

## SECTION 3-1

## SECTION SUMMARY

## Air Masses and Fronts

### Guide for Reading

- ◆ What are the major types of air masses that affect the weather in North America?
- ◆ What are the main types of fronts?
- ◆ What are cyclones and anticyclones?

A huge body of air that has similar temperature, humidity, and air pressure throughout it is called an **air mass**. Scientists classify air masses according to temperature and humidity. **Tropical**, or warm, air masses form in the tropics and have low air pressure. **Polar**, or cold, air masses form north of 50° north latitude and south of 50° south latitude and have high air pressure. **Maritime** air masses form over oceans and are humid. **Continental** air masses form over land, in the middle of continents, and are dry.

**Four major types of air masses influence the weather in North America: maritime tropical, continental tropical, maritime polar, and continental polar.** Maritime tropical air masses from the Gulf of Mexico bring warm, humid air to the eastern United States. Maritime tropical air masses from the Pacific Ocean bring warm, humid air to the West Coast. Continental tropical air masses from the Southwest bring hot, dry air to the southern Great Plains. Maritime polar air masses from the Pacific Ocean bring cool, humid air to the West Coast. Maritime polar air masses from the Atlantic Ocean are often pushed out to sea by westerly winds. Continental polar air masses from central and northern Canada bring cold air to the central and eastern United States.

The prevailing westerlies generally push air masses from west to east in the United States. As air masses move across the land and the oceans, they bump into each other. However, if they have different temperatures and densities, they do not mix. The area where the air masses meet and do not mix becomes a front. When air masses meet at a front, the collision often causes storms and changeable weather.

**There are four major types of fronts: cold fronts, warm fronts, stationary fronts, and occluded fronts.** A cold front forms when cold air moves underneath warm air, forcing the warm air to rise. Cold fronts move quickly and bring cold, dry air. A warm front forms when warm air moves over cold air. Warm fronts move slowly and bring warm, humid air. A stationary front forms when cold and warm air masses meet but neither one has enough force to move the other. It may bring many days of clouds and precipitation. An occluded front forms when a warm air mass is caught between two cooler air masses. The warm air mass is cut off, or **occluded**, from the ground. The occluded warm front may cause clouds and precipitation.

A swirling center of low air pressure is called a **cyclone**. Cyclones are also called “lows.” **Cyclones and decreasing air pressure are associated with storms and precipitation.** **Anticyclones** are high-pressure centers of dry air. They are also called “highs.” Anticyclones lead to dry, clear weather. Because of the Coriolis effect, in the Northern Hemisphere winds spin in a counter-clockwise direction in a cyclone and in a clockwise direction in an anticyclone.



**SECTION 3-1**

**REVIEW AND REINFORCE**

**Air Masses and Fronts**

**◆ Understanding Main Ideas**

Fill in the blanks in the table below.

**Air Masses**

Type	Where It Forms	Temperature	Humidity
1. _____	Over ocean	Warm	Moist
Maritime polar	2. _____	Cold	Moist
Continental tropical	Over land	3. _____	4. _____
Continental polar	5. _____	6. _____	Dry

**3**

**◆ Building Vocabulary**

Fill in the blanks to complete each statement.

7. A huge body of air that has similar temperature, humidity, and air pressure throughout it is called a(n) \_\_\_\_\_.
8. \_\_\_\_\_ air masses form in the tropics and have low pressure.
9. Air masses that form over oceans are called \_\_\_\_\_ air masses.
10. \_\_\_\_\_ air masses form north of 50° north latitude and south of 50° south latitude.
11. The area where air masses meet and do not mix becomes a(n) \_\_\_\_\_.
12. \_\_\_\_\_ air masses form over land, in the middle of continents.
13. A warm air mass that is cut off from the ground is said to be \_\_\_\_\_.
14. A swirling center of low air pressure is called a(n) \_\_\_\_\_.
15. \_\_\_\_\_ are high-pressure centers of dry air.