

SOLUTIONS TO THE MODULE #3 STUDY GUIDE

1. a. Atmosphere – The mass of air surrounding a planet
 - b. Atmospheric pressure - The pressure exerted by the atmosphere on all objects within it
 - c. Barometer - An instrument used to measure atmospheric pressure
 - d. Homosphere – The lower layer of earth’s atmosphere, which exists from ground level to roughly 80 kilometers (50 miles) above sea level
 - e. Heterosphere – The upper layer of earth’s atmosphere, which exists higher than roughly 80 kilometers (50 miles) above sea level
 - f. Troposphere – The region of the atmosphere that extends from ground level to roughly 11 kilometers (7 miles) above sea level
 - g. Stratosphere – The region of the atmosphere that spans altitudes of roughly 11 kilometers to 48 kilometers (30 miles)
 - h. Mesosphere – The region of the atmosphere that spans altitudes of roughly 48 kilometers to 80 kilometers (50 miles)
 - i. Jet streams – Narrow bands of high-speed winds that circle the earth, blowing from west to east
 - j. Heat – Energy that is transferred as a consequence of temperature differences
 - k. Temperature – A measure of the energy of random motion in a substance’s molecules
 - l. Thermosphere – The region of the atmosphere between altitudes of roughly 80 kilometers and 460 kilometers
 - m. Exosphere – The region of the atmosphere above an altitude of roughly 460 kilometers
 - n. Ionosphere – The region of the atmosphere between the altitudes of roughly 65 kilometers and 330 kilometers, where the gases are ionized
2. Atmospheric pressure would be greater than it is now. After all, if there were twice as many molecules in the air, the mass of air pressing down on everything in the atmosphere would be twice as high.
 3. The students used different liquids. A given volume of the liquid used by the first student weighs more than the same volume of the liquid used by the second student. Remember how a barometer works. The height of the column of liquid is determined by the amount of liquid necessary to counteract the atmospheric pressure pushing on the liquid. The heavier the liquid, the less will be necessary to achieve this effect. Thus, if a given volume of liquid used by the first student weighs more than the same volume of liquid used by the second student, the liquid in the first student’s barometer will not have to rise as high to counteract the force provided by atmospheric pressure.