# Bow High School - Course Map

| **Course Title: Chemistry** |
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| **Department: Science** |

| **Unit Name: Intro to Chemistry** |
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| **Topics:**<br>• Safety<br>• Significant figures<br>• Data analysis and using Sheets and TUVA<br>• Dimensional analysis<br>• Scientific notation<br>• Lab equipment names and uses<br>• Measurement review (estimating last digit, using balance and graduated cylinder)<br>• Writing formal lab reports: Chem Is Try Lab<br>• Accuracy vs precision (error is not human error) |
| **School Competencies:**<br>• Logical Processing (Problem Solving & Analysis - Foundational)<br>• Scientific Experimental Design (Problem Solving & Analysis - Advanced) |
| **Course Competencies:**<br>• Scientific Process Skills<br>• Writing a Formal Lab Report |
| **Formative Assessments:**<br>• Daily Problems<br>• Equipment inventory<br>• Lighting a burner<br>• Intro to the lab lab<br>• Lemonade lab<br>• Sig fig lab<br>• Penny lab/data analysis<br>• Problem Sets |
| **Summative Assessments:**<br>• Summative<br>• Chem is Try Formal Lab |

# Bow High School - Course Map

**Unit Name: Water**

**Topics:**

- Ionic bonding
- Solubility graph: reading and using as well as how they are made
- Solubility as a concept:  solutions, solvent and solute (saturated, un and supersaturated)
- How to make particle diagrams
- Dissolving: like dissolves like; drawing particle diagrams of salts in water
- Water wells and water quality
- Arsenic, lead, uranium and other contaminants

**School Competencies:**

- Logical Processing (Problem Solving & Analysis - Foundational)
- Scientific Experimental Design (Problem Solving & Analysis - Advanced)

**Course Competencies:**

- Cause and Effect
- Stability and Change
- Science Process Skills

**Formative Assessments:**

- Daily problems
- Solubility races labette
- Water testing collection and analysis of results
- Water filtration labette
- Distillation demonstration
- Paper chromatography labette
- Column Chromatography  labette
- Borax crystals labette
- POGIL: Ionic naming
- Online activities
- Balancing equations

**Summative Assessments:**

- Summative
- Honors: Independent bioassay on effects of arsenic in water

# Bow High School - Course Map

| **Unit Name: Chemical Careers** |
| --- |
| **Topics:**<br>● College or after HS exploration<br>● Funding post secondary education and cost-benefit analysis<br>● Critical review of college choices (using Naviance)<br>● Research a career of choice: day in the life and chemistry involved |
| **School Competencies:**<br>● Logical Processing (Problem Solving & Analysis - Foundational)<br>● Scientific Experimental Design (Problem Solving & Analysis - Advanced) |
| **Course Competencies:**<br>● Chemistry Careers |
| **Formative Assessments:**<br>● Interview of 3 adults about career choices<br>● College research and report |
| **Summative Assessments:**<br>● Research paper<br>● College Review |

# Bow High School - Course Map

| **Unit Name: Chemical Reactions** |
|---|
| **Topics:**<br>● Chemical/physical change<br>● Types of reactions review and add precipitation reactions<br>● ID of unknowns: reactivity, solubility, flame tests<br>● Stoichiometry<br>● Limiting reactants |
| **School Competencies:**<br>● Logical Processing (Problem Solving & Analysis - Foundational)<br>● Scientific Experimental Design (Problem Solving & Analysis - Advanced) |
| **Course Competencies:**<br>● Structure and Function<br>● Energy and Matter<br>● Writing  Formal Lab Reports<br>● Cause and Effect<br>● Science Process Skills |
| **Formative Assessments:**<br>● Chalk lab<br>● Balloon lab<br>● Precipitation Reactions lab (simulated and real) |
| **Summative Assessments:**<br>● summative<br>● Formal lab report on reactions lab scale up<br>● Midterm unknown ID lab |

# Bow High School - Course Map

| **Unit Name: Origin of the Elements** |
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| **Topics:**<br>● Chemical elements are universal<br>● Elements were first formed in big bang<br>● As the universe expanded more and larger elements were formed |
| **School Competencies:**<br>● Logical Processing (Problem Solving & Analysis - Foundational)<br>● Scientific Experimental Design (Problem Solving & Analysis - Advanced) |
| **Course Competencies:**<br>● Structure and Function<br>● Energy and Matter<br>● Writing  Formal Lab Reports<br>● Cause and Effect |
| **Formative Assessments:**<br>● 3 worksheets on origin of the elements and the periodic table |
| **Summative Assessments:**<br>● Project |

# Bow High School - Course Map

**Unit Name: Atomic Theory and Periodic Table**

**Topics:**

- History of atomic theory
- Intro to quantum mechanics
- Probability model of the atom
- Electron configuration
- Development of periodic table
- Different types of periodic table
- Trends of the periodic table: mass, val. Electrons, radius, electronegativity, boiling and melting points, metals and nonmetals

**School Competencies:**

- Logical Processing (Problem Solving & Analysis - Foundational)
- Scientific Experimental Design (Problem Solving & Analysis - Advanced)

**Course Competencies:**

- Patterns
- Scale, Proportion and Quantity

**Formative Assessments:**

- Daily problems
- Electron config model building
- Pattern tiles
- Rutherford's gold foil expt simulation
- Spectra of gases lab
- POGIL: electron config

**Summative Assessments:**

- Summative
- Atomic HistoryTimeline

# Bow High School - Course Map

| **Unit Name: Acids and Bases** |
| --- |
| **Topics:**<br>● Definitions (Arrhenius, Bronsted-Lowry and Lewis)<br>● Net ionic equations<br>● Equilibrium and K (introduced for honors)<br>● Strength<br>● Concentration<br>● Acid/base neutralization reactions<br>● Titrations |
| **School Competencies:**<br>● Logical Processing (Problem Solving & Analysis - Foundational)<br>● Scientific Experimental Design (Problem Solving & Analysis - Advanced) |
| **Course Competencies:**<br>● Energy and Matter<br>● Structure and Function<br>● Writing Formal Lab Reports<br>● Science Process Skills |
| **Formative Assessments:**<br>● Daily problems<br>● intro to acids and bases labette<br>● Indicators labette<br>● Titration labette |
| **Summative Assessments:**<br>● Summative<br>● Titration of an Antacid Formal Lab |

# Bow High School - Course Map

| **Unit Name: Organic Chemistry** |
| --- |
| **Topics:**<br>● Covalent bonding and covalent compounds<br>● Hydrocarbons:  alkanes, alkenes, alkynes<br>● Polymers<br>● Addition and condensation to form polymers<br>● Types of plastics |
| **School Competencies:**<br>● Logical Processing (Problem Solving & Analysis - Foundational)<br>● Scientific Experimental Design (Problem Solving & Analysis - Advanced) |
| **Course Competencies:**<br>● Structure and Function<br>● Systems and System Models<br>● Science Process Skills<br>● Writing a Formal Lab Report |
| **Formative Assessments:**<br>● Daily Problems<br>● Modeling polymers activity<br>● Making slime labette<br>● Esters lab<br>● Types of plastic lab, including ID of unknown |
| **Summative Assessments:**<br>● Plastic Lab (ID of unknown plastic)  have not done these since before covid<br>● Summative Exam |