

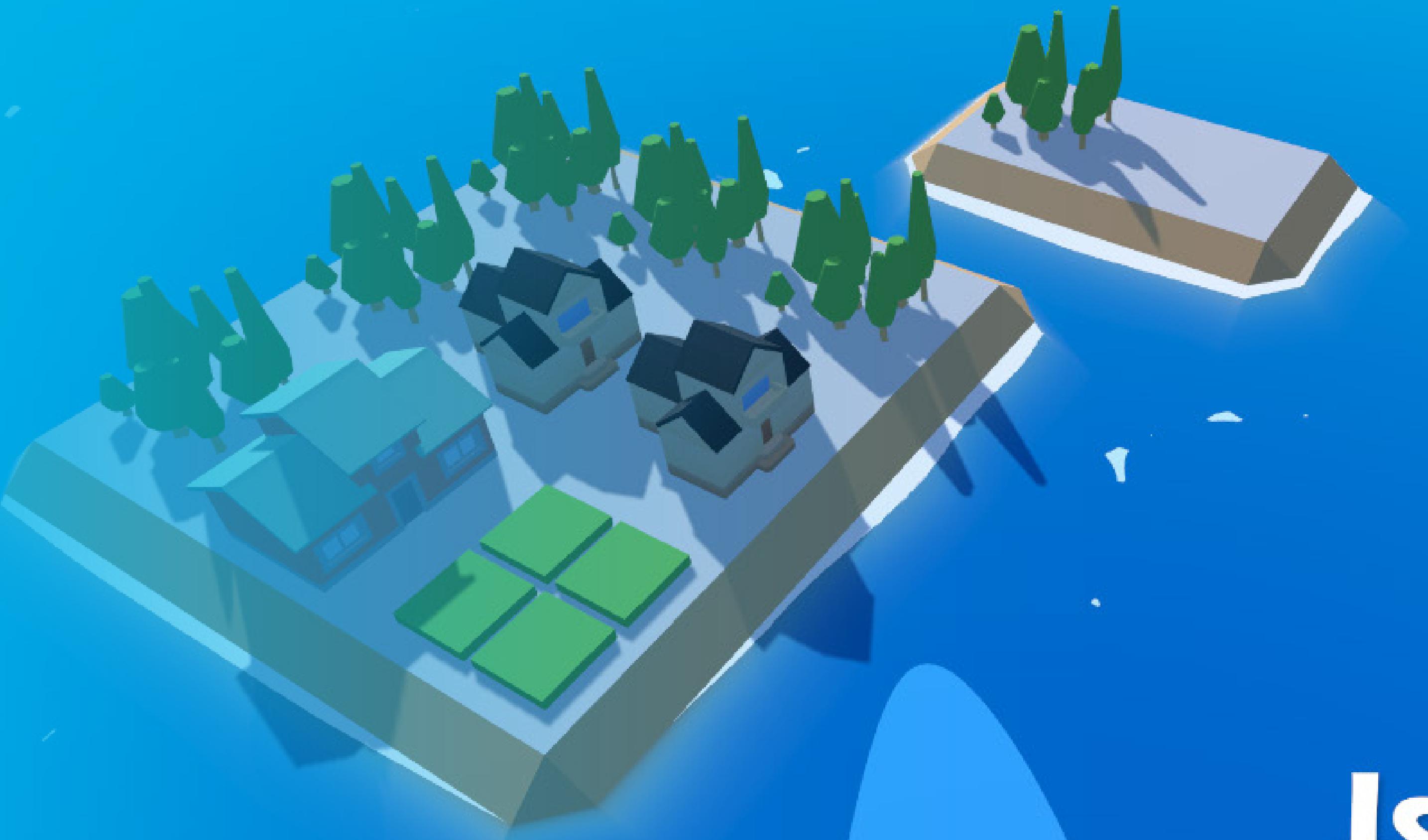
This is a city simulation game
made with Unity.
This game primarily talks
about global warming, and
encourages people to save it.

Made with:



Demo Link:

