**Predict-Observe-Explain: Dalton’s Law of Partial Pressures**

<https://phet.colorado.edu/sims/html/gas-properties/latest/gas-properties_all.html>

**Predict:** Fifty heavy particles have been added to the container. How will the pressure change when I add 50 more heavy particles to the container? Note the initial pressure of the gas in the container.

**Observe:** What happened when 50 more heavy particles were added to the container?

**Explain:** Why did the pressure change in the way you described after the particle addition?

**Predict:** Fifty heavy particles have been added to the container. How will the pressure change when I add 50 light particles to the container? Note the initial pressure of the gas in the container.

**Observe:** What happened when 50 light particles were added to the container?

**Explain:** Why did the pressure change in the way you described after the particle addition? Did the pressure change in a different way than it did when the number of heavy particles doubled? Does the total pressure of a gas mixture depend on the identity of the ideal gas?

**Extend:** 1. Calculate the mole fraction (χ) of each substance in the mixture. Show all your work. Then, use the mole fraction and the total pressure from the pressure gauge to calculate the partial pressure of each substance in the mixture.

2. Using the number of particles and the total pressure in the simulation after I have changed the number of particles, calculate the mole fraction of each substance, then calculate the partial pressure for each substance in the mixture.