Timing	Unit 로 Topics Covered	Labs and Activities	Materials Needed
2.5 weeks	Introduction to Chemistry Safety & Nature of Science • Types of lab equipment • Safety equipment in the chemistry classroom • Scientific processes • Experimental design Measurement • Metric units & conversions • Scientific notation • Dimensional analysis • Accuracy v. precision • Significant figures • Graphing Law v. Theory • Scientific processes & peer review	<ul> <li>Nature of Science Demonstrations</li> <li>Lab Equipment Scavenger Hunt</li> <li>Safety Equipment Map</li> <li>Bubble Experimental Design Lab</li> <li>Measuring Lab Stations</li> <li>Dimensional Analysis Lab</li> <li>Accuracy v. Precision Lab</li> <li>Mass and Volume Lab</li> </ul>	<ul> <li>Small whiteboards</li> <li>Erasable whiteboard markers</li> <li>2 candles</li> <li>Several beakers- small, medium, and large</li> <li>2 latex balloons</li> <li>Water</li> <li>2 empty soda cans</li> <li>Straw</li> <li>Index card</li> <li>100 g of zinc filings</li> <li>20 mL of sodium hydroxide (NaOH)</li> <li>Hot plate</li> <li>Tongs</li> <li>Pre-1982 penny</li> <li>Various pieces of lab equipment</li> <li>Various pieces of safety equipment in the room</li> <li>Bucket or large beaker</li> <li>Graduated cylinders (preferably plastic)</li> <li>Straws</li> <li>Water</li> <li>Liquid dish soap (not ultra concentrated)</li> <li>Corn syrup</li> <li>Plastic spoons or stirring rods</li> <li>Metric rulers</li> <li>Electronic balance</li> <li>Triple or quadruple beam balance</li> <li>Small rock</li> <li>Thermometer</li> <li>Food coloring (optional)</li> <li>Marble</li> <li>Textbook (or other large rectangular object)</li> <li>Meter sticks</li> <li>Pennies</li> <li>Stopwatch (or phone)</li> <li>Markers</li> <li>Notebook paper or scrap paper</li> <li>Set of metal cylinders (honors only)</li> </ul>

Timing	Unit 로 Topics Covered	Labs and Activities	Materials Needed
2 weeks	Matter Properties of Matter • States of matter • Intensive v. extensive properties Classification of Matter • Pure substances • Mixtures Conservation of Mass • Physical v. chemical changes	<ul> <li>Observing Matter Demo</li> <li>Aluminum's Intensive Properties Lab</li> <li>Separation of a Mixture Lab</li> <li>Conservation of Mass Stations</li> </ul>	<ul> <li>Small bag of flour</li> <li>Small bag of sugar</li> <li>Salt (NaCl from grocery store or chemical supply cabinet)</li> <li>1-2 boxes baking soda (NaHCO<sub>3</sub>)</li> <li>Aluminum foil</li> <li>Vinegar</li> <li>Droppers or pipettes</li> <li>Hot plate</li> <li>Beaker tongs (or heat-resistant safety gloves)</li> <li>Electronic balances</li> <li>Graduated cylinders- 100 mL (preferably plastic)</li> <li>Metric rulers</li> <li>Small beakers</li> <li>Set of metal cylinders (from last unit) or aluminum BBs</li> <li>Water</li> <li>Small amount of sand</li> <li>Small amount of ron filings</li> <li>Seeds or popcorn kernels</li> <li>Plastic zipper bags</li> <li>Weigh boats</li> <li>Spoon or scoopula</li> <li>Distilled water</li> <li>Funnel</li> <li>Magnets</li> <li>Beaker tongs</li> <li>Filter paper</li> <li>Extra fine grade (0000) steel wool</li> <li>Small glass vials or clear film canisters</li> <li>Ice</li> <li>1.0 M NaCO<sub>3</sub> solution</li> <li>1.0 MgSO<sub>4</sub></li> <li>Bunsen burner or small butane burner</li> <li>Evaporating dish</li> <li>Crucible tongs</li> <li>Alka-seltzer tablets</li> </ul>

