

WHY TEMPERATURES VARY

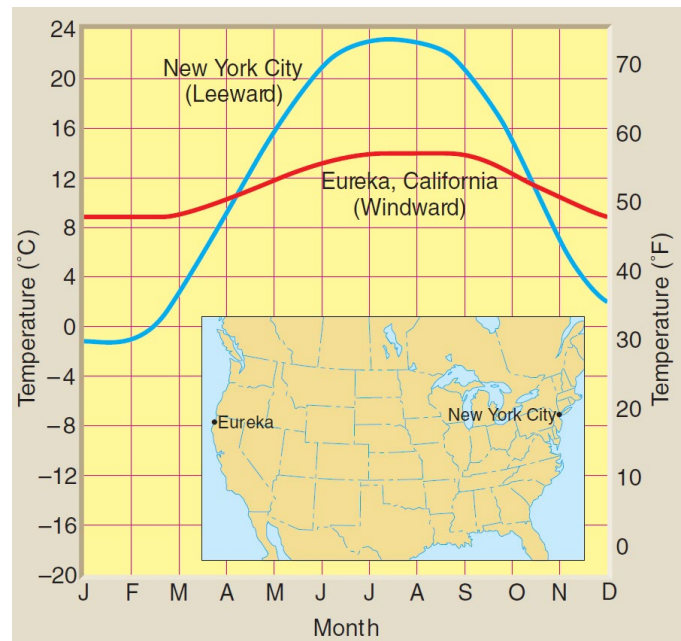
NAME _____

The temperature on Earth can vary for many different reasons. The first reason is **latitude**. The closer you are to the equator (closer to 90° latitude), the warmer it is. Likewise the closer you are to the North or South pole (closer to 0° degrees latitude), the colder it is. If two cities are located at the same latitude, they can still be different temperatures due to the influence of **land and water**. If one of those cities is by the ocean and the other is further inland, the water will cause temperatures to be milder (cooler summers, yet warmer winters). So let's say 2 cities are at equal latitudes and both are right next to oceans—they can STILL vary in temperature if one is a **windward coast** and the other is a **leeward coast**. The windward coast city will be milder due to ocean air flowing overhead. A 4th reason to have varying temperatures is the presence of **mountains**. If you are on the leeward side of the mountain, most of the water has been removed from the air and temperature has more of a continental influence. The windward side of the mountain still enjoys the mildness provided by wet ocean air. Speaking of mountains, **altitude** can also affect temperature. The higher up a mountain you are, the higher in the troposphere you are, therefore, it is colder.

Use the temperature graphs to answer the questions.

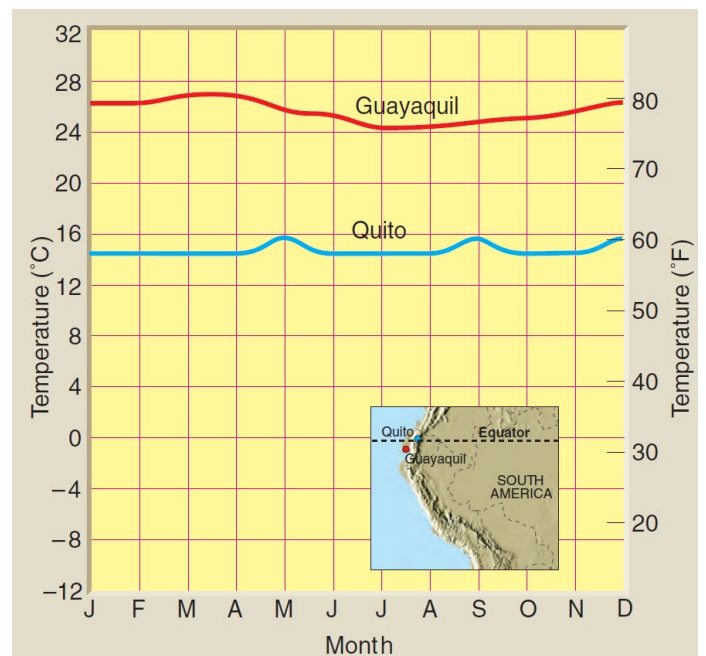
Eureka and New York are at the same latitude of 40°, yet look at how different the temperatures are.

1. Which has the warmer summers?
2. Which has the colder winters?
3. Which has "milder" seasons? (not very hot in summer and not very hot in winter)
4. Which way does the wind blow across America? (from east to west or from west to east?)
5. Which city has the windward coast?
6. The leeward coast?



