Name _____ Date _____ Period _____

ZornScience
zornscience.org

Gas Laws and KMT Lab Check

AP Chemistry

Open the Gas Laws and KMT Lab and open **Lab check**. For each question, press **Set up the lab**, make the change yourself, and answer in the lab. Record your readings and explanations here.

1. **Squeeze the gas.** Set up 1.00 mol N_2 at 300 K in 10.0 L with temperature held. Record the gas law pressure. Then move the volume to 5.0 L and record the new pressure. Explain the change using particle collisions.

2. **Find absolute zero.** Open Graphs, choose V vs T, press Run sweep, and turn on the °C axis. At what temperature does the dashed line reach zero volume? Explain why gas law calculations use kelvins.

3. **Light and heavy particles.** In the Speeds tab, compare He and Ar at 300 K. Record each average speed. How do their average kinetic energies compare? Show that the speed ratio is about the square root of the mass ratio.

4. **Share the pressure.** Set up a mixture of 1.00 mol He, 0.50 mol Ar and 0.50 mol Kr at 300 K in 10.0 L. Record the total pressure and the partial pressure of helium. Show the partial pressure with the mole fraction.

5. **When helium is not ideal.** Choose Real gas. Set up 1.00 mol He at 300 K in 2.50 L with temperature held, then squeeze it to 0.25 L. Record PV/nRT. Is it above or below 1? Which part of PV/nRT grew, and why?

Completion code: **Score:** of 5 on the first try

CC BY-NC-SA 4.0 | zornscience.org