

# 4GP6A Design Doc

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## **- <Core Gameplay Mechanic #1> : Player movement**

Keep warm is a 2D turn-based multiplayer game. We have multiple players to play this game on one device and the control of movement of each characters is same. The players are able to control the characters by using keyboard: “left” key moves the character to the left, “right” key moves the character to the right. The speed of the character’s movement will be consistent all the time, there is no accelerate and slow down for the speed, and there is no lead-time before the movement begin. The players can jump by pressing the “Space” key, and climb up on the ladder by pressing “up” key when the player under the ladder. Boolean variable isGrounded is set to check if the player is on the air by checking the collision between the player and the ground. If the boolean is false, it means the player is on the air and no action is allowed to perform until the boolean is set to true.

## **- <Core Gameplay Mechanic #2>: Game Pause**

The pause function is implemented to meet the requirements of pausing by player. The pausing menu scene will show up by pressing the pause button at top right of corner. On the menu, there are three options. “Resume” will allow players to continue their game. The game will be terminated when the “Exit” is pressed. The setting page will show if the “Setting” button is pressed. The game will freeze if it is on the pause menu while the music keep going. More details are under the section: Menu.

## **- <Core Gameplay Mechanic #3>: Player’s status**

The players will have 3 status: Health, hunger and warm . The player's' status is shown on status bar and all players' status are full(health 100, warm 100, hunger 100) when the game is started. And all these bars are stacked together, warm on the very top, health on the bottom, they are on up-left of the P1 character, and up-right of

the P2 character, they have different color, Health is Green, hunger is yellow and warm is red.

For the health, it is a measurement of overall physical well-being. When the player's health bar does not go down to 0, the player status is alive, and when the player's health bar goes down to 0, the player is dead. Health does not drain over time, but it starts to drain when the player's hunger bar or the player's warm bar goes to zero, and it starts to drain when the players out of the warm area, and health is lost instantly when the player hits a hurtful trap.

Health	Starving	Out of warm area	Cold	Hurtful trap
100	-10 per round	-15 per round	-10 per round	-20

Hunger is the measurement which determines whether or not the character is starving and it can be increased by consuming food. Different food has different effect on the hunger(Check the list on the mechanic #5). The character loses 10 Hunger every round as soon as the game started.

Warm is the the measurement which determines whether or not the character is cold situation. The “weather” in the game gets colder every round, and the player loses 12 Warm every round. Some items listed in the section of mechanic #5 will increase this status when the player is in the range of 300 of them.

## - <Core Gameplay Mechanic #4> Player's interaction

In most cases, player need to interact through a button on screen to pick up an item when the player approach it. The button for picking up the item will be shown when the player's character is directly on the item. Players will not be able to interact with each other directly. They can only deploy traps or leave items on the ground to indirectly interact with the other player. The item or trap on the map will be

intractable for both 2 players. No matter which player leave a trap on the map, that trap will be triggered if a player step on it.(Trap is the only item category that cannot be picked up by players) There is another interaction that can be made by players at any time in game. The player can move his/her mouse to any item that is currently on the map and there will be a small window appear beside the mouse shows the description of the item. The window will disappear after the mouse is moved away from the item. The player can perform his/her action no matter where the mouse is. This means the player can still move while a description window is still open.

There will be a rigidbody for each item and character in the game. When the rigidbody of a character collide with another item's rigid body, the option for picking up the item will be displayed. By selecting that button, the item will be deleted in the map and be added to the player's inventory. The pick up button for two players are different. This preventing from one player end his turn on an item and leave the pick up option not clicked. In player A's turn the button for Player B will never appear. The description window will display if the coordinates of the mouse on camera are in the range of the coordinates of the item.