<https://flandrescarlet-15532.itch.io/island-city>



Start

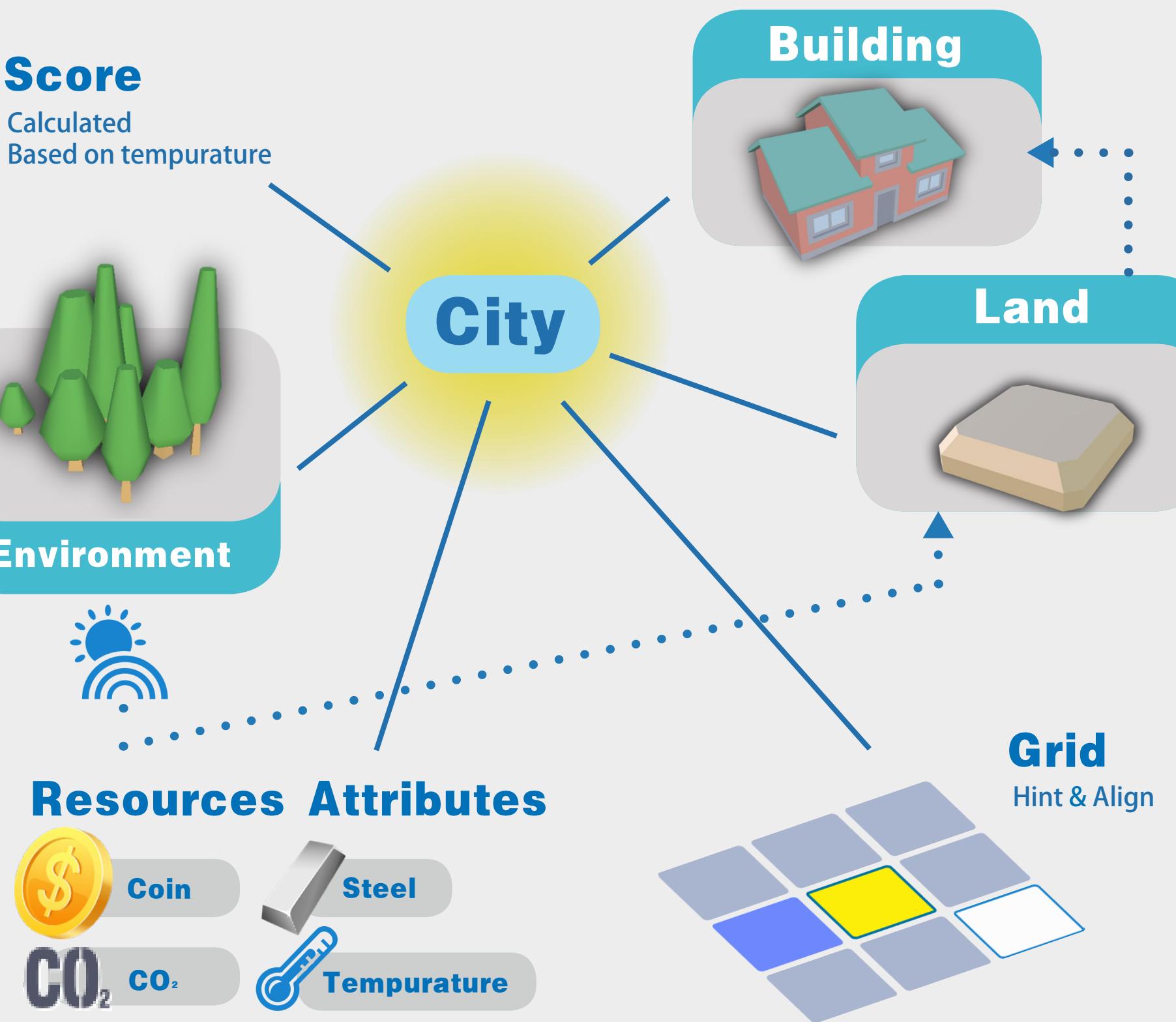
Tutorial

Story

Exit

#

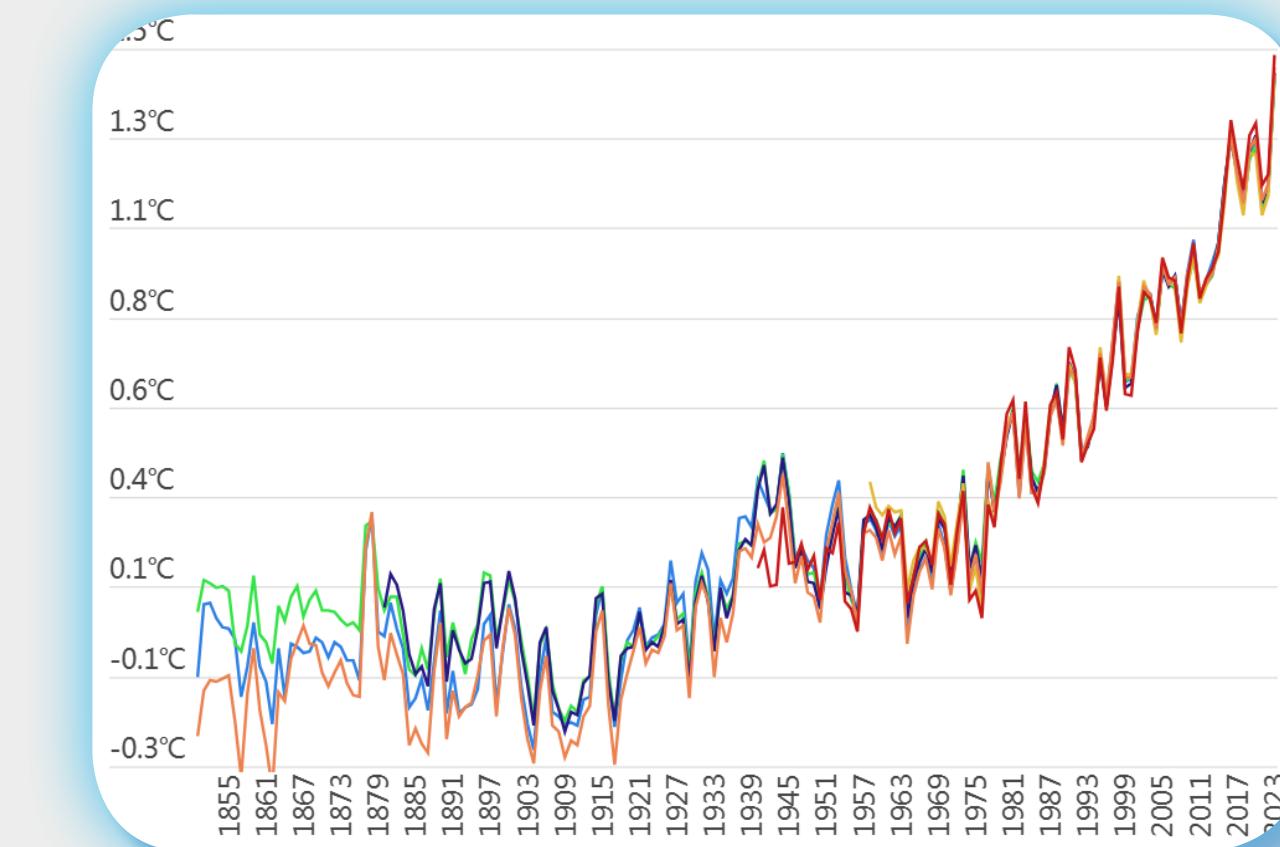
IDEA • Mind Map



I observed that simulation games are usually interesting, and people often feels a sense of achievement when they build something on their own. Besides, with a simulation game, people can understand the difficulty of doing something, and learn knowledge about it. Therefore, I decided to make a simulation game, presenting the serious problem of global warming to people.

RESEARCH

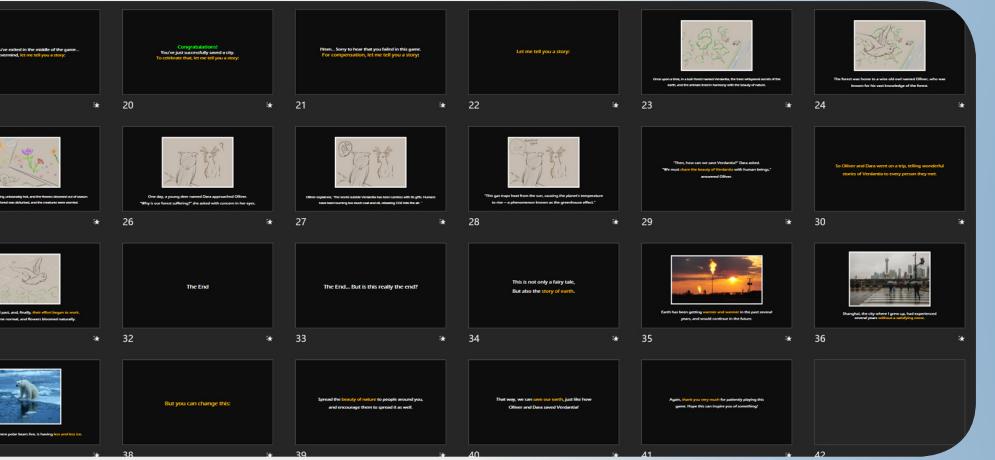
I looked for information about global warming online, and found some impressing data:
A city like Ney York and Shanghai produces more than 190 million tons of CO₂ annually, which is about 500 000 kilo tons every day.



Currently, average global temperature is about 17 °C , about 1.5 °C higher than that in 19th Century. However, a save temperature that prevents sea surface from rising should be lower than 13°C .

Eventually, I set my game' s goal to controlling average temperature of a single city to 5°C , and set the emission of CO₂ of factories and residences based of the researches.

ABOUT THE STORY



01

Congratulations!
You've just successfully
saved a city. To celebrate
that, let me tell you a
story:

Seems that you've exited
in the middle of the
game... Well, nevermind,
let me tell you a story:

02

Hmm... Sorry to hear
that you failed in this
game.
For compensation, let
me tell you a story:

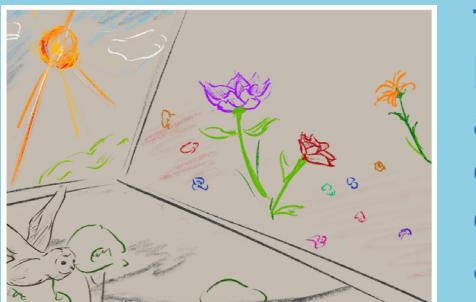
Let me tell you a
story:



03



04



The summers were
becoming unbearably hot,
and the flowers bloomed
out of season. The balance
of the forest was disturbed,
and the creatures were
worried.

05

05



One day, a young
deer named Dara
approached Olliver.
"Why is our forest
suffering?" she asked
with concern in her
eyes.

06

06



Olliver explained, "The world outside
Verdantia has been careless with its
gifts. Humans have been burning too
much coal and oil, releasing CO2 into
the air."



11

Several years had past, and,
finally, their effort began
to work. Summers became
normal, and flowers bloomed
naturally.

The End

The End... But is this
really the end?

07

08

08

"Then, how can we save Verdantia?"
Dara asked. "We must share the
beauty of Verdantia with human
beings", answered Olliver.

07



"This gas traps heat from the sun,
causing the planet's temperature to
rise-a phenomenon known as the
greenhouse effect."

12

This is not only
a fairy tale, but
also the story of
earth.



Earth has been getting warmer and
warmer in the past several years, and
would continue in the future.

13



Shanghai, the city where I grew
up, had experienced several years
without a satisfying snow.

14



The North Pole, where polar
bears live, is having less and less
ice.

15

Again, thank you very much
for patiently playing this game.
Hope this can inspire you of
something!

