

Games and Simulations for Learning

Assignment: Game Design Project 2: Design Document Alyshia, James, and Taylor

1. Working title
EcoMaker
2. Description of play experience
Players are given a biodome with a predetermined climate. Learners begin to develop unique plants and animals able to survive in the Biodome. As the learners progress, they realize that all parts of an ecosystem must maintain balance. It is all or nothing. As the game progresses, environmental threats to the biodome are presented to the players; which compel them to review their previous assumptions and change their tactics to preserve the life they have previously established.
3. Goal
Design a balanced, thriving ecosystem by creating organisms that are able to survive the conditions of the biodome.
4. Learning goals
Demonstrate their understanding of the balance that exists between living and nonliving factors in an ecosystem.
Demonstrate their understanding of how organisms interact to transfer energy in an ecosystem.
5. Basic elements
<p>Actions</p> <p>Players select physical features of organisms.</p> <p>Players choose how to resolve system threats.</p> <p>Goals</p> <p>Add a balanced population of organisms to the biodome.</p> <p>Rules</p> <ul style="list-style-type: none"> •Physical characteristics of the designed organisms be able to survive the environment.

•All life must maintain 10:4:2:1:3 ratio of Primary Producers (PP): Primary Consumers (PC): Secondary Consumers (SC): Tertiary Consumers (TC): Decomposers (DC)

Objects

Biogenerator

Observation Deck

Status Dashboards

Playspace

Indoor Laboratory

Observatory

How these all create play

The play environment is a simulated biodome which enforces the closed-system concept. The players have access to two locations: the Indoor Lab, where the organisms are designed on the Biogenerator, and the Observation Deck inside the Observatory where the players view the interactions between organisms in their ecosystem.

6. Learning mechanics

Apply their understanding of physical adaptations to select characteristics for the organisms they create that allows them to survive the biodome's climate and conditions.

Apply their understanding of energy transfers and relationships in an ecosystem to balance the number of organisms at each energy level.

7. Annotated list of design values

Experience

As a pioneering scientist, players chose the physical characteristics of the organisms they are creating. As they see their visions materialize after printing, they develop feelings of pride and admiration for their work. With pride comes protection. As ecological threats come against the biodome, player chose how to respond to maintain equilibrium.

Theme

In this simulation game, maintaining life by maintaining balance presents the players a myriad of choices soliciting their investment into this gaming experience.

Point of View

EcoMaker presents as a first-person simulation which invites the player to invest in gameplay. Using simple, colorful, and eye-catching graphics, players feel pride and a desire to protect their new creations as they come to life.

Challenge

While being attentive to the lives they have created, players are challenged to constantly alter their perspectives and priorities to resolve new threats that come against the life in the biodome.

Decision-Making

Initially, players use their understanding of adaptation to choose the physical characteristics for the new habitants of their biodome. As the game progresses, the ecological threats that come against the biodome are announced by the biodome's AI control Benson. With their understanding of what constitutes a balanced ecosystem, players determine their course of action either in the lab or the observatory to preserve the life of organisms .

Skill, strategy, chance, and uncertainty:

Players can flex and strengthen their decision-making muscles using their comprehensive understanding a balanced ecosystem to maintain balance of their biodome. Catastrophic ecosystem threats are scientifically sound and respond to the number of organisms the player creates on each energy level of the ecosystem, and how well their physical structures promote survival in the biodome.

Context:

Players aged ten and older will find it hard to believe they are playing a learning game. As the Lead Scientists, and the Ultimate Decision Maker, EcoMaker pulls the player into an immersive experience they will want to continue in and out of the classroom.

Emotions:

