

Extraction : Final Documentation

Summary:

Extraction is a 3-4 player board game inspired by the resource management mechanic and framework of CATAN. Players compete to expand their territory by extracting resources, building roads and settlements, trading, and attacking other players. Because players must continue extracting resources to progress, scarcity creates competition and tension between players. Each time resources are collected from a tile, a token is removed from that space. Once all tokens have been removed, the tile is flipped over and can no longer produce resources for the remainder of the game. This mechanic supports how systems built around growth and consumption can eventually lead to instability, conflict, and environmental exhaustion over time.

The intended audience for this game is anyone who enjoys strategy and resource management games like CATAN, specifically those wanting higher stakes player interaction and a board that changes over time. The game is designed to communicate the long-term environmental and social consequences of overconsumption. Rather than saying this directly, the game allows players to experience collapse through their own decisions during play.

Design Process & Thought Process:

Game Design Document

Core concept: *Extraction* is a competitive resource management game where the land and its resources are finite and shared among players. Players compete to acquire these limited resources for their own economic growth, but aggressive extraction contributes to long-term environmental damage.

The game's *message* is about the short-term gain and long-term consequences of our extraction of resources from the earth. Its *purpose* is to make players feel the consequences of environmental destruction through gameplay.

The *rules* of *Extraction* are based in the building, trading, and resource collection mechanisms of CATAN, with modified mechanics regarding scarcity and depletion. Each time resources are collected from a producing tile, one token is permanently removed from that space on the board. Once all tokens are removed, the tile becomes depleted and can no longer produce. Additional rules include number disc redistribution when rolling a 7, attack and defense mechanics between neighboring players, and efficiency tied to upgrading settlements and localizing new infrastructure.

The *core mechanic* is the token-based depletion of the land and shifting availability of resources. While resource extraction is necessary to continue progressing in the game, unsustainable practices can permanently deplete resources and create future scarcity.

Additional *mechanics* include:

- Number disc redistribution when rolling a 7
- City efficiency, which allows players to collect 2 resources for every 1 token removed
- Attack and defense between neighboring players
- Trading of limited resources
- Expansion through building roads, settlements, and cities

Iterative Design

Iteration 1 was a rough proof of concept. Setup referenced sections of the original CATAN rulebook, and the rules for depletion were still vague and unexplored. During the first playtest, players noted confusion about the number discs and what a disc exchange would look like in practice. I also found that allowing players the option to extract an additional resource went against the overall message of my game. This was replaced by a system of blocks that would physically represent depletion in my second iteration.

“The current player has the option to extract an additional resource card from that tile, but must exchange the value of that tile, essentially adding +1 depletion to the tile. For example, the player would swap their 5 (****) for a 4 (***) , or a 9 (****) for a 10 (***) because it will be less likely to be rolled again in play.”

-Selection from the Iteration 1 Extraction Rulebook

At this point in development, the theme was still somewhat undecided, and I had noted my consideration of using the Spanish conquest of the Aztecs or a modern capitalistic approach to support my concept of extraction.

Iteration 2 (yellow) was mostly self-contained, with the exception of having to reference the CATAN rulebook for specifics on the different Development Cards. Iteration 2 includes new rules for setup that explain how to place the number discs. Unlike the game setup for CATAN, It is important that these are placed **following** the placement of each player’s starting settlements. The depletion system was indicated by the number of blocks remaining on each tile, and the attack mechanic was developed further in this version.

Players wanted there to be a consequence to attacking a settlement if the attack failed and this change is reflected below:

If the attack is unsuccessful, the defending player can draw a resource card at random from the attacking player's hand.

-Selection from the Iteration 2 Extraction Rulebook

The winning condition was still "first to 10 points" with no depletion endgame.

Iteration 3 (orange) refined the attack mechanic significantly. It added the resource card wager requirement, clarified that cities and settlements can both be targeted, and introduced the Longest Route consequence when a longest road is broken.

