18) to be crafted
    - Turret
        - Requires seeds (30) and crystals(30) to be crafted

Inventory

The inventory is available at all times and can be accessed by pressing "i" on the keyboard. When the inventory is accessed it will show up in the middle of screen. The inventory is a grid that contains all collected items. Collected items of the same type will "stack" in one block for a maximum of 50 items. The inventory grid will have a maximum of 20 slots. If all the slots are full, the player must either use the items or remove them to make space. Removing an item will discard it and it cannot be recollected or used again.

Restoration

Types of environment items to be restored:

- Dying Plants - 10
- Dry Land - 10

The total number of environments to be restored is 20, but this current value is strictly for testing purposes and is subject to change based on gameplay balancing.

The respective machines must be placed on or next to these dying environments.

For each environment item that is restored, the progress bar increases by 5%. If a machine is destroyed, the environment becomes unrestored and the progress decreases by 5%.

All environment items will be in the home base area. No restorations will take place in the farming environments.

Enemy Waves

- Enemies
    - All the same type of creature
    - All the same size
    - All have the same strength for relative wave
    - All move at the same speed
    - Enemies attack machines
    - Enemies can attack player, but its only a stun, there's no health damage
    - Enemies attack by lunging at machines and player.

- 3 waves
    - Wave type 1
        - 5 enemies in wave
        - 2 hits to kill enemies
        - Deal damage to player?
        - This wave type happens when progress is from 50% - 75%
            - this will give the player time to learn the other systems and prep for enemy attacks
        - Enemies need to deal 10 damage to a machine to destroy it
    - Wave type 2
        - 7 enemies in wave
        - 5 hits to kill enemies
        - This wave type happens when progress is from 75%-90%
        - Enemies need to deal 7 damage to a machine to destroy it
    - Wave type 3
        - 10 enemies in wave
        - 7 hits to kill enemies
        - This wave type happens when progress is from 90%-99%
            - game ends at 100%
        - Enemies need to deal 7 damage to a machine to destroy it

Weapons

- Melee Staff
    - Can be upgraded
        - Basic
            - deals 1 hit damage
            - Breaks after 10 hits, ie 10 damage dealt
        - Upgraded 1
            - deals 2 hit damage
            - Breaks after 35 hits, ie 70 damage dealt
        - Upgraded 2
            - deals 4 hit damage
            - Breaks after 140 hits
    - Can carry multiple weapons in inventory, like Minecraft
- Laser Turret
    - Independent of force field
    - Can be placed anywhere
    - Fires 5 shots in a second when enemies are in range
    - 1 shot is 1 hit damage
    - Turret must be charged using energy crystals
    - Turret runs out of energy after 200 shots, ie 40seconds of active time
        - Must place 30 energy crystals on it to refill its energy
    - Turrets can be destroyed by enemies
    - Destroyed turrets cannot be fixed, a new turret must be built
    - Turret lasers can shoot through the force field

Combat

- Using the staff
    - player presses the hit button, the character will perform a hit. Staff must touch the enemy for a successful hit to occur. Hits are only counted when the staff touches the enemy, the staff will only break after the necessary amount of successful hits.
- Using the turrets
    - the player can place down turrets at any location in their base, within the designated areas that allow items to be placed.
    - The player can place down a maximum of 10 turrets based on this space
    - The player can have turrets in their inventory and can place turrets at any time