



## Answer Key and Scoring Rubric

### Student Post-Test (Middle School)

### Score 0 - 12 points

#### Introduction

Pretend that you are a travel agent and have been asked to arrange a trip for your class during the month of June. The students have selected two cities (Townville and Gotham City) and have asked you to make the final choice. Your teacher has only one requirement: You must select the warmest city.

Unfortunately, you do not know what the temperature for either of these cities will be. Your teacher has informed you that there is a way to determine the temperature by comparing its location with other cities around the world. Therefore, your first job is to determine the trend. You then contacted some of your friends around the world and asked them to record their temperature over the same week and average it. Each of your friends from the following schools sent this information:

School	City	State	Country	Latitude	Longitude	Temperature (°C)
Kameyosek	Edmonton	Alberta	Canada	54	-114	8
Woodbridge	Bridgeville	DE	USA	39	-75	22
Abraham Lincoln	Miami	FL	USA	25	-80	
Georgetown	Georgetown	Prashad	Guyana	7	-58	32
Marshall Rd.	Brisbane	Queensland	Australia	-27	153	25
San Martín	Buenos Aires		Argentina	-34	-58	15
Rosetta	Hobart	Tasmania	Australia	-43	142	12

Students from the Abraham Lincoln School forgot to average their daily temperature and instead sent you the temperature for each of the five days. This means that you will have to average it and insert it into the table above before you can move to the next step.

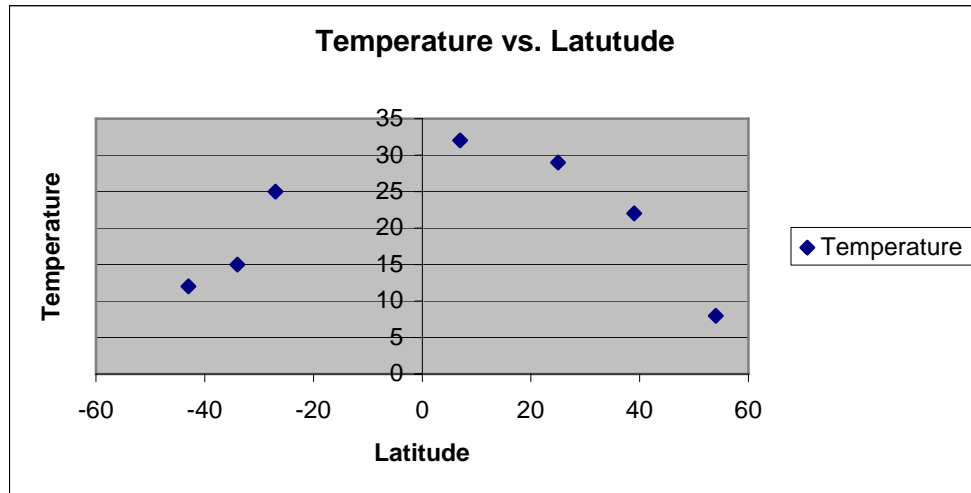
	Monday	Tuesday	Wednesday	Thursday	Friday
Temperature (°Celsius)	28	26	29	31	28

1. What was the Average Temperature for the week? 29 °C (2 points)

## Graph the Results

The next step is to plot the different schools using Latitude and the Temperature in degrees Celsius. Use the graph below to plot all seven schools. One example, the Kameyosek School from Canada, has already been completed for you.

GRAPH 1



2. What trend have you noticed? **The closer to the equator the warmer the temperatures. In general, in May the locations in the northern latitudes have higher temperatures when compared to locations in the southern hemisphere that are the same distance from the equator.**
3. Why do you think this is so? **Locations at the equator receive the most direct sunlight. In June, the earth is tilted so that the regions in the northern hemisphere receive more direct sunlight than regions in the southern hemisphere.**

### Scoring for Graph and questions 2 and 3

**Full Credit (5 points)** Graph is entirely complete and accurate and student has correctly identified the trend and the reason for it.

#### **Partial Credit (3 points)**

Graph is entirely complete and accurate, but student does not show clear understanding of the relationship between temperature and latitude.

#### **Partial Credit (1 point)**

Graph partially completed or completed, but conclusions are erroneous. Student attempts to explain trend, but response is not logical

## Making the Choice

---

Now that you've determined the trend, you are prepared to decide which of the two choices selected by your class is the warmest. The two cities that were selected are:

City: Townville                      City: Gotham City  
Latitude: 47° North                      Latitude: 12° South

4. Add these two cities to the graph on the previous page.

**Score: 2 points, no partial credit.**

5. Which of the two cities is the warmest? Gotham City
6. Why? (Please base your results using information from the graphs above).  
**The graph indicates that temperature decreases as the latitude increases and vice versa. Gotham is in the lower latitudes (southern hemisphere) where the temperatures is higher. If you plot Gotham on the graph you find that it should have a temperature around 30 deg. C. Townville would be around 8 or 9 deg. C. Thus Gotham must be warmer.**
- 

**Scoring:**

**Full Credit:**

**(3 points)** Student answers correctly, indicates the temperature that the two cities would be at based on the graph and references the trend.

**Partial Credit:**

**(2 points)** Student answers correctly based on the graph and references the trend.

**(1 point)** Student answers correctly, but does not reference the graph.

---

## Follow-up Questions

---

Add this city to the graph on the previous page:

City: Bakerstown  
Latitude: 5° South  
Temperature: 10° Celsius

7. Why do you think this city is different than the others? What are some factors that might affect the temperature?

**Bakerstown should be much warm based on where it is located (near the equator). Some other factor must be lowering the temperature. Factors that might affect the temperature are altitude (e.g. at the top of a mountain) and proximity to a large body of water.**

Scoring:

**Full credit:**

**(3 points)** Student plots city correctly, mentions the location close to the equator, and gives two other factors that might affect temperature.

**Partial credit:**

**(2 points)** Student plots the city correctly, mentions the location close to the equator, and gives one other factor that might affect temperature.

**(1 point)** Student plots the city correctly and mentions that the city is close to the equator.

---