Investigating the Eating Habits of the Mantid

Student Handout

A mantid is an insect that we commonly refer to as a praying mantis. Mantids rarely move. They are much like the insect version of a sloth. Because they are easy to keep track of, mantids are often used in biological studies. Researchers have been studying the relationship between the distance a mantid will move to seek food and the amount of food already in the mantid’s stomach. The distance is measured in millimeters, and the amount of food is measured in centigrams. In research, food was placed progressively nearer to a mantid. The distance at which the mantid began to move toward the food was labeled the maximal distance of reaction (R). The amount of food in the mantid’s stomach was measure. This amount was called the degree of satiation (S). Measurements for 15 mantids are given.

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| Satiation, S (cg) | 11 | 18 | 23 | 31 | 35 | 40 | 46 | 53 | 59 | 66 | 70 | 72 | 75 | 86 | 90 |
| Reaction Distance, R (mm) | 65 | 52 | 44 | 42 | 34 | 23 | 23 | 8 | 4 | 0 | 0 | 0 | 0 | 0 | 0 |

1. Using your graphing calculator, make a scatter plot of the data. Make a sketch of this scatter plot in your notes. What type of function do you think would best fit the data?
2. Is this a good model? How do you know?
3. What information does the slope of our model gives us in the context of our problem? Your answer should be in the form of a sentence and should use units and numerical information.
4. According to our model, what is the greatest distance that a mantid will move for food? Algebraically justify your work.
5. Biologists call the level of satiation at which an animal will not seek food the *hunger threshold*. What is the hunger threshold for the mantid? Algebraically justify your work.