**Predict the Relationship**

Bianca loves Christmas lights. She loves them so much, that she convinced her family to leave them up all year round. However, she has noticed that the lights don’t shine as bright during the summer evenings as they do during the winter nights.

Bianca also loves dynamic electricity. She loves it so much, that she decided to conduct a little experiment to see if there is any relationship between the brightness of her precious Christmas lights and the temperature outside. She decided to record several measurements of voltage and current in her Christmas lights circuit on three different days: on a hot summer’s eve, during a cool autumn dusk, and on a cold winter’s night. Her results are organized in the tables below.

Task 1:

Using Google Sheets, graph the three sets of data. What information can be determined from each graph?

Task 2:

Using Google Sheets and the information determined in the previous task, establish if there is a correlation between the brightness of Bianca’s Christmas lights and the temperature outside. Is there anything that you have learned in statistics (in math class) that might help you complete this task?

Task 3:

Does your answer to the previous question surprise you? Or is it as you expected based on what you have learned this year about electricity (in science class)? Explain.

|  |  |
| --- | --- |
| **Table 1**  Current & Voltage measured during a hot summer's eve (31°C) | |
|
|
| **Current  (A)** | **Voltage  (V)** |
| 0.0000 | 0.00 |
| 0.0073 | 1.00 |
| 0.0139 | 1.30 |
| 0.0325 | 1.95 |
| 0.0454 | 2.32 |
| 0.0577 | 3.33 |

|  |  |
| --- | --- |
| **Table 2**  Current & Voltage measured during a cool autumn's dusk (2°C) | |
|
|
| **Current  (A)** | **Voltage  (V)** |
| 0.00 | 0.00 |
| 0.14 | 1.36 |
| 0.27 | 2.83 |
| 0.39 | 3.57 |
| 0.52 | 5.44 |
| 0.74 | 6.73 |
| 0.99 | 8.72 |

|  |  |
| --- | --- |
| **Table 3**  Current & Voltage measured on a cold winter’s night (-28°C) | |
|
|
| **Current  (A)** | **Voltage  (V)** |
| 0.00 | 0 |
| 6.43 | 10 |
| 9.99 | 20 |
| 14.48 | 30 |
| 18.79 | 40 |
| 21.81 | 50 |