

Terrafarm

Formal Game Proposal

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1. Formal Game Proposal

1.1 Game Description

Terrafarm is a turn-based strategy game set on a previously uninhabited planet, in which the player establishes a foothold to quickly exploit the planet before the collapse of its ecosystem. The player is able to erect several types of buildings to acquire energy and mass, which can be used to expand. While the player's empire grows and might eventually span the entire planet, they also need to deal with climate catastrophes and other hazards that are caused by careless exploitation of the planet's resources.

The player needs to fight against the threats caused by self-induced climate change and acquire as much money as possible before the planet's ecosystem collapses – leading to the inevitable demise of the player's empire. As the world is generated randomly, each game offers a slightly different experience.

1.2 Story

The player is part of an alien species which is rapidly expanding their reach to ultimately colonize the entire galaxy. To reach this goal, they have adapted their biology to quickly transform themselves into industrial buildings. The player settles on an unmarred planet, rich with resources, with the ultimate goal of generating as many resources as possible while interacting with the planet's climate and ecosystem.

1.3 World Layout

The shape of the planet is a truncated icosahedron. Each hexagon (or pentagon) serves as a spot where the player can construct a building. The tile itself has a terrain type, which can constrain what type of building can be constructed, or influence its performance in positive or negative ways.

1.4 Resource Types

The game features two basic types of resources: Energy and Mass. Some buildings generate energy, which is required to sustain the operation of buildings. Other buildings generate mass, which is used to create new buildings. Both can be exchanged for the other at the galactical market (at a reduced rate), and at the end of the game are sold for credits to calculate your score.

1.5 Building Ideas

The player can erect various power plants to generate energy and mass. However, each building has advantages and drawbacks. Some may generate more power in exchange for more pollution, while others may pose different dangers.

- **Combustion Power Plant:** This power plant burns biomass to generate a fair amount of energy, but also quickly pollutes the environment, possibly reducing the players turn limit due to climate events.
- **Fission Reactor:** The fission reactor splits atoms to generate vast amounts of energy and pollution. Additionally, it carries the risk of exploding, damaging the player's structures and leaving behind a large financial gap. It is a high-risk, high-reward building!
- **Wind Turbines:** Wind turbines generate a low amount of pollution, but also a limited amount of energy.
- **Mass Extractor:** Pulls biomass from the planet's terrain. Uses large amounts of energy.

