

**Chapter 18 Moisture, Clouds, and Precipitation**

**Section 18.2 Cloud Formation**

*This section explains what happens when air is compressed and expanded. It also describes processes that lift air, how stable and unstable air behaves, and how condensation occurs.*

**Reading Strategy**

As you read, write the main idea for each topic in the table below. For more information on this Reading Strategy, see the **Reading and Study Skills** in the **Skills and Reference Handbook** at the end of your textbook.

Topic	Main idea
Adiabatic temperature changes	a.
Stability measurements	b.
Degrees of stability	c.

**Air Compression and Expansion**

- ➡ When a parcel of air is allowed to expand, it \_\_\_\_\_.
- Why does a parcel of air expand as it rises upward through the atmosphere?  
 \_\_\_\_\_  
 \_\_\_\_\_
- Is the following sentence true or false? The rate of heating or cooling of saturated air is the dry adiabatic rate.  
 \_\_\_\_\_
- When a parcel of air reaches its dew point, the process of \_\_\_\_\_ begins.
- After a parcel of air rises past the condensation level, the rate of cooling decreases because of the release of latent \_\_\_\_\_.

**Processes That Lift Air**

- ➡ List four mechanisms that can cause air to rise.  
 \_\_\_\_\_  
 \_\_\_\_\_

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7. Complete the table below.

Processes That Lift Air		
Process	Cause of Lifting	Typical Resulting Weather Pattern
Orographic lifting	mountains block airflow	
Frontal wedging		clouds and rain
Convergence		
Localized convective lifting		

8. What causes a rain shadow desert? \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

9. A(n) \_\_\_\_\_ is produced when two air masses collide.

10. Is the following sentence true or false? Localized convective lifting produces thermals that lift birds to great heights.  
 \_\_\_\_\_

**Stability**

11. ➡ A parcel of air that is less dense than the surrounding air is \_\_\_\_\_ and will tend to rise.
12. ➡ Is the following sentence true or false? Unstable air tends to remain in its original position. \_\_\_\_\_
13. Circle the letter of the sentence that best describes a temperature inversion.
  - a. Air temperature increases with height.
  - b. Air temperature decreases with height.
  - c. Low-altitude air is unstable.
  - d. High-altitude air is unstable.
14. Clouds associated with lifting of \_\_\_\_\_ air often produce thunderstorms.

**Condensation**

15. ➡ For condensation to occur, air must be \_\_\_\_\_.
16. Is the following sentence true or false? Above the ground, tiny particles called condensation nuclei serve as surfaces for water-vapor condensation. \_\_\_\_\_