

TEACHER ANSWER SHEET



Answer Key and Scoring Rubric
Student Pre-Test (Elementary)
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 December. The students have selected two cities (Springfield and Metropolis) 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)
Pinehurst	Albany	Auckland	New Zealand	-36	174	19
Kippa-Ring		Queensland	Australia	-27	153	25
Mareeba		Queensland	Australia	-17	154	34
Mazapan School	La Ceiba	Atlantida	Honduras	16	-87	25
Kfar-Shmriyau Rispon	Herzelia		Israel	32	35	12
George Washington	Cleveland	Ohio	USA	41	-81	
Badger Road	North Pole	Alaska	USA	55	-147	0

Students from the George Washington 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.

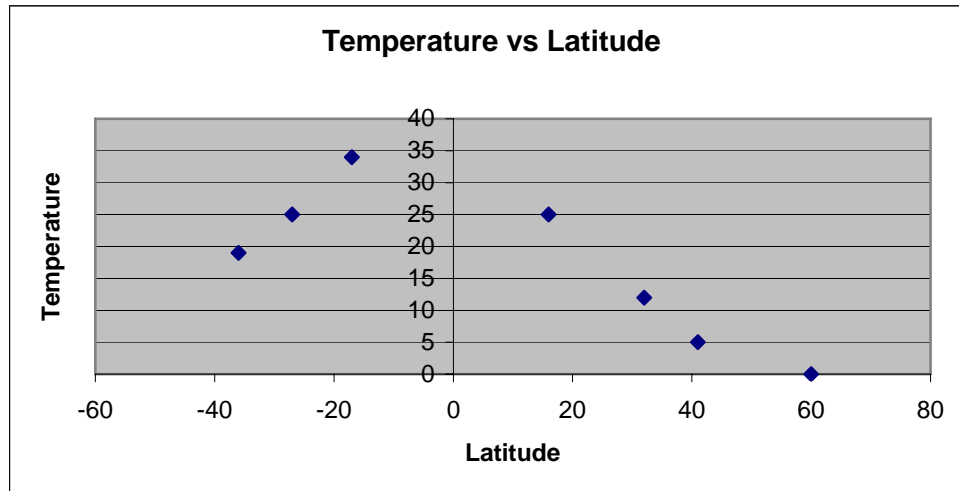
	Monday	Tuesday	Wednesday	Thursday	Friday
Temperature (°Celsius)	4	5	7	3	6

1. What was the Average Temperature for the week? 5 °C (2 point)

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 Pinehurst School from New Zealand, 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, December the locations in the northern latitudes have lower temperatures when compared to locations in the southern hemisphere that are same distance from the equator.**

3. Why do you think this is so? **Locations at the equator receive the most direct sunlight. In December, the northern hemisphere is tilted away from the sun and therefore it receives less direct sunlight than corresponding locations in the southern hemisphere (which is tilted toward the sun).**

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: <u>Springfield</u>	City: <u>Metropolis</u>
Latitude: <u>47° North</u>	Latitude: <u>12° South</u>

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? Metropolis

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. Metropolis is in the lower latitudes (southern hemisphere) where the temperatures appear to be higher in December. If you plot Metropolis on the graph you find that it should have a temperature around 35 deg. C. Springfield would be around 3 or 4 deg. C. Thus Metropolis 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.