## **- <Core Gameplay Mechanic #5>Resources/Craftable items**

There are 4 different categories of items in total including “food”, “crafting material”, “crafted items” and “Traps”. Each player can hold 12 blocks for items. If the item is stackable, then it can be stacked in one block up to a number of 20. Otherwise, each item cost one block in inventory. the player hold 21 same stackable item, it will cost the player 2 blocks in the inventory. Player can pick up an item by standing on it and clicking the “Pick up” button appear on the HUD. If a player want to use a food item, he shall open the inventory first and use the mouse to click on the certain block that contains the food he wants. The icon of the block will turn to gray for 2 seconds and not accessible in this time period, The player can use it again after the 2 seconds when the icon turn back to normal again. The number of food will be reduced by one and certain hunger and warm value will be changed to the current value and display on the screen. Raw meat as a special craftable item in food category, when player click on it, it will not be consumed directly. There will be a pop out window ask if the player want to cook or eat. At this time, the player will not be able to move. If the player stand beside a campfire, the cook option will be selectable, otherwise, the cook option will be gray and player can only select eat or cancel. For each crafting material items, when player click on it, there will be a pop out window shows the craftable items, and indicates all materials it needs. If the player doesn't have enough required materials, that craftable item will be gray and not selectable. When a player select a trap, player will be directed to the map with in the camera. Player can put the trap any place in the range of camera on the floors of map by clicking certain place.

Each item in the game has a unique ID number and all of items has a category label and values for “warm” and “Hunger”. All items will be in a database in game. All player's status will also be recorded in another database. Each time player use or craft an item, there will be an operation done in the database about the status, including warm and hunger value, player's amount of items, etc.

## List of Items

ID	Name	Warm	Hunger	Description	Stackable	Sprite	Category
1	Campfire	100	0	Crafted by 4 wood logs, last for 5 rounds	F	Campfire	Crafted Items
2	Wood log	20	0	Collectable from map, can be used to craft campfire or burn as torch for 1 round	T	Log	Material
3	Apple	0	10	Collectable from map, recover hunger	T	Apple	Food
4	Raw meat	0	15	Collectable from certain point on map, recover hunger	T	Raw	Food
5	Cooked Meat	10	40	Crafted beside a campfire with raw meat, reduce the life of campfire for 1 round,	T	Cooked	Food

				recover hunger a lot and provide little warm value			
6	Banana	0	15	Collectable from map, recover hunger	T	Banana	Food
7	Gear	0	0	Collectable from map, material for items	T	Gear	Material
8	Spring	0	0	Collectable from map, material for items	T	Spring	Material
9	Bear trap	0	0	Craft by 2 gears and 2 springs, stop the player that step on it for 10 seconds and reduce that player's hp by 20	F	Trap	Trap
10	Trap Hole	0	0	Craft by 3 gears, 3 springs and a cooked meat, stop the turn of the player who step on it	F	Hole	Trap
11	Trap	0	0	Craft by 4	F	Tool	Craft

	removal tool			gears and 2 springs, can be used to remove a trap on map			ed Item
12	Tooth Trap	0	0	Craft by 2 gears and 2 springs, deals 10 damage to the player			

## - <Core Gameplay Mechanic #6> menus

There will be a main menu before for player before the level is loaded. The menu includes settings of the game on audio and video. A start game option is provided here, and after clicking it, player can choose the map they want or load a game. There will also be a “random” option available for players so the map will be randomly chosen by computer. In game, there is a pause menu button on the top right corner of the game. There will be a “Resume”, “Setting” and “Exit” option.

The main menu will be created as a separate scene in the game and it leads to different scenes depends on the player selection. In game menu will be a layer below the camera. When it is called, the game activity will be paused. Resume game option will hide the pause menu layer and resume all paused activity. Setting option will allow player to change game settings(Graphics/Sound). Exit option will make the gaming scene end and back to the main menu scene.



## **- <Core Gameplay Mechanic #7> Craft/Inventory**

Craft is a in-game mechanic that allows players to craft or make items. Craft can be done by selecting an item to be crafted in one of the crafting tabs and the players are checked if there are sufficient materials in their inventory. They will receive 1 or more of the crafted item in the inventory instantly, by their choice of the craft number in the craft tabs, and associated crafting materials will disappear in their inventory. All the items in the craft tabs are craftable(the requirement of crafting materials is displayed by putting the mouse on the item in the crafting tabs) and no crafting recipe is needed since the average playing time of a game is around 15 minutes and the crafting system should not be hard to understand by players. There is no restriction on the number of items a player can craft at once as long as the player has enough crafting materials.

