Working Example: *Arctic Saga*

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Arctic Saga is an educational board game designed to simulate marine spatial planning, a technique used to resolve stakeholder spatial interests in disputed regions. Players negotiate stakeholder economic interests while working together to maintain the Arctic environment.

Seed

Tell us about your idea or project. What's your vision?

Arctic Saga is a three to four player board game of strategy, resource management, and negotiations. Players explore territory, create a network of developments for profit, and withstand nature's fury for not developing green technology and preserving the environment. Players embody the roles of stakeholders with an interest in the area: Oil, Shipping, Fishing, and Tourism. As players acquire materials and resources, they will often negotiate with other players to improve their own standing via trading. *Arctic Saga*'s endogenous mechanics, such as territory placement, negotiations, and environmental conditions, are largely-based on actual science and reality.

We envision our game being played in aboard cruise ships, in classrooms, and in casual environments. Takeaways from game-play will certainly be influenced by these differing environments and we plan to observe these differences in gains during the upcoming year. Ultimately, we hope that players will learn about the Arctic region, negotiation, environmental welfare, systems-thinking, and connectivity.

What problem are you trying to solve and why does it matter?

Arctic Saga is derived from a classroom exercise developed by the Barnard Earth Science Institute titled Arctic SMARCTIC (Strategic Management of Resources in Terms of Crisis). As its title indicates, SMARCTIC was designed as an informative experience for students interested in learning about the current Arctic environmental and economic climate. The purpose behind the creation of Arctic Saga was to design a self-facilitated version of the classroom exercise that conveyed the central tenets of the SMARCTIC classroom exercise that could be distributed and played at a number of venues including cruise ships, museums, and classrooms.

The ice in the polar region continues to decline; polar bears and many other wild animals are being endangered because of the encroaching presence of industry and human expansion. Estimates points to complete ice disappearance over the next decades. It's imperative to reach as many audiences as possible to educate them on the

importance of the stability in this region, as well as environment-changing effects that are occurring. We feel that the development of an educational board game is a way we can reach audiences who can learn through playing, while also engaging with the science which forms the backdrop of this game, and understand the stakeholders vying for control of the region.

Sprout

What are some of your initial concepts or designs? We'd love to see them.

At first, we had thought the game was intended to depict the importance of the preservation of ice in the Arctic region. We had begun to conceive a game in which players would attempt to develop on top of the ice and, after continued, reckless development, would cause the ice to melt thereby destroying their developments.

To simulate this, we felt two important learning objectives were necessary to portray: 1) the management of territory and resources and 2) the balance of cooperation and competition through negotiation. To discover ways to convey our learning objectives, we observed the mechanics of a number of popular board games.

For spatial and resource management and negotiation, we turned to the *Settlers of Catan* and *A Game of Thrones: The Board Game*. Both *Settlers* and *Game of Thrones* require players to constantly vie for resources while still maintaining cordial relations with their neighbors lest they fall out of their neighbors' good graces too early in a game, eliminating the player from contention. Designing for this weighted competition was crucial for our learning objectives which called for us to reflect the real-world competitive environment that stakeholders currently vie for in the Arctic environment.

While emphasizing competition, it also was vital to emphasize the collaborative component of operating in the Arctic environment. In the real world, if one stakeholder succeeds in claiming all of the resources to be found in the Arctic region, then that may result in a good payoff for them; however, their selfish actions may put the environmental climate of the region in danger. To simulate these aspects, we turned to collaborative games such as *Pandemic* and *Forbidden Island* which do well in creating an atmosphere of cooperation in the face of impending disaster.

Have your initial concepts/designs changed? Why have they changed? Show us how they're being refined and iterated.

Upon presenting our initial design concepts, ideas, and direction to our PI and the Barnard Earth Institute, we talked to our content expert and learned that we were moving in a completely different direction than desired. Our game was complicated; fueled by our own ambitions to design a game on our own, one that was influenced heavily by Euro micromanagement games, and without any real foundations in actual science. Needless to say, our designs/concepts changed drastically. This experience showed our design team just how much a content expert is required to ground the design in reality, or at least have it move in an expected direction.

Another change was our attitude towards the design process. This was the first game we've ever produced and we felt a mix of excitement, pride, and perhaps even a little bit of a chip on our shoulder. We had limited experience, to put it lightly, but we were confident in our abilities because we felt that all one really needed to design a game was hardcore gaming experience, passion, and a lot of enthusiasm. Eventually, these three aspects proved insufficient. We learned the lesson that having the experience and wisdom to know that we don't know something, or at the very least know that we're stuck in the design process and need help, is essential as well. We started caring less about designing the ultimate game that everyone would want pay and gladly shout "Shut up and take my money!" when we showed it to them, and instead began to really sit down and consider mechanics, balance, narrative, and if everything fit appropriately.

