You should have seen that as you compressed the container, the temperature increased faster than linearly as volume decreased. Adiabatic expansion and compression can be described by the equation P1V1^k = P2V2^k with k=Cp/Cv. From that equation, solve for T2 with P1 and V1 as your initial state. Graph it. Does this fit what you saw?\n

So, did you figure out why the collisions with a moving wall cause a temperature change?\n

Why is the temperature change nonlinear? Think about how the number of molecules hitting the moving wall changes as pressure increases.\n

If you compress and expand the container a few times, you’ll notice that the temperature starts to creep up. Why does it do that? Related: Is this expansion/compression reversible?\n