The previous building is returned to the player that was attacked to be reused. If successful, an attack may break up the length of their player's road. If that player has the Longest Road card, they must return it to the supply until another player meets the requirements, or until the building is taken back in another attack... The defeated player may decide to roll to take their building back once it is their turn, following the same rules for an attack. An attack can be avoided through fortification, building roads around your buildings to prevent access.

-Selection from the Iteration 3 Extraction Rulebook

I fixed some of the wording to add clarity to the rules, and addressed some issues during playtest. Specifically what happens when nobody has built on a tile that is rolled for production, which is nothing. I also changed the rules to allow players to use discs from depleted tiles in the disc exchange when rolling a 7. This prevents stagnation towards the end of the game. The winning condition was then updated to:

Play continues until there are no possible moves that can be made by anyone. Players count their total points and whoever has the most points at the end of the game, wins.

-Selection from the Iteration 3 Extraction Rulebook

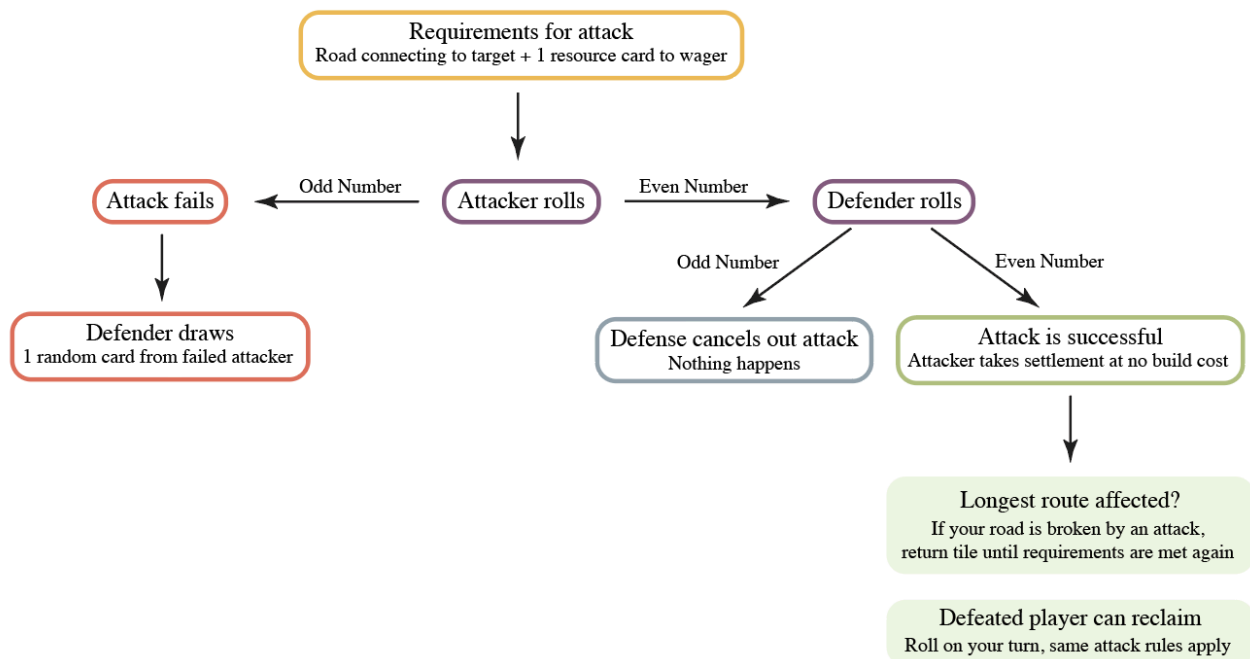
Iteration 4 (red) is the most current rulebook for *Extraction*. In this version, the desert tile was integrated as pre-depleted, an example of rolling a 7 was added, and the winning condition was fully rewritten around the depletion metaphor.

Play continues until there are no valid actions that can be made by anyone on their turn. When a player cannot collect resources, build, trade, or attack, they are out of the game (the land has been exhausted for them). When all players have been eliminated this way, the game ends. Players count their total points and whoever has the most wins.

