

~~Charles' Law Worksheet~~
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$\frac{V_1}{T_1} = \frac{V_2}{T_2}$ Key

- 1) The temperature inside my refrigerator is about 4° Celsius. If I place a balloon in my fridge that initially has a temperature of 22° C and a volume of 0.5 liters, what will be the volume of the balloon when it is fully cooled by my refrigerator?

$V_1 = 0.5L$
 $T_1 = 295K$
 $V_2 = ?$
 $T_2 = 277K$

$$\frac{(0.5L)(277K)}{295K} = 0.47L$$

- 2) A man heats a balloon in the oven. If the balloon initially has a volume of 0.4 liters and a temperature of 20° C, what will the volume of the balloon be after he heats it to a temperature of 250° C?

$V_1 = 0.4L$
 $T_1 = 293K$
 $V_2 = ?$
 $T_2 = 523K$

$$\frac{(0.4L)(523K)}{293K} = 0.71L$$

- 3) On hot days, you may have noticed that potato chip bags seem to "inflate", even though they have not been opened. If I have a 250 mL bag at a temperature of 19° C, and I leave it in my car which has a temperature of 60° C, what will the new volume of the bag be?

$V_1 = 250mL$
 $T_1 = 292K$
 $V_2 = ?$
 $T_2 = 333K$

$$\frac{(250mL)(333K)}{292K} = 285.10mL$$

285.10 mL

- 4) A soda bottle is flexible enough that the volume of the bottle can change even without opening it. If you have an empty soda bottle (volume of 2 L) at room temperature (25° C), what will the new volume be if you put it in your freezer (-4° C)?

$V_1 = 2L$
 $T_1 = 298K$
 $V_2 = ?$
 $T_2 = 269K$

$$\frac{(2L)(269K)}{298K} = 1.81L$$