1. Suppose two gases in a container have a total pressure of 1.20 atm. What is the pressure of gas B if the partial pressure of gas A is 0.74 atm?

2. What is the partial pressure of water vapor in an air sample when the total pressure is 1.00 atm? The partial pressure of nitrogen is 0.79 atm, the partial pressure of oxygen is 0.20 atm, and the partial pressure of all other gases in air is 0.0044 atm.

3. What is the total pressure in a sealed flask that contains oxygen at a partial pressure of 0.41 atm and water vapor at a partial pressure of 0.58 atm?

4. Find the partial pressure of oxygen in a sealed vessel that has a total pressure of 2.6 atm and also contains carbon dioxide at 1.3 atm and helium at 0.22 atm.

5. Determine the partial pressure of each gas as shown in the figure to the right. Note: The relative numbers of each type of gas are depicted in the figure.

6. A mixture of 1.00 g of hydrogen and 1.00 g of helium is placed in a 1.00-L container at 27°C. Calculate the partial pressure of each gas and the total pressure.

7. A sample of air contains only nitrogen and oxygen gases whose partial pressures are 0.80 atm and 0.20 atm, respectively. Calculate the total pressure and the mole fractions of the gases.

8. A mixture of gases contains 0.31 mol $CH_4$, 0.25 mol $C_2H_6$, and 0.29 $C_3H_8$. The total pressure is 1.50 atm. Calculate the partial pressures of the gases.

9. The partial pressure of methane gas, $CH_4(g)$, is 0.175 atm and that of oxygen gas is 0.250 atm in a mixture of the two gases.
   a. What is the mole fraction of each gas in the mixture?
   b. If the mixture occupies a volume of 10.5 L at 65°C, calculate the total number of moles of gas in the mixture.
   c. Calculate the number of grams of each gas in the mixture.

10. Consider the three flasks in the diagram to the right. Assuming the connecting tubes have negligible volume, what is the partial pressure of each gas and the total pressure after all the stopcocks are opened in torr? Assume volume is additive. Hint: Recall Boyle’s Law before applying Dalton’s Law.
11. A tank contains a mixture of 52.5 g oxygen gas and 65.1 g carbon dioxide gas at 27°C. The total pressure in the tank is 9.21 atm. Calculate the partial pressures of each gas in the container.

12. Helium is collected over water at 25°C and 1.00 atm total pressure. What total volume of gas must be collected to obtain 0.586 g helium? (At 25°C the vapor pressure of water is 23.8 torr.)

13. A mixture of helium and neon gases is collected over water at 28.0°C and 745 mmHg. If the partial pressure of helium is 368 mmHg, what is the partial pressure of neon? (Vapor pressure of water at 28°C = 28.3 mmHg.)

14. A sample of ammonia ($NH_3$) gas is completely decomposed to nitrogen and hydrogen gases over heated iron wool. If the total pressure is 866 mmHg, calculate the partial pressures of nitrogen and hydrogen.

15. Consider the three gas containers shown in the diagram below. All of them have the same volume and are at the same temperature.
   a. Which container has the smallest mole fraction of gas A (blue sphere)?
   b. Which container has the highest partial pressure of gas B (green sphere)?

16. The volume of the box on the right is twice that of the box on the left. The boxes contain helium atoms (red) and hydrogen molecules (green) at the same temperature.
   a. Which box has a higher total pressure?
   b. Which box has a lower partial pressure of helium?