Timing	Unit & Topics Covered	Labs and Activities	Materials Needed
3.5 weeks	<ul> <li>Atomic Structure</li> <li>History of the Atomic Theory</li> <li>Democritus, Dalton, Thomson, Rutherford, Bohr, Schrodinger</li> <li>Subatomic Particles</li> <li>Subatomic charges</li> <li>Structure of the atom</li> <li>Isotopes</li> <li>Radioactive decay (alpha, beta, gamma)</li> <li>Mass spectrometry</li> <li>Electrons</li> <li>Bohr energy Levels</li> <li>Valence electrons</li> <li>Electromagnetic spectrum</li> <li>Quantum Theory</li> </ul>	<ul> <li>Atomic Theory Timeline Project</li> <li>Discovering Charges Lab</li> <li>Bean Isotopes Lab</li> <li>Modeling a Bohr Atom</li> <li>Flame Test Lab</li> <li>Electron Configuration Dominoes</li> </ul>	<ul> <li>Markers (optional)</li> <li>Posterboard (optional)</li> <li>Scotch<sup>™</sup> tape</li> <li>Balloons</li> <li>Dried red beans</li> <li>Dried white beans</li> <li>Dried black beans</li> <li>Clear plastic cups or bags</li> <li>12 g sodium chloride (NaCl)</li> <li>9 g lithium chloride (LiCl)</li> <li>15 g potassium chloride (CaCl<sub>2</sub>)</li> <li>27 g copper chloride (CaCl<sub>2</sub>)</li> <li>32 g strontium nitrate (Sr(NO<sub>3</sub>)<sub>2</sub>)</li> <li>14 g lithium nitrate (LiNO<sub>3</sub>)</li> <li>250 mL Erlenmeyer flasks</li> <li>Wooden splints</li> <li>Bunsen burners or small butane burners</li> <li>Burner striker</li> </ul>
3.5 weeks	<ul> <li>Compounds</li> <li>History of the Periodic Table</li> <li>Organization of the Periodic Table</li> <li>Identifying elements</li> <li>Periodic Trends</li> <li>Valence electrons</li> <li>Atomic radius</li> <li>Electronegativity</li> <li>Electron affinity</li> <li>Ionization energy</li> <li>Ionic Compounds</li> <li>Properties of ionic compounds</li> <li>Naming of ionic compounds</li> <li>Properties of molecular (covalent) compounds</li> <li>Naming molecular compounds</li> </ul>	<ul> <li>Organizing the Periodic Table</li> <li>Periodic Table Coloring</li> <li>Element Instagram Profile</li> <li>Battle of the Periodic Trends</li> <li>Ion Card Matching</li> <li>Electrical Conductivity Lab</li> <li>Electroplating Lab</li> <li>"Pass the Buck" Game</li> </ul>	<ul> <li>Sets of paint sample strips (free at hardware stores)</li> <li>Plastic zipper bags</li> <li>Colored pencils</li> <li>Computers</li> <li>700 Index Cards</li> <li>Markers</li> <li>Sticky notes (optional)</li> <li><u>Conductivity meters</u> (or make your own)</li> <li>Small beakers</li> <li>Distilled or deionized water</li> <li>Sand</li> <li>Solid copper (from Unit 1)</li> <li>Aluminum foil</li> <li>~10 g calcium chloride (CaCl<sub>2</sub>)</li> <li>Sports drink</li> <li>Salt (NaCl)</li> <li>Wax</li> <li>Copper sulfate (CuSO<sub>4</sub>)</li> <li>Sugar (sucrose)</li> <li>Ethanol or isopropyl alcohol</li> <li>9V batteries</li> <li>Insulated wires with alligator clips</li> <li>Copper wire</li> <li>Quarters</li> <li>Small whiteboards</li> <li>Erasable whiteboard markers</li> </ul>

Timing	Unit & Topics Covered	Labs and Activities	Materials Needed
