**SCIENCE Study Guide**

Chapter 5: “Earth’s Weather”

![MPj04308490000[1]]() EARTH’S ATMOSPHERE

* The **Troposphere** is the layer of (**gas**/ liquid/ or solid) closest to the surface of the Earth. It is the layer of the atmosphere where most of Earth’s **weather** occurs. It also contains **99**% of the air in the atmosphere.
* As you get higher in the atmosphere, the space between particles (decreases/ increases) which causes the air pressure to (decrease/ increase). Therefore, the top of a mountain has (more/ less) air pressure than the base of a mountain.
1. What is air pressure? The force put on a given area by the weight of the air above it.
2. The lower the altitude, the (lower/ higher) the atmospheric pressure.
3. Name the three variables that can change air pressure. Temperature, volume, humidity/amount of water vapor
4. Mercury and aneroid are two types of barometers that are used to measure air pressure.
5. What would the weather conditions probably be like in an area with high barometric pressure? Would it have a high or low altitude? Cold and dry with a low altitude
6. Name one place on earth that would most likely have low barometric pressure. Why (what are the weather conditions usually like)? Florida because it is warm and humid (wet weather)

![MCj04135340000[1]]()AIR CURRENTS AND WIND

1. What causes wind? Air moving from an area of high pressure to an area of low pressure
2. Uneven heating of the Earth by the Sun causes land and water temperatures to change.

These changes in temperature cause winds that move air masses because of differences in air pressure.

1. What are global winds and what causes them? Winds that move steadily in predictable directions over long distances. Caused by uneven heating and Earth’s rotation on its axis.
2. Convection is the movement of heat through a gas or liquid. In this process, warm air (rises/sinks), and the cold air (rises/sinks).
3. The Earth’s shape is one reason for different differences in temperature around the world.
4. What part of the Earth receives the most heat energy from the sun? Equator

![MPj03212310000[1]]()OCEANS AND AIR TEMPERATURE

1. What effect do oceans have on temperatures of places near the coast and places further inland? Why? In the summer, the temperature is cooler on the coast because the sun warms the land quickly, but there is little change in air temp. near the water because there is little change in ocean temperature. It is warmer near the coast in the winter because ocean water warms the air. Ocean and land heat the air above it, and the slow warming and cooling of the oceans keep air in a narrow range of temperatures.
2. What are ocean currents and how do they affect weather and climate? Ongoing movement of ocean water. They affect weather because they transfer heat from one place to another.
3. An El Nino is a change in weather conditions caused when a change in ocean currents leads to warmer temperatures at the surface of the ocean. These warmer temperatures cause air pressure to (rise/fall), causing winds to change direction.

 ![MPj04075660000[1]]()SEVERE WEATHER

1. Identify two properties that can be used to describe air masses (*Hint: Think about the words you used to describe low-pressure or high-pressure conditions in questions 5 and 6)*. Temperature and moisture/humidity.
2. What is a front and what causes it? Changes in weather where two air masses meet
3. What happens to the air right before a thunderstorm? Cold, dry air meets warm air – runs into a warm moist air mass and pushes warm air up
4. Explain how lightning is formed and how it causes thunder. Electric charges build up in clouds and discharge to create lightning. Thunder is caused by the intense heat caused by lightning expanding in the air.
5. What is a hurricane and where is it formed? A violent tropical storm that forms over the ocean with a central eye
6. What happens in the eye of a hurricane? Low pressure area with no precipitation or wind

![MCj01493260000[1]]()PREDICTING THE WEATHER

1. In this country, weather fronts or systems move from N / E / S / W to N / E / S / W.
2. In high and low-pressure systems, air is moved to the (right/ left) because of the rotation of the Earth.
3. What is a weather map and why might it be important for it to have symbols? A weather map show data about weather conditions across a large area during a specific time. Symbols show directionand location of weather patterns (air temp., wind speed, precipitation, etc.)
4. Weather forecasts depend on information gathered about air pressure, wind speed, and (temperature/ weather fronts) to predict weather.
5. Describe the kind of weather data each instrument gathers:
6. Doppler Radar: Speed, direction, and precipitation of winds/clouds/rain
7. Satellites Movement of clouds/storms