-Selection from the Iteration 4 Extraction Rulebook

This fixed a problem during playtest where no valid moves could be made before the game technically ended.

Images and diagrams were also incorporated, including an attack/defence flowchart.



-Selection from the Iteration 4 Extraction Rulebook

Game Mechanics

Resource Collection/Management Mechanic:

As stated above, the *core mechanic* is the token-based depletion of the land and shifting availability of resources. While resource extraction is necessary to continue progressing in the game, unsustainable practices can permanently deplete resources and create future scarcity.

How this works: Players roll two dice and add them together. The total determines which hexes produce resources this turn. “All players with a settlement on a producing hex may collect 1 resource card that corresponds to that hex tile’s resource type. One token is then removed from that tile. Once all tokens are removed from a hex tile, that tile is ‘depleted’ of its resource and is flipped over.” -*The Extraction Rulebook*



The above image illustrates the extraction of a resource. One token will be removed from this tile after collection, and the tile will be flipped over to show its depletion (there are no more tokens left on this tile).

Number disc redistribution when rolling a 7:

In CATAN, when a player rolls a 7, they move a robber piece around the board. In *Extraction*, “When a player rolls a 7, hexes do not produce any resources. Instead: The player swaps the number disc on a tile of their choosing with either one of a different tile, or a number disc that was previously placed into the supply (no longer in use following depletion).” -*The Extraction Rulebook*. The tokens are not involved in this exchange.

How this works: As an example, you might move a high-frequency disc off of a nearly depleted tile and use it to increase production of a different hex.

	●	●●	●●●	●●●●	●●●●●	●●●●●●
●	2	3	4	5	6	7
●●	3	4	5	6	7	8
●●●	4	5	6	7	8	9
●●●●	5	6	7	8	9	10
●●●●●	6	7	8	9	10	11
●●●●●●	7	8	9	10	11	12

Each dot on the number disc represents the possible combinations for rolling that number, and how frequently it will be rolled.

Efficiency Mechanic:

Upgrading a settlement to a city allows players to collect more efficiently. “Cities are worth 2 points and allow a player to collect two resources while only extracting one token from a hex tile” -*The Extraction Rulebook*. Localizing settlements to multiple intersections around a specific hex can allow you to collect 2-6 per extraction depending on how many settlements you can afford to place.

How this works: By either upgrading a settlement to a city, or placing more settlements at the intersections around a hex, players can extract resources more efficiently and slow depletion of that resource.

Attack Mechanic:

Players have the option to “attack a neighboring settlement or city. This is any building of another color, but they must have first built a road that connects to the settlement. Roll one die for luck... the other player may then roll the other dice for defense, following the same rules for success” -*The Extraction Rulebook*.



Example: White builds a road leading to one of Red’s settlements. White rolls for attack and is successful. Red rolls for defense and is unsuccessful. White replaces Red’s settlement with one of their own color. Red previously had the card for the Longest Route and must either attack white on their turn, or build in another direction if they would like to earn these points back.

How this works: If the attack is unsuccessful, the defending player may steal a card from the attacker’s hand at random. If the defending player is successful in stopping the attack, this cancels out any efforts and nothing happens. If the attack is successful, the defeated player may decide to roll to take their building back once it is their turn, following the same rules for an attack. An attack can be avoided though fortification, building roads around your buildings to prevent access.

Trading Mechanic:

When resources become scarce, people often rely on the ability to make trades for what they need. “During your turn, other players may offer to trade with you, not with others or with the supply. To trade with the supply, you must have 3 of the same resource to exchange for 1 of a different resource” -*The Extraction Rulebook*.

How this works: This mechanic allows for limited resources to get redistributed among other players.



Player Goals

Players win by having the most points when all players have been eliminated, meaning no one can collect, build, trade, or attack. Points come from settlements (1), cities (2), earning the Longest Route tile (2), earning the Largest Army tile (2), and by collecting point cards (1). Because extraction depletes resources more quickly, players must balance expansion and survival as depletion accelerates the endgame.

