

Name: \_\_\_\_\_

## Gas Law Problems

If I have 5.6 liters of gas in a piston at a pressure of 1.5 atm and compress the gas until its volume is 4.8 L, what will the new pressure inside the piston be?

If a gas in a closed container is pressurized from 15.0 atmospheres to 16.0 atmospheres and its original temperature was 25.0 °C, what would the final temperature of the gas be?

I added 15 L of air to a balloon at sea level (1.0 atm). If I take the balloon with me to Denver, where the air pressure is 0.85 atm, what will the new volume of the balloon be?

A small research submarine with a volume of  $1.2 \times 10^5$  L has an internal pressure of 1.0 atm and an internal temperature of 15°C. If the submarine descends to a depth where the pressure is 150 atm and the temperature is 3°C, what will the volume of the gas inside be if the hull of the submarine breaks?

People who are angry sometimes say that they feel as if they'll explode. If a calm person with a lung capacity of 3.5 liters and a body temperature of 36°C gets angry, what will the volume of the person's lungs be if their temperature rises to 39°C. Based on this, do you think it's likely they will explode?

If I initially have 4.0 L of a gas at a pressure of 1.1 atm, what will the volume be if I increase the pressure to 3.4 atm?

## Ideal Gas Law Practice Worksheet

*Solve the following problems using the ideal gas law:*

- 1) How many moles of gas does it take to occupy 120 liters at a pressure of 2.3 atmospheres and a temperature of 340 K?
  
  
  
  
  
  
  
  
  
  
- 2) If I have a 50 liter container that holds 45 moles of gas at a temperature of 200<sup>0</sup> C, what is the pressure inside the container?
  
  
  
  
  
  
  
  
  
  
- 3) It is not safe to put aerosol canisters in a campfire, because the pressure inside the canisters gets very high and they can explode. If I have a 1.0 liter canister that holds 2 moles of gas, and the campfire temperature is 1400<sup>0</sup> C, what is the pressure inside the canister?
  
  
  
  
  
  
  
  
  
  
- 4) How many moles of gas are in a 30 liter scuba canister if the temperature of the canister is 300 K and the pressure is 200 atmospheres?
  
  
  
  
  
  
  
  
  
  
- 5) I have a balloon that can hold 100 liters of air. If I blow up this balloon with 3 moles of oxygen gas at a pressure of 1 atmosphere, what is the temperature of the balloon?