Building on ice? Dropped. A complex trading and resource management only an economics major could understand? Also dropped. We focused on and tested several simple concepts: strong, yet simple mechanics with a foundation in science (the play-space, negotiation, cooperation, and territory expansion). Each mechanic, starting off complex, but becoming further and further refined through play-testing and prototyping, came to represent reality, in a way as best as games can I suppose, but also connected with the original learning goals of the project. This occurred over a period of about half a year and it's safe to say that our current version is pretty much unrecognizable if you compare it to the original incarnation of the project.

Evolution of the Game Board

We first started with the map on the left (Figure 1) that details the combined interests of stakeholders in the region (red = high interest, orange = middle interest, yellow = low interest). From that we attempted to create a territory map that represents areas of differing interest to stakeholders and illustrates areas of contention. This version proved too expansive for simple game-play. We reduced the total number of territories in the third iteration making a more connected board that would allow for more player confrontation. We also incorporated ice-locked areas to represent the learning goal that melting ice has advantages for stakeholders.

Figure 1: Evolution of the Game Board

Victory Paths

The three victory paths in *Arctic Saga* (Figure 2). Titan of Industry and the Investment mechanic were remove as of the last iteration in order to simply the game-play experience by limiting the cognitive burden on new playrs. Whether a new victory path will replace it depends on if a new mechanic can be developed that ties into thescience

Figure 2: Victory Paths

The Earth

To represent the environment In *Arctic Saga* included two primary components: the EcoMeter and the Season dial (Figure 3). The EcoMeter allow players to receive immediate feedback to their actions and requires them to work cooperatively to ensure that the environmental does not reach critical levels of degradation (aka Eco Level 12). The season dial shows the passing of time literally (game turns) and metaphorically (real-world seasons). The season dial also reflects how seasonal conditions in the Arctic environment would affect investor interests. In the summer, players are allowed to explore previously ice-locked territories in the inner regions, demonstrating the advantages of melted ice. In the winter, all production ceases as the elements become too harsh to work in.

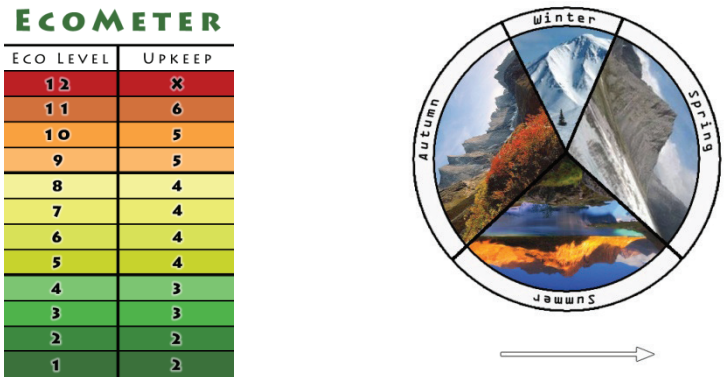

Figure 3: The EcoMeter and Season Dial

Bloom

What were some of your big challenges and how did you handle them?

Upon completing our first iteration, we presented Arctic Saga to our consortium members during a designated game night. Members of the consortium predominantly featured content experts whose experience with board game play was minimal on average. After three rotations of the game, we had learned that the general consensus was that the game was difficult to learn but made sense after continued and repeated play, a common trend among many board games. However, unlike common board games, very few individuals would likely revisit an educational game, such as Arctic Saga, except out of necessity.

On the other hand, we had also introduced the game to individuals who frequently play board games and learned that their biggest complaint was that the game was too simple. Used to games that required more of a competitive edge and in-depth strategy, experienced gamers were unsatisfied by limited complexity that was meant to scaffold the experience of those new game players. For some, if the educational Arctic aesthetic was removed from the game they mentioned that they would prefer play a game with the more nuanced mechanics found in traditional board games.

We are currently in the process of reiterating taking this feedback in mind, but one important lesson we learned is that the difficulty in instructional design lies strongly in user familiarity with the form of the task, in this case a game. Those unfamiliar with games were more concerned with learning how to play the game rather than exploring the embedded learning goals. On the other hand, many of those who were experienced gamers would not encounter those embedded learning goals simply because they would not want to continue to engage with a simple game.

Our biggest take-away from this experience was that simple need not be easy. We are still trying to cut down the number of total mechanics in this game to lower barriers to entry and to enhance learning objectives; however, that does not mean that we are seeking to make the game easier. We feel that the greatest games are those that can convey the most memorable experiences with the simplest mechanics. We seek to make Arctic Saga a game that can endogenously relate content through simple yet compelling mechanics in order to cater to all players.