The BrishLab - Science for the "Net" Generation

BrishLab

ES13A Air Masses and Fronts

Name:			
Date:	_/_/	Period _	_ Room _

Did you know?

- 1 An air mass is a large body of air that has about the same conditions throughout. For example, an air mass might have cold dry air.
- 2 An air mass takes on the conditions of the area where it forms. A continental polar air mass has dry cold air. A maritime polar air mass has moist cold air.
- 3 Most air masses form over polar or tropical regions. They may form over continents or oceans. Air masses that form over continents are called continental air masses.



Those that form over oceans are called maritime air masses (see Fig. 1).

So, why is it important to me?

4 Weather is always changing. One day might be cold and cloudy. The next day might be warm and sunny. Even on the same day, the weather can change a lot. A beautiful morning might be followed by a stormy afternoon. The weather changes because of moving air masses.

What are the big ideas I need to know?

- 5 Air masses cause the weather to change when they move because winds and jet streams push them along. Cold air masses tend to move toward the equator from both poles. Warm air masses tend to move toward the poles from the equator (see Fig. 2).
- 6 When a cold air mass moves south from the pole, it runs into a warm air mass moving north from the tropics. The boundary between two air masses is called a front. Air masses usually don't mix at a front. The differences in temperature and pressure cause clouds and precipitation.



The BrishLab - Science for the "Net" Generation

Name:

BrishLab

ES13A Air Masses and Fronts

- 7 A cold front occurs when a cold air mass runs into a warm air mass (see Fig. 3). The cold air mass is moving faster than the warm air mass and brings colder temperatures. It lifts the warm air mass out of its way. As the warm air rises, its water vapor condenses. Clouds form, and precipitation falls. If the warm air is very humid, precipitation can be heavy.
- 8 Temperature and pressure differences between the two air masses cause winds. These may be strong along a cold front. Cold fronts often bring stormy weather.
- 9 As the fast-moving cold air mass keeps advancing, so does the cold front. In fact, cold fronts usually move rapidly. They often bring sudden changes in the weather. They may create a thin line

of storms as they move. In the spring and summer, thunderstorms and tornadoes may occur along cold fronts. In the late fall and winter, snow storms may occur. After a cold front passes, the cold air mass behind it brings cooler temperatures.

A warm front occurs when a warm air mass runs into a cold 10 air mass and generally bring cloudy weather (see Fig. 4). The warm air mass is moving faster than the cold air mass. It flows up over the slower-moving cold air. As the warm air

rises, it cools. Clouds and light precipitation are likely. Warm fronts move slowly and cover a wide area. After a warm front passes, the warm air mass behind it brings warmer temperatures.

What about?

- Sometimes two air masses stop moving when they meet. They become stalled in one place. This 11 creates a stationary front. It may bring clouds and precipitation to the same area for many days.
- 12 Air always flows from higher to lower pressure. Earth's surface is spinning making the winds rotate in a circular pattern forming a cyclone or anticyclone (see Fig. 5).
- In the Northern Hemisphere, cyclones and anticyclones rotate 13 in the directions shown. They rotate in the opposite directions in the Southern Hemisphere.
- 14 A cyclone is a system of winds that rotates around a center of low pressure. Cyclones usually bring cloudy, wet weather. An

anticyclone is a system of winds that rotates around a center of high pressure. Anticyclones bring fair, dry weather.

. 00



Room



Figure 5 - Cyclones and Anticyclones

Figure 4- A Warm Front

d Development e of Frontal Lifting

Receding Cold Air Ahead of Warm Front

Date: / / Period

Advancing Warm Air Behind Warm

Front

Warm Front Map Symbol