Build an Ecosystem Game

In order to apply our knowledge of the relationship between organisms in an ecosystem, you and your group are going to design an ecosystem and test the effects of biotic and abiotic factors on the ecosystem.

First we will start out by doing a short simulation of the predator/prey relationship. Follow the instructions on the half sheet. As you perform the simulation, watch to see the change in both the predator and the prey populations over 10 generations.

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| Generation  | Predator | Prey |
| 1 |  |  |
| 2 |  |  |
| 3 |  |  |
| 4 |  |  |
| 5 |  |  |
| 6 |  |  |
| 7 |  |  |
| 8 |  |  |
| 9 |  |  |
| 10 |  |  |

Now that that simulation is over, think about how realistic this simulation is. If you could add constraints or instructions to the simulation, what would you add? *Would you add more levels of competition among organisms? What abiotic factors would you add to the ecosystem that would affect population numbers?*

**Designing your own simulation:**

For the rest of class today and ½ of class on Wednesday/Thursday you will be designing a new simulation that will measure the change in population over two generations in an ecosystem of your choosing.

**Your simulation must have the following:**

* A realistic ecosystem *(kangaroo’s and polar bears cannot exist in the same ecosystem)*
* A measurable population change for at least three organisms in the ecosystem
* At least 2 **abiotic** factors that interrupt the population change
* At least 2 **biotic** factors that do not belong to the populations you are measuring, but that might affect the success of the other species in your simulation
* 2-4 people must be able to participate in the simulation
* **Pieces must be labeled/ differentiated (the practice simulation had paper and note cards) BONUS POINTS if you make a full on board game out of this assignment.**

You will play your board games on May 4th, 2018 and make a graph of the population changes!

Good luck designers!

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| **Ecology Simulation Rubric** |
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| **SCORING DOMAIN** | **EMERGING** | **DEVELOPING** | **PROFICIENT** | **ADVANCED** |
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| **Academic Content Ecosystems** | Students did not follow the requirements of the game. No academic vocabulary words were used, only one trophic level was represented Students may have also chosen an unrealistic ecosystem. | Students either based the simulation off of an unrealistic ecosystem, or they did not represent two trophic levels, any outside factors. Students also did not use academic vocabulary words in their game. | Students based the simulation on a real ecosystem. Students used between 3-5 academic vocabulary words. Only two trophic levels were present and only one of two factors (biotic OR abiotic) were used to explore a realistic ecosystem | Students based their simulation on a real ecosystem; furthermore, the simulation infuses academic vocabulary and appropriate scenarios throughout its play. Students used multiple (3+) trophic levels, biotic and abiotic factors to explore an ecosystem that contains a dynamic population of organisms. |
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| **Academic Content Application of Mathematics** | There is no way to track a changing population while performing the simulation. | The simulation started off with accurate populations numbers, but students were unable to quantify exact numbers throughout. | The simulation only models one population of organism in the game, but the population can be graphed. | The simulation models accurate population changes for every organism throughout the game. Students are able to easily track the changing population and make a graph if necessary when playing it. |
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| **Habits of Mind Quality** | Design is sloppy, not colorful, or professional in quality. The game designed does not follow the requirements.  | Design is creative, but The rules of the are unclear, or there are elements of the simulation that are not included in the rules | Design is engaging, neat but is lacking professional quality. Some of the rules could be re-worded for clarity. | Design is vibrant engaging, neat, organized and professional in quality. The rules are clear, concise and easy to follow. This simulation could be played outside of the classroom. |
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