**IB chemistry: gas laws simulations**

**Boyle’s Law**

Use simulation: <http://group.chem.iastate.edu/Greenbowe/sections/projectfolder/flashfiles/gaslaw/boyles_law_graph.html>

* The relationship between which two properties is being investigated?
* Which property is the independent variable? What is its unit? What is its SI unit?
* What is the unit of the dependent variable? What is the SI unit? What is the conversion?
* Which variables are kept constant?
* Select ‘air’ as the gas.
* Collect at least 5 data points.
* Plot the graph and describe the relationship shown – select P vs V.
* What shape is the line of best fit?
* On the graph select 1/P vs V. Describe the shape of the line of best fit and the relationship it shows.
* Write this relationship in a mathematical way.
* What is the uncertainty of both measuring instruments? Comment on the correspondence between the random uncertainty and the precision of the data.
* Repeat the experiment with the other 3 gases. Does the nature of the gas matter?

**Charles’s Law**

Use the simulation:

<http://group.chem.iastate.edu/Greenbowe/sections/projectfolder/flashfiles/gaslaw/charles_law.html>

* Click on ‘show data table’ if not shown and click on ‘show plot”.
* What relationship is being investigated?
* Which property is the independent variable? What is its SI unit?
* What is the unit of the dependent variable? What is the SI unit? What is the conversion?
* Which variables are kept constant?
* Collect at least 5 data points.
* What shape is the line of best fit on the plot?
* Write the relationship shown by this plot in a mathematical way.
* Does the nature of the gas matter?
* What is the uncertainty of both measuring instruments? Comment on the correspondence between the random uncertainty and the precision of the data.

Summary: State both laws.