

Winds, Air Masses, Fronts & Storms Study Guide

- Describe the characteristics of cool air.
More dense so it sinks, molecules are close together.
- Describe the weather conditions necessary for thunderstorms to occur. **Typically form on hot, humid afternoons or when a fast moving warm front over takes a slower cold front. Formed within Cumulonimbus Clouds.**
- List and explain in detail the 4 types of air masses.
Maritime Tropical- Warm and Moist Maritime Polar- Cold and Moist
Continental Tropical- Warm and Dry Continental Polar- Cold and Dry
- List and explain in detail the 4 types of fronts.
Cold Front- fast moving, takes over a slow moving warm air mass; can cause thunderstorms; cool, clear weather to follow.
Warm Front- fast moving, takes over a slow moving cold air mass; warm, humid weather follows
Stationary Front- when a cold and warm air mass meet and neither can move the other; can cause precipitation and clouds.
Occluded Front- a warm air mass caught between two cold air masses; precipitation can occur.
- Explain the difference between a high pressure system and a low pressure system.
The direction of their winds.
- Describe the weather associated with a high pressure system.
High Pressure System- also known as Anticyclone; brings dry, clear weather; cold air sinks and spins clockwise.
Low Pressure System- also known as Cyclone; brings storms and precipitation; warm air rises and spins counterclockwise around the center.
- What type of storm is a funnel cloud associated with?
Tornado
- Describe the general location of Tornado Alley.
Located in the Midwest region of the United States.
- Explain where hurricanes typically form.
Can only form over water that is at least 80°F.
- Describe the eye of a hurricane.
The eye of the hurricane has light winds and fair weather.
- Explain how air masses are moved over the continental United States.
They move from west to east by the Prevailing Westerlies and Jet Streams.
- In what direction do the prevailing westerlies push air masses?
From West to East.
- Describe where to best seek shelter from tornadoes and thunderstorms.
Thunderstorms- Indoors, away from objects that conducts electricity. If outside, find a low lying area and lay down.
Tornadoes- Indoors in a basement or lowest level of house; away from windows and glass doors.
- What instrument is used to measure wind speed?
Anemometer
- Explain the difference between local winds and global winds.
Local Winds- winds that move over short distances caused by heating of a small area of the Earth's surface.
Global Winds- Winds that move over long distances.
- Explain the Coriolis Effect.
Due to the Earth's rotation, causes winds to turn to the right in the Northern Hemisphere and the left in the Southern Hemisphere.
- Describe the doldrums.
Occur at the equator; has very little wind due to the warm air rising.
- Compare and contrast sea breeze and land breeze.
Sea Breeze- Occurs during the day; cool breeze blows from the sea to the land.
Land Breeze- Occurs at night; cool breeze blows from the land to the sea.
- Explain what causes wind.
Winds are caused by the unequal heating of the Earth's surface and the rising and sinking motion of air (convection currents).
- Describe precipitation. **Any solid or liquid that falls from clouds; rain, snow, sleet, hail**
- Explain the cause of convection currents. **Convection currents are caused by the rising and sinking motion of air.**
- Describe in detail Earth's major wind belts.
Polar easterlies- wind belts that extend from the poles to 60° latitude in both hemispheres. They form as cold, sinking air moves away from the poles. They can carry cold arctic air over the U.S. which can produce snow and freezing weather.
Prevailing Westerlies- the wind belts found between 30° and 60° latitude in both hemispheres. They blow toward the poles from west to east. These winds can carry moist air of the U.S. producing rain and snow.
Trade Winds- the winds that blow from 30° latitude almost to the equator in both hemispheres. They curve to the West as they blow toward the equator.
Doldrums- occur at the equator; has very little wind due to the warm air rising.
- What is meteorology? **The study of the atmosphere and weather.**
- Explain the characteristics of a hurricane.
Strong winds and rains; low pressure system that spins counterclockwise; forma over warm water.