Estimating Air Temperature **B**

NAME: _____ **52 Points Possible**

1. As air descends, it _____ at a rate of _____ Fahrenheit for every _____ feet in elevation. (+3 points)

2. As air rises, it _____ at a rate of _____ Fahrenheit for every _____ feet in elevation. (+3 points)

3. The side of a mountain that moving air must travel down in elevation is called the _____ side of the mountain, or the _____ side of the mountain. (+2 points)

4. The side of a mountain that moving air must travel up in elevation is called the _____ side of the mountain, or the _____ side of the mountain. (+3 points)

5. The _____ usually receives little or no precipitation from air that is descending down its face. (+1 point)

6. The _____ usually receives the precipitation from air that is forced to rise. (+1 point)

Directions: Determine the theoretical temperature of the following locations. Assume the air mass is moving from the lower elevation to the higher elevation unless indicated otherwise. Do not round your answers - calculate to 2 decimal points.

7. It is **82** degrees Fahrenheit in Los Angeles (**sea level or 0**). What is the temperature on Mt. Lyell in Yosemite National Park, which has an elevation of **13, 174** feet using the Normal Lapse Rate (3.5^0F for every 1,000 feet in elevtion)?

   How many feet did the air rise of fall? 13, 174

   How many units of 1,000 feet did the air rise or drop? 13.174 ÷ 1,000 = 13.174

   How many degrees did the temperature rise or fall? 13.174 × 3.5^0F = 46.10^0F

   What is the temperature on Mt. Lyell in Yosemite National Park? 82^0F– 46.10^0F = 35.0^0F (+4 points)

(+13 points possible this page)

8. It is 35 degrees Fahrenheit in Anchorage, Alaska (sea level). What is the temperature on Mt. Wood in the Wrange Mountains, which has an elevation of 14,367?

   How many feet did the air rise or fall? _____

   How many units of 1,000 feet did the air rise or drop? _____

   How many degrees did the temperature rise or fall? _____

   What will be the air temperature at Wrange Mnt? _____

9. An air mass is moving onto land from the Pacific. In Los Angeles the temperature is 62 degrees Fahrenheit. What will be the air temperature at Pickets Pass in the San Gabriel Mts., which has an elevation of 6,200 feet?

   How many feet did the air rise or fall? _____

   How many units of 1,000 feet did the air rise or drop? _____

   How many degrees did the temperature rise or fall? _____

   What will be the air temperature at Donner Pass? _____

   (+4 points)

10. If the same air mass continues to move east, what will be the temperature at Needles, CA, which has an elevation of 500 feet?

    How many feet did the air rise or fall? _____

    How many units of 1,000 feet did the air rise or drop? _____

    How many degrees did the temperature rise or fall? _____

    What will be the air temperature at Reno? _____

    (+4 points)

(+12 points possible this page)

11. An air mass is moving out of the Rocky Mountains. At the Continental Divide, 11,112 feet, the air temperature was 20 degrees Fahrenheit. What will be the air temperature of this air mass when it reaches Independence , Missouri, which has an elevation of 600 feet above sea level?

    How many feet did the air rise or fall? _____

    How many units of 1,000 feet did the air rise or drop? _____

    How many degrees did the temperature rise or fall? _____

    What will be the air temperature at Kansas City? _____

    (+4 points)

12. An air mass is moving from the Atlantic Ocean near Charleston, SC (Sea Level). The air is 41 degrees Fahrenheit. What will the temperature be at the top of the Blue-Ridge Mountains which has an elevation of 3,080 ft?

    How many feet did the air rise or fall? _____

    How many units of 1,000 feet did the air rise or drop? _____

    How many degrees did the temperature rise or fall? _____

    What will be the air temperature at Blue Mountain? _____

    (+4 points)

13. If the same air mass continues to move northwest, what will the temperature be at Knoxville, Tennessee, which has en elevation of 906 feet?

    How many feet did the air rise or fall? _____

    How many units of 1,000 feet did the air rise or drop? _____

    How many degrees did the temperature rise or fall? _____

    What will be the air temperature at Canton? _____

    (+4 points)

(+12 points possible this page)

14. An air mass is moving from the Himalayan Mountains from K-2 at 28,251 feet toward Nepal. The air temperature is -82 degrees Fahrenheit. What will the temperature be at Katmandu, 17, 000 ft?

    How many feet did the air rise or fall? _____

    How many units or 1,000 feet did the air rise or drop? _____

    How many degrees did the temperature rise of fall? _____

    What will be the air temperature at Katmandu? _____

    (+4 points)

15. If that same air mass continues to move south-southwest, what will the temperature be at Dhaka, Bangladesh, which has an elevation of 13 feet?

    How many feet did the air rise or fall? _____

    How many units or 1,000 feet did the air rise or drop? _____

    How many degrees did the temperature rise of fall? _____

    What will be the air temperature at Bombay? _____

    (+4 points)

16. Air is being pushed up and down a mountain. The air temperature at Bethel, Alaska, elevation 121 feet, is 9^0 F. The air rises up to Mount McKinley, 19,470 feet, then back down to Whitehorse, Yukon Territory, Canada, 2,317 feet. (+7 points)
Draw a diagram showing the following (Label the items).:

- Mt. McKinley
- Identify Bethel, Alaska
- Identify the windward side
- Identify the leeward side
- Place the elevation at the top of the mountain.
- Show what the temperature will be at the summit
- Show what the temperature will be if the air descends to Whitehorse, Yukon Territory, Canada (2,317 feet).

(+15 points possible this page)