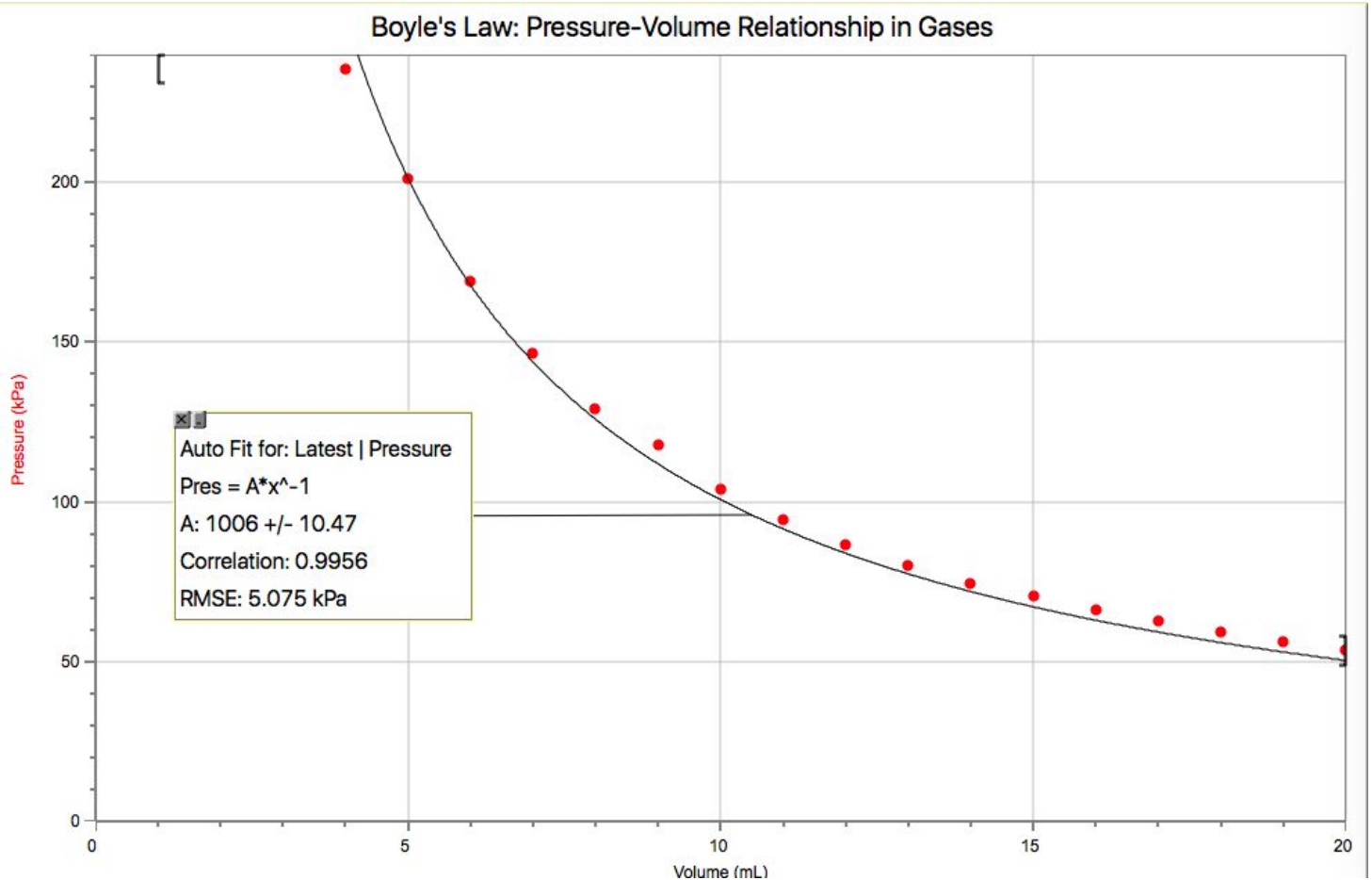
Gas Laws

Mr. Quinton

Lab

- P vs V
- Curve
- Inverse
- P = k (1/V)



Summarize Gas Relationships

Pressure	Volume	P = k (1/V)	Boyle
Pressure	Temperature	P = kT	Gay-Lussac
Volume	Temperature	V = kT	Charles
Volume	Amount	V = kn	Avogadro

Can We Combine?

Mini Activity... varying P-V-T-AMT and investigating the impact on the others

“Sliders”

Trial	P	V	T	AMT	Note
1			-	-	Boyle
2	-			-	Charles
3	-		-		Avogadro
4		-		-	Gay-Lussac

Combined Gas Law Use

$$\frac{P_1 V_1}{T_1} = \frac{P_2 V_2}{T_2}$$

Word About Units

- Pressure - can be any (must be consistent)
- Volume - can be any (must be consistent)
- Temperature - can be....

Temperature

- Must be positive number
- New temperature scale = Kelvin
- 1 K = 1° C increment
- Absolute: Temp (K) = T (°C) + 273

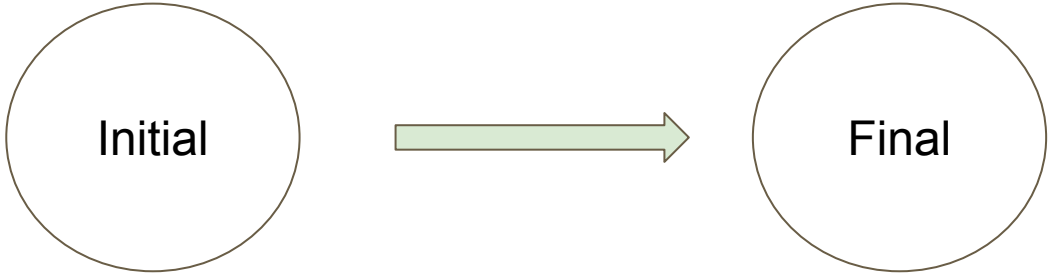
Examples

- -10°C + 273 = 263K
- 22°C + 273 = 292 K

Problem Example

A balloon filled with Helium occupies a volume of 2.5 liters. It is initially at a temperature of -14°C and the gas has a pressure of 2.4 atm. The balloon is heated to a temperature of 34° and has a new volume of 4.1 liters. Determine the new pressure of the helium gas.

Solution



P1	2.4 atm	P2	?
V1	2.5 L	V2	4.1 L
T1	-14°C	T2	34°C