17

But you can change this:

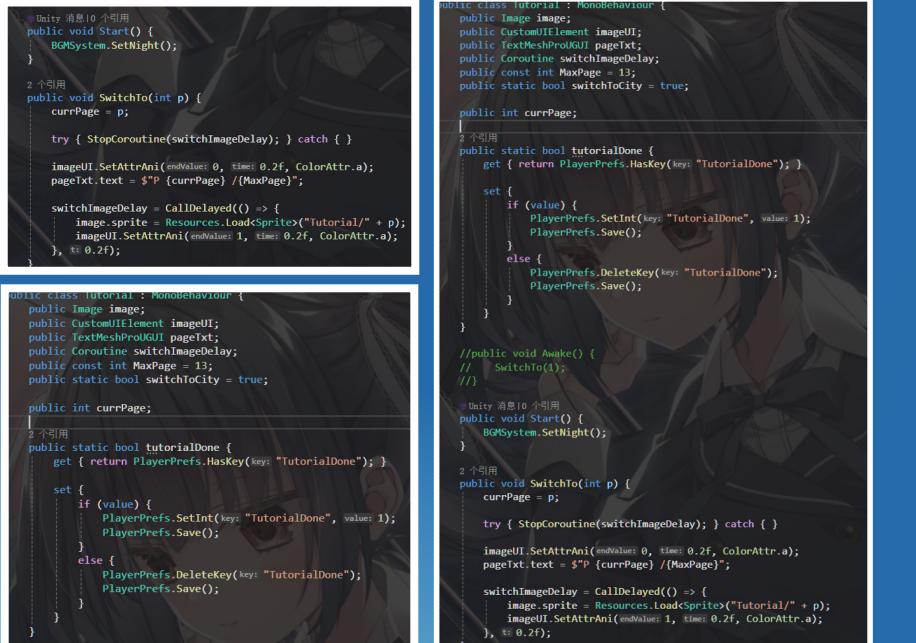
Spread the beauty of nature
to people around you, and
encourage them to spread it as
well.

That way, we can save our
earth, just like how Olliver and
Dara saved Verdantia!

Welcome to Island City!

In this game, you'll be operating a city.

I made pictures telling players how to play this game, and they would be played when the player clicked "Start" for the first time if they hadn't finished the tutorial before.



Now, you can begin your trip in Island City!

500
+0/round

100
+0/round

You have two types of resources:



Coins

and



Steels

01

02

You can use these resources to buy lands and build Buildings / Environments on them.

Lands Buildings Environments

Land_3x3

Land_1x1

270
/ 0

30
/ 0

03

Around a block, a yellow grid means Buff, a red grid means Debuff. You can read the description of buildings for more information.



04

Coins: + 15 / round
CO2: + 0.05kt / round

05

As shown in their descriptions, buildings produce resources every round.
(Either Coins or Steels.)

06

co. +20
+0kt/round

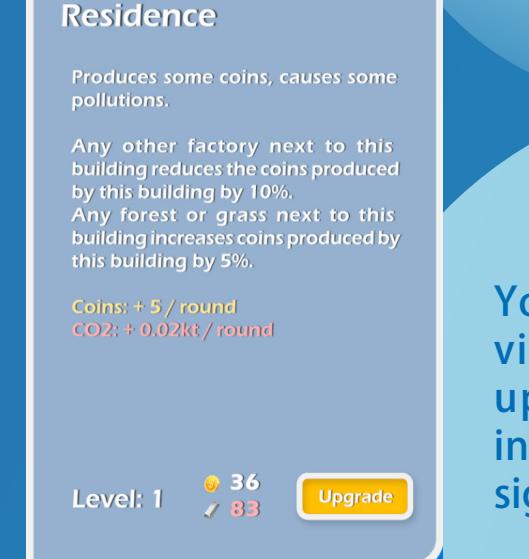
This is called CO2 Deviation Level. When it's positive, temperature rises. When it's negative, temperature falls.



Tutorials

10 Keys

- Select / Drag
- Cancel
- Scale In / Out
- Remove Block
- Z / Esc
- Exit



07

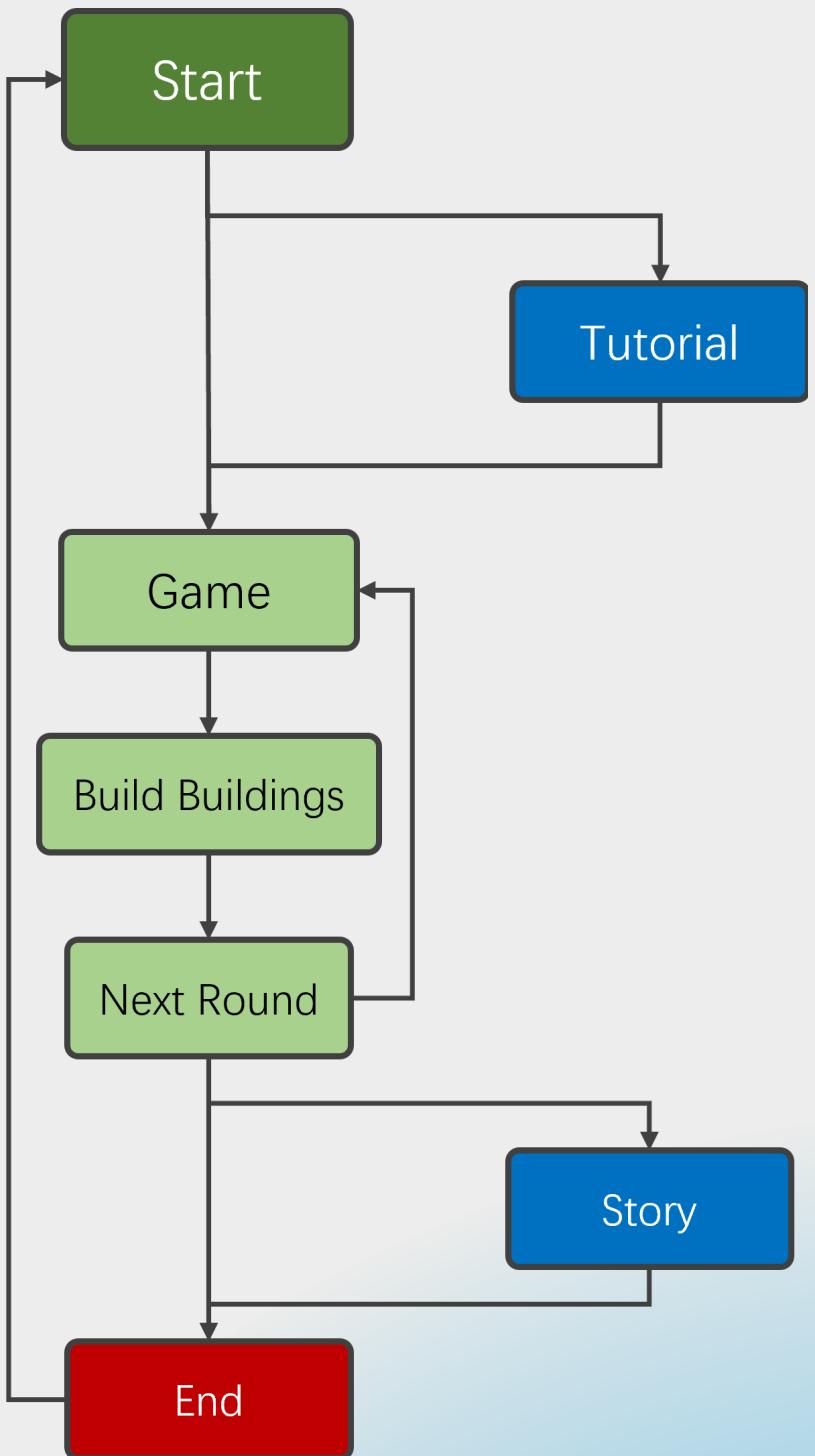
You can click on a block to view details. You can also upgrade buildings, which increases their productivity significantly.

