

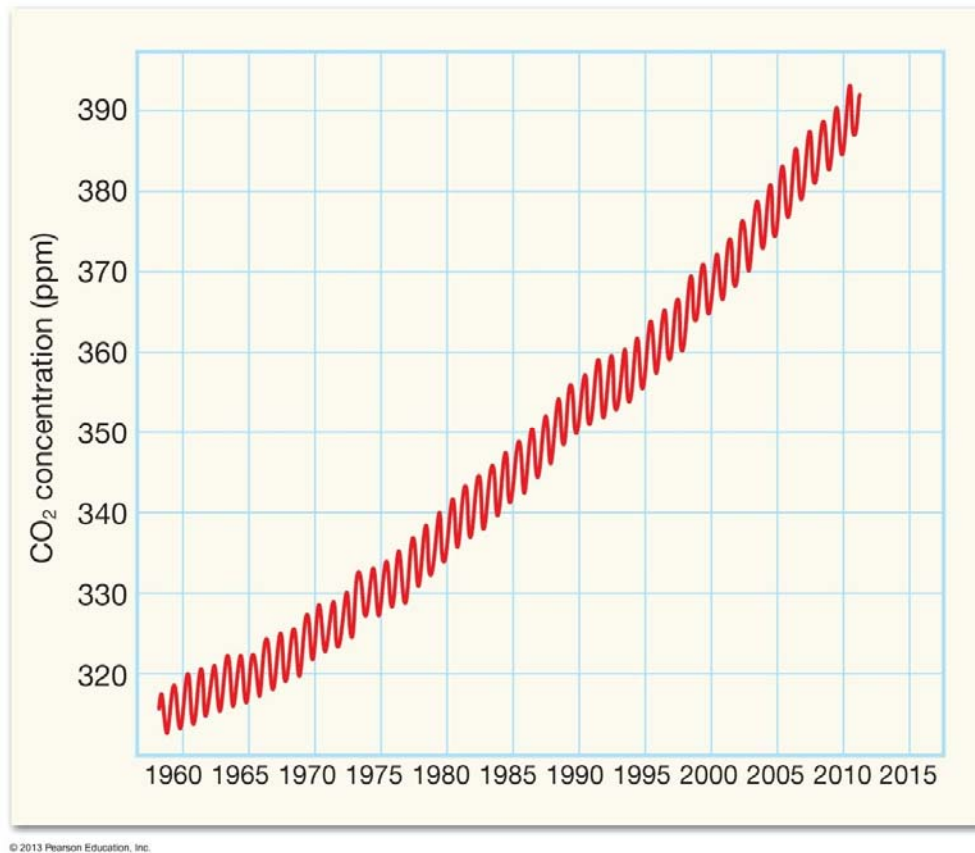
Meteorology

Chapter 1 Worksheet 2

Name: _____

Circle the letter that corresponds to the correct answer

Consider the following diagram, and then answer the question below.



- 1) According to current scientific consensus, what is the reason for the upward trend in overall CO₂ concentrations demonstrated in the graph above?
 - a) large and increasingly frequent volcanic eruptions
 - b) changes in Earth's atmosphere brought about by natural climate variation
 - c) rapidly increasing fossil fuel combustion and the resulting emissions
 - d) The causes are still unknown.
- 2) What best explains the "bumps" seen in the CO₂ concentrations on the graph above?
 - a) greater amounts of CO₂ released by the burning of fossil fuels for heat during the winter
 - b) higher levels of traffic producing more CO₂ during the summer travel season
 - c) changes in plant growth that result in less CO₂ being absorbed during the dormant season
 - d) a cyclic pattern in the eruption of volcanoes, causing more CO₂ to be released each spring

- 3) Scientists believe that a growing amount of this gas in the atmosphere will probably bring about a warming of the lower atmosphere.
- a) nitrogen
 - b) carbon dioxide
 - c) oxygen
 - d) argon
 - e) hydrogen
- 4) Which of the following is NOT a variable component of the atmosphere?
- a) water vapor
 - b) ozone
 - c) aerosols
 - d) argon
- 5) This variable atmospheric component can exist in all three states of matter (solid, liquid, and gas) at the temperatures and pressures that normally exist on Earth.
- a) nitrogen
 - b) methane
 - c) oxygen
 - d) water
 - e) ozone
- 6) Which of the following is the MOST important atmospheric component with regard to the earth's climate and the formation of weather systems?
- a) water vapor
 - b) ozone
 - c) oxygen
 - d) nitrogen
 - e) argon
- 7) The most important source of the free oxygen in our atmosphere is:
- a) green plants that carry on photosynthesis.
 - b) deforestation.
 - c) volcanic degassing.
 - d) the dissociation of water vapor in the upper atmosphere.
- 8) Water vapor represents what fraction of the air near the earth's surface?
- a) 40 - 100 percent
 - b) about 20 percent
 - c) less than 4 percent
 - d) 0 - 100 percent
 - e) about 10 percent
- 9) Photosynthesis:
- a) was prevalent during the first years of the earth's atmosphere.
 - b) releases carbon dioxide into the atmosphere.
 - c) is carried out primarily by bacteria.
 - d) releases oxygen into the atmosphere.