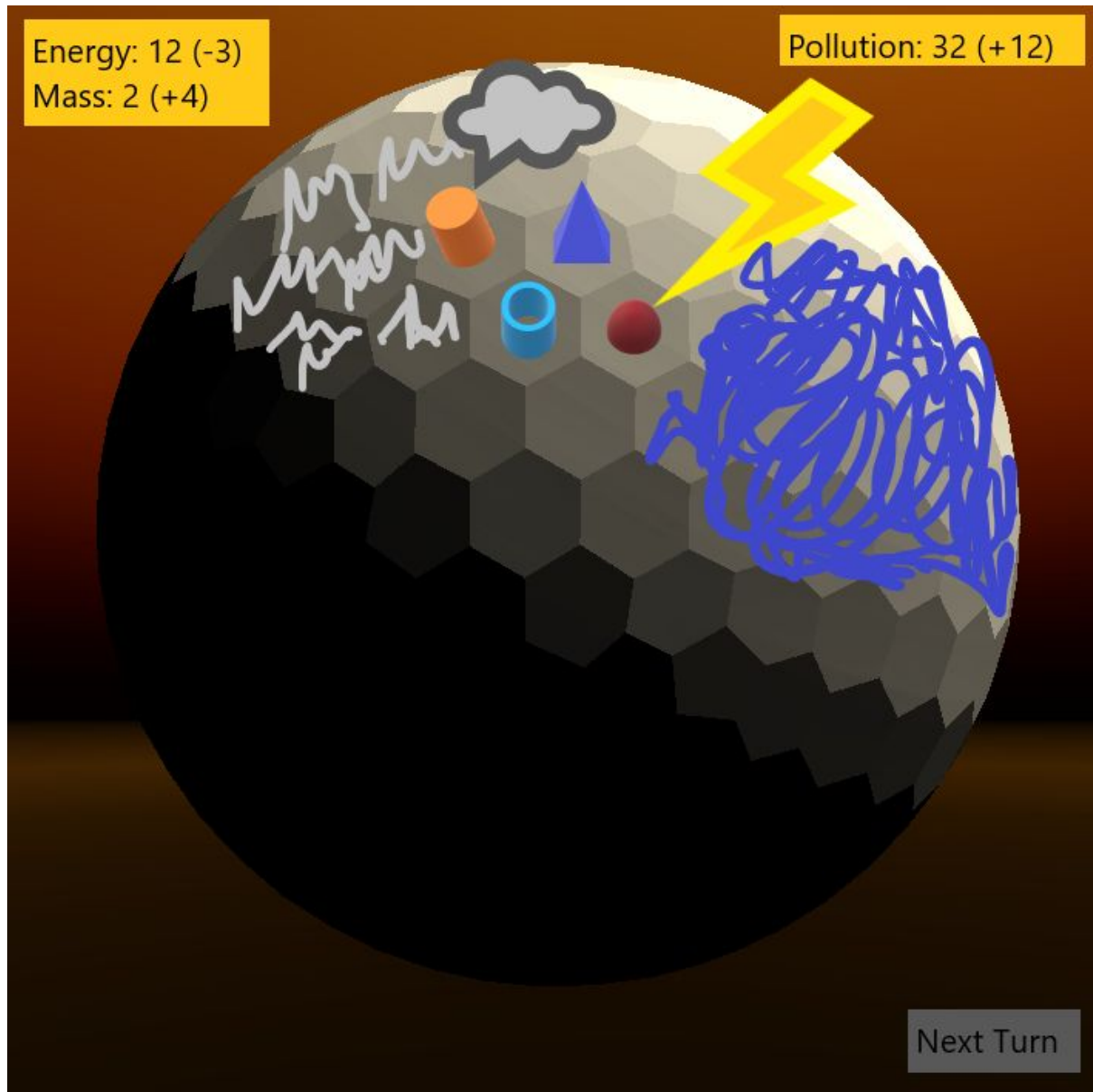
1.6 Climate Effects Ideas

Pollution from buildings will begin to heat up the atmosphere, ultimately making the planet uninhabitable due to high temperatures.

Additionally, during gameplay, other random events may happen depending on the player's pollution:

- **Lightning Strike:** May hit player's building causing it to take large damage
- **Earthquake:** Deals low damage over a wide area
- **Ion Storm:** Lowers the production of a building for the next X turns

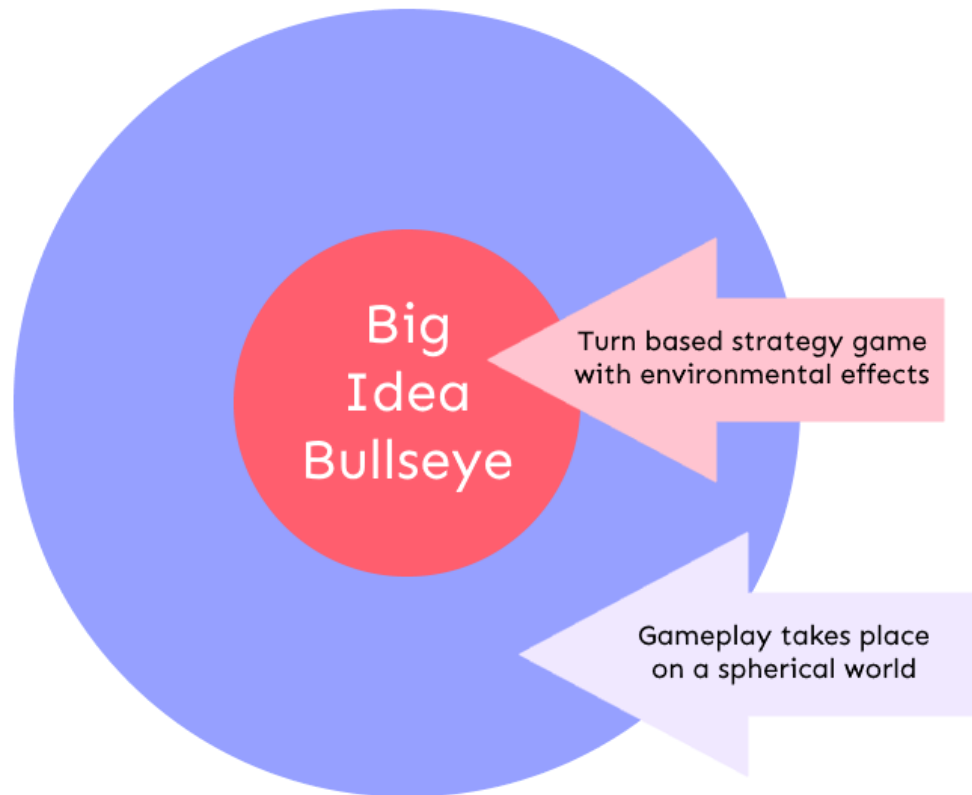
1.7 Concept Art



1.8 Technical Achievement

Our technical achievement will come from the fact that the game takes place on a truncated icosahedron, so extra precautions need to be taken in areas such as graphics, camera control and coordinate systems. Additionally, we would like to incorporate procedural elements into the world layout such as mountains and water to increase replayability.

