

Lesson 2 : Population Dynamics Activity

Set Up & Rules:

Start the game with the approximate ratios:

2 Tiger Sharks (start on one end line of grid)

20 Sea Grasses (fixed positions throughout grid)

8 Sea Turtles (start on other end line of grid)

Allow each round to last for 1:00 (adjust as needed)

If a Tiger Shark 'eats' (tags) 1 sea turtle, they survive. If a Tiger Shark 'eats' 2 sea turtles, each additional will become a Tiger Shark in the next generation.

If a Sea Turtle 'eats' (tags) 2 sea grasses, they survive. If a Sea Turtle 'eats' 3 sea grasses, each additional will become a Sea Turtle in the next generation.

If Sea Grass tags a Tiger Shark, the Tiger Shark must walk for the rest of that round.

Dead Tiger Sharks, eaten Sea Grasses & Sea Turtles will become Decomposers for the next generation.

Decomposers become Sea Grasses following their 1 generation as a Decomposer.

At Generation 10, introduce a scenario (ex. Overfishing decimates the Tiger Shark population, leaving 1 left, etc.)

Record data between each round to be used for later analysis.

Data Table:

Graph:

Create a line graph that displays the changes of population over 16 generations. Be sure to include Tiger Sharks, Green Sea Turtles, and Sea Grass in your graph. Predict a realistic carrying capacity for the Green Sea Turtle and draw a dotted line in your graph to represent this.

Post-Activity Assessment ?'s

1. Draw & Label a correct food chain as it relates to this simulation:

2. Describe your graph. How did predator & prey population change over time?

3. According to your results, how does prey population affect predator population?

4. Assume a disease completely wipes out the Tiger Shark population from this ecosystem. What would happen to the Green Sea Turtle population first?

5. From #4, what might happen to the Green Sea Turtle population later on?

6. Although Tiger Sharks do not directly prey on Sea Grass, how do they affect the population of Sea Grasses?

7. Identify 1 limitation of this simulation as it relates to a real ecosystem. (What is something that may affect these populations in the real world that the simulation overlooks?)

$$\text{Population Growth Rate} = \frac{N}{T} \text{ (change in population size } \div \text{ change in time)}$$

8. What was the Green Sea Turtle population growth rate from generation 4 to generation 10?