

>> Diane Jewell: A gas at 250 degrees C exerts 7.7 atmosphere pressure. What pressure will it exert at 120 degrees C? Now we're working with temperature, pressure, temperature again, and pressure. Okay, so let's go ahead and label these. This would be a temperature in the first situation, pressure in the first situation. Now a change occurs, so that there's going to be a second pressure resulting from a second temperature. Okay, so, we have two situations, and we're comparing temperature with pressure. That's Gay-Lussac's law. Gay-Lussac says that pressure one divided by temperature one equals pressure two divided by temperature two. In other words, as pressure goes up, temperature is going to go up. As pressure goes down, temperature goes down, or vice-versa. As temperature goes up, pressure goes up. Temperature goes down, pressure goes down. So, let's take a look at what we have. We have our temperature one is 250. Remember we have to turn that into kelvin because this is gas laws. So, we add the 273, makes it into 523 kelvin. Same with temperature two. We add the 120 with the 273 gives us 393 kelvin for our second temperature. So, now let's go ahead and work with our Gay-Lussac's law. We are trying to find the answer for what is the second pressure. Here's a second pressure right here. We need to get rid of this guy right here. We've got to get rid of temperature. So, we're going to – whereas here we're dividing by temperature two, here we're going to multiply both sides by temperature two, so that we can eliminate temperature two from the left-hand side of our equation. This leaves us now with pressure one equals pressure one times temperature two divided by your temperature one. Now we have our equation to plug numbers into. Pressure one was the 7.7 atmosphere. Temperature to down below is 393 kelvin, and our first temperature 523 kelvin. So, let's go ahead and cancel out kelvin. Our answer ends up being in units of atmosphere, and we have 5.8 atmosphere being the new pressure when the temperature is decreased. Okay, does this make sense now? Temperature decreases from 250 down to 120. We would then expect the atmospheres, the pressure and atmospheres, to decrease also. So, if we start at 7.7, it should get smaller, and it did.