

# Atmosphere Study Guide

## Earth's Atmosphere

1. List each of the five layers of the atmosphere, along with their distinguishing characteristics.
2. List each of the gases that make up with the atmosphere.
3. Which gas is the most abundant?

## Air Masses and Fronts

1. Explain how heat is transferred through conduction, convection, and radiation.
2. Explain how air masses form and the differences between maritime, continental, polar, and tropical air masses.
3. Explain how cold, warm, stationary, and occluded fronts are formed; their associated weather; and describe the symbols associated with each front on a weather map.

## Air Pressure and Wind

1. Describe what air pressure is and how it varies with altitude (height).
2. Explain how air behaves within a convection cell.
3. Explain how an area of high pressure and an area of low pressure is formed and how wind is created.
4. Explain why the Coriolis Effect occurs and how it affects global wind patterns.
5. Describe the direction of the winds and the latitudes associated with the trade winds, prevailing easterlies, and the polar easterlies.
6. Describe what the Jet Stream is and its effect on our weather.

## Humidity and Precipitation

1. Explain the difference between humidity and relative humidity.
2. Explain the effect of air temperature on relative humidity.
3. What does the relative humidity need to be, for condensation to occur?
4. Explain what the dew point is and describe the type of precipitation that occurs above and below the freezing point.
5. Explain how and when clouds form.
6. Explain how Lake Effect Snow is formed.
7. Explain how hail is formed.
8. Explain how rainbows are formed.

## Thunderstorms

1. List the three conditions needed for the formation of a thunderstorm.
2. Explain what creates unstable air.
3. Describe the type of cloud associated with a thunderstorm.
4. List three different methods that can provide lift to unstable, moist air.
5. Describe that the rain shadow effect is.
6. List the three stages of a thunderstorms and describe their associated updrafts and downdrafts.
7. Explain what lightning is and how it is formed.
8. Explain what thunder is and how it is formed.

## **Tornadoes**

1. Describe what a supercell thunderstorm is and how it is formed.
2. Explain why tornadoes are most common in the central plains.
3. Explain how the tornado ranking system is determined.
4. Describes the hazards associated with tornadoes.
5. Describe what to do before, during, and after a tornado.

## **Hurricanes**

1. Where and when do hurricanes form?
2. Explain how a hurricanes form.
3. Describe what creates a storm surge, why it is more dangerous at high tide, and why it can threaten places that are not even on the coast.
4. Explain how the classification system for hurricanes is determined.
5. Describe the various hazards associated with hurricanes.
6. Describe what to do before, during, and after a hurricane.

## **Weather Analysis**

1. Describe what each of the following instruments are used for: thermometer, barometer, anemometer, and hygrometer.
2. Describe the type of weather associated with a high pressure system and a low pressure system.
3. Describe how one knows when a storm is approaching, in relation to a barometer.
4. Explain what urban heat islands are and how they are formed.
5. Explain what the heat index is and why it is important to pay attention to the heat index.
6. Describe various way that the National Weather Service collects data and uses it to predict the weather.

## **Air Pollution**

1. Describe the difference between primary and secondary air pollution.
2. Describe what smog is and how it was traditionally formed and how is currently formed.
3. Describe what photochemical smog is and how it is formed.
4. Explain why ozone is harmful in the troposphere.
5. Describe the benefits ozone provides high in the stratosphere.
6. Explain how the hole in the ozone was formed and its associated health risks.
7. Describe various way to reduce smog and the hole in the ozone.

## **Acid Precipitation**

1. List the pH range for acids, bases, and neutral solutions.
2. Explain how acid precipitation is formed.
3. Describe the effects of acid precipitation on the environment.
4. Describe various way of reducing acid precipitation.