2.5 weeks	<ul> <li>Bonding</li> <li>Types of Chemical Bonds</li> <li>Ionic bonding</li> <li>Covalent bonding</li> <li>Metallic bonding</li> <li>Multiple bonds &amp; bond length</li> <li>Molecular Models</li> <li>Models of bonding structures (Lewis, space- filling, ball-and-stick)</li> <li>Octet rule</li> <li>VSEPR &amp; molecular geometry</li> <li>Intermolecular Forces</li> <li>Bond polarity</li> <li>Types of IMFs (dispersion forces, dipole-dipole, hydrogen bonding)</li> </ul>	<ul> <li>Modeling Lewis Structures</li> <li>VSEPR Balloon Lab</li> <li>Paper Chromatography Lab</li> <li>Molecular Modeling Review</li> <li>Intermolecular Forces Lab</li> </ul>	<ul> <li>Cheerios<sup>™</sup> or Apple Jacks<sup>™</sup> (two different colors works best)</li> <li>Pretzel sticks</li> <li>Round balloons (colored and white)</li> <li>String or small rubber bands</li> <li>Paper chromatography strips or large filter paper</li> <li>Isopropyl alcohol</li> <li>Water</li> <li>Black permanent markers</li> <li>Black vis-à-vis water soluble markers</li> <li>Tape</li> <li>Beakers</li> <li>Rulers</li> <li>Scissors (optional)</li> <li>Ball-and-stick molecular modeling set (or use gumdrops and toothpicks)</li> <li>Droppers</li> <li>Pennies</li> <li>Aluminum foil</li> </ul>
2.5 weeks	<ul> <li>The Mole</li> <li>Molar Quantities</li> <li>Counting units</li> <li>Calculating molar mass</li> <li>One-step molar conversions</li> <li>Two-step molar conversions</li> <li>Composition of Compounds</li> <li>Calculating percent composition</li> <li>Empirical and molecular formulas</li> </ul>	<ul> <li>Relative Mass &amp; Counting Lab</li> <li>Finding Moles Lab</li> <li>Empirical Formula Lab</li> <li>Finding the Empirical Formula Demonstration</li> </ul>	<ul> <li>Large bag of Styrofoam peanuts (or any uncountable quantity of small objects)</li> <li>Film canisters</li> <li>Dried red beans</li> <li>Dried white beans</li> <li>Dried black beans</li> <li>Plastic zipper bags</li> <li>Electronic balances</li> <li>Solid copper &amp; aluminum samples (from Unit 1 supplies)</li> <li>Small birthday candles</li> <li>Long butane lighters or Bunsen burners</li> <li>Aluminum foil</li> <li>Metric rulers</li> <li>Sugar</li> <li>Weigh boats</li> <li>Table salt</li> <li>Chalk</li> <li>Baking soda</li> <li>Beakers</li> <li>Water</li> <li>Pennies (optional)</li> <li>Extra fine grade (0000) steel wool</li> </ul>

Timing	Unit 로 Topics Covered	Labs and Activities	Materials Needed
2.5 weeks	<ul> <li>Chemical Reactions</li> <li>Balancing Chemical Reactions</li> <li>Physical v. chemical changes</li> <li>Writing chemical equations</li> <li>Balancing chemical equations</li> <li>Types of Chemical Reactions</li> <li>Synthesis, decomposition, single-replacement, double-replacement, combustion reactions</li> <li>Predicting products from chemical reactions</li> </ul>	<ul> <li>Physical &amp; Chemical Changes Lab</li> <li>Modeling Chemical Reactions</li> <li>The Chemistry Prom Demonstration</li> <li>Types of Reactions Lab Stations</li> </ul>	<ul> <li>Scrap paper</li> <li>Magnets</li> <li>Iron filings</li> <li>Sulfur powder</li> <li>Baking soda</li> <li>6 M HCl</li> <li>Dropper bottles</li> <li>Test tubes with stoppers</li> <li>Scoopulas</li> <li>Beakers</li> <li>Calcium chloride (CaCl<sub>2</sub>)</li> <li>Aluminum foil</li> <li>Distilled water</li> <li>Stirring rods</li> <li>Test tube tongs</li> <li>Bunsen burner or small butane burner</li> <li>Sugar</li> <li>Atomic modeling (or colored candies such as Skittles<sup>™</sup>)</li> <li>Legos (optional)</li> <li>Mittens or thick gloves</li> <li>Magnesium (Mg) ribbon</li> <li>Wooden splints</li> <li>Barbecue lighter</li> <li>Bunsen burner or small butane burner</li> <li>Vatch glass</li> <li>Isopropyl alcohol</li> <li>Evaporating dish</li> <li>Ice</li> <li>Crucible tongs</li> <li>6 M NaOH solution</li> </ul>