Inventory is a in-game mechanic that allows players hold items. The player can hold 12 different stacks of items. Most items can be stacked that allow the players to carry multiples of the same item. However, players can only hold one item in each slot if it is unstackable. Players cannot pick up/collect any more items if their inventory are full. Players are able to throw their item out to the ground by dragging the item out of the inventory. This is accomplished by using IDropHandler in C#. (Assets/Script/Slot for details)

## **- <Core Gameplay Mechanic #8> Traps**

The players are able to place any traps in their inventory to the ground and the traps will only affect other players. Three kinds of traps has been designed at this moment. BearTrap is a trap that can be placed on the ground and freeze any player that steps on it for 10 seconds in their own turn. Tooth Trap is another a trap that can be placed on the ground and it deals 10 damage to any player that steps on it.(Player's health status will decrease by 10) Trap hole will terminate the player's current turn when

player steps on it. The traps will not be triggered if other players jump over it but they are not obvious to see on the map especially under any items.

## **- <Core Gameplay Mechanic #9> Player's Turn**

This game is a turn-based game and each player is only allowed to perform his actions in their own turn. The player who has the first turn will be randomly determined by using a random class in C#. Each turn has a fixed turn time of 15 seconds and the remaining time of each turn is shown in the bottle left corner. Turn time is the amount of time the player has to perform multi actions during his/her turn. If the player's turn time expires, the player's turn will end and the player will not allowed to do any more actions until his/her next turn. There is no restriction on the number of actions a player can perform in one turn.

Action is a in-game mechanic that players can do to achieve the winning goals. Players are able to move, collect items, craft items and place traps but multi actions are not allowed to do at the same time.

## **- <Core Gameplay Mechanic #10> Camera system**

The game camera follows the general area of the player who has turn initiative. After a certain amount of time, the camera switches views the area of next player's turn. This is done by using a timer a several different variable checks. After a timer compares current time to previous logged time (time of turn switch), it decides whether or not to call a function which redefines the object(i.e. player) of the camera's focus. These camera switches are interrupted when certain game states are reached (e.g. game win) or a menu is opened. These states are represented with booleans that trigger the logic path of main controller to avoid calling the camera update function.

The game camera is orthogonal giving the illusion that the objects are all on a 2D plane. There is only one camera and it can controlled by moving the player

sufficiently enough in a direction. The game camera is also responsible for displaying game screens and menus which are images the camera keeps in its view.

## **- <Core Gameplay Mechanic #11> Game Settings**

The game settings are applied immediately and can be applied while in game. There is a button in the bottom right corner that is always visible and clickable. This button toggles the pause menu that gives various options to the player to select. Some of these options include: Resume, settings and exit. Under the settings player can change the sounds and music. These changes are persistent and will only be reset if the game is stopped and restarted. This is accomplished by using boolean variables for the state of the setting buttons. After a button is clicked, it executes a function and updates a variable that will dictate what operation it performs on the next click.

The buttons on the settings menu will not perform any function unless the condition that “the settings menu is visible” is true. This helps reduce the number of redundant variables in the program. This is important for making the overall game flow as clear as possible.

## **- <Core Gameplay Mechanic #12> MiniMap**

The minimap was designed to give the player a general sense of where they are relative to each other on the level. The minimap updates every time it's opened and shows the change of positions of the players relative to where they were. In order to view the minimap, you have to click the settings button which displays an image with markers representing the players. The game does not pause when they view this map and it will take time out of their turn if they want to see it.

The map does not fully show the environment as we wanted players to have to explore the levels to find where traps and food are. The map represents a scaled down

version of the level and gives a general area (player markers not exact scale) of where the players are.

## **- <Core Gameplay Mechanic #13> levels**

The levels look like a 2D platformer in a jungle/forest setting. There are traps within the levels as well as food and supplies. The traps will hinder your movement and potentially kill the player if they not careful (prolonged exposure to traps causes death). The goal in the level's is to reach a certain amount of food thereby starving out your opponent. The levels have different layouts of platforms and traps which add to the game's playability.

A major obstacle in the game is the moving toxic gas that closes in on the players. As the game goes on, the fog moves inward on the level causing players to have to move towards each other. Levels become more difficult with increased traps and platforming representing the increased desperation of the characters in the game's narrative.