Your aim is to keep temperature between 25 °C and -10 °C within 100 rounds.

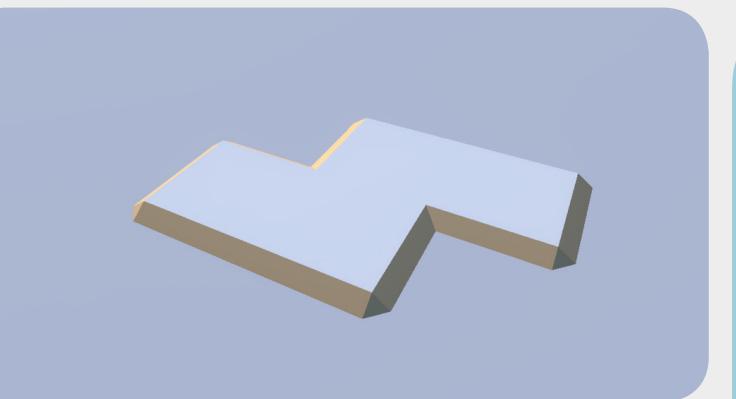
15°C
+0.1°C/round

Round: 1 / 100

Core ■ Mechanism Setting



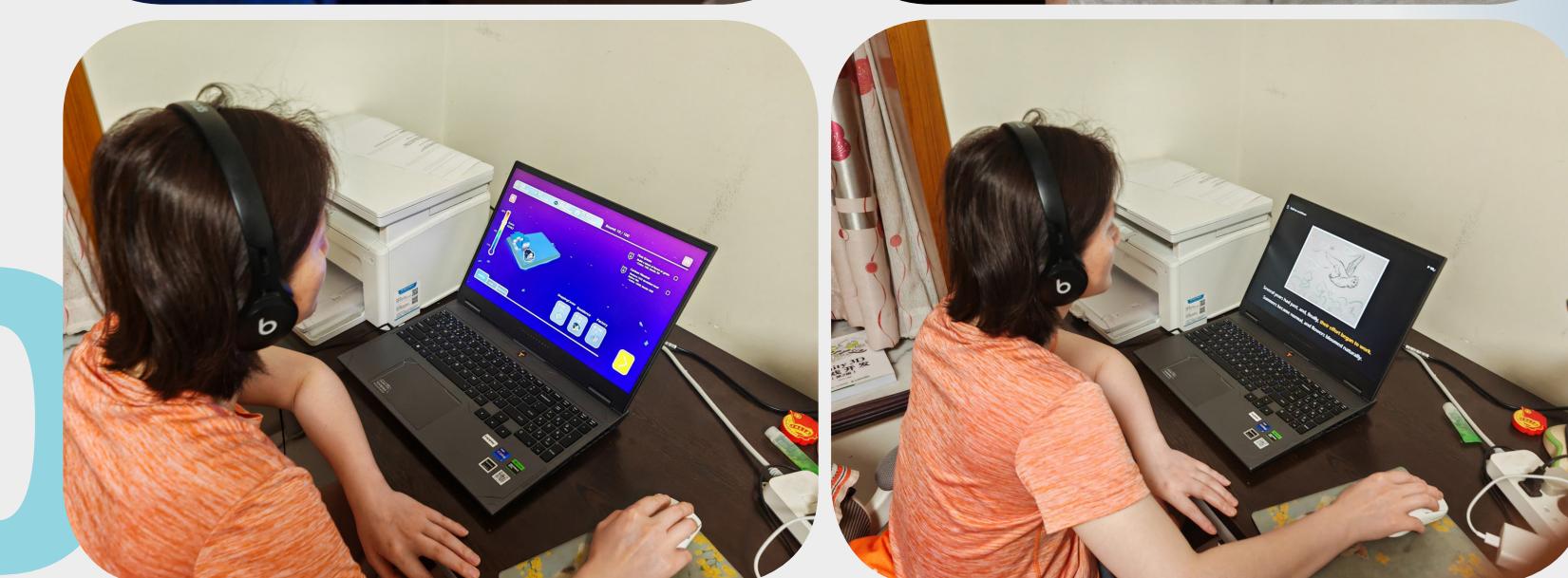
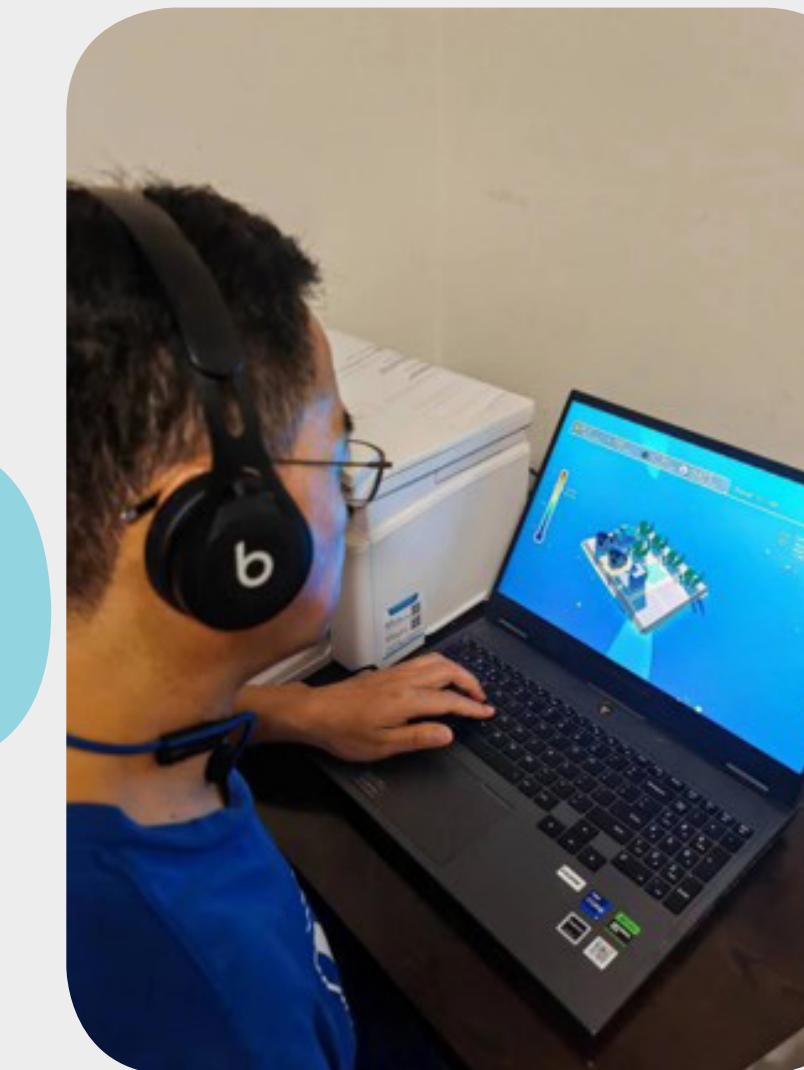
PROTOTYPE ■



Problem: Due to PCG, the size of one block changes when blocks around it changes, so buildings cannot be placed properly on one block.

Solution: Changing the size and shape of blocks at the edge to make sure that every block's shape and size is the same.