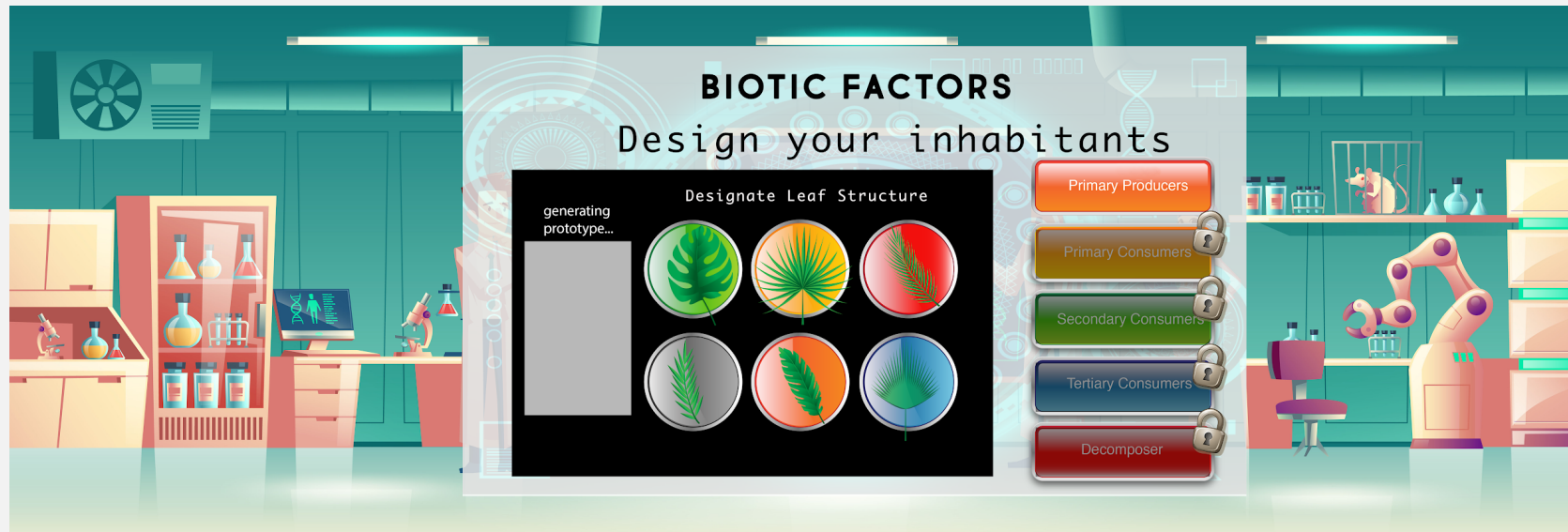
Players experience enjoyment, pride, and motivation while creating their own organisms and maintaining a world for them to thrive.

8. Interface and controls

Control over the game state is established through relatively simple point and click player actions, so that all the complexity of the game lies is what changes to make to the biome and not how to make those changes occur. In the Laboratory, players will design organisms and

unlock different energy levels as the game progresses. Players chose from design options with a simple click. Once the design organism has been approved by the player, they chose to release the organism into the biodome. Players then get a view of the entire closed-system (biodome) surface from the observation deck in the Observatory.

Screenshots of each level and learning objective.





