**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:**  Laptop  LCD Projector  Chalk, chalk board, | **Student Resources:**  Pen, pencil  Calculator  Text 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. |

**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 |

**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 = K  Volume = L |
| **Pressure and Temperature Law** |  | Pressure = kPa, mm Hg, atm  Volume = L |
| Combined gas law |  | Pressure = kPa, mm Hg, atm  Volume = L  Temperature = K |
| Ideal Gas law | R = **8.3143510  kPa L/mol K** |  |
| Dalton’s Law | **Ptotal = P1 + P2 + P3 +...** | Kpa |
| Molar Volume of gas |  | V = STP = 22.4 mol/L  V = SATP = 24.8 mol/L |
| Pressure conversions | mm Hg to kPa  given  kPa to mm Hg | 1 atm = 101.325kPa  1 atm = 760 mm Hg |

**Questions**

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