EVERGLADES POPULATION GAME

MATERIALS:

- Game Board
- Playing Pieces- unifix cubes
    - GREEN (40 pieces)
    - PINK (20 pieces)
    - BLUE (10 pieces)
    - YELLOW (10 pieces)
- 1 Die (number cube)

OBJECT OF THE GAME:

The object of the game is to keep your animal population from becoming extinct. The game is over when either (A) only one species remains or (B) after 6 rounds. If you use Option B, the species with the highest population increase after 6 rounds is the winner.

PLAYERS:

2- 3 players

- Player 1: Rabbit Population
- Player 2: Alligator Population
- Player 3: Recorder/Python Population
    - For the first game, Player 3 will be the recorder but in game 2 when the Python is introduced, Player 3 will take the additional role of the Python Population.

RULES:

Starting Pieces

- 5 Alligators (blue)
- 15 rabbit (pink)
- 34 Grass (green)
- 2 Burmese Python (yellow) **NOT USED IN THE FIRST GAME**

1. Each player rolls the dice to see who will be the first to place ALL their game pieces on the game board in any arrangement they choose. The player with the lowest roll places their pieces first and then the next lowest roll goes second. There may be only one game piece per square and no game pieces can be placed in the alligator hole or on a space occupied by a tree.

2. After all the game pieces have been placed on the board, place the grass (34 green cubes) on the board in the free spaces.
    - NOTE: When another game piece is introduced (python) the grass may be placed on tree spaces if necessary.

3. The player who rolled the highest roll takes the first turn.

4. On a player's turn they roll the dice and can move their game pieces the number of moves specified on the dice.
    - The player can move multiple game pieces in one turn but the total number of moves cannot exceed the amount they rolled. For example, if a player rolls a 5, they can move one game piece 2 spaces and another game piece 3 spaces.

- Game pieces may not move diagonally but can move forward, backward, left and right. If a game piece is moved during a turn and the final space it lands on at the end of the player's turn is occupied by another game piece, the following rules apply:

- **Rabbit Game Piece**:
  - When a rabbit game piece lands on a space with GRASS...it gets to "eat" the grass. Stick the rabbit game piece on top of the grass game piece. The grass now travels with the rabbit that has "eaten" it.
  - When a rabbit game piece lands on a space with an ALLIGATOR, it gets "eaten" by the alligator. Stick the alligator game piece on top of the rabbit game piece. The rabbit now travels with the alligator that has "eaten" it.

- **Alligator Game Piece**:
  - When an alligator game piece lands on a space with GRASS, it will move the grass to a free space.
  - When an alligator game piece lands on a space with a RABBIT, it gets to "eat" the rabbit. Stick the alligator game piece on top of the rabbit game piece. The rabbit now travels with the alligator that has "eaten" it.
  - When the alligator lands on a space with the python, a dice roll must determine who will win the battle (highest roll “eats” the other).

- **Python Game Piece**: **NOTE: PYTHON GAME PIECE IS NOT INTRODUCED UNTIL GAME 2**
  - When a python game piece lands on a space with GRASS, it will move the grass to a free space.
  - When an python game piece lands on a space with a RABBIT, it gets to "eat" the rabbit. Stick the python game piece on top of the rabbit game piece. The rabbit now travels with the python that has "eaten" it.
  - When the python lands on a space with the alligator, a dice roll must determine who will win the battle (highest roll “eats” the other).

- **NOTE**: A player can break up its moves so that one game piece may move more than one time in a turn. For example, if you roll a 6, one game piece may move 2 spaces, three times. Each of the three moves for that particular game piece will cause it to land on three different spaces. In this way, the game piece will be allowed an opportunity to "eat" multiple times in a turn.

5. After every round, be sure to record the ending population for the grass, rabbits, alligator, and python (when added).

6. After every 2 rounds, there is a Cycle of Life Round Up. During this time, the following actions occur:
   - (A) Every piece you have on the board that does not have at least one food item will die (and must be removed from the board).
     - Each rabbit must have 1 grass pieces to survive
     - Each alligator must have 1 rabbit (or python) to survive
     - Each python must have 1 rabbit (or alligator) to survive
   - (B) Every piece remaining with a food source may reproduce (see below).
     - To calculate the number of offspring reproduced per species, see formula below:
     - RABBIT: Number of Surviving Species x 2 = # of offspring
     - ALLIGATOR: Number of Surviving Species x 0.5 = # of offspring
     - PYTHON: Number of Surviving Species x 1 = # of offspring

   NOTE: When calculating the number of offspring reproduced, round up to the nearest whole number.