1.0



PLAY TESTING ■

TECHNICAL ART ■ -PCG Land

Each block of land is consisted of 4 smaller blocks, and each small block changes its shape based on the state of blocks around it.

```
public void InitEntity() {
    entity = Object.Instantiate(Resources.Load<LandEntity>(path: "Prefabs/LandEntity"));
    entity.pos = pos;
    entity.SetPositionAni(new Vector3(pos.x, y: -0.2f, pos.y) * 20, new Vector3(pos.x, y: 0.1f, pos.y) * 20, time: 0.2f);
    CallDelayedAsync(() => entity.SetPositionAni(new Vector3(pos.x, y: 0, pos.y) * 20, time: 0.1f), t: 0.2f);
    CallDelayedAsync(() => entity.transform.position = new Vector3(pos.x, y: 0, pos.y) * 20, t: 0.3f);
}

1 个引用
public void UpdateEntity() {
    if (entity) { //checks if entity is null
        int[][] map = new int[3][];
        for (int i = 0; i < 3; i++) {
            map[i] = new int[3];
            for (int j = 0; j < 3; j++) {
                if (owner.lands.ContainsKey(pos + new Vector2(i - 1, j - 1)))
                    map[i][j] = 1;
            }
        }
        entity.UpdateBlocks(map);
    }
}

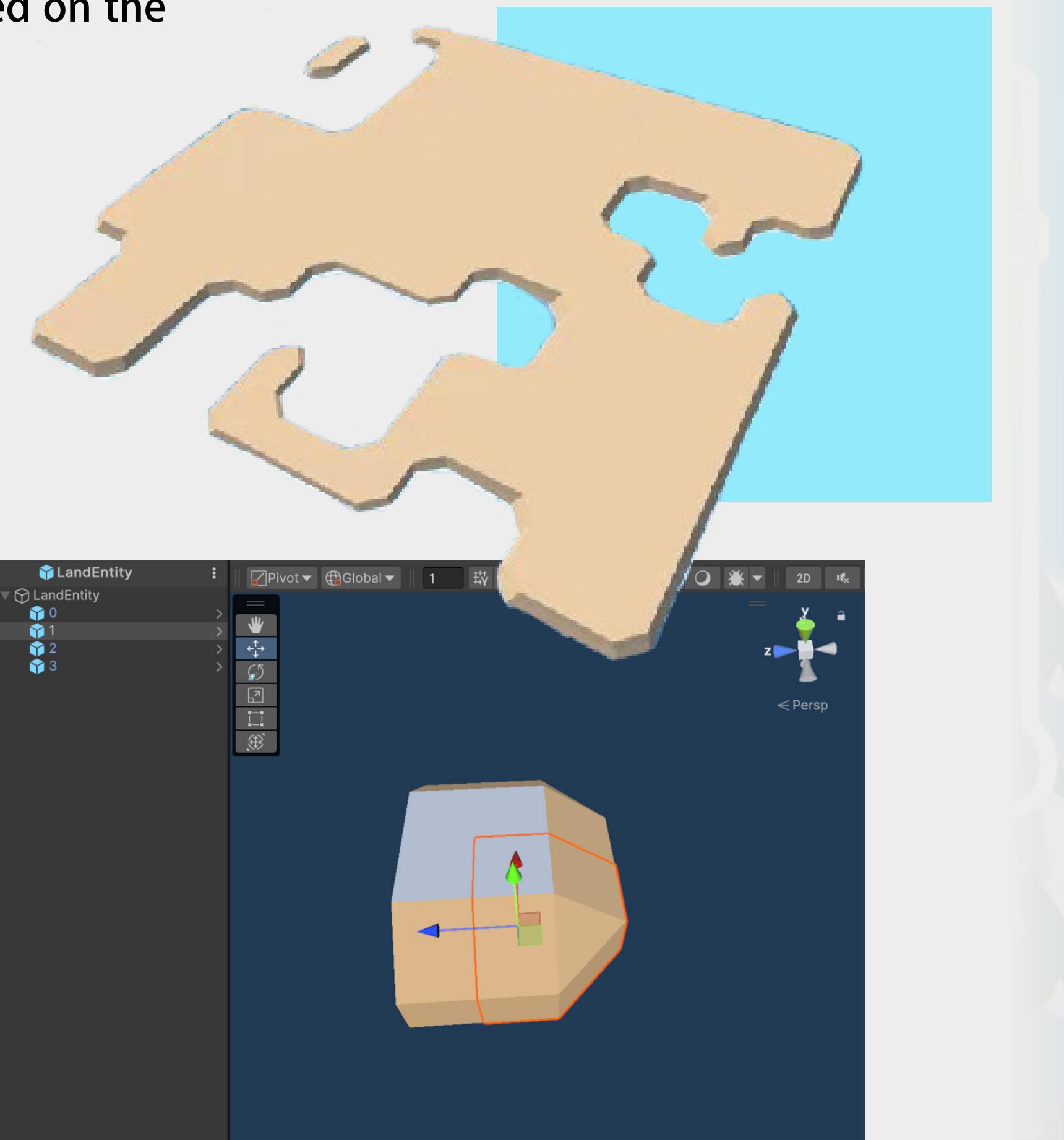
2 个引用
public void UpdateNearbyEntity() {
    for (int i = 0; i < 3; i++) {
        for (int j = 0; j < 3; j++) {
            var Vector2 key = pos + new Vector2(i - 1, 1 - j);
            if (owner.lands.ContainsKey(key))
                owner.lands[key].UpdateEntity();
        }
    }
}
```

```
7
8     public List<MeshFilter> blocks = new List<MeshFilter>();
9     public static Vector2Int[] factors = { new Vector2Int(x: -1, y: 1), new Vector2Int(x: 1, y: 1), new Vector2Int(x: 1, y: -1), new Vector2Int(x: -1, y: -1) };