Gameplay Sequence



Hills produce brick



Forests produce wood



Pastures produce wool



Fields produce wheat



Mountains produce ore



The desert produces nothing



In this playtest we can see that White has built the Longest Route and has acquired an additional 2 points for having done so. White's city is at risk of being attacked because they have not built a road to fortify it from Blue building a connecting road.

In the second photo we see that Blue did attack and take White's city, interrupting their Longest Route and costing them their earned points. Red was able to steal the 2 points for the Longest Route by continuing to build their road. We can also see that though there were resources left on the pasture (11), and in the forest (5), nobody had built a settlement on those tiles and could therefore not extract any of the resources. The final image was taken after no moves could be made by any of the participating players.

Note: The water in both of these images is a placeholder for depleted land in the development of my game.

The gameplay sequence of a single turn follows rolling both dice, identifying producing hexes, extracting resources and removing tokens, checking for depletion, then taking actions. Potential actions include building by buying, trading with others or the supply, and attacking.



The image above shows an example of a setup halfway through the game, including the resources each of the three players may have at this point. I created this setup to evaluate if the previous game could have ended up differently. Specifically, I wanted to test what would happen if White was able to attack Blue for their City back. I decided that this was a necessary change and reflected this change in my third iteration. The following was the result of this playtest, which looks very similar to the depletion of the last game.



To the left, a player is engaging in a disc swap after rolling a 7. This was a key movement in the game because it allowed for White to start extracting sheep from the tile with the newly placed 6 disc. Nobody had sheep and players had to rely on trade.

Game Board & Components:

The game board and components are as follows:

18 number discs



+ Tokens for each frequency dot



card back



19x brick



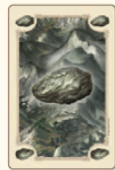
19x wood



19x wool



19x wheat

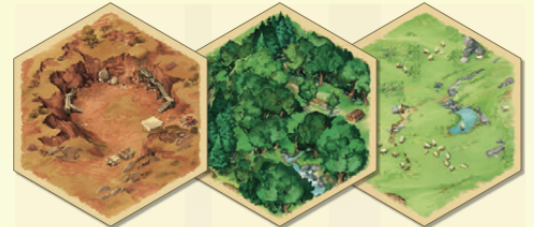


19x ore

2 dice



19 terrain hexes



3x hills

4x forests

4x pastures



4x fields

3x mountains

1x desert

20 settlements (5x each color)



16 cities (4x each color)



60 roads (15x each color)



The components influence the gameplay because players can visually see the depletion of the board and can take actions based on what resources they need, and their own territory's reach.

In my next iteration, I intend on creating a custom game board, resource/development cards, and tokens that follow my theme of depletion. For example, on one side of a hex tile would be a beautiful forest, and on the other, complete deforestation.

Rulebook & Playtesting:

Rulebook Sample

Gameplay

The game is played in a series of turns, starting with the first player, and moving clockwise.

On your turn:

- Roll both dice and add them together. The total determines which hexes produce resources this turn.
- All players with a settlement on a producing hex may collect 1 resource card that corresponds to that hex tile's resource type. One token is then removed from that tile. If no one has built around a number rolled, the hex does not produce resources this turn and no tokens are removed. Once all tokens are removed from a hex tile, that tile is "depleted" of its resource and is flipped over. Once a tile is depleted it is out of use for the rest of the game. The associated number disc is placed face up in the supply and can be reintroduced into the game when a player rolls a 7. **If a player has multiple settlements on that hex, they collect 1 resource card for each settlement, and 2 resource cards for each city.**
 - If there are not enough resource cards in the supply to fulfill everyone's production, then no one receives any of that resource. However, if only one player is affected, give that player as many of those resource cards as remain in the supply.



