

Review - Section 2A

Answer every question. For the questions that require math, show your work.

1) As you fly up into the air in a plane, the air pressure decreases. Explain, in terms of Boyle's law, what would happen to a balloon if you fly in a plane from the ground to the clouds, and from the clouds down to the ground.

As you go up to the clouds, the pressure will decrease and the volume of the balloon will increase. As you go back to the ground, the pressure will increase and the volume of the balloon will decrease.

2) What would happen if you completely inflated a balloon in a warm store and then took outside on a cold day. Answer in terms of pressure and temperature.

As the temperature went down, the balloon would shrink in volume. The particles would move more slowly, not hit the walls as often, and the balloon would collapse.

3) Explain why the pop can "crunched" in the lab in the beginning of the chapter. Remember, you boiled a little water inside the can and then transferred it immediately to a bucket of ice water.

As the steam (water as a gas) in the can cooled, the particles started moving more slowly. The gas did not push on the inside of the can as hard, and the volume decreased.

4) A sample of neon occupies a volume of 420 mL at 25.0 °C. What will be the volume of the neon when the temperature is lowered to -14.0 °C. Assume the pressure and number of moles is held constant.

365 mL

5) A cylinder with a movable piston contains 4.30 liters of air at a pressure of 1.1 atm. A change to what volume will result in a pressure of 0.55 atm in the cylinder? Assume constant temperature.

8.6 L

6) If the pressure in a 4.36 liters container of oxygen is 0.92 atm, what would the pressure be on the same mass of oxygen in a 3.20 liter container? Assume constant temperature.

1.25 atm

7) A gas occupies a volume of 215 mL at 220. K. What volume will it occupy at 320 K? Assume constant pressure.

313 mL

8) A 2.5 liter sample of sulfur hexafluoride gas is originally produced at 32.0 °C and 4 atm. What volume will it have at 2 atmospheres and 27 °C?

4.9 atm

9) A gas is at a temperature of 65 °C and a volume of 0.75 L. What will be the volume of the gas if it is cooled 15 °C? Assume constant pressure.

0.64 L

10) A sample of gas in a 5.0 L container has a temperature of 12 °C. If the volume of the gas is decreased to a 4.0 liter space, what will be the new temperature?

228 K or -45 °C

11) A sample of methane gas (CH₄) was placed in a 30.0 L container at 273K and 1 atm (STP). Calculate its new pressure if the temperature is reduced to 250 K and the volume goes down to 17.0 L.

1.6 atm







12) A rigid gas cylinder with a volume of 49 liters is filled with propane gas at 31 °C and has a pressure of 6.0 atmospheres. If the gas were released to STP conditions, what would the new volume be?

264 L

13) A gas is trapped in a balloon at 15 °F. What is that temperature in Celsius and in Kelvin?

-9.4 °C and 263.6 K

14) Fill in the chart below that shows the relationships between properties of the gases:

Property 1	Change	Property 2	Change	Relationship
Pressure		Volume		Inverse (indirect)
Pressure		Temperature		Direct
Volume		Temperature		Direct