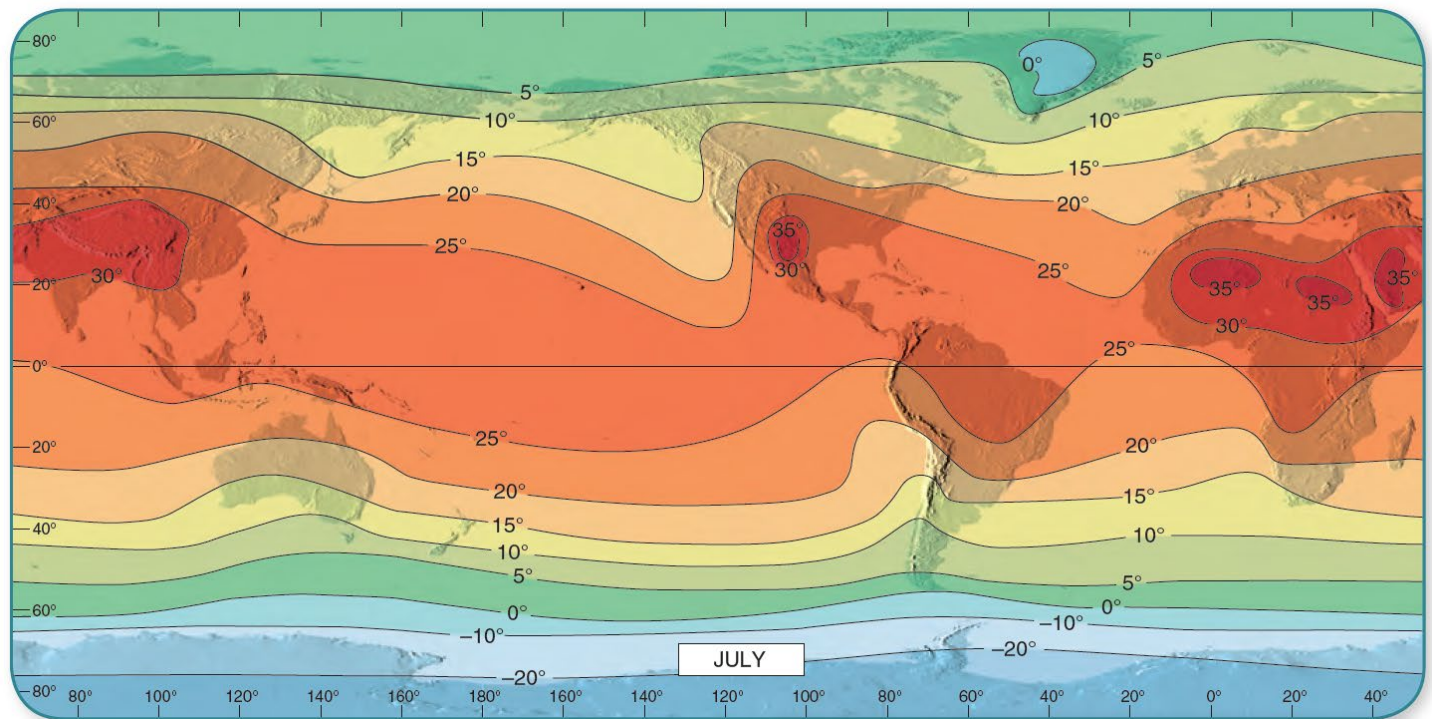
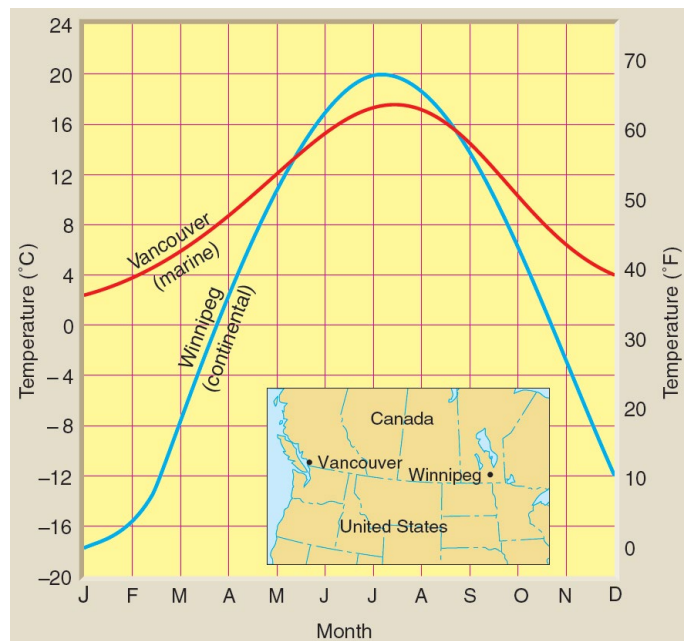
Guayaquil is the city furthest east and it is at the bottom of a mountain. Quito is a city that is actually on the mountain, just a short distance northeast of Guayaquil. Notice their very different temperatures. Both these cities are at nearly the same latitude right by the equator.