- 10) Which of these was NOT involved with the formation and evolution of our present atmosphere?
- a) stratification
 - b) cooling
 - c) outgassing
 - d) photosynthesis
- 11) Which one of the following gases has the greatest effect on weather?
- a) nitrogen
 - b) oxygen
 - c) argon
 - d) ozone
 - e) water vapor
- 12) Which of these is NOT a significant factor in the role played by particles or dust in the atmosphere?
- a) cloud formation
 - b) ozone production
 - c) reflection of sunlight
 - d) absorption of sunlight
- 13) The first function of water vapor in the earth's original atmosphere was to:
- a) fall as rain and thus cool the earth's surface.
 - b) create oxygen.
 - c) increase the amount of carbon dioxide in the atmosphere.
 - d) provide needed nourishment for primitive plants.
 - e) block the solar wind.
- 14) The *ozone layer* is found in the:
- a) thermosphere.
 - b) stratosphere.
 - c) troposphere.
 - d) mesosphere.
 - e) ionosphere.
- 15) Dust and aerosols in the atmosphere are associated with all of the following EXCEPT:
- a) altering the amount of oxygen in the atmosphere
 - b) optical phenomena such as red sky at sunset
 - c) reflection of solar energy
 - d) condensation and cloud formation
- 16) This atmospheric component absorbs damaging ultraviolet radiation from the Sun.
- a) neon
 - b) argon
 - c) helium
 - d) nitrogen
 - e) ozone

- 17) Studies have shown that on average ozone depletion is greatest over this area.
- a) Antarctica
 - b) Australia
 - c) Europe
 - d) the Middle East
 - e) North America
- 18) When chlorofluorocarbons (CFCs) are subjected to sunlight, _____ is released, in turn leading to the destruction of ozone molecules.
- a) chlorine
 - b) carbon
 - c) nitrogen
 - d) hydrogen
 - e) carbon dioxide
- 19) Ozone:
- a) is considered beneficial at the surface of the Earth.
 - b) protects life on Earth by filtering harmful UV radiation from sunlight.
 - c) is rapidly depleting for reasons scientists do not yet fully understand.
 - d) is concentrated in the mesosphere.
- 20) The Montreal Protocol:
- a) is generally considered a diplomatic disaster by most environmentalists.
 - b) called for a 10 percent reduction in CFC production by the end of the century.
 - c) has already created a reduction in ozone-depleting gases in the atmosphere.
 - d) was not adhered to by the United States.
 - e) was designed primarily to address the problem of global warming.
- 21) Ninety percent of our atmosphere lies below an altitude of about:
- a) 65 km.
 - b) 16 km.
 - c) 100 km.
 - d) 6 km.
 - e) 31 km.
- 22) With an *increase* in altitude, air pressure:
- a) increases at a constant rate.
 - b) increases at a decreasing rate.
 - c) decreases at a decreasing rate.
 - d) decreases at an increasing rate.
 - e) decreases at a constant rate.
- 23) Atmospheric pressure is caused by:
- a) Earth's magnetic field.
 - b) the weight of the air above.
 - c) the rotation of Earth.
 - d) solar radiation.

Circle "T" if the statement is true or "F" if the statement is false

- T F 24) The rise of atmospheric carbon dioxide levels over the last century is due primarily to the burning of fossil fuels.
- T F 25) Ozone is actually a form of the element hydrogen.
- T F 26) Ozone is continually created in our atmosphere by solar radiation.
- T F 27) At one time the earth's atmosphere contained no free oxygen.
- T F 28) Ozone is a significant atmospheric component in the greenhouse effect.
- T F 29) The depletion of stratospheric ozone is primarily a problem only in urban areas.
- T F 30) Depletion of the ozone layer leads to increased amounts of UV radiation striking the surface of the earth.
- T F 31) The largest hole in the ozone layer was observed in 1974.
- T F 32) Weather occurs in the thermosphere.
- T F 33) The stratosphere is an example of a temperature inversion.
- T F 34) The tropopause is found where the air temperature stops decreasing with height.

Answer the following questions

35) What are the two energy sources for the earth system?

36) What causes the region of warmer temperatures found in the stratosphere?