This project illustrates the ideal gas law by producing a surface plot showing the volume as the pressure and temperature each vary through a range of values. The ideal gas law is given by:

$$PV = nRT$$

where $P$ is the pressure of the gas in kilopascals (kPa), $V$ is the volume of the gas in liters (L), $n$ is the number of molecules of the gas in units of moles (mol), $R$ is the universal gas constant (8.314 L*kPa/mol*K), and $T$ is the absolute temperature in kelvins (K).

Assuming a sample of an ideal gas contains 1 mol of molecules at a temperature of 273 K, this script varies its pressure from 1 to 101 kPa in steps of 2 kPa and varies its temperature from 270 to 320 K in 50 increments. The script calculates all of the possible values showing the relationship in a surface plot.

An ideal gas is one in which all collisions between molecules are perfectly elastic. Such a gas can be characterized by three quantities: absolute pressure ($P$), volume ($V$), and absolute temperature ($T$). The relationship among these quantities in an ideal gas is known as the ideal gas law: $PV = nRT$. Assuming that a sample of an ideal gas contains 1 mol of molecules at a temperature of 273 K, this script varies its pressure from 1 to 101 kPa in steps of 2 kPa and varies its temperature from 270 to 320 K in 50 increments. The script calculates all of the possible values and shows the relationship in a surface plot.