

Adiabatic Temperature Changes – The Orographic (Mountain) Effect

1. Complete the following sentence:

Air cools due to _____ and warms due to _____.

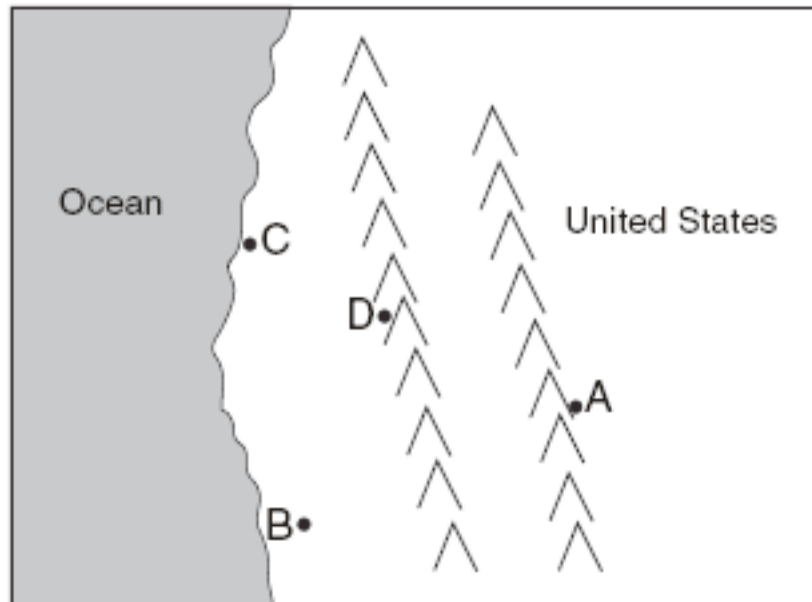
2. Complete the following sentence using the terms: compresses, cools, expands and warms.

Rising air on the windward side of a mountain _____ and _____ while descending air on the leeward side _____ and _____.

3. Complete the following sentence using the terms: dry, wet, warm and cool.

The climate on the windward side of a mountain range is generally _____ and _____ while the climate on the leeward side is _____ and _____.

(Questions 4,5) The map below shows the location of 4 cities, A, B, C and D in the western United States where prevailing winds are from the southwest.



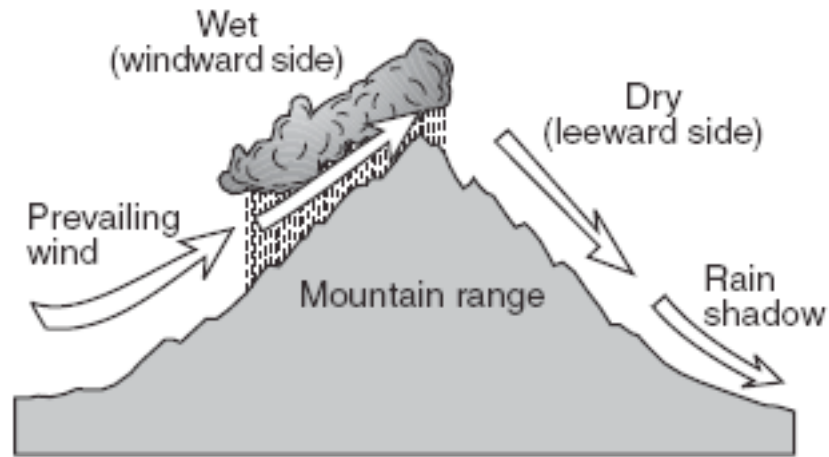
4. On the answer line below, write the letter of the city that receives the least amount of average yearly precipitation.

Answer: City _____

5. Compare the general climates of city C and city A.

Answer:

(Questions 6–9) The cross-section below shows how prevailing winds have caused different climates on the windward and leeward sides of a mountain range.



6. What is happening to the air that is rising on the windward side of the mountain range?

Answer:

7. Why does the windward side of the mountain range have a wetter climate?

Answer:

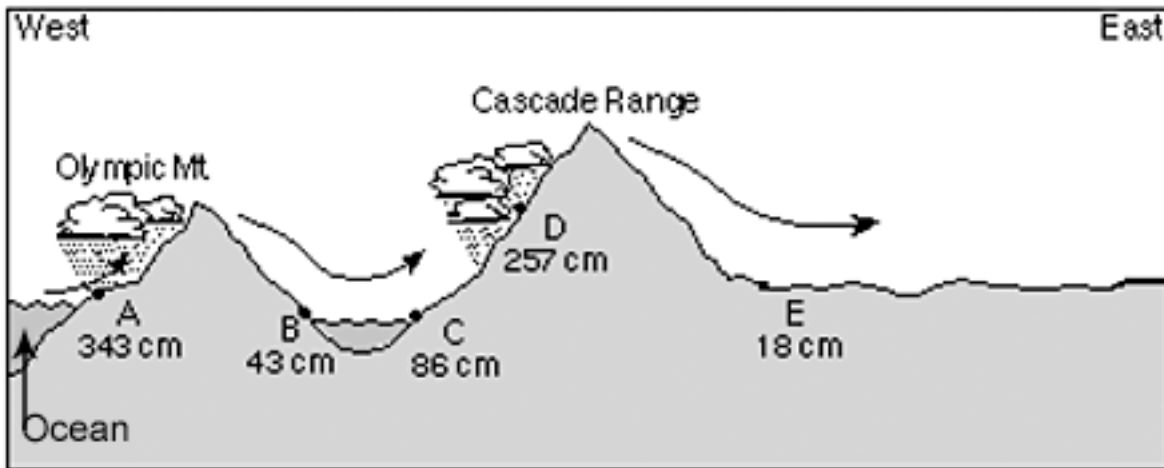
8. On which side of the mountain, windward or leeward, is the Dew Point reached?

Answer:

9. Which side of the mountain range, windward or leeward, will receive the least amount of average yearly precipitation and why?

Answer:

(Questions 10–13) The diagram below shows the average yearly precipitation, in centimeters, at location A through E across the state of Washington. Arrows indicate the direction of prevailing winds.



(Not drawn to scale)

For Questions 10 and 11, place the correct letter in the answer blank.

10. Which 2 locations receive the most average yearly precipitation?

Answer: _____ and _____

11. Which 2 locations receive the least average yearly precipitation?

Answer: _____ and _____

12. Referring back to your answers for questions 7 and 8, what accounts for the difference between the average yearly precipitation for the 2 locations receiving the most precipitation versus the 2 cities receiving the least average yearly precipitation?

Answer:

13. Look at locations A and D. Both letters are located on the windward side of a mountain range.

Why should location D receive less precipitation than location A?

Answer: