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| **Item** | **Significant gaps** | **Some guessing** | **Great command** |
| **Week 1** |  |  |  |
| Describe where metals & nonmetals appear in the Periodic Table, and name the kinds of elements that combine to make covalent compounds and salts |  |  |  |
| Identify which of these is Rutherford’s view of atoms, and explain the main features |  |  |  |
| Identify which of these is Schrödinger’s modification of Rutherford’s view, and explain the main differences |  |  |  |
| State the number of protons, neutrons, and electrons for an oxygen atom having zero net charge and a mass number of 18 |  |  |  |
| **Week 2** |  |  |  |
| Sketch how the temperature of the atmosphere changes as you go up in a balloon through the troposphere and stratosphere. |  |  |  |
| Name the top two most abundant gases in Earth's atmosphere, and their approximate percentages |  |  |  |
| The concentration of argon in air is approximately 0.93%. Converting to ppm, this would be ... |  |  |  |
| Indicate a region of Earth where you’d expect less-than-average concentrations of CO2, and another region where you’d expect greater-than-average concentrations |  |  |  |
| Give chemical names of two of these hydrocarbons |  |  |  |
| Calculate the approximate molecular weight of H2O, and specify the units of your answer |  |  |  |
| What’s the next stoichiometric coefficient you’d be tempted to find in the following chemical equation? |  |  |  |
| **Week 3** |  |  |  |
| Suppose the height (*h*) of a mercury barometer is 77 cm. What’s the pressure in atm? |  |  |  |
| In a spreadsheet, show how to enter the number 6.02×1023 in a spreadsheet using the “E” notation method |  |  |  |
| Use a spreadsheet to compute the number of moles in a 350-mL container at ordinary temperature and pressure |  |  |  |
| State the charges you’d expect on each of the following ions |  |  |  |
| Write the chemical formulas for the following salts |  |  |  |
| Using Spartan, construct and interpret an electrostatic potential map of H2O |  |  |  |
| **Week 4** |  |  |  |
| Write the electron configuration of Beryllium (Be) |  |  |  |
| Write the electron configuration of Boron (B) |  |  |  |
| Write the electron configuration of Carbon (C) |  |  |  |
| Use Spartan to determine if a visible photon is likely to be emitted by Na+ after it is excited to 1s22s22p53p1 |  |  |  |