



40 Years of Inspiring, Educating, Connecting.

## Technology Integration Workshop 2016

**Unit Title: Gas Laws**

**Grade Level: 10-12**

**Subject Area: Chemistry**

**Duration/Length/Number of class periods: 15 class periods**

**Description:**

The characteristics of gases can be explained through temperature, pressure, volume and number of moles.

**Established Goals (National, State, Local):**

9.1.1.1.2

Understand that scientists conduct investigations for a variety of reasons, including: to discover new aspects of the natural world, to explain observed phenomena, to test the conclusions of prior investigations, or to test the

9.1.1.2.1

Formulate a testable hypothesis, design and conduct an experiment to test the hypothesis, analyze the data, consider alternative explanations, and draw conclusions supported by evidence from the investigation.

9.1.3.4.6

Analyze the strengths and limitations of physical, conceptual, mathematical and computer models used by scientists and engineers.

**What Enduring Understandings are desired?**

Students can create a diagram of the different states of matter and how the changes of state of matter related.

Students can connect the movement of particles to the states of matter.

Changes of states of matter are related to properties of matter.

**What Essential Questions will be considered?**

How are physical properties (temperature, volume, pressure, number of particles) are related?

**Students will know / be able to:**

Students will be able to design a simple demo to show the effect of change in volume, temperature or pressure affects the other as a

result will be know the relationship between the different parameters.  
 Students will be able to explain/ demonstrate gas laws or show graphically the different gas laws.  
 Students will use their knowledge of gas laws to solve real life problems.

Description	<i>Units must include at least one of each formative, summative, introductory activity and learning activity. Check the appropriate box; one per row.</i>	Fo rm ati ve	Su m ma tiv e	Intr odu ctor y Acti vity	Lea rnin g Acti vity	Stu dent Tec hno logy Use d	Teac her Tech nolog y Used	IST  E Stan dards
<b>Lesson starter on general properties of gases, students will be given pretest on google form</b>		X		x		X	x	<b>3a</b>
Lesson on gas laws, practice worksheets on google doc.		X		X	X	X	x	<b>2d, 4c</b>
<b>Gas laws Simulation</b> <a href="https://phet.colorado.edu/en/contributions/view/">https://phet.colorado.edu/en/contributions/view/</a>			X			X	X	<b>1c</b>
<b>Gas Laws Labs</b> <a href="http://www.flinnsci.com/teacher-resources/teacher-resource-videos/best-practices-for-teaching-chemistry/gas-law">www.flinnsci.com/teacher-resources/teacher-resource-videos/best-practices-for-teaching-chemistry/gas-law</a>			X				X	<b>3d, 4c</b>

**Materials, tools and resources: Classroom textbook, computer Lab for Atomsmith software and ipad**

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**Additional credit given to**