7. At the end of the Cycle of Life Round Up:

- All “eaten” and "dead" pieces are returned to the species bags.
- Additional offspring are added to the board. A dice roll determines who will add their offspring to the board first (lowest roll goes first). Offspring may be added to the free spaces on the board.
- 5 Grass pieces are added to the remaining free spaces on the board (if possible).

GAME OVER:

- If you are short on time, you can play just 6 rounds and the winner will be determined by the species with the greatest increase in population.
  - Continue the game for 6 rounds with one Cycle of Life Round per two rounds (3 total). Be sure to record the population for each round as you go. The species with the highest percentage increase in population at the end of 6 rounds win.
  - TO CALCULATE:
    [(Ending Population – Starting Population) ÷ Starting Population] x 100 = Percent Increase
- If you would like to play the game for longer, you can play until only one species remains and this will be the winner.
  - If the rabbit species is decimated (none remaining) and only the python an alligator remain, the winner will be determined by the species with the greatest percent population increase.

GAME 2:

For the second game, the python player is introduced. After two games have been played compare the populations of the species before the python was introduced and after. A line graph might help you visualize the data. What do you think would happen if you played more games and did not reset the starting populations?

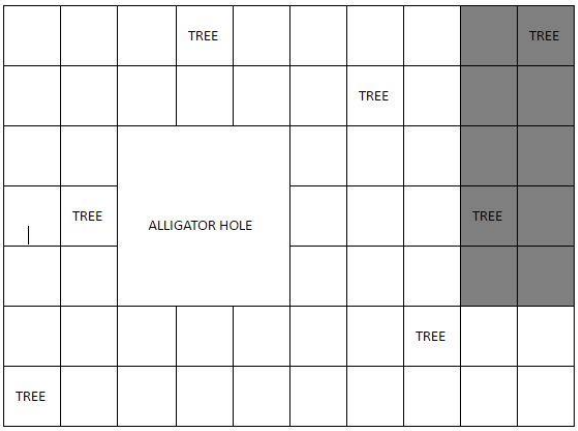
MODIFYING THE GAME:

After you have played two games look at the data and see if the populations seem to simulate what is actually happening in the Everglades.

- Do you think the game accurately represents the interactions of the plants and animals in the ecosystem?
- Do you think the game accurately predicts the populations of the plants and animals in the ecosystem?

If not, how could you modify the game to make it more accurate?

- Consider adjusting the starting populations, reproduction factors, and rules. In this way you can "debug" the game to make the simulation model more accurate.
- Consider adding "Action Cards" that introduce additional circumstances and variables into the simulation. See examples below.
- Perhaps action cards could be drawn when a player lands on a space with a tree on it. You could also consider marking spaces on the board as "Draw an Action Card".
  - A Python round up is held and one python is killed. Remove one python piece.
  - A person releases a Burmese Python it got as a pet into the Everglades when the snake becomes too big. Add one python game piece.
  - There is a drought and 2 grass pieces “die” and are removed from the board.
  - Human Impact: Some of Everglades is drained and 9 squares are taken. Everything in those 9 squares dies.



PLAYING PIECES:

Alligator

STARTING POPULATION: 5

EAT

- When the Alligator comes into contact with the rabbit, it eats the rabbit (take the rabbit piece).
- When the Alligator comes into contact with the python, a dice roll must determine who will win the battle (highest roll "eats" the other).

DIE

- If the Alligator goes without eating at least one rabbit per 2 rounds, it automatically dies.

REPRODUCE

- Every two rounds, the alligator reproduces. The number of offspring is determined by the current surviving alligator population (on the board) x a reproduction factor (number of times the alligator reproduces in a year).
- Reproduction Factor: 0.5

Rabbit

STARTING POPULATION: 15

EAT

- When the rabbit comes in contact with grass, it eats the grass.

DIE

- If the rabbit goes without eating at least one grass pieces per 2 rounds, it automatically dies.

REPRODUCE

- Every two rounds, the rabbit reproduces. The number of offspring is determined by the current surviving rabbit population (on the board) x a reproduction factor (number of times the rabbit reproduces in a year).
- Reproduction Factor: 2

Burmese Python

STARTING POPULATION: 2

EAT

- When the Burmese Python comes into contact with the rabbit, it eats the rabbit (take the rabbit piece).
- When the Burmese Python comes into contact with the alligator, a dice roll must determine who will win the battle (highest roll "eats" the other).

DIE

- If the Burmese Python goes without eating at least one rabbit per 2 rounds, it automatically dies.

REPRODUCE

- Every two rounds, the Burmese python reproduces. The number of offspring is determined by the current surviving python population (on the board) x a reproduction factor (number of times the python reproduces in a year).
- Reproduction Factor: 1