

AOS 100/101  
Spring 2012

HOMework #1  
(Due Fri. February 10)

*Please provide concise, grammatically correct, neatly written answers to the following questions. All questions can be answered in, at most, a few sentences. Don't forget to write your name on the paper!!!*

**NAME:**

- 1) The Earth's atmosphere did not always contain abundant amounts of oxygen ( $O_2$ ). What significant event led to the development of the  $O_2$  reservoir? Explain how. Once the  $O_2$  was present in large amounts, ozone ( $O_3$ ) developed in trace amounts. In what profound way did the presence of  $O_3$  change the nature of life on Earth? Explain.

(10 pts)

- 2) Two balls, A and B, of identical size are placed on a lab table and shot towards one another at the same speed. After colliding with each other, B recoils farther from the point of impact than does A. Which ball has a greater density? Explain your answer.

(10 pts)

- 3) An elastic, rubber balloon is inflated inside a classroom. Once it is sealed (airtight) it is placed in a giant freezer. The atmospheric pressure is the same in the classroom and the freezer.

- (a) How does the temperature of the air *inside the balloon* change?
- (b) How does the speed of the molecules of air inside the balloon change? Explain with reference to the definition of temperature.
- (c) Is the force associated with each molecular impact on the *inside* of the balloon larger or smaller after moving the balloon to the freezer? Explain your answer.
- (d) What change to the balloon would be observed? Explain.

(15 pts)