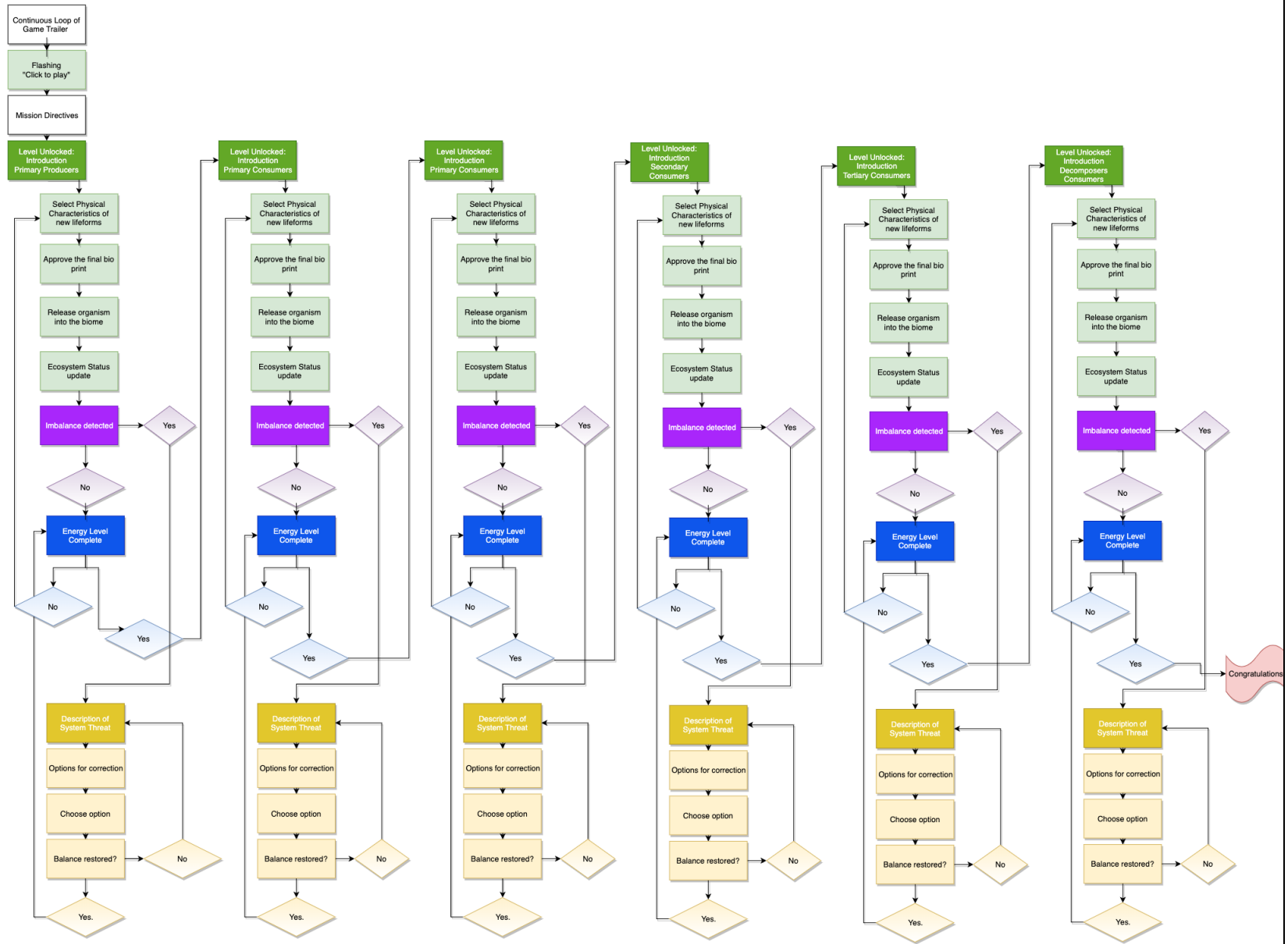


Game flowchart

As the player introduces more and more complexities to the closed-system, they will follow an iterative process of:

- 1) Observing the current state of their biome and identifying problems occurring within.
- 2) Constructing an organism.
- 3) Introducing the organism to the biome and observing the outcome.
- 4) Reflecting on the effects of the organism and tweaking its characteristics to better fit the current needs of the biome.

Players may take several loops in this cycle of trial and error before creating a successfully balanced biome.

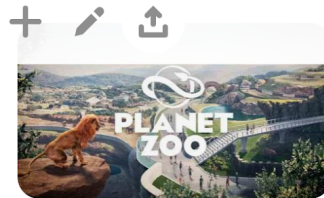


Mood board

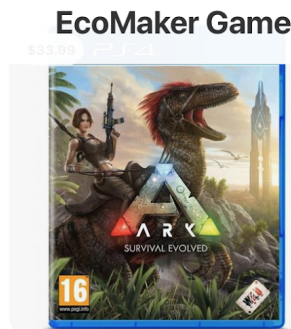
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The Oregon Trail: Adventures...
AwardWiki.org



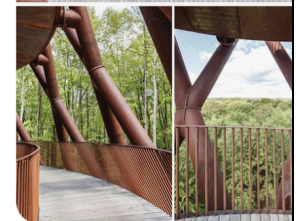
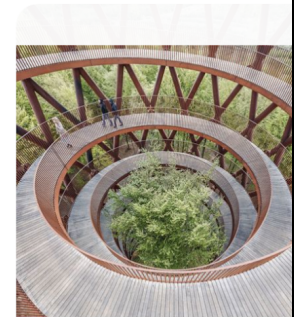
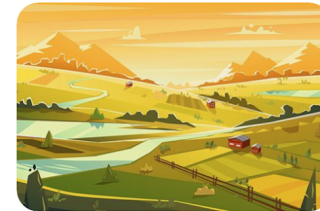
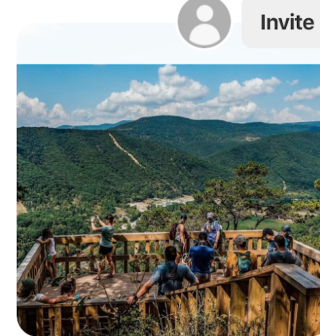
Planet Zoo Trailer Introduces
Frontier's Next Sim Title...



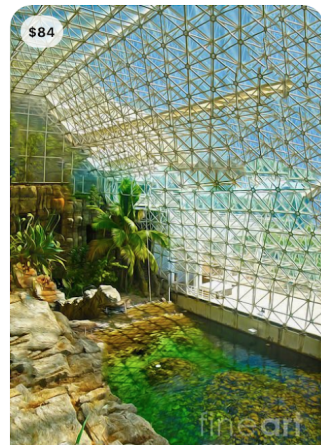
ARK: Survival Evolved
Playasia



Amazon Towers, Paul Allen's Geek
Zone Cursed by Dullness



A Sculptural Observation Tower
Has Opened In Denmark



Gallery of AD Classics: Montreal
Biosphere / Buckminster...

9. Assessment-related telemetry

The game will collect data on how many iterations it takes each student to complete a successful design and release of an organism, as well as aggregating data on what systems changes students have the most difficulty in reacting to on average. The previous metric allows instructors to intervene with specific students about concepts they may be having trouble with, while the latter metric can pinpoint the misunderstood step in the process of energy transfers and relationships within the closed system. Following a growth mindset approach, students are made aware of unsuccessful attempts immediately by the game and are allowed to improve their design until a sustainable ecosystem has been created. Grading would be performed using only the final version of the organism that was created, however to differentiate the lesson for advanced students, players would have the option of trying to create a complex ecosystem with the fewest total iterations and edits to their organisms.