

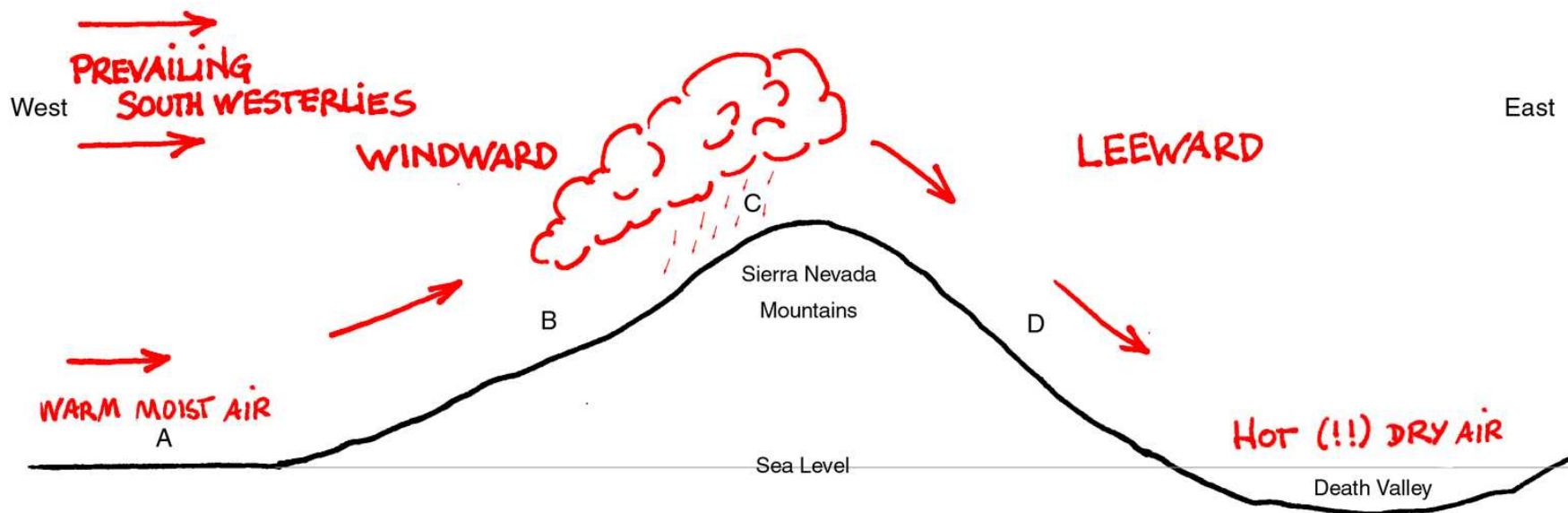


NAME: _____

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The Formation of Rainshadow Deserts / The Orographic Effect

Teacher Answer Key



Match the appropriate description with its corresponding area (A, B, C, D or Death Valley) from the diagram above:

Death Valley. Air is very warm¹ and dry, creating a “rain shadow desert” here

C. Cooling triggers condensation, forming clouds and precipitation, and releasing additional heat into the air²

¹ Adiabatic (occurring without gain or loss of external energy) heating by compression, as well as the earlier release of latent heat during condensation, results in very hot, dry air.



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- B.* Warm air rises as it moves eastward over the Sierra Nevadas. The air expands³ and cools⁴ as it rises.
- D.* Compression of dry, descending air warms it further.
- A.* Warm moist air moves eastward over coastal California

² Condensation releases latent heat of evaporation (stored in water vapor) back into the environment as measurable, sensible heat, keeping the rising air warmer than dry air that has risen to the same altitude. That heat will add to the warming effect on the leeward side of the mountains.

³ Atmospheric pressure decreases with altitude. The decrease in confining pressure causes the rising air to expand.

⁴ Expanding air cools adiabatically. A CO₂ fire extinguisher illustrates the point perfectly. If you have one in your room, get permission to do a 3 second discharge at close range onto a dark colored fleece jacket or shirt. Have students observe the frozen CO₂ on the jacket, and feel the “cold” on the underside of the CO₂ ice.