

Dot Plots and Temperature

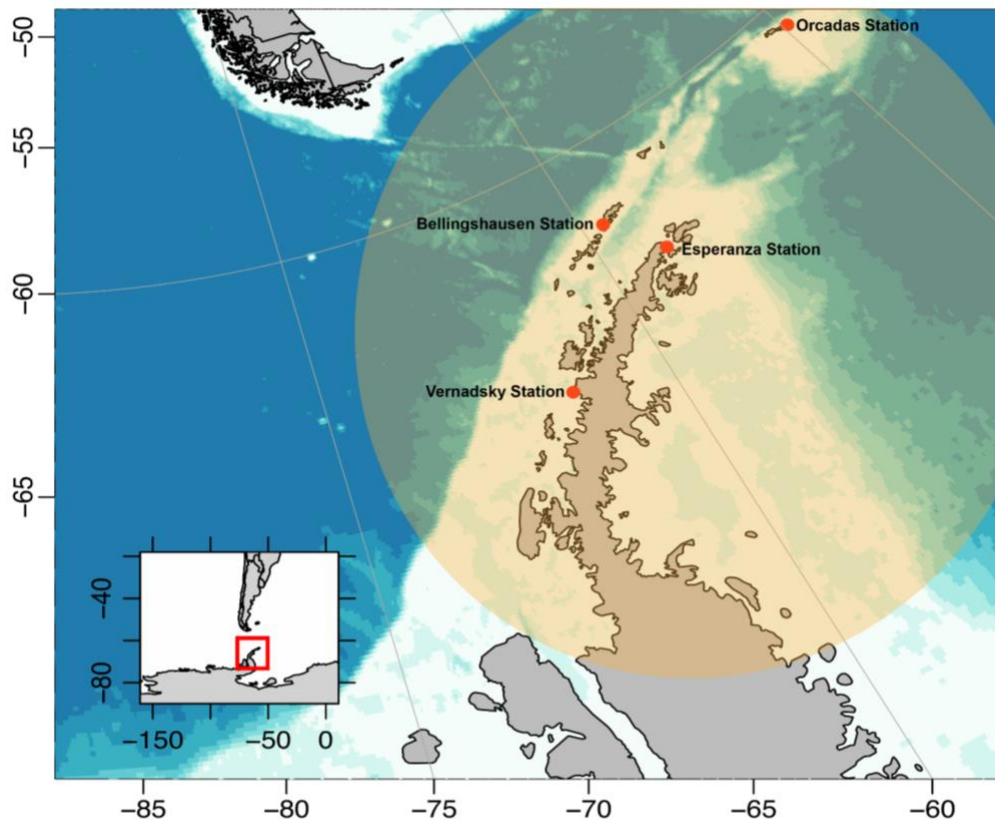
Teacher Answer Key

Throughout this assignment, we will be trying to answer the following questions.

What is the average temperature in Antarctica?

Have these temperatures changed over time?

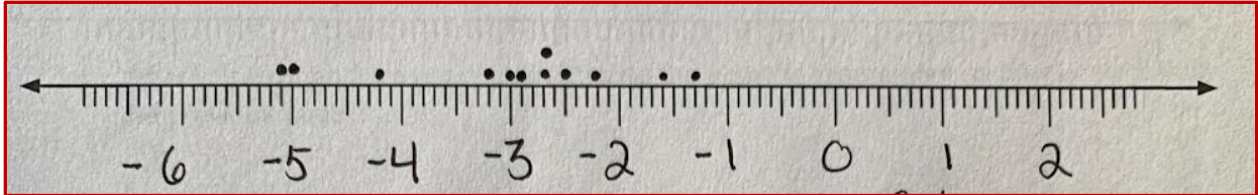
You will be provided with temperatures over a period of time. These temperatures have been collected from the scientific bases shown in the image below.



Year	Station	Avg Temperature (C)	Avg Temperature (F)
1976	Faraday	-5	23
1976	Esperanza	-5.1	22.8
1976	Orcadas	-3.2	26.2
1976	Bellingshausen	-2.7	27.1
1996	Faraday	-2.2	28
1996	Esperanza	-4.2	24.4
1996	Orcadas	-2.7	27.1
1996	Bellingshausen	-1.3	29.7
2016	Faraday	-2.9	26.9
2016	Esperanza	-2.5	27.5
2016	Orcadas	-3	26.6
2016	Bellingshausen	-1.6	29.1

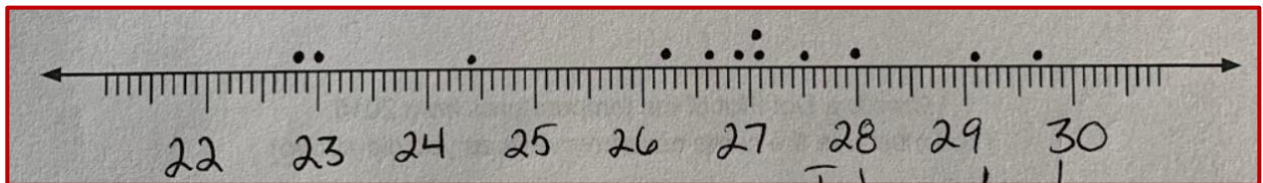
1. What are the four different locations where this data was collected?
Faraday, Esperanza, Orcadas, Bellingshausen
2. Will four locations give us an accurate representation of the temperature in Antarctica? Why or why not? Why do you think you are only given four locations?
Either answer is acceptable. Must explain reason in full sentences.
3. Which year had the lowest average temperature? What was that temperature?
1976 had the lowest temperature at -5.1°C or 22.8°F
4. Which year had the highest average temperature? What was that temperature?
1996 had the highest temperature at 1.3°C or 29.7°F
5. Before creating a dot plot or calculating the averages, do you believe that there has been a temperature change in Antarctica? Why or why not?
Either answer is acceptable. Must explain reason in full sentences.

