CHAPTER 3		BLM 3.2.7
ASSESSMENT	**Atmosphere and Pressure**	

1. What is the troposphere? Find the major and minor components of the troposphere. Assume dry air conditions.

2. **(a)** List four common units of pressure.

   (b) Convert 125 kPa to atm.

   (c) Convert 743 mmHg to kPa.

   (d) Convert 550 mmHg to bar.

   (e) Convert 2.34 bar to kPa.

3. Atmospheric data is gathered at various altitudes and is presented in the following table.

Altitude (km)	Mass of 1 L sample (g)	Pressure (mmHg)	Temperature (ºC)
0	1.20	760	20
5	0.73	407	−12
10	0.41	218	−46
20	0.13	62	−53
30	0.035	18	−38
40	0.009	5.1	−18
50	0.003	1.5	2
60	0.0007	0.42	−26
80	0.00007	0.03	−87

3. cont'd.
(a) Plot temperature (in Kelvin) vs. altitude. Describe the graph shape.

(b) Plot pressure vs. altitude. Describe the graph shape.

(c) Which graph exhibits a more consistent pattern?

(d) How do pressure and mass of air change with altitude?

(e) A plane climbs to 32,000 ft. Determine the data for the pressure, temperature and mass of air present at this altitude.

(f) The atmosphere has 4 layers: troposphere, stratosphere, mesosphere, and thermosphere. Find the boundaries of these layers in km. Mark the two graphs created with these boundaries.

(g) A weather balloon rises from an altitude of 0 km to 10 km. What changes in temperature and pressure are observed? What changes would this cause in the balloon?

4. Show by substitution that pressure of a gas (P) depends upon the density of air (d), the height of the air column (h) and acceleration due to gravity (g). ($P = dgh$)
Use these equations : $\text{Force} = \text{mass} \times \text{acceleration due to gravity} \quad F = mg$

$$\text{Pressure} = \frac{\text{Force}}{\text{Area}} \quad P = \frac{F}{A}$$

$$\text{Density} = \frac{\text{mass}}{\text{volume}} \quad D = \frac{m}{V}$$

5. How could you design an experiment to determine, like Blaise Pascal, that atmospheric pressure decreases with altitude?