



Atmospheric Stability and Vertical Air Motions

The diagram at the bottom of the page illustrates what happens to an air parcel as it moves over a mountain. Answer the questions related to the diagram.

Assume that the (dry) dew point temperature lapse rate is $2^{\circ}\text{C}/\text{km}$.

When the air is saturated the dew point temperature lapse rate is $6^{\circ}\text{C}/\text{km}$.

1. What is the value of the Dry Adiabatic Lapse Rate? _____

What is the value of the Moist Adiabatic Lapse Rate? _____

2. What lapse rate was used to determine the air parcel temperature at 1 km? (circle one)

DALR

MALR

3. What lapse rate would be used to determine the air parcel temperature at 2 km? (circle one)

DALR

MALR

4. Determine the air temperature at the top of the mountain and write the value in the box.

5. Determine the dew point temperature at the top of the mountain and write the value in the box.

6. Determine the air temperature at the base of the mountain on the leeward side and write the value in the box.

7. Determine the dew point temperature at the base of the mountain on the leeward side and write the value in the box.

8. Sketch in the location of where you would expect a cloud to form.

9. As the air descends from the top of the mountain to 1 km, it warms, why?

10. Based on this example, what type of climate or environment would you expect to find on the leeward side of the mountain ranges?