10    public static Mesh[] meshList = null;
11    public int[][] publicMap = null;

12    1 个引用
13    public static void InitMeshList() {
14        meshList = new Mesh[3];
15        for (int i = 0; i < 3; i++) {
16            meshList[i] = Resources.Load<MeshFilter>("Prefabs/Land/LandBlocks/" + i.ToString()).sharedMesh;
17        }
18    }

// public void OnDrawGizmosSelected() { .. }

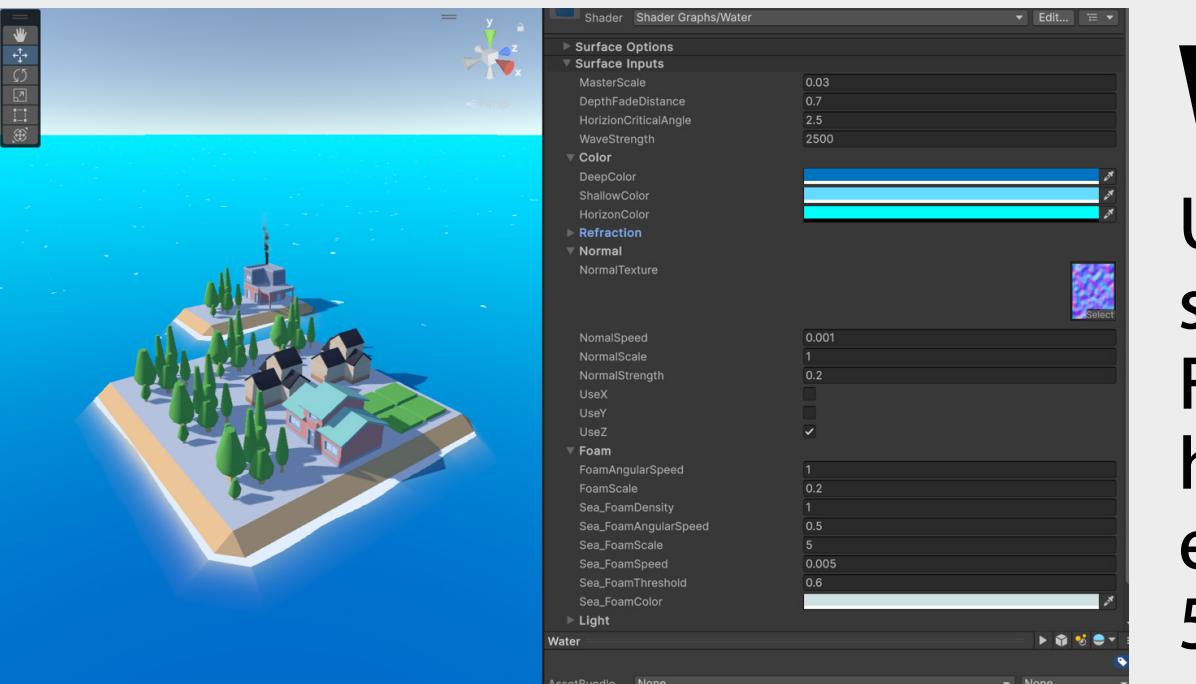
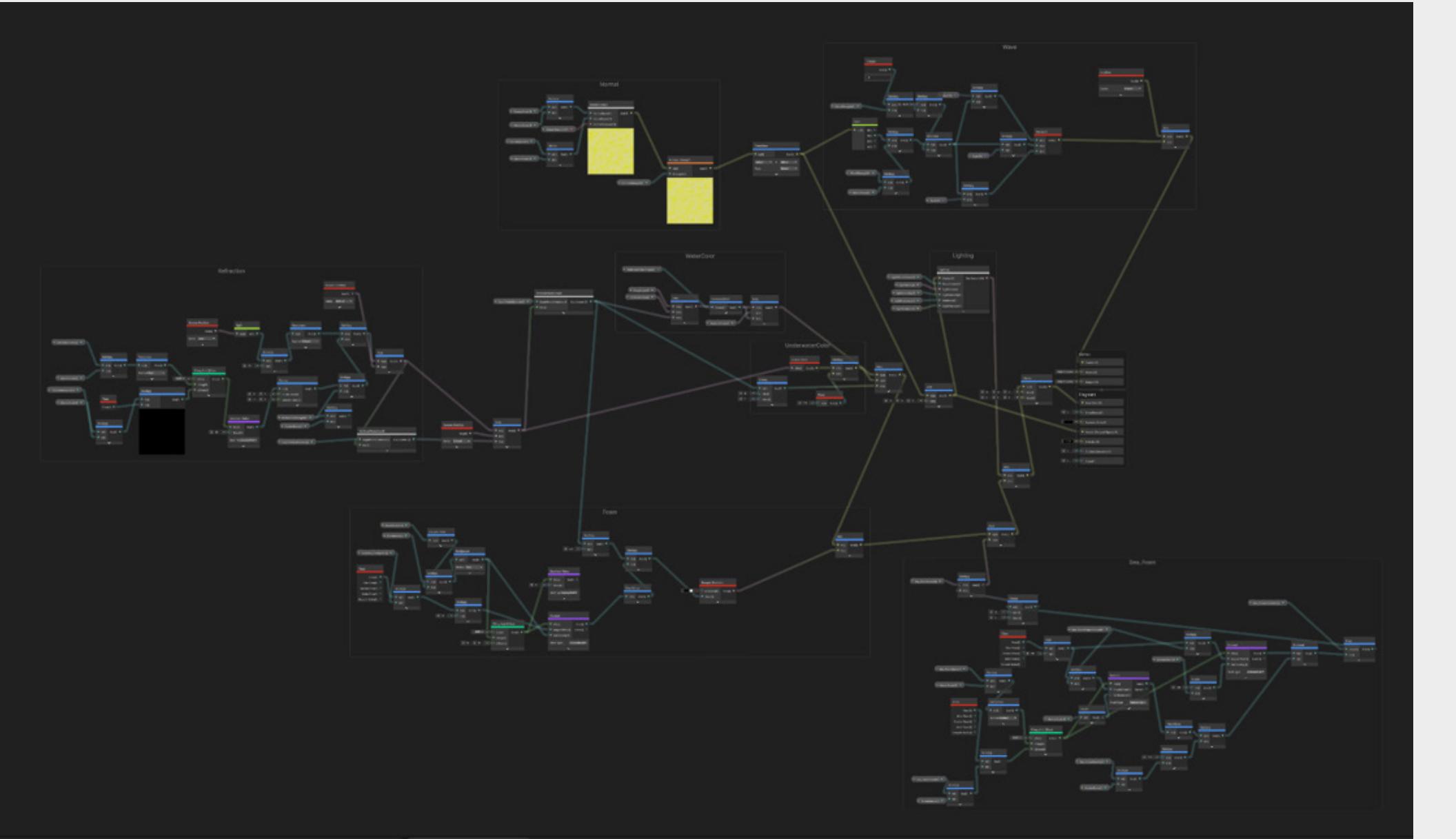
1 个引用
19    public void UpdateBlocks(int[][] map) {
20        publicMap = map;
21        int x, y;
22        int a, b, c;
23        foreach (MeshFilter block in blocks) {
24            var Vector2Int v = factors[3];
25            var Vector3 originalDirection = new Vector3(x: -90, y: -270 + 90 * i, z: 0);
26            a = map[1 + v.x][1];
27            b = map[1 + v.x][2];
28            c = map[1 + v.x][1 + v.y];
29            if ((a + b + c) == 0) {
30                block.mesh = meshList[0];
31                block.transform.eulerAngles = originalDirection;
32            }
33            else if ((a + b == 1) {
34                block.mesh = meshList[1];
35                originalDirection.y += ((v.x + v.y) != 0 ? a : b) * -90;
36                block.transform.eulerAngles = originalDirection;
37            }
38            else if ((a + b == 2) {
39                block.mesh = meshList[2];
40            }
41            block.transform.localPosition = new Vector3(v.x * 5, y: -12.5f, v.y * 5);
42            i++;
43        }
44    }
45}
46}
47}
48}
49}
50}
51}
52}
53}
54}
55}
56}
57}
58}
59}
60}
```



