

- 5) Some students believe that teachers are full of hot air. If I inhale 2.2 liters of gas at a temperature of 18°C and it heats to a temperature of 38°C in my lungs, what is the new volume of the gas?

$$V_1 = 2.2\text{L}$$

$$T_1 = 291\text{K}$$

$$V_2 = ?$$

$$T_2 = 311\text{K}$$

$$\frac{2.2\text{L}}{291\text{K}} = \frac{V_2}{311\text{K}}$$

$$\text{S.F.} = 2.4$$

$$= 2.35\text{L}$$

- 6) How hot will a 2.3 L balloon have to get to expand to a volume of 400 L? Assume that the initial temperature of the balloon is 25°C .

$$V_1 = 2.3\text{L}$$

$$T_1 = 298\text{K}$$

$$V_2 = 400\text{L}$$

$$T_2 = ?$$

$$\frac{2.3\text{L}}{298\text{K}} = \frac{400\text{L}}{T_2}$$

$$= 51826.09\text{K}$$

$$T_2 = \frac{(400\text{L})(298\text{K})}{2.3\text{L}}$$

- 7) I have made a thermometer which measures temperature by the compressing and expanding of gas in a piston. I have measured that at 100°C the volume of the piston is 20 L. What is the temperature outside if the piston has a volume of 15 L? What would be appropriate clothing for the weather?

$$V_1 = 20\text{L}$$

$$T_1 = 373\text{K}$$

$$V_2 = 15\text{L}$$

$$T_2 = ?$$

$$\frac{(15\text{L})(373\text{K})}{20\text{L}} =$$

$$\text{S.F.} = 280\text{K}$$

$$= 279.75\text{K}$$

$$20\text{L}$$

Cold

$$\frac{V_1}{T_1} = \frac{V_2}{T_2}$$