Challenge #1

For this challenge, you will get three temperature graphs of places within 100 miles of Los Angeles, CA, and Owatonna, MN, with average high temperatures in July and January each year (in degrees F).

1. Using a computer, go to [www.googlemaps.com](http://www.googlemaps.com). Click “sign in”, use the email: [earthsciclass3@gmail.com](mailto:earthsciclass3@gmail.com) and password: huskies1.
2. Click the upper left button, select “your places”, then “maps”. There you will find the team challenges map with each location you need saved.
3. Each location name will appear when you hover your mouse over it.
4. Compare the location of each of the 4 cities to their temperature graphs and record your observations. What geological features do you notice are nearby? Write your observations in your notebook.

Analysis: Write 3 statements you can make of the temperature patterns in the four cities. Use data from the graphs to explain your reasoning.

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Location: Santa Monica, CA

Average January Temperature: 64

Average July Temperature: 71

Location: Big Bear Lake, CA

Average January Temperature: 47

Average July Temperature: 81

Location: Pomona, CA

Average January Temperature: 68

Average July Temperature: 90

Location: Owatonna, MN

Average January Temperature: 22

Average July Temperature: 82

Challenge #3

The city of Belem, Brazil, is located at latitude 1°S, which is almost at the equator. Below are the average monthly temperatures in Belem, Brazil, during one year.

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sept | Oct | Nov | Dec |
| 78°F | 78°F | 78°F | 78°F | 79°F | 79°F | 78°F | 79°F | 79°F | 79°F | 79°F | 79°F |

Owatonna, MN is located at latitude 44°N. Below are the average monthly temperatures for one year.

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sept | Oct | Nov | Dec |
| 22°F | 28°F | 40°F | 57°F | 68°F | 79°F | 82°F | 80°F | 72°F | 59°F | 41°F | 26°F |

Alert, Nanavut in Canada is located at latitude 82°N. Below are the average monthly temperatures for one year.

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sept | Oct | Nov | Dec |
| -25°F | -28°F | -28°F | -13°F | 11°F | 30°F | 38°F | 34°F | 15°F | -3°F | -17°F | -21°F |

1. Create a line graph using the data from each of the three cities. Use a different color for each line.
2. Discuss how you would explain the reason behind the different temperature patterns of each city. Write 3 statements using the data and what your group discussed.

Challenge #3

The city of Belem, Brazil, is located at latitude 1°S, which is almost at the equator. Below are the average monthly temperatures in Belem, Brazil, during one year.

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sept | Oct | Nov | Dec |
| 78°F | 78°F | 78°F | 78°F | 79°F | 79°F | 78°F | 79°F | 79°F | 79°F | 79°F | 79°F |

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|  |  |  |  |  |  |  |  |  |  |  |  |
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Challenge #2

The city of Santa Rosa, Argentina, is located at latitude 37°S.

The city of Richmond, Virginia, USA, is located at latitude 37°N.

The city of Owatonna, Minnesota, USA, is located at latitude 44°N

Below are the average monthly temperatures in those two cities during one year.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | January | March | May | July | September | November |
| Santa Rosa 37°S latitude | 74°F | 67°F | 52°F | 45°F | 54°F | 67°F |
| Richmond  37°N latitude | 38°F | 48°F | 66°F | 78°F | 70°F | 49°F |
| Owatonna  44°N | 22°F | 40°F | 68°F | 82°F | 72°F | 41°F |

1. Find each location on Google Maps
2. Answer the following questions in your notebook (think about the 4 locations in Earth’s orbit).

- Why is it warm in Santa Rosa, Argentina, when it is cold in Richmond, Virginia?

- Why is it cold in Santa Rose, Argentina, when it is warm in Richmond, Virginia?

- How do these two cities compare to Owatonna, MN?

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| Owatonna  44°N | 22°F | 40°F | 68°F | 82°F | 72°F | 41°F |

1. Find each location on Google Maps, click “save” to keep each city marked.
2. Answer the following questions in your notebook (think about the 4 locations in Earth’s orbit).

- Why is it warm in Santa Rosa, Argentina, when it is cold in Richmond, Virginia?

- Why is it cold in Santa Rose, Argentina, when it is warm in Richmond, Virginia?

- How do these two cities compare to Owatonna, MN?

Challenge #4

Four friends were sharing their ideas about why it is warmer in the summer than in the winter. This is what they said:

Ava: “It’s because the Sun gives off more heat in the summer than in the winter.”

Raul: “It’s because Earth’s tilt changes the angle of sunlight hitting Earth.”

John: “It’s because Earth orbits closer to the Sun in the summer than in the winter.”

Shakira: “It’s because one side of Earth faces the Sun and the other side faces away.”

Answer the following in your notebook:

* Which friend do you most agree with? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* What evidence would you use to support your friend and how would you explain your reasoning?

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Answer the following in your notebook:

* Which friend do you most agree with? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* What evidence would you use to support your friend and how would you explain your reasoning?