Timing	Unit & Topics Covered	Labs and Activities	Materials Needed
3 weeks	<ul> <li>Stoichiometric Relationships</li> <li>Mole Ratios</li> <li>Mass-to-Mass Conversions</li> <li>Limiting Reactants</li> <li>Calculating limiting and excess reactants</li> <li>Chemical Equilibrium</li> <li>Reversible reactions</li> <li>Dynamic equilibrium</li> <li>Le Châtelier's Principle</li> </ul>	<ul> <li>S'more Stoichiometry</li> <li>Decomposition of Baking Soda Lab</li> <li>"Find the Error" Stoichiometry Stations</li> <li>Limiting Reactant Spoons Game</li> <li>Limiting Reactant Lab</li> <li>Equilibrium Straw Activity</li> <li>Factors Affecting Reactions Student- Led Lab</li> </ul>	<ul> <li>Graham crackers</li> <li>Large marshmallows</li> <li>Chocolate bars</li> <li>Plastic sandwich bags</li> <li>Bunsen burners or small butane lighters</li> <li>Wooden skewers</li> <li>Baking soda</li> <li>Electronic balances</li> <li>Heat-resistant test tubes</li> <li>Test tube tongs</li> <li>Scoopulas or spoons</li> <li>Test tube racks</li> <li>Wooden splints</li> <li>1 M HCl in dropper bottle</li> <li>Decks of playing cards</li> <li>Plastic spoons</li> <li>Magnesium (Mg) ribbon</li> <li>6 M HCl solution</li> <li>Graduated cylinders (preferably glass)</li> <li>Plastic drinking straws</li> <li>Small graduated cylinders (10 mL)</li> <li>Food coloring</li> <li>Alka-seltzer tablets</li> <li>Film canisters with lids</li> <li>Hot plates</li> <li>Beakers</li> <li>Ice</li> <li>Mortar and pestle (optional)</li> <li>Thermometers</li> <li>Vinegar</li> <li>Citric acid</li> </ul>

Timing	Unit 로 Topics Covered	Labs and Activities	Materials Needed
3 weeks	<ul> <li>Gas Laws</li> <li>Kinetic Molecular Theory</li> <li>Behavior of gases</li> <li>Pressure</li> <li>Effect of intermolecular forces on states of matter (viscosity, surface tension, capillary action)</li> <li>Phase changes &amp; heating curves</li> <li>Relationship between Gas</li> <li>Particles</li> <li>Simple gas law calculations (Charles', Boyle's, Gay- Lussac's)</li> <li>Combined Gas Law calculations</li> <li>Ideal Gas Law calculations</li> <li>Ideal gas stoichiometry</li> </ul>	<ul> <li>Gas Laws Phenomena Demonstration</li> <li>Viscosity Demonstration</li> <li>Gas Laws Virtual Exploration</li> <li>Gas Law Lab Stations</li> <li>"Build an Airbag" Ideal Gas Laws Lab</li> </ul>	<ul> <li>Perfume</li> <li>Large beaker (1000 mL)</li> <li>Scrap paper</li> <li>Clear plastic cup</li> <li>Balloons</li> <li>Clear 2L soda bottle with cap</li> <li>Matches</li> <li>3 disposable plastic water bottles</li> <li>Ice</li> <li>Thumbtack or nail</li> <li>Empty soda can</li> <li>Hot plate</li> <li>Beaker tongs</li> <li>Hard boiled egg</li> <li>250 mL Erlenmeyer flask</li> <li>Plastic straws</li> <li>Graduated cylinders</li> <li>Aluminum foil</li> <li>Cookie sheet or piece of cardboard</li> <li>Stopwatch (or phone)</li> <li>Small beakers</li> <li>Small plastic-coated paper clips</li> <li>Droppers</li> <li>Corn syrup</li> <li>Vegetable oil</li> <li>Dish soap</li> <li>Glass capped vials (or test tubes with stoppers)</li> <li>Thermometers</li> <li>Large plastic syringe</li> <li>Large marshmallow</li> <li>Ketchup packet</li> <li>Homemade lung model</li> <li>Baking soda</li> <li>Vinegar</li> <li>Balloons</li> <li>Electronic balances</li> <li>Small Erlenmeyer flasks</li> <li>String</li> <li>Graduated cylinders</li> <li>Weigh boats</li> <li>Metric Rulers</li> <li>Computers</li> </ul>