**For the upcoming test, you should be able to:**

1. Explain the difference between ***weather*** and ***climate***. Provide examples of each.

weather= the general condition of the atmosphere **at a particular time and place**

climate= the general condition of the atmosphere **over many years**

1. Identify the 2 main atmospheric gases and their percentages (%).

N2 – 78% O2 – 21%

1. Describe the major ***oxygen*** reservoirs and how O2 cycles between them.

\*atmosphere, \*water (solid, liquid, gas), plants/animals

Describe the major ***nitrogen*** reservoirs and how N2 cycles between them.

 \*atmosphere, \*ground (soils, animal waste, living plants, fertilizer, dead plants/animals), oceans, live animals, rain water, live plants, groundwater, surface water

1. List the importance of the following components in the atmosphere:
	* H2O vapor
	* Ozone
	* Atmospheric Dust

absorbs the sun’s energy absorbs UV rays scatter’s the sun’s radiation

helps form clouds condensation nuclei

emitted from volcanoes

1. Describe the following about ***ozone***. can block sun’s rays/can cool temps
* It’s main function in the atmosphere: How ozone is destroyed: How are we fixing it:

O3 absorbs UV rays/protects life on Earth. It’s mainly destroyed by CFC’s

(coolants and aerosols made for older refrigerators and air conditioners and hair sprays).

Slowly correcting the situation by banning use of CFC’s.

1. List the major characteristic and explain the ***temperature*** trend for each layer below.

**Troposphere Stratosphere Mesosphere Thermosphere**

temp 🡻 as elevation 🡹 temp 🡹 as elevation 🡹 temp 🡻 as elevation 🡹 temp 🡹 as elevation 🡹

 weather ozone layer coldest layer ionosphere

 blends into exosphere and space

1. Describe what ***air pressure***  is and how it changes as you move UP through

the atmosphere. the weight of the air above pushing down on us; it decreases with

elevation as there is less air above you the higher up you go.

1. Describe how each layer of the atmosphere selectively *filters* out part of the EM spectrum.

Thermosphere & Mesosphere

Stratosphere

Troposphere

N, O absorbs short wave radiation like gamma, UV, x-rays ozone absorbs UV absorbs heat (infrared) and light waves

in clouds, water vapor, and CO2

1. Explain what causes scattering of light in the atmosphere and how it produces blue skies during daytime and red/orange sunrises and sunsets. dust and gas particles scatter solar radiation.
2. Describe how ***albedo*** differs between urban (buildings) areas and rural (land) areas.

Dark-colored objects absorb more heat; light-colored objects absorb less heat. B/c cities have many asphalt roads and parking lots, they absorb heat more than rural areas.

Explain how albedo helps cause lower winter temperatures in Michigan, but warmer summer temps.

The high albedo of snow will help temps stay low in winter. Grass and blacktop

have low albedo and will help temps to rise.

1. Describe how radiation, conduction, and convection each help in

heating our troposphere.

Radiation from the sun heats the surface, air molecules touching the warm

surface is warmed by conduction, and then the warm air rises and mixes the

heat into the atmosphere by convection.

Explain the daily 2-3 hour delay between peak radiation and

max temperature in the *troposphere*. It takes about 2-3 hours for the initial solar energy

that radiated from the sun to be absorbed by the earth’s surface and then

for the air above it (heated by conduction) to rise and mix by convection.

1. Describe how *greenhouse* gases help cause the natural greenhouse effect.

Gases such as water vapor and methane, which occur in the atmosphere

naturally, absorb the longwave infrared waves that are reradiated from

Earth’s surface, helping to keep our planet warm.

1. Explain how **latitude** influences how warm or cold an area is.

The lower latitudes (the tropics) receive more direct rays of

solar radiation and are warmer than higher latitudes

(like the temperate zones and the polar regions)

which receive less direct rays.



1. Explain how **elevation** influences how warm or cold an area is.

See the given graph. The average temp 🡻 as elevation 🡹 b/c as air rises, it expands

and cools.

1. Explain how **maritime/continental** influence controls how warm or cold an area is.

See the sample graph. Water has a higher specific heat than land, meaning it takes longer to heat

up but also takes longer to lose its heat. (remember our discussion about cooking food in

aluminum foil? The food stays hot longer and the aluminum foil cools rapidly) A maritime location

is near a large body of water. A continental location is not near a coast. Maritime locations

have a lower temp range b/c the large body of water that it is near will keep the winter months slightly warmer

and the summer months slightly cooler than a location at the same latitude that is not by a large body of water.

1. Explain how wind forms on Earth.

Solar radiation warms the surface of the earth (more so at the tropical regions).

The warmed surface warms the air above it. This warmed air rises by convection

b/c its less dense. When it rises it creates a low pressure area. Air from a high

pressure area moves in to take its place. (wind)

1. Describe how the westerly winds form at the mid-latitudes.

From 30oN to 60oN, flow from West to East

Describe how the trade winds form at the low-latitudes.

From 0oN (Equator) to 30oN, flow from East to West