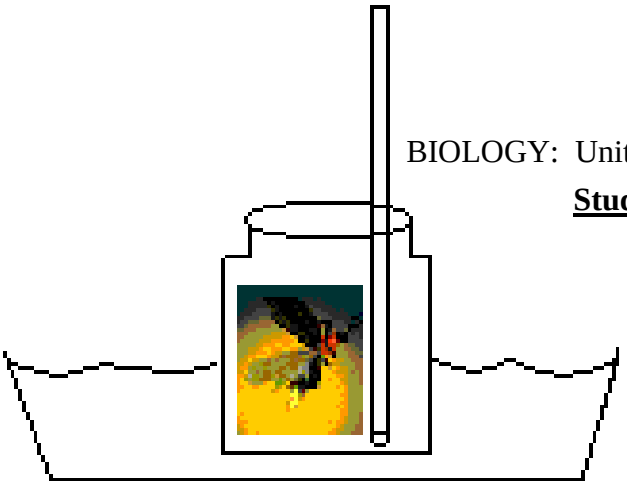


NAME _____

BIOLOGY: Unit 1 (The Methods of Science)

**Study Guide #2**

# Don't Blink

…or You Might Miss This En"LIGHT"ening Fun

While catching fireflies with my children this summer at dusk, we noticed that they seem to blink more quickly when the temperature is warmer, therefore making them easier to catch. This might make sense because all chemical reactions happen faster at higher temperatures, even the reactions inside living organisms. To see if there really is a relationship between air temperature and the number of times male fireflies blink to attract that "special" female watching below in the grass, my children conducted the following experiment. First we captured two male fireflies from the back yard and placed each in a glass jar with holes in the lid for ventilation. Then each jar was placed in a plastic tray or tub. The air temperature inside the jar was measured with a thermometer inserted into the jar and could be adjusted by filling the tray with water of various temperatures. Data collection involved recording the number of blinks per minute three times for each jar at various temperatures. The data is summarized in the table below.

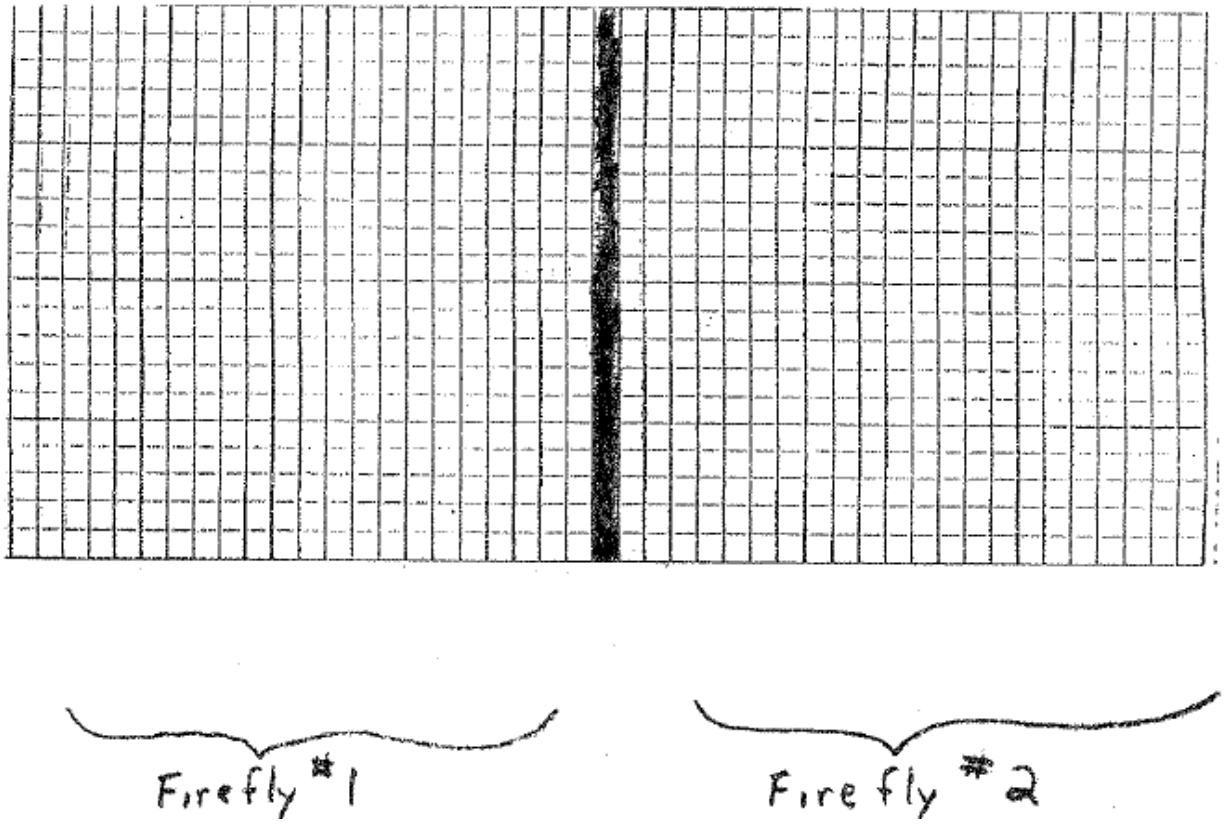
| | Blinks / Minute | | | | | |
|---|---|---|---|---|---|---|
| Temperature (F) | Firefly #1: "BLINKIE" | | | Firefly #2: "BUSTER" | | |
| 50 | 0 | 0 | 0 | 0 | 0 | 0 |
| 55 | 1 | 2 | 1 | 0 | 0 | 0 |
| 60 | 3 | 3 | 4 | 1 | 0 | 1 |
| 65 | 7 | 9 | 6 | 2 | 3 | 3 |
| 70 | 15 | 14 | 16 | 6 | 9 | 10 |
| 75 | 23 | 21 | 23 | 17 | 14 | 16 |
| 80 | 28 | 28 | 29 | 21 | 22 | 21 |
| 85 | 28 | 27 | 28 | 22 | 20 | 20 |
| 90 | 27 | 29 | 29 | 21 | 22 | 20 |
| 95 | 26 | 25 | 26 | 19 | 18 | 17 |
| 100 | 11 | 12 | 9 | 7 | 10 | 8 |

1. What is the sum of all chemical reactions in an organism called?
2. What is the Dependent variable in this experiment ?
3. What is the Independent variable in this experiment ?
4. Discuss 3 other variables that may affect the data other than the temperature?

5. How many experimental groups were used in this experiment ?

6. Explain what the control group is OR describe how you would create a more controlled experiment ?

7. Design a graph that best represents the data for each firefly. Remember to follow the 5 graphing rules !!




8. Why did the number of blinks per minute vary sometimes at each given temperature?

9. Discuss how the results or data patterns were similar between the 2 fireflies

10. Discuss how the results or data patterns were different between the 2 fireflies?

11. Predict how many times "Blinkie"(firefly #1) will blink in a minute if the temperature is 105 degrees F ?