Population of Locker Creatures at AMES

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Abstract: Starting with a matched trio of locker creatures, one of each sex, their population vs. messiness curve was investigated. The experiment was conducted in both clean and messy locker environments. It was found that locker creature populations increase more rapidly in messy lockers.

1. INTRODUCTION:

This investigation was carried out to determine the locker creature population growth rates in AMES High School. This problem is of great interest to the janitorial staff, as they must deal with the late night emergence of the creatures from their nesting sites in the lockers. Students will also be interested in the growth rates of these creatures in clean vs messy lockers since they may have scary encounters with these creatures between classes. Because of this, it is important to find the growth rate vs time in both clean and messy lockers.

1. THEORY:

Because no studies of these creatures have ever been made, there are no known theories about their growth rates. The ability to use ultra-high frequency radio waves to detect locker creatures is a recent development. Hopefully this lab will help to establish a known relationship between growth rate and messiness.

1. EXPERIMENTAL DETAILS:

Locker creatures emit a call in the frequency range of 10 to 20 gigahertz. They emit these calls when exposed to light. Students will proceed down the hall randomly opening lockers and listen for the cries of the locker creatures using an ultra-high frequency listening device. Students will count the number of cries heard in 10 seconds and then will give the locker a relative neatness rating from 0 to 10, with 0 being neat and 10 being messy. A total of 20 lockers will be sampled. Data will be averaged and a graph of population vs neatness will be made. A mathematical relationship will then be derived.

1. RESULTS:
* In order to randomly sample lockers we drew locker numbers from a hat.
* Two lockers were locked and we had to draw again.

|  |  |  |
| --- | --- | --- |
| **Locker #** | **Locker Neatness Rating** | **Number of Cries in 10 seconds** |
| 1 | 0 | 0 |
| 2 | 2 | 3 |
| 3 | 5 | 8 |
| 4 | 2 | 4 |
| 5 | 4 | 7 |
| 6 | 7 | 12 |
| 7 | 3 | 3 |
| 8 | 8 | 13 |
| 9 | 10 | 20 |
| 10 | 10 | 19 |
| 11 | 5 | ~~23~~ Dave mistook a squeaky door for the cries of the locker creatures |
| 12 | 3 | 3 |
| 13 | 8 | 12 |
| 14 | 2 | 1 |
| 15 | 1 | 2 |
| 16 | 4 | 5 |
| 17 | 7 | 10 |
| 18 | 6 | 8 |
| 19 | 3 | 4 |
| 20 | 5 | 7 |

**Calculation table: Average Cries and Neatness Rating**

|  |  |
| --- | --- |
| **Rating**  | **Average Number of Cries** |
| 0 | 0 |
| 1 | 2 |
| 2 | 2.7 |
| 3 | 3.3 |
| 4 | 6 |
| 5 | 7.5 |
| 6 | 8 |
| 7 | 11 |
| 8 | 12.5 |
| 9 | none reported |
| 10 | 19.5 |

Slope of Line:

$$m=\frac{15-10}{9-6}$$

$=1.67$ cries/Neatness Rating

1. DISCUSSION:

Lockers were chosen at random using a hat with the numbers of all lockers in it. We found 2 of the lockers to be locked, and had to draw another number. Once the numbers of cries heard in 10 seconds, as recorded on a stopwatch, was counted then all the members of the lab team cam to an agreement on the neatness rating of the locker. Lockers with the same rating were matched up and the number of cries was averaged. A graph of Cries vs Neatness Rating was then drawn. The relationship was found to be nearly linear and a line of best fit was drawn on the graph. The slope of the graph was found by extracting two random points on the line and plugging them into the following slope equation below:

$$m=\frac{C\_{2}-C\_{1}}{R\_{2}-R\_{1}}$$

where $C\_{2}$ and $C\_{1}$ are the y-coordinates representing cries and $R\_{2}$ and $R\_{1}$ are the x-coordinates representing neatness rating.

The slope was found to be 1.75 cries per neatness rating. This means that for each increasing degree of messiness there is a 1.75 times increase in the number of locker creatures that can be expected.

Locker messiness degrees in this lab are based on our perceptions and not on any definite measuring tool. Therefore, locker neatness is not a measurable variable. It is not knowne what effect the locked lockers would have had on the results. Perhaps people with lock are neater than those without. Locker number 11 could have also effected the data since the true number of cries is not known. We are also assuming that the number of cries is directly related to the number of creatures. This is now known, however, to be certain.

1. CONCLUSION:

For this experiment we find that locker creature populations are directly related to locker messiness. We predict a 1.67 times increase in creatures for each degree of locker messiness. Suggestions for further study include the formation of a measureable locker neatness scale as well as a relationship between the number of cries and the actual number of creatures present.

1. REFERENCES:
2. Do You Really Know What is Behind That Door, Janitor Magazine, June 1989
3. Jones, Billy Bob. Billy-Bob’s Guide to Hearing Really High-Pitched Sounds, Way Down South Publishing. 1995