Score:
39452



TECHNICAL ART ■ -Environment

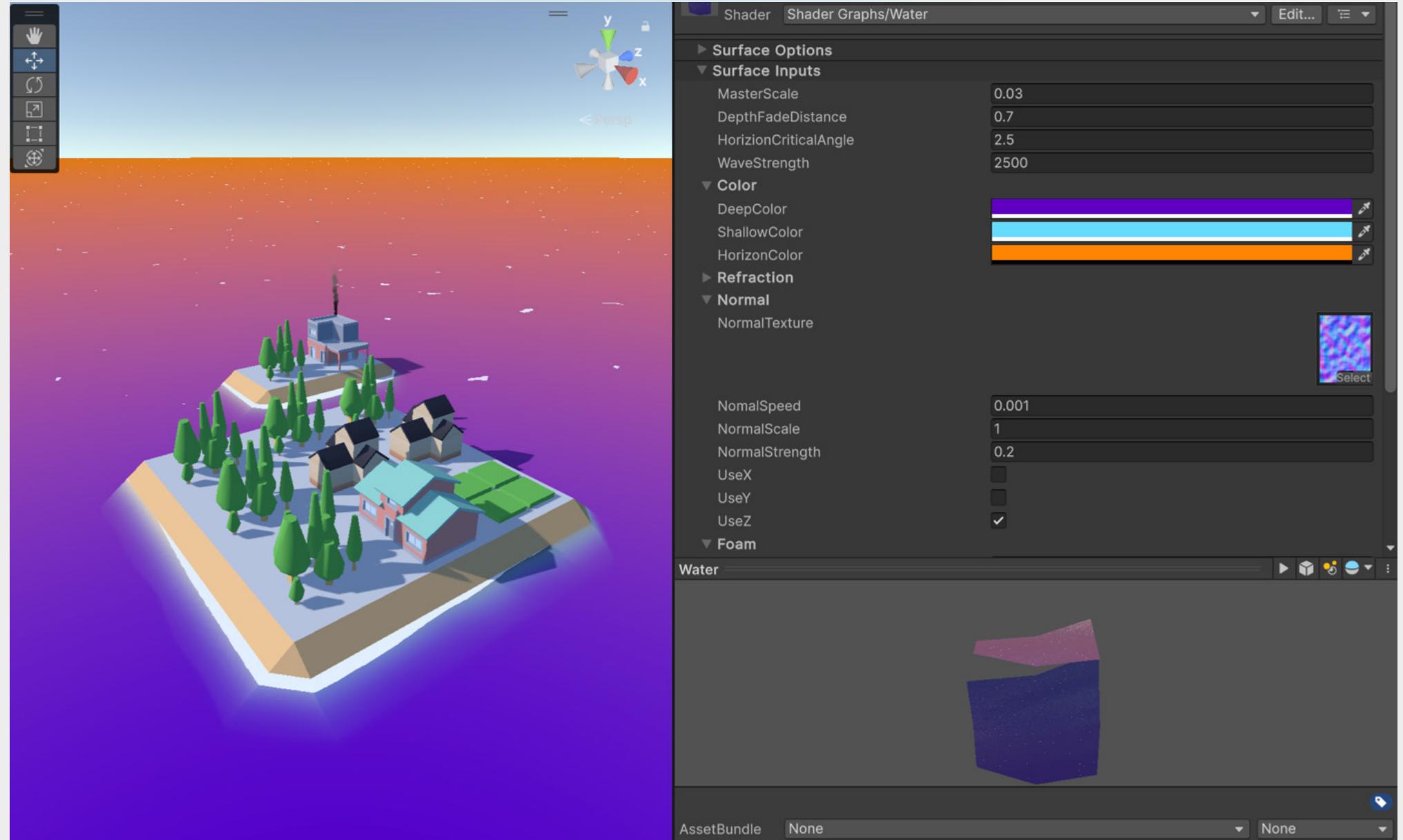


Water

Using Shader Graph to create a sea surface.
Following a tutorial at
<https://developer.unity.cn/projects/646755dcedbc2a0dceeb0c5a>.

Skybox

Using Coroutine to control the sun' s position and Water' s color.



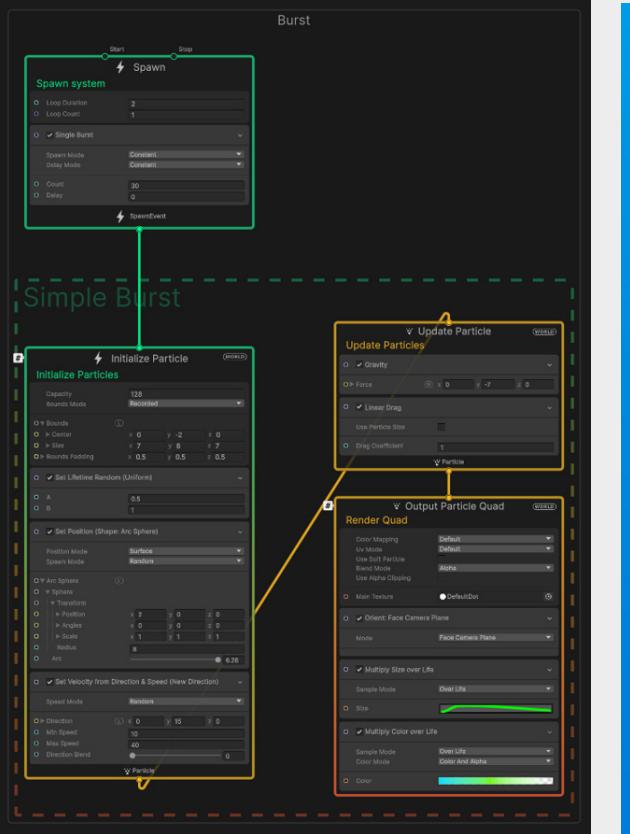
```
public void SetMorning() {
    try {
        StopCoroutine(sunAttribSetDelay);
    } catch {}
    try {
        StopCoroutine(SunBrightnessAni);
    } catch {}
    isMorning = true;
    sun.rotation = nightSunPos_2;
    sun.SetRotationAni(morningSunPos, t: 1.5f);
    lightChanged = false;
    SunBrightnessAni = StartCoroutine(Repeat((float percent) => {
        sunLight.intensity = percent + 0.01f;
        water.materialSetColor(deepWater, Color.Lerp(purple, deepBlue, percent));
        water.materialSetColor(horizon, Color.Lerp(orange, mintyBlue, percent));
        if (!lightChanged && percent > 0.1f) {
            City.activeCity.SetLight(on: false);
            lightChanged = true;
        }
    }), time: 1.5f, interval: new WaitForSeconds());
    sunAttribSetDelay = CallDelayed(() => {
        sun.rotation = morningSunPos;
        sunLight.intensity = 1;
        water.materialSetColor(deepWater, deepBlue);
        water.materialSetColor(horizon, mintyBlue);
    }, t: 1.6f);
}
```

```
public IEnumerator ChangeTime() {
    bool night = false;
    while (true) {
        var Vector3 sunRotation = sun.rotation;
        if (sunRotation.x > 0 && sunRotation.x < 180) {
            var float p = Mathf.Clamp((1 - Mathf.Abs(sunRotation.x - 90)) / 90f) * 1.5f, min: 0, max: 1;
            water.materialSetColor(deepWater, Color.Lerp(purple, deepBlue, p));
            water.materialSetColor(horizon, Color.Lerp(orange, mintyBlue, p));
            sun.transform.rotation *= Quaternion.Euler(euler: new Vector3(x: 0.15f, y: 0, z: 0));
            sunLight.intensity = Mathf.Clamp((p - (Mathf.Abs(sunRotation.x - 90)) / 90f) * 1.5f, min: 0, max: 0.8f) + 0.01f;
        } else if (sunRotation.x < 0 || sunRotation.x > 180) {
            sun.transform.rotation *= Quaternion.Euler(euler: new Vector3(x: 0.6f, y: 0, z: 0));
            sunLight.intensity = 0.01f;
        }
        if (night && sunRotation.x > 20 && sunRotation.x < 150) {
            StartScene.instance.SetLight(on: false);
            BGSystem.SetMorning();
            night = false;
        } else if (!night && (sunRotation.x < 20 || sunRotation.x > 150)) {
            StartScene.instance.SetLight(on: true);
            BGSystem.SetNight();
            night = true;
        }
        yield return new WaitForSeconds();
    }
}
```

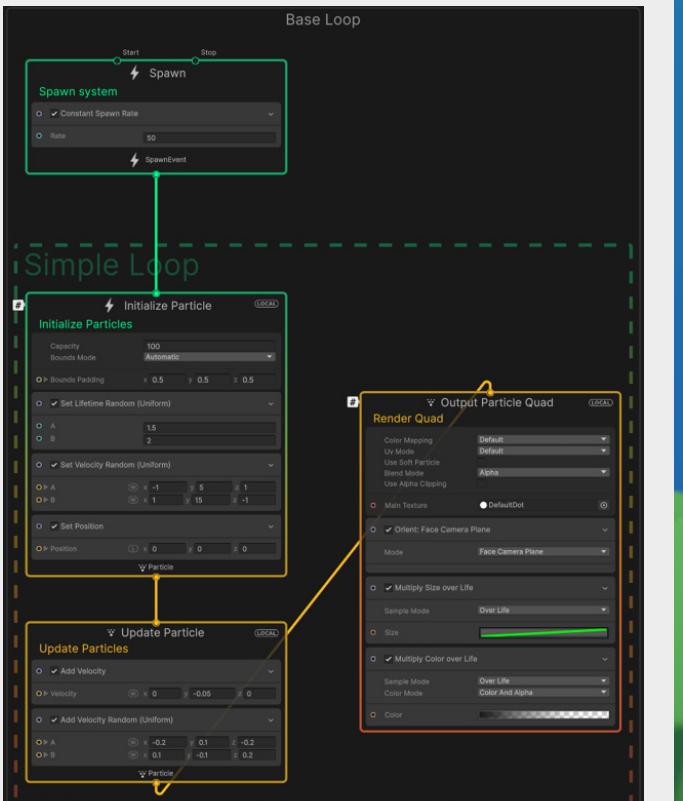
TECHNICAL ART

-VFX Shader

Using VFX Graph to create smoke for factory and visual effect for building / upgrading.



