**WHO GIVES A HOOT?:** NAME\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

A Simulated Study of Bioaccumulation

Data Table I - Family Data

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | ADULTS |  | FLEDGLINGS | | |  | |  |  |  | |  | |  |  | |
|  | Male | Female | 1 | 2 | 3 | | 4 | | 5 | | 6 | | 7 | | TOTAL |
| Red | **3** | **4** | **8** | **6** | **X** | | **X** | | **X** | | **X** | | **X** | |  |
| Orange | **2** | **4** | **5** | **11** | **X** | | **X** | | **X** | | **X** | | **X** | |  |
| Yellow | **3** | **2** | **3** | **5** | **X** | | **X** | | **X** | | **X** | | **X** | |  |
| Green | **5** | **6** | **7** | **7** | **X** | | **X** | | **X** | | **X** | | **X** | |  |
| Blue | **2** | **5** | **10** | **8** | **X** | | **X** | | **X** | | **X** | | **X** | |  |
| Brown | **3** | **4** | **2** | **4** | **X** | | **X** | | **X** | | **X** | | **X** | |  |
| TOTAL |  |  |  |  | X | | X | | X | | X | | X | |  |

Table 2 - Class Data - RODENTS EATEN

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Family |  | Rodent Species Eaten | | |  | |  |  | |  |  |
| Number | Red | Orange | Yellow | Green | | Blue | | | Brown | | TOTAL |
| 1 |  |  |  |  | |  | | |  | |  |
| 2 | **8** | **16** | **8** | **21** | | **19** | | | **11** | |  |
| 3 | **12** | **16** | **18** | **21** | | **13** | | | **16** | |  |
| 4 | **5** | **4** | **7** | **7** | | **7** | | | **5** | |  |
| 5 | **X** | **X** | **X** | **X** | | **X** | | | **X** | |  |
| TOTALS |  |  |  |  | |  | | |  | |  |

Table 3 - Class Data - MORTALITY and SURVIVORS

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  | number of deaths - only count one | | | | | |  |  |  | |  |  | | |
| Family | # | # | **Starvation**  **(at least 8 M&Ms)** | |  | **Pesticide**  **(4 or more green M&Ms)** | |  | survivors | | | | | |  |
| Number | adults | fledglings | adult | fledglings | | adults | fledglings | | adults | | | fledglings | | | |
| 1 | **2** | **3** | **0** | **0** | | **2** | **2** | | **0** | | | **1** | | | |
| 2 | **2** | **7** | **0** | **5** | | **1** | **2** | | **1** | | | **0** | | | |
| 3  Broken talon | **2** | **4** | **0** | **0** | | **2** | **3** | | **0** | | | **1** | | | |
| 4 | **1** | **4** | **0** | **4** | | **1** | **X** | | **0** | | | **0** | | | |
| ~~5~~ | **X** | **X** | **X** | **X** | | **X** | **X** | | **X** | | | **X** | | | |
| TOTALS |  |  |  |  | |  |  | |  | | |  | | | |

Discussion Questions: (use class data to answer questions)

1. How many rodents were eaten by the owls? \_\_\_\_\_\_\_\_\_\_\_
2. How many rodents survived predation? \_\_\_\_\_\_\_\_\_\_\_
3. How large was the initial owl population? \_\_\_\_\_\_\_\_\_\_\_
4. How many owls were killed by starvation? \_\_\_\_\_\_\_\_\_\_\_
5. How many owls were killed by the pesticide? \_\_\_\_\_\_\_\_\_\_\_
6. How many owls survived? \_\_\_\_\_\_\_\_\_\_\_
7. Which owls were more likely to be poisoned by pesticides - those who ate a lot or those who ate just enough to survive?
8. Did the number of adults in the family influence the number of fledglings that survived? Explain your answer.
9. Did the owl with the broken talon provide for its family as well as the owls without broken talons? Explain your answer.
10. Did the number of fledglings in each family influence the survival rate in the family? Explain your answer.
11. If we had played this game with only 100 rodents, how would you expect the outcome to be different?
12. In a naturally occurring ecosystem, the number of rodents and owls in a given area stays relatively the same from generation to generation. Explain why this happens.
13. How do humans and their activities influence the population of owls?
14. A beetle enters the forest where the owls are nesting. The beetle carries a fungus which destroys the trees where the owls build their nests. Predict how this event many influence populations of owls and the rodents in this area.