7. Why isn't Quito a hot city? It is right by the equator!
8. Which city is higher in the troposphere?
9. How does the troposphere temperature change as you go up?
10. Which bolded word above is affecting the temperature differences in this example?



Vancouver is located near the Pacific ocean and Winnipeg is in the middle of the continent. Though they are at the same latitude, they have very different temperatures.

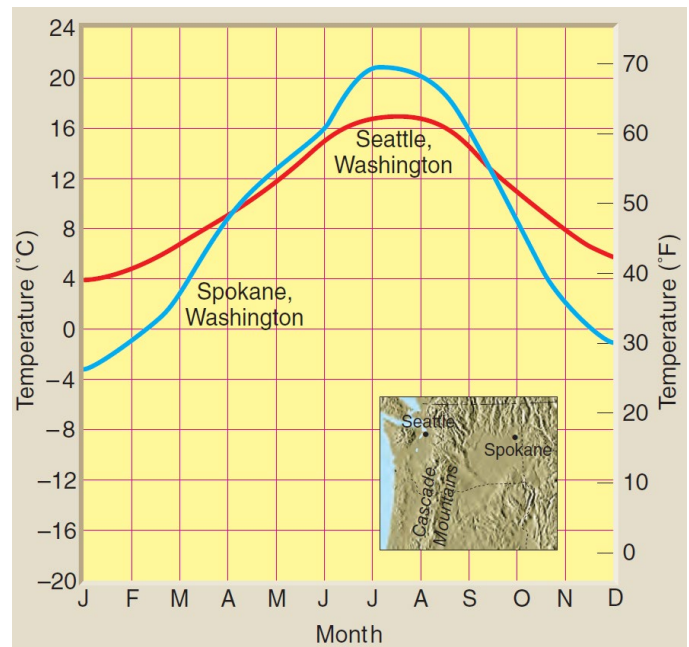
11. Which city has mild (warm) winters?
12. Which city has harsh (hot) summers?
13. Which city has the biggest range of temperature from winter to summer?
14. If you lived in Vancouver, would the air be more moist, or more dry?
15. If the air is moist in Vancouver would there be more clouds or less?
16. If there are more clouds in summer, what will that do to the temperature?
17. Which bolded phrase in the reading goes with this example?



18. Which way do latitude lines go? (up and down North to South) or (sideways East to West)
19. Longitude?
20. What is located at 0° latitude? _____ What is located at 90° latitude? _____
21. Near what latitude are temperatures the hottest?
22. Why is that? (what is happening with sunlight at the latitude in the above question?)

Seattle and Spokane are at nearly the same latitude, yet their temperatures are very different.

23. What barrier (landform) do you see between the 2 cities?
24. Seattle enjoys a mild climate. Why is that so? (what is nearby?)
25. Would the air in Seattle be more wet or dry?
26. If the air is more wet in Seattle would there be more clouds or less?
27. If there are more clouds in winter, what will that do to the temperature?
28. Which city is on the leeward side of the mountain? The windward?



29. Look at latitude 0. What is the temperature range in the Northern and Southern hemispheres at this latitude?
30. At latitude 0 how will the temperatures compare from July to December?
31. How much do the temperatures range at Santa's workshop?
32. If the coldest temperature is -20 celsius, what would the warmest temperatures be where Santa lives?
33. According to the reading, why are the temperature ranges smaller for the southern hemisphere?

Latitude	Northern Hemisphere (°C)	Southern Hemisphere (°C)
0	0	0
15	3	4
30	13	7
45	23	6
60	30	11
75	32	26
90	40	31