Upgrade / Build

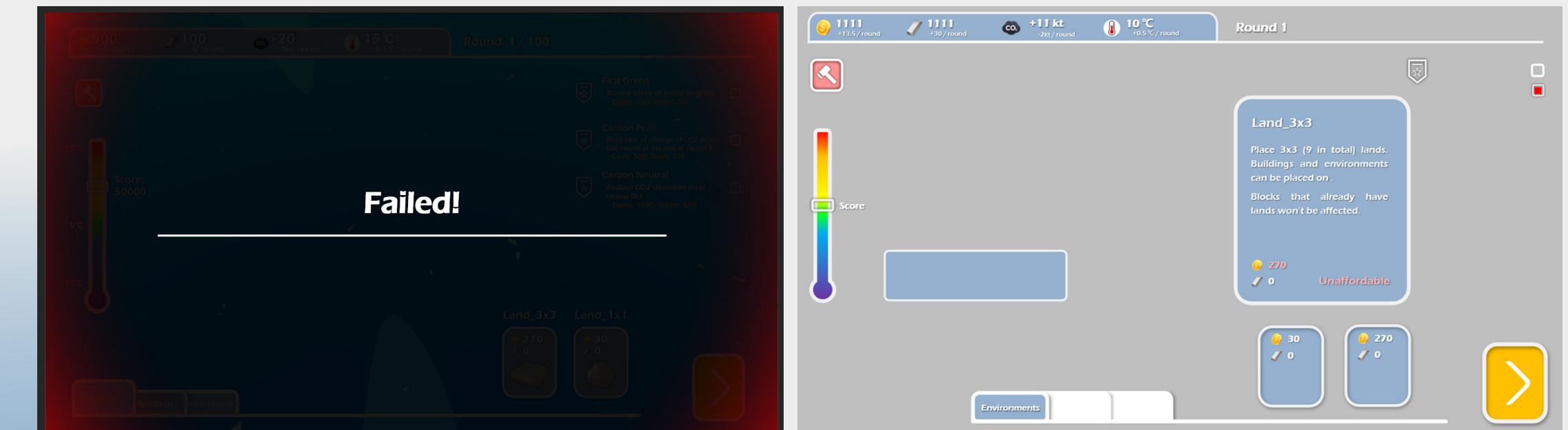


Smoke

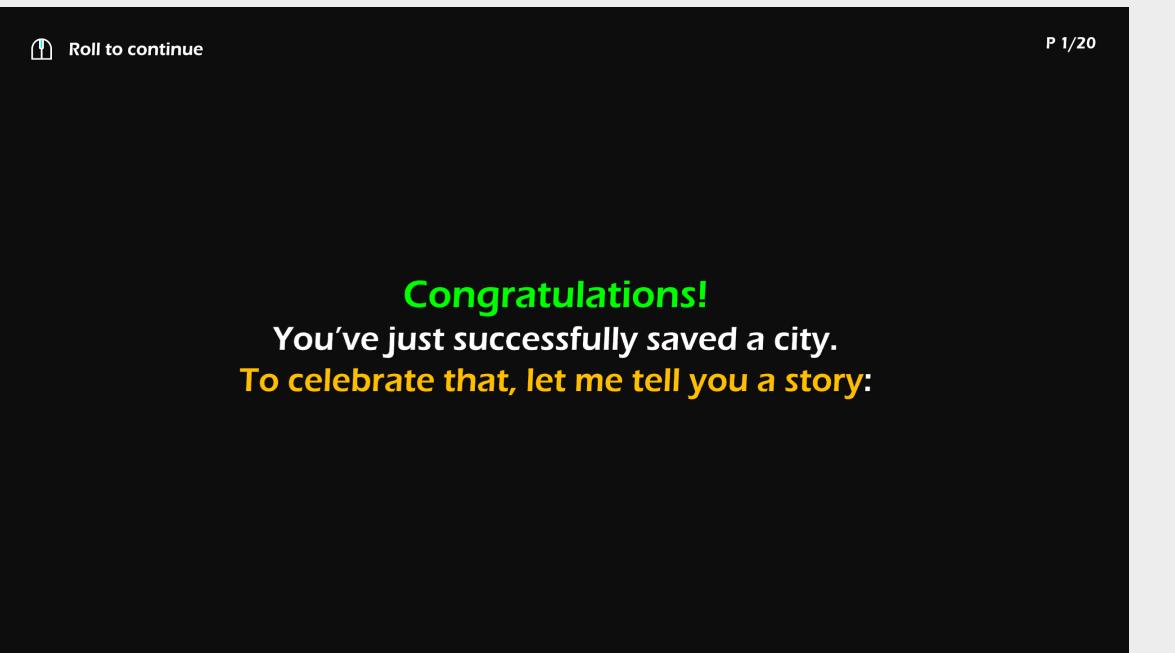
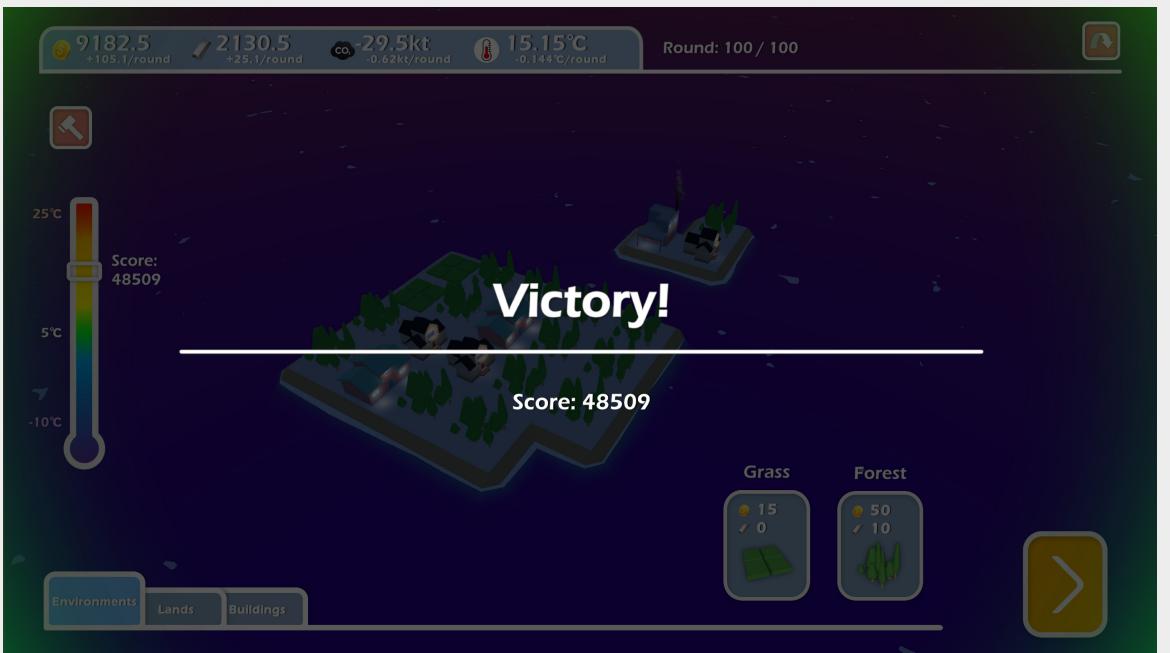
UI DESIGN



Start
Load
Exit



FINAL OUTPUT ■



Language Options

The game is currently only available in English, but global warming is a world-wide problem. Therefore, I'm planning to add more languages so that the game can encourage people who don't speak English to save our planet.

FUTURE PLAN ■

Infinite Mode & Save/Load Feature

I'm also planning to add an infinite mode and a Save/Load Feature, since this enables players to utilize his/her creativity.

New Scoring System

The scoring system can be changed into a way such that score is not only based on temperature, but also the number of buildings/environments a player build, so that players would be motivated to build more blocks instead of sticking with blocks that already exist.