

McKinsey - Ecosystem Building Guide

This is a 35-minute time limit game. You will be placed randomly into either a mountain or a reef scenario. (Click here to sign up and play the game for FREE!)

In this guide, we will walk you through:

- 1. Game Objective
- 2. Game Description
- 3. Main Challenges of this game
- 4. How to tackle the game





Game Objective:

Your goal is to construct an ecosystem comprising 8 species from a selection of 39. There are three primary objectives to accomplish:

- 1. The ecosystem should establish a continuous food chain.
- 2. Ensure a calorie surplus for each predator-prey pair.
- 3. Align the ecosystem with the terrain specifications of your chosen location

Game Description:

1. Terrain Specifications

Each location within the ecosystem is characterized by seven to eight terrain specifications, which can be selected by pinpointing a location.

In the Mountain scenario, there are 8 terrain specifications: Elevation, Soil pH, Precipitation, Temperature, Wind Speed, Air Pressure, Humidity, and Cloud Height.

In the Reef scenario, you'll find 7 terrain specifications: Depth, Water Current, Water Clarity, Temperature, Salt Content, Dissolved Oxygen, and Wind Speed.





Each species has its own set of required terrain specifications, typically ranging from two to four. Failure to meet these terrain requirements will result in the species dying out. These requirements often come in ranges

2. Food Chain Continuity

In the game, you will be given a total of 39 species, categorized into two main types: producers and consumers.

- **Producers**: These include plants and corals. Their sole source of food is typically sunlight or other natural elements. Consequently, they neither have prey nor consume calories.
- Consumers: This category comprises animals, which can further be classified as Herbivores
 (plant-eating animals), Carnivores (animal-eating animals), or Omnivores (consumers of both
 plants and animals). Additionally, some consumers hold the status of "apex animals," indicating
 that they do not have natural predators and are not consumed by any other species within the
 ecosystem.

3. Calories Balance

Each species in the ecosystem is characterized by two essential figures: **Calories Needed** and **Calories Provided**.

A species can thrive under the following conditions:

- 1. **Sufficient Energy for Survival**: The species' calorie needed is lower than the total calorie provided by the ecosystem.
- 2. **Avoiding Extinction by Predation**: The species' calorie provided surpasses the combined calorie consumption by the species that prey upon it.

In essence, for a species to thrive, it must have enough energy to sustain itself and should not be consumed to the point of extinction by its predators.

Main Challenges of this game:

- 1. **Information Overload**: Handling a significant amount of data that requires absorption, calculation, analysis, and prioritization. This encompasses the specifications of 39 species, terrain characteristics of each location, and dietary rules.
- Distracting and Irrelevant Information: Certain details provided may not be relevant and are
 included to divert your attention or lead you into making assumptions. It's essential to refrain
 from making any guesses or relying on any prior knowledge related to the environment, ecology,
 or zoology

How to tackle the game:

Here's a breakdown of how to approach the game, following a 3-step process:





Step 1: Location Selection

- 1. Use a spreadsheet or scratch paper to record the terrain specifications and calorie provided data for the mini-game's producers.
- 2. Examine the data to identify which terrain specifications remain consistent across all species and which ones change. Focus only on the changing terrain specifications (usually 2 of them), while the others are intended to divert your attention.
- 3. Calculate the total calories provided for the producers in each group of terrain specifications. The group with the highest calorie provision is likely the easiest to construct the food chain.

Step 2: Food Chain Building

- 1. Examine the data to list consumers with compatible terrain requirements in your spreadsheet.
- 2. Select the apex predator with the lowest calorie requirement as the starting point for the food chain.
- 3. Construct the food chain starting from the apex predators and work your way down, listing the food sources for each top-level predator. Keep progressing in this manner until you reach the lowest tier, which includes corals and plants. Ideally, the food chain should encompass 3-4 levels and encompass 8 species.
- 4. Alternatively, you can build the food chain from the bottom up by examining the "Eaten By" specifications of each species, working your way up to the top predators.
- 5. Throughout the process, prioritize species with high calorie provision and low-calorie requirement. This should increase the chances of a calorie surplus in the food chain and allow room for additional species if the initial chain falls short of the required 8 species.
- 6. If your food chain doesn't reach the necessary 8 species, work from the bottom up to identify gaps of unused surplus calories and fill these gaps with predators or plant-eating animals.

Step 3: Sanity Check

- 1. Ensure that each species in your food chain aligns with the chosen location.
- 2. Verify that the food chain is continuous, meaning that the listed food sources match the descriptions of each species.
- 3. Confirm that each species in the food chain has an adequate calorie supply and isn't consumed to extinction based on the provided eating rules.
- 4. If any of the three checks are not met, make adjustments to the food chain.





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