**Predator-Prey Interactions Answer KEY**

**Materials**:

100 small “prey” cards that represent mice

25 large “predator” cards that represent foxes

**Note:** Your lab table or desk represents the ecosystem. Please clear all objects.

**Procedure:**

1. Spread 3 small mouse cards out on the table.

2. Toss 1 large fox card onto the table, trying to make the fox card “capture” (land on) as many mouse cards as possible.

\*\*\***Note**: In order to survive, the fox must capture at least 3 mice. It will be impossible for your predator to survive at this point.

3. Remove any mouse cards captured. Record your data for the Generation 1 in the Predator-Prey Data Table.

4. The mouse population doubles each generation. Count how many mice you have left on your table. Add double that number of mouse cards to the table (For example, if you have 2 mouse cards, add 4 more).

5. Record the number in the data table under the 2nd generation “Number of Mice.” (This should be twice the number you have under the “Number of Mice Remaining” for Generation 1.)

6. Your fox died during the first round, but another fox moves into the ecosystem for the second round. Since your fox died, write 0 in the “Number of Foxes Remaining” for Generation 1 and write 1 in the “Number of Foxes” for Generation 2 to represent the new fox.

7. Repeat the tossing procedure and record your data for Generation 2.

8. Again, the number or mice doubles, and if your fox doesn’t capture 3 mice, it dies. But a new fox moves in again for the next generation. Keep repeating the tossing procedure, adding double the number of mice remaining for each generation.

9. As the number of mice increases, the fox will be able to capture enough prey to survive. When the fox survives, then the number of foxes doubles and you add to your fox population by adding fox cards. You will toss as many fox cards as you have. Remember to remove any captured mice from the ecosystem.

10. Keep repeating the tossing procedure until you have recorded data for 15 generations.

11. Based on your data for the first 15 generations, predict the data for Generations 16–20. Write your predictions in the shaded area of the data table.

12. Graph your data in a two-line graph, with the lines representing the number of foxes and mice. Place the generation on the x-axis and the number of organisms on the y-axis. *Students’ graphs will vary based on their data. Check the graph is constructed properly and match the data in the student’s data table.*

**Predator-Prey Data Table** *Student data will vary. Check the predictions in the rows for Generations 16–20 to see if they are consistent with the data for Generations 1–15.*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Generation** | **Number of Foxes** | **Number of Mice** | **Number of Foxes Remaining** | **Number of Mice Remaining** |
| 1 |  |  |  |  |
| 2 |  |  |  |  |
| 3 |  |  |  |  |
| 4 |  |  |  |  |
| 5 |  |  |  |  |
| 6 |  |  |  |  |
| 7 |  |  |  |  |
| 8 |  |  |  |  |
| 9 |  |  |  |  |
| 10 |  |  |  |  |
| 11 |  |  |  |  |
| 12 |  |  |  |  |
| 13 |  |  |  |  |
| 14 |  |  |  |  |
| 15 |  |  |  |  |
| 16 |  |  |  |  |
| 17 |  |  |  |  |
| 18 |  |  |  |  |
| 19 |  |  |  |  |
| 20 |  |  |  |  |

**Analysis Questions**

1. As the number of foxes increases, what happens to the number of mice?

*As the number of foxes increases, the number of mice decreases.*

2. What do you think would happen to the fox population if most of the mice died from disease?

 *If most of the mice died, the foxes would either die or eat a different prey.*

3. What do you think would happen to the mouse population if the number of fox predators, such as wolves, increased?

*If the number of fox predators increases, then there would be less foxes, and the number of mice would increase.*

4. If you removed the foxes from this community, what would your graph look like?

*The number of mice would increase, and then level off when the mouse population reaches a point when there are not enough resources in the environment to support more of them.*

**Conclusion**

Use complete sentences summarize the relationship between the population size of foxes and mice. Use the words “if” and “then” to explain the cause-and-effect relationship.

*If the number of foxes increases, then the number of mice decreases and vice-versa. The size of each population depends on the size of the other population.*