*Rolling a 7 - When a player rolls a 7, hexes do not produce any resources. Instead:

- The player swaps the number disc on a tile of their choosing with either one of a different tile, or a number disc that was previously placed into the supply (no longer in use following depletion). The tokens are not involved in this exchange. For example, you might move a high-frequency disc off of a nearly depleted tile and use it to increase production of a different hex.

On your turn (Continued) :

Actions - You may take as many actions as you like and in any order, as long as you have the resources to do so.

- Build by buying
 - Roads, settlements, cities, and development cards each have different costs. You must spend resources to “build” something and add it to the board, or draw a development card. Return used resources to the supply.



- **Roads:** Roads are not worth points, and are only used to connect settlements or cities. There must be at least one road in between any two buildings, and a new road must connect to one of your existing roads or buildings. **The first player to have 5 continuous roads can take the Longest Route tile, worth 2 points.**



- **Settlements:** Settlements are worth 1 point and are placed at empty intersections. They must be connected to at least one of your existing roads, but may be built in-between previously placed roads of your color. Once all 5 of the provided settlements have been placed, you must upgrade one of your settlements to a city to continue building more settlements.



- **Development cards:** Development cards remain hidden until used. To play, place the card face up. Development cards never go back into the supply. If the supply runs out, there are no more development cards in play. You may not trade development cards. *See original rule sheet for details on the different cards* When you play a Knight card, complete the actions as directed above for “Rolling a 7”.

- Upgrade your settlements to increase return



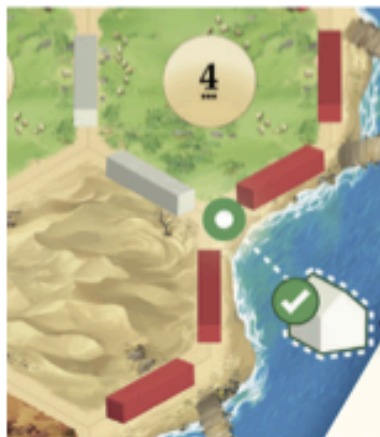
- **Cities:** Cities are worth 2 points and allow a player to collect two resources while only extracting one token from a hex tile. This form of building is more efficient. Cities always replace a settlement. To build a city, remove one of your settlements from the board, return it to your own supply of building materials, and place the city where the settlement was originally located. You may not build more than what you have in your building material supply.

On your turn (Continued) :

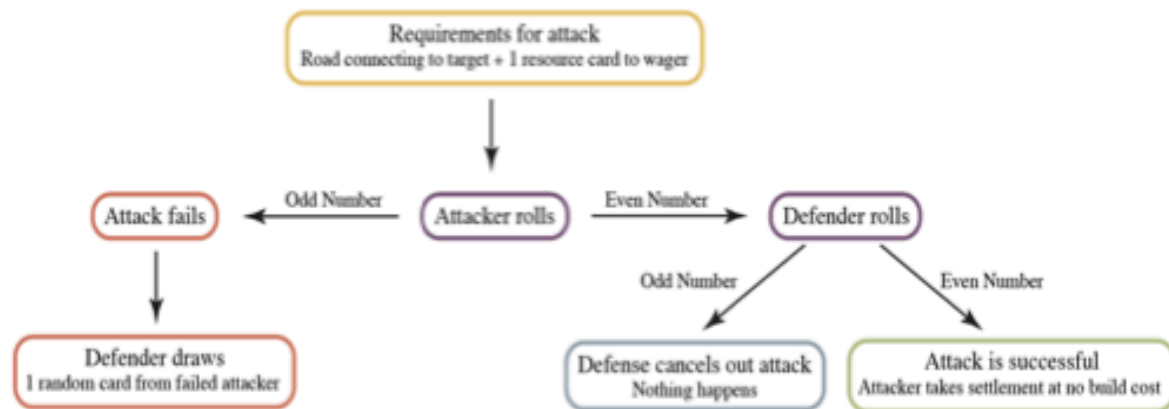
- Trade with players, or with the supply
 - During your turn, other players may only trade with you, not with others or with the supply.
 - To trade with other players, announce which resource(s) you want and which resource(s) you are willing to trade. Other players may accept your proposal, make counteroffers, or make their own proposals.
 - To trade with the supply, you must have 3 of the same resource to exchange for 1 of a different resource.



