**Lesson plan**

**Course:** **SCH 3U**

**Unit:** Gases and Atmospheric Chemistry

**Topic:** Review

**Lesson:** Lesson 9

**Grade and Level:** Grade 11 University

**Date:**

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| **Description of Topic:** Today the students will review the unit  |

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| **Learning Expectations** |
| **Overall Expectations:**F1. analyse the cumulative effects of human activities and technologies on air quality, and describe some Canadian initiatives to reduce air pollution, including ways to reduce their own carbon footprint;F2. investigate gas laws that explain the behaviour of gases, and solve related problems;F3. demonstrate an understanding of the laws that explain the behaviour of gases. |
| **Specific Expectations:** |

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| **Teacher Resources:** LaptopLCD ProjectorChalk, chalk board,  | **Student Resources:**Pen, pencilCalculatorText book |

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| **Teaching / Learning Strategies** |
| -Note taking, problem solving,  |

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| **Steps: (sequence, time lines, teacher/ student roles)**  |
| 1. Review
2. Questions
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| **Accommodations / Modifications**  |
| -The students will be given an assisted note -The lesson will be done on power point.- The note will be posted on mrhoover.weebly.com |

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| **Assessment & Evaluation** |
| * The students questions will be checked for completion.
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**Questions:**  Page

**SCH3U: U5-L9 Date:**

**Unit 5 Gases and Atmospheric Chemistry: Review**

**Key Ideas**

* States of matter
	+ Forces
	+ Kinetic molecular theory
* Boyles law
	+ Pressure and volume
* Charles Law
	+ Temperature and volume
	+ Kelvin
* Pressure temperature law
	+ Pressure and temperature
* Combined gas law – can replace all three above
	+ Pressure, volume, and temperature
	+ Understand the relationships between temperature, pressure and volume.
* Idea gas Law
	+ (These assumptions are not true in all cases especially with extreme temperatures and pressures. When we make calculations we pretend that it is a perfect world situation)
	+ Volume-temperature and pressure temperature graphs are perfectly straight lines.
	+ Gas does not condense to a liquid when it cools
	+ Gas volume = 0 at absolute zero
	+ pv = nRT
	+ Gas particles have no volume
	+ Gas particles do not attract each other
* Law of combining values
	+ When measured at the same temperature and pressure, volumes of gaseous reactants and products of chemical reactions are always in simple ratios of whole numbers
* Avogadro’s theory
	+ Equal volumes of gases at the same temperature and pressure contain equal numbers of molecules
* Molar volume
	+ The volume that one mole of a gas occupies at a specified pressure and temperature.
		- VSTP = 22.4 L/mol VSATP = 24.8 L/mol

**Terms**

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| --- | --- |
| * Absolute zero
* Atmospheric pressure
* Boyle’s law
* Charles’ Law
* Combined gas law
* Combined gas law
* Gas constant
* Ideal gas
 | * Ideal gas law
* Kelvin temperature scale
* Kinetic molecular theory
* Pressure
* Pressure and temperature law
* Molar volume
* Partial pressure
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**Formulas**

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| --- | --- | --- |
| **Type** | **Formula** | **Units** |
| Boyle’s Law | P1V1 =P2V2 | Pressure = kPa, mm Hg, atm |
| **Kelvin temperature** | TK=  tc  +  273.15   tc  =  TK  -  273.15 | K or °C |
| **Charles Law** | V1T2= V2T1  | Temperature = KVolume = L |
| **Pressure and Temperature Law** | $$\frac{p\_{1}}{T\_{1}}=\frac{p\_{2}}{T\_{2}}$$ | Pressure = kPa, mm Hg, atmVolume = L |
| Combined gas law | $$\frac{p\_{1}v\_{1}}{T\_{1}}= \frac{p\_{2}v\_{2}}{T\_{2}}$$ | Pressure = kPa, mm Hg, atmVolume = LTemperature = K |
| Ideal Gas law | $$PV=nRT$$R = **8.3143510  kPa L/mol K**  |  |
| Dalton’s Law | **Ptotal = P1 + P2 + P3 +...** | Kpa |
| Molar Volume of gas | $$n=\frac{v}{V}$$ | V = STP = 22.4 mol/L V = SATP = 24.8 mol/L |
| Pressure conversions | mm Hg to kPagiven $mm Hg x\frac{101.325kPa}{760mmHg}$kPa to mm Hg$$given kPa x\frac{760 mm Hg}{101.325 kPa}$$ | 1 atm = 101.325kPa1 atm = 760 mm Hg |

**Questions**

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