Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_   Period: \_\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Data Discussion for Patterns in Solar Cells

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| **Research Question:**How does the angle between the ground and a given solar cell affect the it power produces? |
| Date: 3/20/2018 (Spring Equinox)Location: Galapagos Islands (Latitude 0o)Solar panel: size = 1 m x 1 m, Efficiency: 20% | Date: 3/20/2018 (Spring Equinox)Location: Oregon (Latitude 45o N)Solar panel: size = 1 m x 1 m, Efficiency: 30% |
| Equation: $Power = 100 cos (θ-0) + 100$ | Equation: $Power = 150 cos (θ-45) + 150$ |
|   |   |
| Date: 3/20/2018 (Spring Equinox)Location: Alaska (Latitude 85o)Solar panel: size = 1 m x 1 m, Efficiency: 20% | Date: Location: Solar panel:  |
| Equation: $Power =100 cos (θ-85)+110$ | Equation:  |
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| Similarities |
| Differences |

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| Prediction Question 1: For the Galapagos solar panel display, what would the power be if you turned it upside down on the roof, that is 180o degrees? Why does this make sense? | Prediction Question 2: For the Alaska solar panel, if instead of tilting it towards the sun you tilted it backwards away from the -95o degrees what would the power be? How could it still be generating a little power? |
| Prediction 1: | Prediction 2: |
| At their respective optimum angles, why is Oregon’s solar panel producing more power than the Galapagos or Alaska solar panel? |

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| In words with some annotated pictures, describe what the values mean the following contexts: |
|  | In the real world, it means | In the graph, it shows up as | In the mathematical model, it is |
| A |   |   |   |
| B |  |  |  |
| C |  |  |  |
| Write out the equation using all words (concepts): |

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| Engineering Design Question: How could you modify a solar panel to increase the effective A, B, and C values? |
| For A: | For B: | For C: |