1.9 Big Idea Bullseye



1.10 Development Schedule

1.10.1 Layered Development Schedule

Functional Minimum

- World Generation
- Input System
- Camera Controls
- Selectable Starting Location
- Buildable Buildings
- Collectable Resources

Low Target

- World features (Water, Mountains)
- Climate effect depending on player-generated pollution
- Simple UI

Desirable Target

- Buildings only placeable on certain terrain
- More building types
- More climate effects

- High scores
- Background Music
- Sound effects

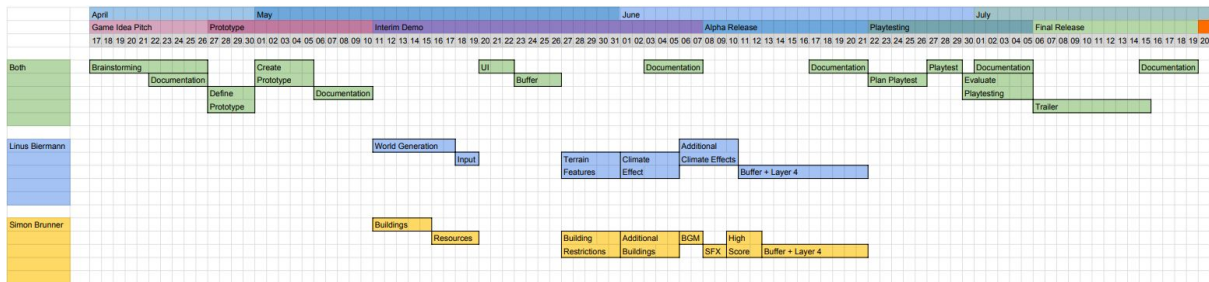
High Target

- Fancier graphics
- Save / Load
- Animated Assets
- More resource types
- Upgradable buildings
- Terrain modification
- More world features
- Implement Story
- World Events

Extras

- Asymmetric Multiplayer
- Online leaderboard
- Mobile platform

1.10.2 Timeline



1.10.3 Task Outline

Task	Description	Member	Planned	Actual
World Generation	<ul style="list-style-type: none"> - generate truncated icosahedron with variable size - layout data to easily access buildings, tiles, etc - foundation for world features - selectable starting location - flat shading 	Linus	15	
Input System	<ul style="list-style-type: none"> - selectable tiles - camera controls 	Linus	4	
Buildings	<ul style="list-style-type: none"> - integrate 4+ buildings - resource generation - pollution / effect on the environment 	Simon	15	
Resources	<ul style="list-style-type: none"> - energy - mass - credits 	Simon	5	
UI	<ul style="list-style-type: none"> - user interface for buildings, construction, resources and various other information panes 	Both	10	
Core	<ul style="list-style-type: none"> - integrate all systems to create a playable prototype 	Both	10	
Terrain Features	<ul style="list-style-type: none"> - mountains, water, ... - make data easily accessible for building perks / detriments / restrictions 	Linus	5	
Building Restrictions	<ul style="list-style-type: none"> -make buildings placeable on certain tiles -impact of the environment (mountains, water) on resource generation 	Simon	10	
Climate Effect	<ul style="list-style-type: none"> - layout foundation different types of effects with variable sizes, effects, ... - create visuals for effects 	Linus	10	
Additional Content	<ul style="list-style-type: none"> - more buildings - more climate effects - extra resource types? - upgradable buildings - world events - terrain modification - add deeper story integration - asymmetric multiplayer - online leaderboards - mobile platform? 	Both	∞	

1.11 Assessment

We hope to appeal to a wide audience through the combination of simple graphics, strategic elements and slower gameplay. Players will have time to think about where they want to place buildings, and how those buildings will interact with the resources they have, the terrain around them and their remaining time. However, since we have only half the members at a team of two, we must be cautious with our planning and make sure the scope of the game does not get too large.

Our plan is as follows: Work on the core features (buildings, resources, world generation, climate effects) and finish these as quickly as possible to establish a good baseline, then work on additional content to hopefully create an engaging experience.