Create a Dot Plot of all temperatures given to us in Celsius



Average Temperature in Celsius

Create a Dot Plot of all the temperatures given to us in Fahrenheit

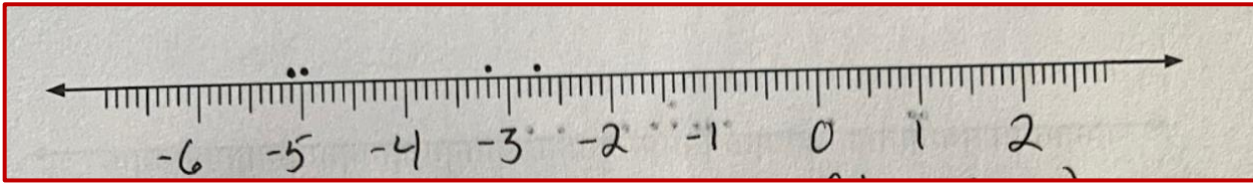


Average Temperature in Fahrenheit

6. Do you notice any clusters of data? (An interval with multiple data points)

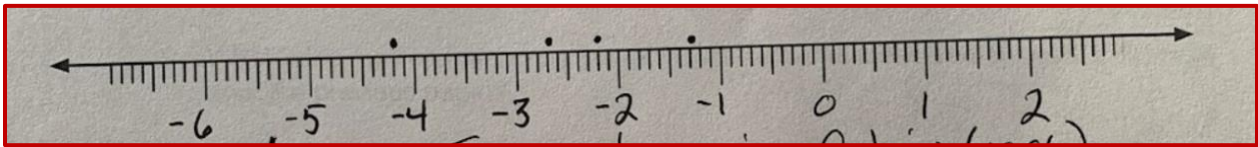
In Celsius, there is a cluster around -3.5° to -2.0° . In Fahrenheit, there is a cluster around 26° to 28° .

Create a Dot Plot of the temperatures from 1976
(You may choose to do Celsius or Fahrenheit)



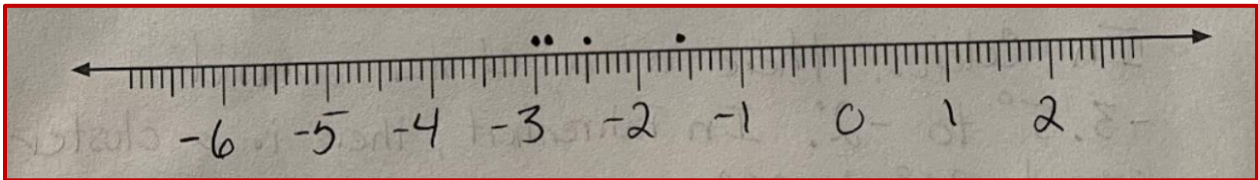
Average Temperatures in Celsius (1976)

Create a Dot Plot of the temperatures from 1996
(You must use the same measurements as you did above)



Average Temperatures in Celsius (1996)

Create a Dot Plot of the temperatures from 2016
(You must use the same measurements as you did above)



Average Temperatures in Celsius (2016)

7. Now that you have created several dot plots, visually, during what year do the temperatures appear to be the lowest? Which year appears to have the highest temperatures?

The temperatures appear to be lowest around 1976 and highest around 2016.

8. What is the mean from every year? (Choose the same measurement as the dot plots from the previous page)

<u>Celsius</u>	<u>Fahrenheit</u>
1976: -4.0°C	24.775°F
1996: -2.6°C	27.3°F
2016: -2.5°C	27.525°F

9. What is the median from every year? (Choose the same measurement as the dot plots from the previous page)

<u>Celsius</u>	<u>Fahrenheit</u>
1976: $-5 + -3.2 = -8.2$ $-8.2/2 = -4.1^{\circ}\text{C}$	$23 + 26.2 = 49.2$ $49.2/2 = 24.6^{\circ}\text{F}$
1996: $-2.2 + -2.7 = -4.9$ $-4.9/2 = -2.45^{\circ}\text{C}$	$29 + 27.1 = 55.1$ $55.1/2 = 27.55^{\circ}\text{F}$
2016: $-2.9 + -2.5 = -5.4$ $-5.4/2 = -2.7^{\circ}\text{C}$	$26.9 + 27.5 = 54.4$ $54.4/2 = 27.2^{\circ}\text{F}$

10. Based on the plots and the averages, do you believe that there has been a change in the temperature in Antarctica?

There has/has not been a change in temperatures in Antarctica (students should then support this with averages or clusters on the dot plots).