- Attack a neighboring settlement or city. This is any building of another color, but you must have first built a road that connects to their settlement and have at least one resource card in hand to wager.



On your turn (Continued) :



If the attack is successful and the defense is unsuccessful, the attacking player may take the settlement and replace it with one of their own color, skipping the building cost. The previous building is returned to the player that was attacked to be reused. If successful, an attack may break up the length of their player's road. If that player has the Longest Road card, they must return it to the supply until another player meets the requirements, or until the building is taken back in another attack.

The defeated player may decide to roll to take their building back once it is their turn, following the same rules for an attack. An attack can be avoided through fortification, building roads around your buildings to prevent access.

Winning

Play continues until there are no valid actions that can be made by **anyone** on their turn.

When a player cannot collect resources, build, trade, or attack, they are out of the game (the land has been exhausted for them). When all players have been eliminated this way, the game ends. Players count their total points and whoever has the most wins.

Playtesting Notes

Player feedback, as well as how this feedback was addressed, is included in the iterative design and gameplay sequence sections of this documentation. The image below shows some notes I took during gameplay that influenced changes in the third iteration.

On your turn (Continued):

- Trade with players, or with the supply
 - During your turn, other players may only trade with you, not with others or with the supply.
 - To trade with other players, announce which resource(s) you want and which resource(s) you are willing to trade. Other players may accept your proposal, make counteroffers, or make their own proposals.
 - To trade with the supply, you must have 3 of the same resource to exchange for 1 of a different resource.
- Attack a neighboring settlement. This is any settlement of another color, but you must have first built a road that connects to their settlement. Roll one dice for luck, if the number is an odd number, the attack was unsuccessful, if it is an even number, the attack was successful. The other player may then roll the other dice for defense, following the same rules for success.
 - If the attack is successful and the defense is unsuccessful, the attacking player may take the settlement and replace it with one of their own color, skipping the building cost.
 - If the attack is successful and defense is successful, nothing happens as their efforts are cancelled out.
 - If the attack is unsuccessful, the defending player can draw a resource card at random from the attacking player's hand.

Winning

The player that reaches 10 points first, wins.

Handwritten notes:

- on grab an unused during swap
- buy city if have resources to attack and place
- * must have road connecting
- road remains?
- replaces city
- goes back in pile
- increase by probability w some sort of trade
- cannot buy more houses once out
- cannot attack if no resources to lose
- placement of house specifically to attack
- block not pulled when hex not collected from
- can put settlement in between road seg
- should have fortified city

Game Reflections

What worked: Building on CATAN's familiar framework allowed me to focus on the functionality of new mechanics. The number disc swapping mechanic when rolling a 7 was very successful during playtest. It was inspired by the idea of allowing players to influence the game's probability system, rather than simply blocking production like the robber mechanic in CATAN. Players responded well to the added control and decision-making this created. The attack mechanic also worked well because it increased player interaction and added additional tension, especially as resources became scarce.

What didn't work: Moving the depletion tokens along with the number discs created confusion and weakened the purpose of the depletion mechanic. Allowing tokens to move between tiles made it possible to exploit the land with fewer consequences, which conflicted with the idea of permanent environmental exhaustion. Permanently removing number discs from the game also caused pacing problems. When only a few hexes remained, and they were tied to low-probability number discs, gameplay became stagnant because players could no longer reliably collect resources or progress. Reintroducing depleted number discs back into the game when rolling a 7 helped maintain pacing and supported the intended endgame.

What I would do differently: The attack mechanic is the least playtested element and would benefit from more playtests. I would also expand on a more customized prototype that supports the experience I am trying to create with my game. Lastly, I would playtest with more diverse groups of different backgrounds and skill levels, specifically focusing on how they felt after playing.

